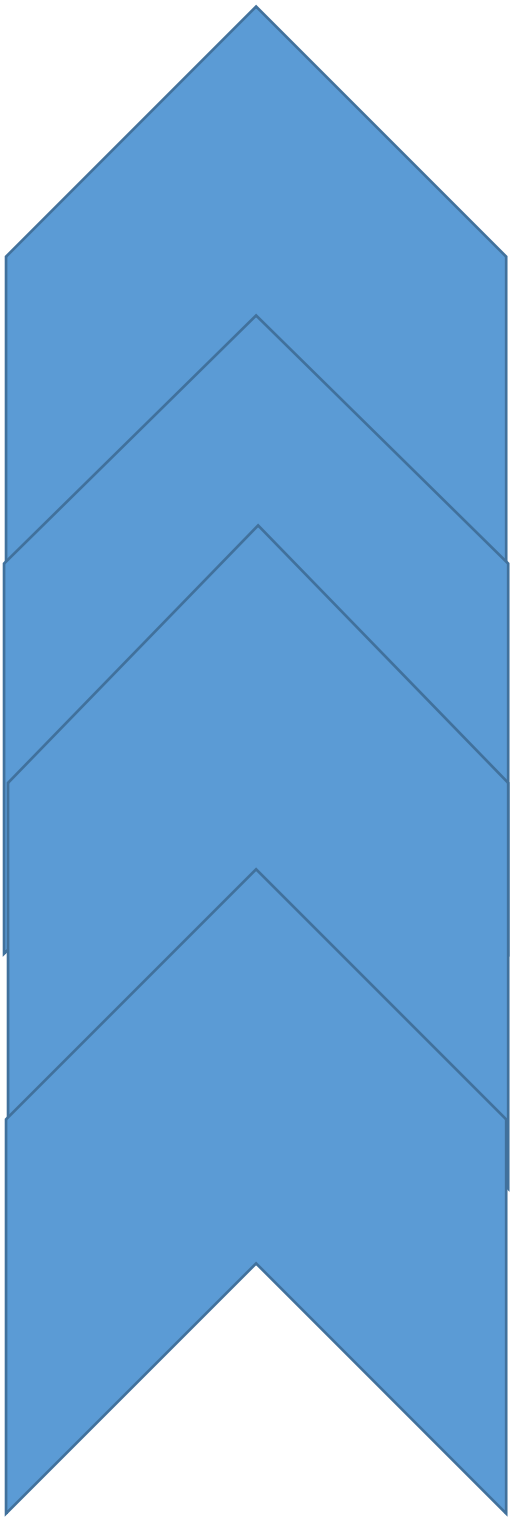
KING FAISAL UNIVERSITY
COLLEGE OF MEDICINE



CONSULTATION SKILLS

FOURTH YEAR

Students MANUAL

AY 2021-2022

Student manual on consultation skills

Academic year 2021-2022

Contents

Specific and general history-taking and review of systems

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Your training: Objectives, programme overview and relationships

1. Training objective: Learning to conduct a consultation

1.1 Year 4 and Consultation

The central theme of year YEAR4 is the consultation. The ***training objective*** is to make students competent in this core physician's task: conducting a consultation and responding to patients' medical queries and complaints. In other words: listening to the patient and asking questions, diagnostic reasoning, conducting further investigations, drawing conclusions, treating the patient, and reporting on these activities.
As a student, you will need to familiarize yourself with the consultation. The tutors will help you, but you will learn most from actual practical situations, from your own experience and by practising. The tutors' role is mainly one of facilitating and providing support; we cannot 'make' you competent. Another source of learning is the feedback from simulation patients and real patients, tutors, and fellow students.
The consultation is a place where competences come together. The physician must be able to communicate (I) in order to solve the problem (II). He/she must have the scientific knowledge (III) to understand the problem to be solved. He/she must be able to examine (IV) and treat (V) the patient. And he/she will only be able to do so properly if he/she can place the patient's problem in their own social context (VI). The physician must also be able to review his/her own performance in order to be able to continue to improve himself/herself and deal with ethical and other conflicts (VII).

1.2 Consultation competence in context: Different types of complexities

Consultation competence is a qualitative assessment: a physician is either competent or not, and an incompetent physician is a bad physician. No one is competent to the same degree all the time or in all situations. Consultation competence is always context-specific: what works for one patient and goes well for you may not work for the next patient, or in a different situation or context. Your level of competence will therefore differ depending on the **complexity** of the consultation.

In the Consultation module we distinguish between five types (or forms) of complexity. These five types are:

a. **Medical complexity**. The level of knowledge you will need differs from one consultation to the next. One medical puzzle will be more complex than another.
b. **Contact complexity**, or communicative complexity. This concerns the relationship and interaction between physician and patient and how the physician is able to communicate. Conversations with some patients are a lot more difficult or, on the contrary, easier than with others. There can be many different causes for this, including the 'match' between physician and patient.
c. **Situational complexity**. This is the situation in which the consultation takes place, in terms of location (room, set-up) and time (speed, workload). If everything is properly organized and there are no time constraints or distractions, the consultation will be very different from and less complex than a consultation conducted under time pressure in an improvised surgery with a lot of activity going on outside. Or, to give you an example that you can relate to as a student: a consultation at the department where you have lots of time for preparation, execution and elaboration will be less complex than the consultation test.
d. **Impact complexity**. This relates to how serious the problem is (life/death or cosmetic), and what effect it has on you.
e. **Professional complexity** (ethical issues, etc.).

It is 'easier' to conduct an effective consultation with a reasonably intelligent 30-year-old with an straightforward health issue in a quiet surgery than with an intellectually challenged 75-year-old with a speech defect and a series of concerns and vague complaints asking for euthanasia, as your surgery is overrunning its schedule with a waiting room full of mothers with crying children. We therefore distinguish these types of complexity and assume that everyone has an intuitive idea of a 'degree of complexity' or complexity level.
For the sake of simplicity, let us distinguish five levels (degrees) of complexity: 1 (simple) to 5 (extremely complex). This therefore applies to all five types or dimensions of complexity.

For example: Medical complexity level 1 to 5. Contact complexity (Cxt-c) level 1 to 5, etc.

Everyone should be able to intuitively put a number on the levels of *all* complexity dimensions in *all* consultations. When someone says he/she finds a particular situation complex, the question will usually be whether he/she is actually talking about the *situation* or about his/her own *competence*. We often tend to view a *shortcoming in our own competence* as a *characteristic of the situation*. In the differentiation applied here, this is **incorrect**: a consultation is complex on a level of 1 to 5, and the 'difficulty' perceived by the physician is an indication of his/her competence.
If a student finds that a consultation was 'too difficult', in the terminology introduced here, the student is really saying that 'the complexity level was too high in relation to my competence level'.

1.3 Consultation competence as a phased student project

It is impossible to become competent all at once. During your first work placement you will feel very inexperienced and not very competent. This will already be different in the second work placement, not to mention the third and fourth! You gain experience, you study, you learn, so your competence will increase – even in increasingly complex consultation situations.
During year YEAR4, your consultation competence should at least reach a satisfactory (Pass) level in all types of level-3 complexity. We describe this as the 'learning outcome' for YEAR4. This competence will increase further in years M2 and M3.

It is likely that your development in this year of your training will take place in phases. The *individual* phasing is different for each student and will therefore not necessarily run in parallel with the training. It is quite normal for a student to be very insecure initially, while it is also quite normal for students to lose their insecurity in most situations except some very specific ones.
Each student's development will be different. But you can also learn from your own development in many ways, and you will be required to keep track of this development in the consultation logbook.

1.4 Consultation competence and complexity: Relationship

Chapter 1 of (Medical consultations) states that the quality of the consultation mainly depends on **keeping the consultation structured** and **maintaining/developing contact** with the patient.
We assume that these aspects will be the first 'victims' if the complexity becomes too much for the student. This manifests itself in the student losing sight of the structure of the consultation and becoming chaotic (or indeed rigid), or in the student losing contact with the patient and getting completely wrapped up in his/her own thoughts on the case.
This seems to be indicative of competence: loss of structure and/or loss of contact in the consultation is an indication or symptom of inadequate competence (in one or more forms of complexity), while the ability to maintain structure and contact is an indication of adequate competence.

Student manual on consultations

Academic year 2021-2022

The consultation: refresher of the model consultation

PS session

- Hand hygiene and basic percussion and auscultation skills/ Lung examination
- Examination of peripheral arteries, oedema and CVP measurement

& Heart examination and blood pressure check,

- Abdominal examination
- Clinical chemical analysis

Large Group sessions;

- **Pharmacology**
- **Lab . results interpretation**

Ci session

- history taking Cardiovascular problems
- The strategy discussion for treatment heart problem
- history taking lung problems
- strategy discussion to treat lung problem

PS session: Hand hygiene and basic percussion and auscultation skills/ lung examination

Size of group
9-12 students

Duration
1 hours

Objective
You will know which requirements hospital staff are subject to in terms of hand and personal hygiene. You will know how to conduct the basic skills of percussion and auscultation. You will have practised using hand hygiene and applying the basic skills of percussion and auscultation. You will have shown the tutor that you have learned the basics of percussion and auscultation skills, as well as hand hygiene.
You will know the role of communication during physical examinations and you will be able to use it in a suitable manner.

Student's tasks
Preparation: Study the study material.
Students are assumed to be familiar with the knowledge acquired during the Bachelor's phase.
Prepare for the Socratic questioning by verifying the percussion sound produced by the following organs / body parts:

- Lungs
- Heart
- Liver
- Stomach
- Spleen
- Abdomen

What could be the aim of percussion when:

- determining the lung borders;
- performing abdomen percussion;
- determining the borders of an organ;
- performing percussion of the lungs, liver, spleen?

At the session:
You will participate in the Socratic questioning, use hand hygiene and practise percussion and auscultation on fellow students. As of this session you will also need to think about communication with the patient during physical examinations!

Study material (study it carefully before the PS session!)
Read appendices 1 to 4 of the theory.
Read about anatomy, position of the heart, lungs, liver and diaphragm.
Watch three film clips about hand hygiene.
'Macleod's clinical examination and accompanying film clips.

Learning aids to be brought to the class by the student
Stethoscope.

Quality/assessment criteria
For each physical examination, the knowledge and application of correct hand hygiene will be assessed. For each physical examination that involves percussion and auscultation, the assessment will also cover the techniques of these skills.

Appendices

1. Theory and practice of hand and personal hygiene at the hospital
2. Theory and practice of percussion and auscultation (stethoscope)
3. Assignments to train basic skills
4. Communication and the physical examination

5. Checklist on communication during physical examination

Theory and practice of personal and hand hygiene at the hospital

Introduction

A study from 2012 showed that compliance with hand hygiene guidelines by care providers in Dutch hospitals, including medical students, was poor. On average, hands are only washed or disinfected once every five times when this is required. The worst scores were awarded to teaching hospitals in this study.

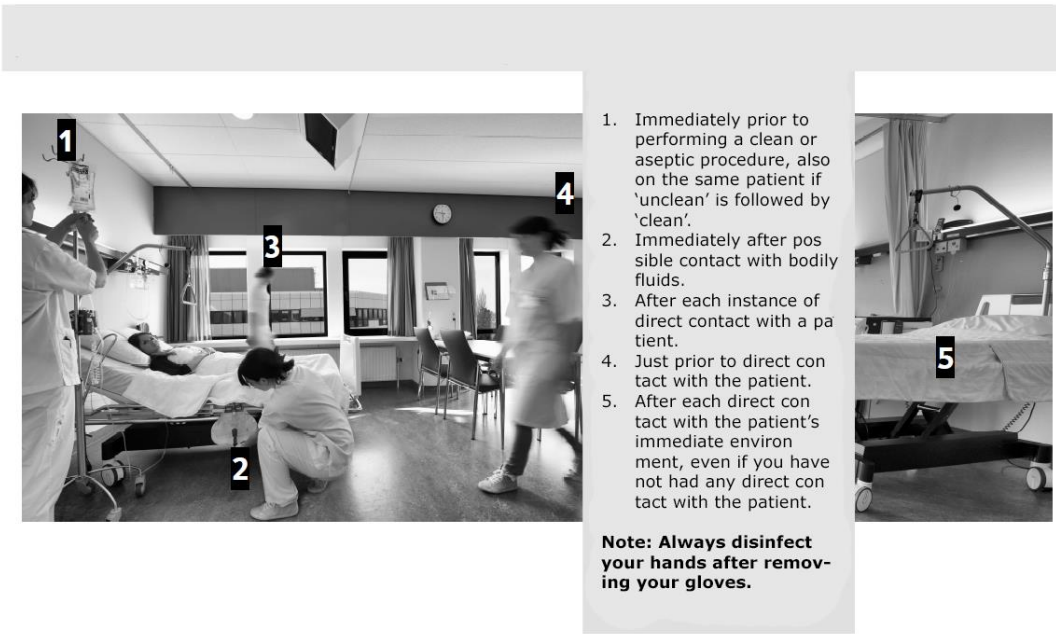
Healthcare-associated infections (HAIs) are a common type of care-related damage. In the Netherlands, 7% of admitted patients get an HAI (with a prevalence of up to 30% in ICUs). Internationally it is assumed that 15 to 30% of HAIs can be avoided through better hand hygiene. Proper hand hygiene is therefore considered the most important measure to prevent infections (by reducing the transfer of micro-organisms from staff to patients). In the Netherlands this can result in the prevention of 18,000 to 36,000 HAIs per year.

This manual sets out the infection prevention guidelines relating to personal and hand hygiene for hospital staff. There are separate guidelines and instructions for infection prevention in connection with surgical procedures. These will be addressed during the junior Surgery clerkship.

The five moments when hand hygiene is required:

1. Immediately before conducting clean or aseptic procedures, even on the same patient if working from ‘unclean’ to ‘clean’
2. Immediately after possible contact with bodily fluids:
    a. If not wearing gloves: apply hand hygiene immediately
    b. If wearing gloves: apply hand hygiene immediately after removing gloves
3. After each direct contact with a patient: when you leave the patient and after removing your gloves
4. Just prior to direct contact with the patient (including a handshake), unless you have used hand hygiene after the previous patient and you are certain that you have not been in contact with the patient’s environment (including door handles etc.)
5. After each direct contact with the patient’s immediate environment (e.g. personal items or bed), even if you have not had any direct contact with the patient himself/herself or if you were wearing gloves

Figure 1. The five moments of hand hygiene



Hand hygiene consists of:

1. *Hand cleaning*: removing dirt and part of the flora that is temporarily present on the hands, using water and soap, or
2. *Hand disinfection*: quickly reducing flora that is temporarily and permanently present on the hands, using hand alcohol, which has a higher reduction factor than hand cleaning.

If necessary, hand cleaning or disinfection is followed by *3. Hand care*: use of hand cream to prevent dehydration, irritation or chapping of the hands.

Wrist watches, bracelets and hand jewellery stand in the way of proper hand hygiene. The same applies to wearing long sleeves. Nails must be kept short and wearing nail varnish or false nails is not permitted.

Table 1 sets out the other **personal hygiene** requirements imposed on staff.

Table 1. Personal hygiene for hospital staff

Hands	
Nails	- Nails are clean and kept short. - Nail varnish and false nails are not permitted.
Jewellery	- During work and when wearing workwear, wrist watches and hand and wrist jewellery cannot be worn.
Minor wounds	- Minor open wounds or skin lesions on the hands must be covered with a moisture-resistant plaster.
Clothing	
Workwear	*Workwear must be worn by anyone performing patient-related duties or activities involving patient material.* - Workwear leaves the lower arms uncovered. - Workwear covers one's own clothing at least down to knee level. - No personal clothing may be worn over workwear. - Workwear must be changed on a daily basis. - Visibly dirty clothing must be immediately replaced with clean clothes.
Other	
Hair	Hair must be clean and long hair must be worn up or tied together.
Beards and moustaches	Beards and moustaches must be well-groomed and kept short.
Handkerchiefs	- Paper hand towels must be used when working. - Handtowels must be discarded immediately after use and the hands must be cleaned with water and soap.
Shoes	- Shoes and clogs must be made of material that can be easily cleaned. - They must be cleaned when they are visibly dirty.
Headscarves	- Headscarves must be worn in such a way as to prevent contact with the patient or patient material during the performance of work. - Headscarves must be replaced by a clean one every day. - Headscarves must be washed at a temperature of at least 60°C.
Food and drink	- In areas where patients are cared for and treated or patient material is used, no eating or drinking is permitted.

Hand disinfection using hand alcohol

Indication:
Hands which are not visibly dirty. Reasons for disinfection are:

- Hand alcohol causes a greater reduction of the flora present (pathogen reduction) than hand cleaning and is therefore preferable if the hands are not visibly dirty.
- Hand disinfection is less aggressive to the hands than hand cleaning.
- Hand disinfection can be easily done at the location where the patient is cared for and is not dependent on the presence of a wash basin, so it also saves time.

Hand alcohol does not have a cleaning effect, however, and can therefore only be used on hands which are not visibly dirty.
Contact with patients with unexplained diarrhoea or patients infected or colonized with one of the micro-organisms listed below form an exception. See hand cleaning.

a. *Clostridium difficile*
b. Adeno-, entero-, noro-, parecho- or rhinoviruses;
c. Hepatitis A or E
d. Parvo B19

Execution:
See also Figure 2.

Hand alcohol is supplied by means of fixed dispensers fitted with elbow operation or touchless control, to prevent contamination.

- Apply hand alcohol to dry hands from a dispenser with elbow operation, avoiding contact with the dispenser's nozzle.
- Fill the hollow of one hand; this amount is sufficient to keep your hands moist during the time it takes the hand alcohol to reach its maximum effectiveness (approx. 30 seconds).
- Now rub the hands against one another carefully for approx. 30 seconds, until they are dry; make sure the fingertips, thumbs, areas between the fingers, and wrists are rubbed properly as well (see Figure 2).
- If you do not allow the hands to dry properly, the disinfection will be less effective; moreover, there will be a risk of skin irritation when using gloves afterwards.

Certain parts of the hands are often overlooked: fingertips, thumbs, wrists and the areas between the fingers.

Hand cleaning with water and soap:
Indications:

1. In case of visible dirt and if the hands feel sticky
2. After going to the toilet
3. After blowing your nose, coughing or sneezing
4. After contact with patients with unexplained diarrhoea or patients infected or colonized with one of the micro-organisms listed above

Execution:
Also see Figure 2.

Liquid soap is supplied via a dispenser suitable for this purpose (see hand disinfection). The use of disinfecting soap to achieve hand disinfection does not offer any added value in terms of normal hand hygiene.

- The tap is opened automatically or is elbow- or foot-operated.
- Wet your hands with water from a fast-flowing tap.
- Apply a layer of soap from the dispenser to your hands, avoiding contact with the nozzle.
- Rub the soap in thoroughly for 10 seconds, and do not forget the fingertips, thumbs, areas between the fingers and wrists (see Figure 2).
- Rinse properly with running water.
- Dry with a disposable towel, including the wrists and skin between the fingers.

The use of an *electrical hand dryer* to dry your hands is *inadvisable*. This is because drying your hands in this way takes too long and mechanical removal of micro-organisms (by means of the towel) does not happen in this case. Moreover, the skin will de dehydrated, which is an unnecessary additional burden on the skin.
After having been washed with water and soap the hands should not be disinfected, because double hand hygiene is too hard on the hands. In addition, the moisture remaining on the hands will dilute the alcohol concentration, so that the disinfectant becomes ineffective.

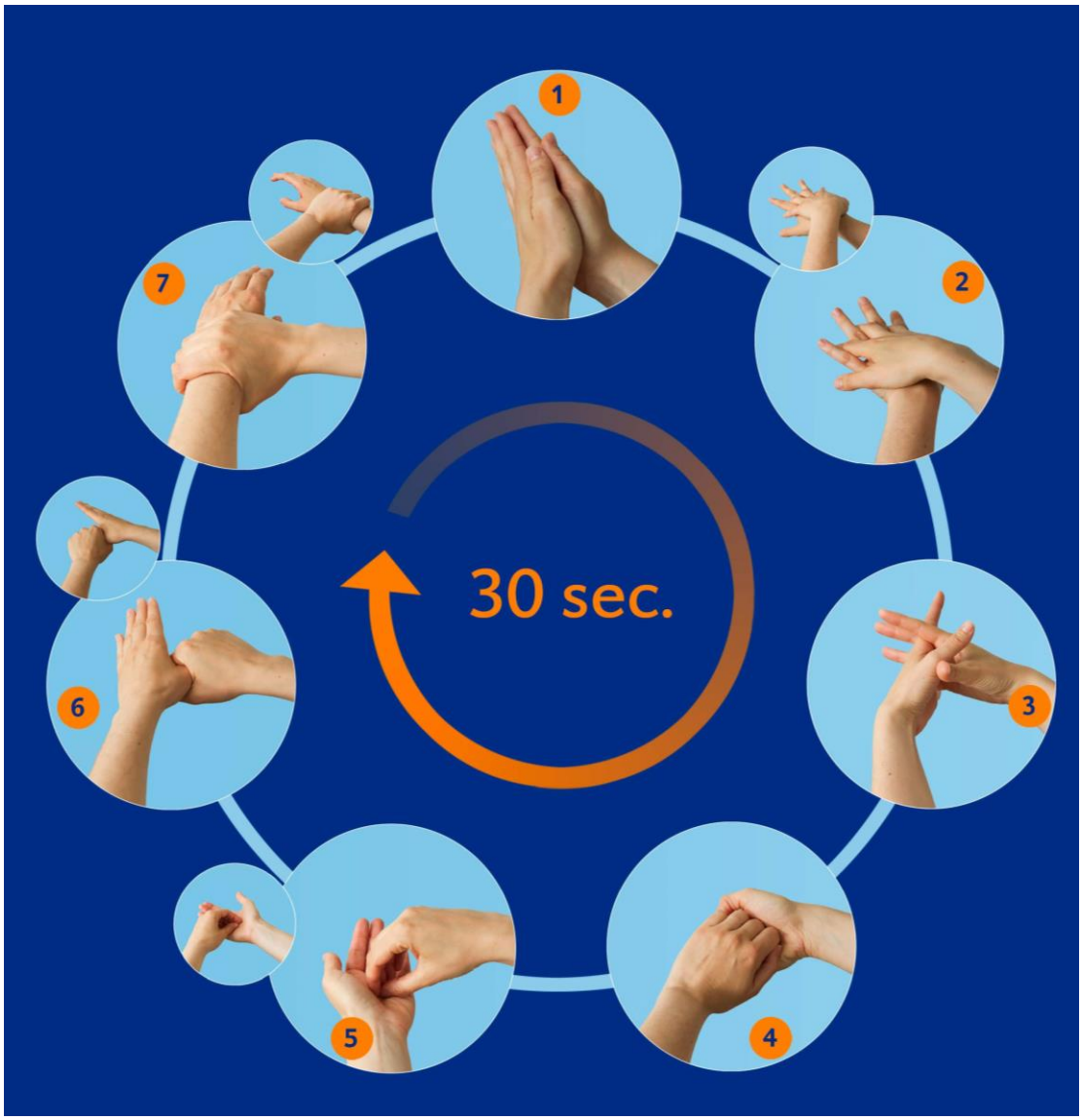
Hand care
The indication for using hand care after hand disinfection or cleaning is to avoid dehydration and irritation of the skin. Moisturizing cream is supplied in tubes for personal use (no jars) or in dispensers with disposable containers. The nozzle of the dispenser or the tube opening should not be touched, as it can become contaminated.

Gloves and hand hygiene
Wearing gloves is not an alternative to hand hygiene. Hand hygiene remains necessary based on the indications mentioned, even if gloves are used. Gloves must be removed after each task and hand hygiene must be applied (hands can become contaminated when gloves are removed). Figure 3 shows how to take off your gloves. Gloves must not come into contact with items outside the patient zone, such as telephones, door handles, keyboards, patient files, writing utensils, etc.

Stethoscope
The stethoscope must be disinfected after each patient contact to prevent possible spreading of micro-organisms. Hand alcohol is not suitable for this purpose, as it contains moisturizing ingredients which are not suitable for disinfection of materials. Alcohol 70% should always be used for this, unless the stethoscope manufacturer advises otherwise.
Patient-specific use of stethoscopes is recommended where possible.

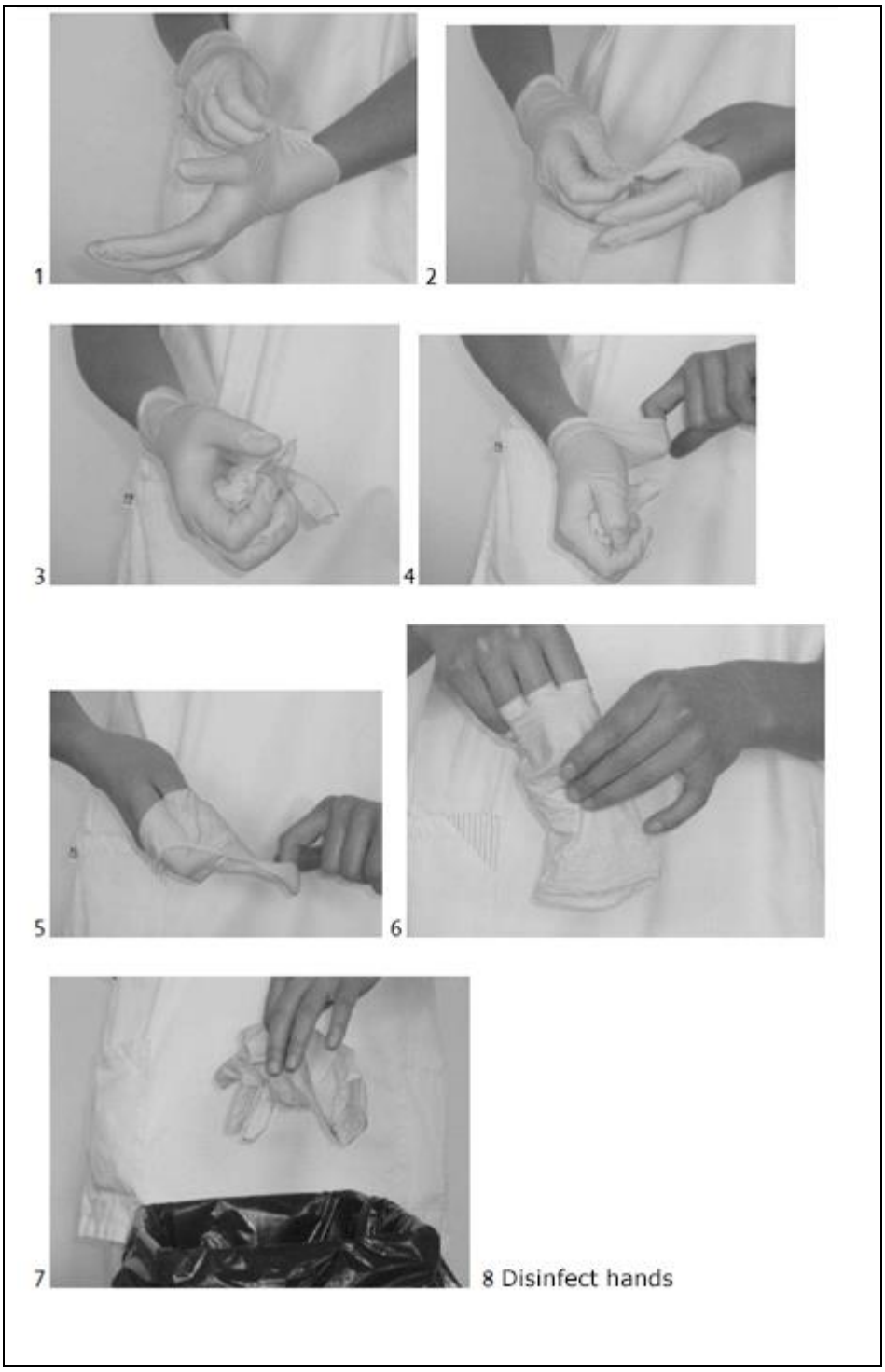
Smartphones
The UMCG has not issued a specific recommendation on the use of smartphones. The reasons for this are as follows. If staff adhere fully to the hand hygiene guideline, additional advice will not be necessary. Staff must disinfect their hands before touching a patient. The same applies after contact with the patient or his/her immediate surroundings. This means that smartphones should not become contaminated with micro-organisms from patients. If micro-organisms were present on a smartphone, this should not be a problem as the member of staff will disinfect his/her hands before any patient contact.

Figure 2. Technique for hand disinfection and hand cleaning



1. Rub the palms of your hands against one another. Don't forget your wrists!
2. Rub the palm of your right hand against the back of your left, and vice versa.
3. Rub the palms of your hands against one another with your spread fingers intertwined.
4. Rub the outside of your fingers in the palm of the other hand, and vice versa.
5. Keep your fingers together and twist them in the palm of your other hand. Do this for both hands.
6. Twist the thumb of your one hand in your closed other hand. Do this for both hands.
7. Twist the wrist of your one hand in your closed other hand. Do this for both hands.

Figure 3. Technique for removing used gloves



This information is based on the infection prevention guidelines ‘Basishygiëne - Persoonlijke Hygiëne medewerkers’ (Basic hygiene - Personal hygiene for staff) and ‘Basishygiëne - Handhygiëne medewerkers’ (Basic hygiene - Hand hygiene for staff) of the UMCG’s Medical Microbiology Department, Infection Prevention section (dated May 2013).
These guidelines can be regarded as the professional standard.

Theory and practice of percussion and auscultation

The basic skills of the physical examination comprise the following:

- Inspection
- Palpation
- Percussion
- Auscultation

The theory and practice of percussion and auscultation will be addressed in more detail in this appendix.

Percussion sounds
When performing percussion, the following main sounds can be distinguished:

- **Sonorous** percussion sound: the resonating deep (low-frequency) percussion sound you hear over large spaces filled with air, such as the lungs.
- **Tympanic** percussion sound: a sound with more high-frequency tones, heard over relatively smaller organs filled with air.
- **Dull** percussion sound: a sound with little resonance, audible over solid organs.
- **Hypersonorous** percussion sound: a highly resonating sound you can hear in case of increased air retention of the lungs.

Execution of percussion
If a right-handed person performs percussion, he/she will tap the second or third finger of the right hand on the second or third finger of the left hand. The second or third finger of the right hand is the percussing finger in this case, while the second or third finger of the left hand acts as plessimeter. The percussion is performed by tapping the percussing finger on the distal interphalangeal joint of the plessimeter finger, using a movement originating from the wrist. You will tap with the tip of your finger, which can only be done if your fingernails are kept very short. It is important that the plessimeter finger is well-connected to the layer beneath and that it does not touch the other fingers. This means that you must keep the fingers of the plessimeter hand spread apart slightly. During percussion you must keep the plessimeter finger perpendicular to the direction in which you percuss (when this direction is top-down, you must keep your plessimeter finger horizontal, in other words). You should be able to hear the percussion sound well, but if you tap too strongly, the borders will become less clear. If you want to determine the borders between two organs which each generate a different percussion sound, you must start well before the expected border and go well beyond it with your percussion as well, in fairly large increments. The transition between the percussion sounds is sometimes gradual and cannot always be defined precisely. If you percuss well beyond the border, you will be able to hear the whole range of sounds properly. Once you have roughly localized the border, you will try to define it more precisely by percussing around the border in small steps.
During the training you will practise the percussion yourself by determining the liver border, because you will hear three different percussion sounds in this way.

Defining the **liver borders using percussion***
The upper border of the liver should be in the fourth to sixth intercostal space on the right. The patient (a fellow student) must undress his/her upper body, fully exposing the thorax (female patients need to take off their bra to enable proper percussion). The abdomen must also be bare to just below the waist (trousers or skirt may be kept on, but must be lowered somewhat). You have used hand hygiene, removed any jewellery and your hands are warm. The patient must lie down on his/her back on the examination table.
When determining the lung-liver border, you will start with percussion of the right hemithorax, well above the expected upper border. This is roughly the transition between the breast tissue and the thoracic wall. Normally you will percuss above the lung and therefore hear a sonorous percussion sound.
You will percuss downwards, in a line that is perpendicular to the centre of the clavicle (this line usually runs just medially of the areola mammae). Patients are often uncomfortable when a nipple is touched, so you should avoid this. Space your percussions about 5 cm apart. When percussing above the liver, you will hear dullness. Once you have reached the border, start percussing more accurately by spacing percussions closer together.

To define the lower border, start percussing well below the costal arch. Once again, percuss on the line that is perpendicular to the centre of the clavicle. Percuss upwards, in the same way as described for determining the upper border. Here, too, the liver will generate dullness on percussion.

Theory on percussion sounds of various organs and of the lung borders

- The **lung** is an organ filled with air and will therefore generate a sonorous percussion sound.
- Through percussion of the lungs you can determine whether the lung's air retention is abnormal. If there are infection infiltrates, air retention may be reduced (you will hear dullness), like with tumours, whereas in case of a pneumothorax or emphysema air retention will be increased (leading to a hypersonorous percussion sound).
- By defining the lung border you can determine whether the lung border is lower or higher than usual, or whether its position is normal (this will be addressed further when lung examination is discussed). A low lower border can be found could be an indication of e.g. asthma exacerbation, and a higher border of diaphragm paralysis.
- Percussion can also be used to determine the mobility of the lung border. Normally, the lung border will move on inspiration and expiration, but as people get older it will become less mobile. Emphysema may also reduce the mobility of the lung border.
- The **heart** is a hollow organ, but because it is filled with blood and never with air, it sounds like a solid organ on percussion, i.e. you will hear dullness.
- The **liver** is a solid organ, which is why you will hear dullness on percussion.
- The **stomach** is a hollow organ with an elastic wall, and will therefore generate a tympanic percussion sound. The sound heard will depend on the extent to which the stomach is full, however.
- The spleen is a solid organ, so you will hear dullness on percussion.
- When percussing the **abdomen** you can come across various percussion sounds. If the liver or spleen is enlarged and if the bladder is very full, you will hear dullness, which will also be the case if there is free fluid in the abdominal cavity (ascites).
- The most important organ that is percussed in case of a normal abdomen is the intestine. This is a hollow organ with an elastic wall, which therefore generates a tympanic percussion sound. The intestine is not entirely empty, however, but contains food bolus and intestinal content in certain places. In these areas you will hear more dullness on percussion. When percussing a normal abdomen the term **'varying tympany'** is therefore used.

- By determining the borders you can determine the **size of an organ**. This will also reveal an abnormal size, therefore. Be aware of the fact that percussion of organ borders is only possible for a limited number of organs (e.g. not for the kidneys) or may be unreliable (for the heart, for instance).
- By performing percussion of the abdomen, you can establish whether any organs are enlarged (liver, spleen), whether there are any **tumours** (which cause dullness as well), and whether the patient has **ascites**. In case of ascites you will hear dullness in the flank that moves when the patient turns to one side. Because the fluid can move between the bowels, the border between dullness and tympany will be closer to the navel on the side the patient is lying on, while the dullness in the other flank will have decreased.
- In addition to the purposes described above, percussion of the abdomen can also be done to **localize pain** in the abdomen. Palpation of the abdomen can be very painful. You can carefully explore this possibility through percussion.

***** Also refer to the book Macleod's clinical examination and the corresponding film clips.

Auscultation, the stethoscope
When performing auscultation, you will use a stethoscope. The stethoscope consists of a headset, a tube connection and a chestpiece.

- The headset: To enable proper sound transmission, the two ends of the headset are at an angle from one another, pointing forward, so that they are in line with the auditory canals during the auscultation. The eartips must seal off the auditory canals completely during the auscultation. To this end the headset must exert sufficient tension to prevent external sound leakage while avoiding uncomfortable pressure.
- The tube connection: The tube connection must be short (not longer than 30 cm) to avoid sound loss. Because of this length restriction, almost all single-tube stethoscopes must be shortened. Use of single-tube stethoscopes is strongly discouraged, by the way (see further down).
- The chestpiece: The chestpiece of a stethoscope usually consists of two parts, i.e. the bell and the diaphragm. If the bell rests loosely on the skin, it will be mainly used to hear mid- and low-frequency sounds. If the bell is pressed onto the skin, the skin will tighten and start acting as a diaphragm. The diaphragm is mainly used to hear mid- and high-frequency sounds. It appears from the literature that across the entire frequency range that can be heard using the stethoscope, the bell is a better sound conductor than the diaphragm. The effect of the diaphragm is to mask low frequencies so that you can concentrate better on the high frequencies. As soon as the sound intensity decreases, the auditory threshold of the human ear for low-frequency sounds drops more quickly than for high-frequency sounds. As the diaphragm weakens the sound intensity across the entire frequency range, the higher frequencies can be heard better, relatively speaking.

Various kinds of stethoscopes from various brands are available on the market. There are different types of tube connections and chestpiece types.

(1) Single tube, double chestpiece
By turning over the chestpiece you can choose between the bell and the diaphragm.

(2) Double tube, double chestpiece
This stethoscope has two tubes, or a single tube with a partition inside. Thanks to the double tube, high-frequency sounds in particular can be heard better than through a single tube. The bell on this type of stethoscope is superior to that of the single-tube type. This is by far the best stethoscope.

(3) Double tube, multi-chestpiece
The multi-chestpiece stethoscope has a chestpiece system which combines the bell and the membrane, so that it does not need to be turned. By exerting less or more pressure, the desired position can be chosen. This system does not perform well for higher frequencies.

We recommend that you choose a good stethoscope straight away, i.e. type (2). Double-tube / double-chestpiece stethoscopes of the brands Littmann and Spirit are recommended. Also refer to the reading list.

Execution of auscultation
Auscultations are best performed in a low-noise area that is adequately heated. The patient needs to remove his/her clothes (not just pull them up!) to avoid disrupting sounds of moving items of clothing (particularly for auscultation of the heart). Keep the chestpiece of the stethoscope in your hands for a while before auscultating, so that it is not too cold.
When using the bell to listen, it should always rest lightly on the skin. The best way to do this is to place the bell loosely on the auscultation site and having it rest on the skin due to its own weight. You can use the chestpiece to manoeuvre the stethoscope in such a way that all of the bell's rim is in contact with the skin.

When using the diaphragm to listen, it is best to place your hand on the patient and press the diaphragm onto the skin using this hand. This will ensure the lowest possible noise disturbance caused by movement of the diaphragm on the skin and hair. The tube must kept off the skin to avoid the sound of a moving tube.

Respiratory auscultation
This training is intended to introduce you to auscultation and teach you to hear differences between diaphragm and bell, and between auscultation after proper instructions and auscultation without proper instructions.
Have the patient undress his/her upper body. For a check-up or screening examination of the lungs of a female patient it will not always be necessary to have her take off her bra (unless it impedes your examination).
Your hands will be clean and warm and you will have warmed your stethoscope in your hands. Listen to the lungs using the diaphragm of your stethoscope.
To allow you to listen to breath sounds properly, the patient must breathe with his/her mouth slightly open, and produce sighs. The patient can determine his/her own breathing pace.

Cardiac auscultation
The intention is for you to familiarize yourself with auscultation of heart sounds and to learn to hear the difference between listening with the bell and the diaphragm.
Have the patient undress his/her upper body, including bra for female patients.

The following organs and structures can be auscultated:

- **Heart:** Normal and abnormal heart sounds and murmurs can be audible and provide information on the heart, heart valves and shunts.
- **Lungs:** The normal breath sounds are clearly audible, but abnormalities can also be determined through auscultation, among other things. Examples are: pneumothorax (reduced breath sounds), bronchial constriction (rhonchi), large infection infiltrate (increased breath sounds), etc. This subject will be addressed in more detail when the lung examination is explained.
- **Intestines/abdomen:** When auscultating the abdomen you can assess the peristalsis and listen for any vascular sounds. You will assess the peristalsis because if the peristalsis cannot be heard or if it is too lively, or if any other sounds can be heard, this may be clinically relevant. If no peristaltic sounds can be heard, this may be a sign of paralysis of the intestine or of obstruction. If the peristalsis is too lively, this may be a sign of IBS (= Irritable Bowel Syndrome).
- **Arteries:** Vascular sounds can occur in case of constriction or an aneurysm of an artery.
- **Organs:** If the blood flow to an organ is increased, vascular sounds can occur. An example of this is the pregnant uterus. The same phenomenon can be found for tumours.

Terminology:

Lungs: sonorous percussion; normal mobility of lung borders
normal breath sounds, no other sounds
Heart: no cardiomegaly on percussion;
regular heart rhythm, no murmurs, no other sounds
Abdomen: normal peristalsis, no vascular sounds
varying tympany, liver and spleen not enlarged on percussion

Appendix 3: Communication and the physical examination

A physical examination is a form of interaction and therefore a form of communication. Touching patients is (tactile) communication. The physical examination is included in the schedule of the consultation model, both in the communication/interaction part and in the medical part. We distinguish between the communication OF the physical examination (i.e. non-verbal) and the communication ACCOMPANYING the physical examination (verbal).

Communication OF the physical examination
The way in which the physician performs the physical examination shows how he/she approaches the patient.
Physical examinations can be conducted respectfully or disrespectfully, and they can be done with or without showing empathy.
The physician must be well aware of what the physical examination can express and also what it can mean to the individual patient (with his/her specific background, history, etc.).
This applies to the way the patient is touched, the closeness and intimacy, the way of looking at the patient or looking away – these are all “messages” to the patient, to which he/she will respond, often with great subtlety. We all know stories of physicians touching patients in a disrespectful or even violent manner, or at least of patients experiencing it like that.

Communication ACCOMPANYING the physical examination
There are three moments of communication when performing a physical examination: BEFORE, DURING and AFTER the physical examination.

Before the actual physical examination, the patient must be adequately informed on why and how the physical examination is being performed. This includes an instruction to undress and therefore also a justification: the breach of
privacy and physical integrity that is always part of a physical examination requires explanation, i.e. a good reason. The patient needs to consent, and this is something else than just obeying the physician. There must be an opportunity for the patient to ask questions or express any hesitations.
Respecting the patient’s privacy includes allowing the patient to ***undress behind the curtain***.
The patient can let you know when he/she is ready for the examination.

Communication will also need to take place during the physical examination: explanation of the way the patient is touched, response to any signs of pain or discomfort, your understanding for this. This is different from the communication OF the physical examination, but the two are closely linked. Can the examination continue, or does the patient need a break? Does the physician maintain eye contact and show empathy? Is the physician’s face visible to the patient and is he/she sufficiently aware of any facial expressions?

After the physical examination: instruction to get dressed, explanation of the findings but not until the patient is fully dressed, etc.

Also refer to the checklist on the next page.

Appendix 4: Checklist on communication during the physical examination

Before the examination

-Clear substantiation of the examination
-Understandable explanation of the examination
-Opportunity for questions / reactions of the patient
-Clear instruction to undress – privacy during undressing

During the examination

-Clear instructions to the patient
-Indication of what you are / will be doing
-Monitoring of the patient's reactions / maintaining eye contact
-Asking about pain

After the examination

-Indication that the examination is finished
-Clear 'instruction to get dressed'
-Indication of when the results will be discussed

General

-Effective
  Ask the right questions, communicate concisely/
  to the point / understandable
-Efficient
  Create business-like collaboration
  Demonstrate skills/dexterity
-Patient-friendly
  Create trust, demonstrate respect

Appendix 5: Assignments to train basic skills

Before the examination
Greeting
Explanation of the examination and reason, opportunity for questions
Instruction to undress (privacy)
Jewellery off, sleeves rolled up, hand hygiene, short and clean nails

Percussion

- Familiarize yourself with the percussion sounds of the heart (dull), lungs (sonorous), abdomen (varying tympany) and stomach (hollow sound of Traube's space).
- Define the upper and lower border of the liver (ventral side) through percussion (see Appendix 1 for technique).

Auscultation of breath sounds

- Place the diaphragm at the back of the thorax and listen to the breath sounds. Do this first while your fellow student is breathing normally with the mouth closed. Then listen while he/she is breathing with the mouth open, and producing sighs (also refer to Appendix 1).
- Try to determine with your eyes closed when your fellow student is inhaling and when he/she is exhaling. Listen whether you can hear a break between the inspiration and expiration. Note that the audible part of the expiration normally lasts shorter than the audible part of the inspiration, despite the fact that the expiration as a whole takes longer than the inhalation. The audible part of the expiration normally lasts a third to half as long as the inspiration. If it lasts longer than the inspiration, it is referred to as extended/prolonged expiration.
- Try to pinpoint when the audible part of the expiration stops and observe, or have your fellow student indicate, when the actual expiration ends.
- Look at the movement of the thoracic wall and pay attention to the changes in the position of the ribs.
- Auscultate in multiple places and listen whether the sounds you hear are different.
- Now auscultate using the bell and listen to the differences this causes.

Auscultation of heart sounds

- Listen at any site 2 cm left of the sternum. Can you hear the heart sounds more clearly with the diaphragm or with the bell? Make sure you use the bell properly.
- Can you identify a first and second sound?

Tip: Palpate the carotid artery in the neck at the same time; you will feel the pulse wave in this artery right after the first sound.

Indications after the examination

- Indication that the examination is finished
- Instruction that the patient can get dressed
- Indication of when the results will be discussed
- Hand hygiene

PS session: Lung examination

Size of group
9-12 students

Duration
1hours

Objective
At the end of the training, the student will be able to carry out a standard examination of the lungs. He/she will be familiar with the backgrounds of the lung examination and will be able to interpret the findings in general terms. In addition, he/she will have consciously practised communication during the lung examination.

Student's tasks
Preparation: Study the study material.
Students are assumed to be familiar with the knowledge acquired during the Bachelor's phase . Study the student manual, and review the anatomy and physiology of the relevant organs / body parts again where necessary.

At the session: Participate in the examination, practise based on the assignments.

Study material
Macleod's clinical examination and accompanying film clips.

Learning aids to be brought to the class by the student:
Stethoscope

Appendices
1. Lung examination
2. Lung examination assignment
3. Checklist for lung examination

Appendix 1: Lung examination

The physical-diagnostic lung examination comprises inspection, palpation, percussion and auscultation.

Inspection
90% of the physical-diagnostic abnormalities in patients with respiratory disorders can be found by looking at the patient properly. This is because shortness of breath often causes visible abnormalities. In addition, you will often be able to say something about the patient's general fitness and this, too, can help you detect a disorder (think of cachexia in cancer patients, for instance).
Visible abnormalities in patients with dyspnoea may be:

- Sitting in a somewhat stooped position (greatest lung volume)
- Increased respiratory rate
- Use of auxiliary respiratory muscles (particularly the sternocleidomastoid, the scalenus and the trapezius)
- Nasal flaring (particularly in young children)
- Intercostal and supraclavicular retractions
- Cyanosis

Patients with respiratory failure can develop impaired consciousness or loss of consciousness.

Specific aspects of inspection

- Fingers. In case of chronic oxygen deficiency, 'clubbing' of the fingernails can occur. This should be regarded in relation to complaints, however, as clubbing sometimes also occurs in healthy people. Clubbing is also associated with pulmonary fibrosis.
- Skin colour. For examination of the respiratory system, central cyanosis is of particular importance. This is because central cyanosis occurs in patients with very low oxygen saturation in the blood. If a patient has central cyanosis, this low oxygen content in the blood can be found in the entire body, which means that you will need to take action quickly to increase the oxygen level.
- Respiratory rate. The normal respiratory rate in adults at rest is around 12 per minute.
- Shape of the thorax. Symmetry and also in anterior-posterior direction (AP diameter).
- Skeletal disorders of the thorax can sometimes strongly decrease the lung volume, and kyphoscoliosis is particularly notorious. In patients with long-term COPD, deformation of the thorax may occur, with the thorax becoming more barrel-shaped. In addition to the thorax abnormalities described above, pectus carinatum and pectus excavatum may also occur. These deformities are not of great respiratory importance but do need to be recognized as they affect the interpretation of thorax images. In patients with pectus excavatum the heart appears to be enlarged on the back-to-front image and sometimes the right heart border is not identifiable.
- Diaphragmatic excursion of the hemithoraxes. Differences in diaphragmatic excursion of the two halves of the thorax can be of great clinical importance. The excursion of one hemithorax is often less pronounced. This can be seen, for instance, in case of a pneumothorax or significant atelectasis (the affected side will take in less volume).
- Patient's muscle condition. A patient with chronic shortness of breath that strongly inhibits his/her daily life will affect his/her ability to physically exert himself/herself. This will become visible over time because the patient's muscle mass will decrease. If you observe this, you will be able to make a reasonable estimation of the severity of the patient's shortness of breath (on exertion) and spare the patient an exercise test in some cases. Poor muscle condition (cachexia) can sometimes also be seen in patients with advanced oncological processes. Obese patients can have a reduced muscle condition as well. This will not be as clear on inspection, but it can be demonstrated by means of a bio-impedance measurement.

Palpation

- To assess the diaphragmatic excursions, you will need to pay attention to the extent of the excursion and the symmetry between the left and the right hemithorax. As during inspection, the difference between left and right is significant. The extent of the excursions depends on the degree of thoracic respiration and the air passage through the airways. A patient with an asthma exacerbation (bronchial obstruction) may have hyperinflation, so that there will be fewer thoracic diaphragmatic excursions, because the thorax has an inspiration position and abdominal breathing is mainly used. Patients with severe COPD often also show hyperinflation.
- The technique of tactile fremitus is rarely used. This technique involves palpation of how sound vibrations, caused by the patient speaking (e.g. having them say '88'), are transmitted to the thoracic wall. The tactile fremitus can be enhanced (increased), reduced or absent. The tactile fremitus is only determined if indicated. Indications may be: forgotten stethoscope (the principle is the same but a number of other sounds cannot be heard) or verification of the findings of auscultation and percussion.

Percussion

- Air retention in contrast to dullness. This time, you will be the one generating the vibrations. The purpose is to identify any abnormalities in air retention. If the air retention has increased, you will hear a deeper, more sonorous percussion sound (hypersonorous percussion sound). If the air retention has decreased, on the other hand, you will hear a shorter, duller percussion sound. In clinical practice it is of great importance to identify dullness. Dullness on percussion can be explained both by fluid in or around the lung (pleural fluid: transudate, exudate, blood, pus) and by organ enlargement or organ displacement (cardiomegaly, high position of a diaphragm dome, liver enlargement, etc.). Moreover, in case of changes in percussion sounds you should note that transitions are often gradual, such as the transition between lung and liver, and the percussion technique used (hard or soft) can strongly affect the place where the transition is observed; the softer the percussion, the lower the transition to the dullness caused by the liver will be found.
- Lung borders. It is normal that when the patient inhales and exhales slowly, the lower border of the lung will be found at the level of Th 10 at the back; on maximum inspiration the lower border will move downwards and on maximum expiration it will move upwards. At the front, the lower border of the lung can be found at Th 5-6; on the right in particular the lower border can be easily identified thanks to the lung-liver transition. Normally, the lung borders will move around three fingers in width (6 cm). This mobility will decrease with age, but can also be impaired by disease processes. For instance, in patients with emphysema (increased air retention) the lung border can often move only very little or not at all. Inflammatory processes in the lower lobe can also inhibit the mobility of a lung border.
  The height of the lung border is informative as well. If the lung border is high, this may mean that the position of the diaphragm is high, or it may point to atelectasis, fluid or a tumour. If the lung border is low, this may be an indication of emphysema or tension pneumothorax.

Auscultation

You will listen for normal or abnormal breath sounds and for abnormal other sounds.

Breath sounds

Normal breath sounds.

Breath sounds are caused by vibration of the vocal cords. This vibration is caused by the turbulent air flow in the larynx during inspiration and expiration. The sounds generated by this are transmitted by the trachea, and then by the bronchi and the lung tissue, to the thoracic wall. During this route the sounds change in intensity and frequency.

If you listen at the thoracic wall using your stethoscope, you will hear a typical sound that is called normal or vesicular. The intensity of the sound gradually increases during inspiration and rapidly disappears during the first third of the expiration phase. Abnormalities in the bronchi, lungs or pleura can change the breath sounds in different ways. The following features of breath sounds can be distinguished: loudness, symmetry (left and right the same), nature of the sound, relation between inspiration and expiration and other sounds.

Reduced or absent breath sounds. The transmission of the breath sounds is reduced if the ventilation (litres/minute) decreases or the conduction of the sound is diminished. Decreased ventilation may affect the entire lung (severe asthma exacerbation) or it may concern a local problem (e.g. bronchus occluded by a tumour). Other causes of decreased ventilation include pneumothorax, displacement of

the lung away from the thoracic wall due to fluid in the pleural cavity, reduced mobility of the thoracic wall.
Diminished sound conduction occurs when the distance between the lung and the thoracic wall is greater. Examples include pneumothorax, pleural fluid, obesity or pleural swelling. On the other hand, the conduction of the breath sounds may also be diminished due to increased air retention in the lung, like with severe COPD.
Increased breath sounds
If the lung tissue through which the breath sounds are conducted from the larynx to the thoracic wall lose their air retention and the density increases, the sounds will be conducted better, Due to the increased density the lung tissue will contain more water. Under water, sound vibrations are conducted better than through air (think of how far sounds reach under water in a swimming pool, for instance). Examples of increased density of the lung tissue are an infiltrate or compression of lung tissue. The conduction will only be better if the bronchus that supplies the sound is open. An infiltrate behind a sputum plug will generate reduced breath sounds, therefore, whereas an infiltrate behind an open bronchus will generate increased breath sounds.
The sound picked up by the stethoscope at the thoracic wall is more like the sound you hear across the trachea than across the normal lung tissue. The breath sounds are sharper, both in the inspiration and the expiration phase. The sound of the expiration is audible during the entire expiration phase, instead of just during the first third. This is referred to as bronchial breath sounds. As is to be expected, bronchial breath sounds are similar to the sound you hear when placing the stethoscope on the trachea.

Other sounds
The other sounds are clinically subdivided as follows:

1. Crepitations:	These are brief (end) inspiratory sounds. They are discontinuous, in other words.
2. Rhonchi:	These are discontinuous and: - present during inspiration, sounding like burbling or rattling and squeaking; they are caused by mucus and have a low frequency; - present during expiration, due to mucus.
3. Wheezing:	Because the pressure in the thoracic cavity increases on expiration, small bronchi can collapse; this is enhanced by the Venturi effect. As a result of this a high-frequency sound occurs on expiration.
4. Pleural friction rub:	These are sounds that can be heard on inspiration and expiration, which often change in nature between phases (i.e. frequency). Pleural friction rub sounds like walking in a fresh layer of snow.

During the CTC weeks of the junior Medicine clerkship, the PS session ‘Pathological lung sounds’ will further address abnormal lung sounds.

Skills description

Preparation

Your hands are warm and clean, without jewellery and with short nails. Tell the patient that his/her upper body will need to be undressed. In some cases female patients will need to take off their bra, depending on whether the bra is impeding the examination. Usually, the bra will not be in the way during the lung examination on the ventral side of the thorax, but it may be on the dorsal side and in the flanks. In such cases it will be better to ask the patient to take off her bra, so it will not be in the way. When doing a more extensive examination including auscultation of the heart, for instance, the bra will need to be taken off.
Tell the patient what you will be doing and why.

Inspection

Shortness of breath

At an outpatients' clinic the inspection starts as soon as the patient is called in. At what pace is the patient walking towards you and is it making him/her out of breath? If the patient does get out of breath, how long does it take for him/her to recover? During the history-taking, you should pay attention to the patient's speed of speech and the number of words the patient can say before he/she needs to take a breath. Does the patient get out of breath due to his/her speaking?
During the conversation you will usually also be able to assess the patient's hands. For further inspection of the patient it is important to have sufficient daylight in the room; paleness, for example, is difficult to assess, and cyanosis and jaundice are often overlooked in artificial light. As an examiner, you will be able to inspect the patient best when you are standing with your back to the window.

Acute shortness of breath

The first thing you will want to determine when seeing the patient is whether he/she has acute shortness of breath. This can be best determined by assessing the patient's consciousness: changed state of consciousness; anxiety, vegetative symptoms (sweating, shock). DD psychogenic dyspnoea. Other things which can be important during inspection are facial expression (anxiety) of the patient, relaxedness or restlessness, posture. The typical posture of patients with severe shortness of breath is to sit up straight, slightly stooped. In addition, the patient may show retractions and use of auxiliary respiratory muscles. In case of acute shortness of breath it will be important to spare the patient as much hassle as possible. Try to obtain as much history information as possible, e.g. through heteroanamnesis.

Fingers

Inspect the patient's nails (you can already do this during the history-taking). For the respiratory system, clubbing of the nails is important.

Skin colour

When doing a lung examination, you should pay particular attention to a pale or ashen-bluish skin colour (cyanosis). If the patient looks pale, consider anaemia as the cause of his/her shortness of breath. Two types of cyanosis can be distinguished, i.e. central cyanosis, which is most obvious from the colour of the lips and tongue, and peripheral cyanosis, which mainly manifests itself as discolouration of the extremities.

Respiratory rate

Determine the breathing rate by counting the respiratory excursions of the chest and abdomen. It will be wise to divert the patient's attention away from his/her breathing, because otherwise the breathing will be forced and you will not be able to obtain reliable information on the respiratory rate. The easiest way to do this is by acting as if you are feeling the pulse, because that way most patients will stop talking as well. If the patient is breathing calmly, you should count the respiratory rate for at least 30 seconds; if you count for only 15 seconds, the error margin will be too great.

Thorax shape

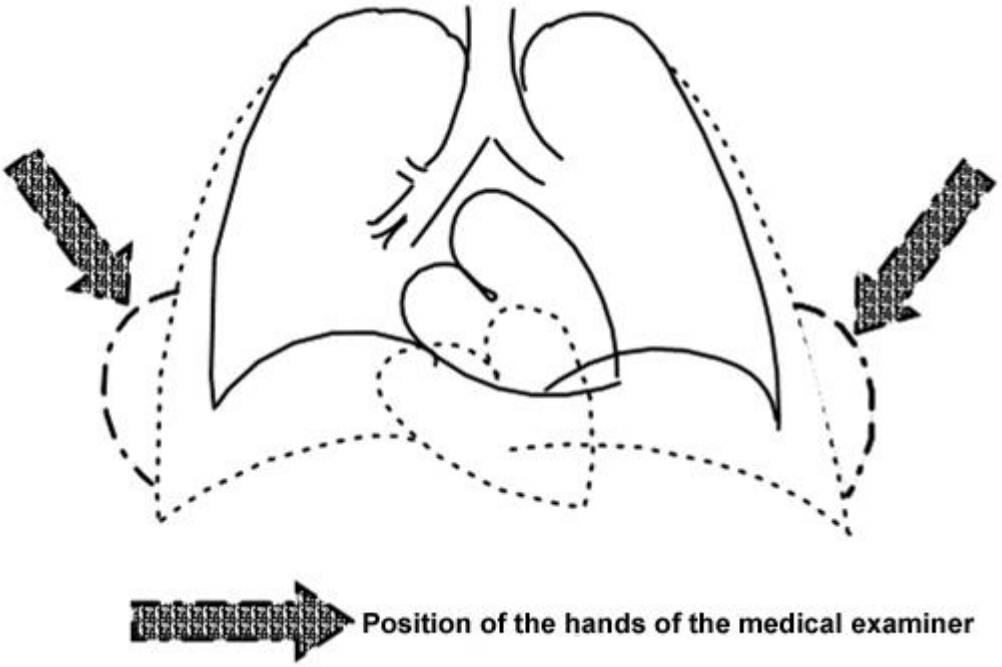
Watch out for major skeletal abnormalities that may affect the patient's breathing. Assess whether the patient is showing scoliosis with respiratory significance (often kyphoscoliosis) by inspecting the spine from top to bottom and seeing whether the vertebrae are in a straight vertical line. Very subtle deviations are not relevant here. Scoliosis can also be easily recognized by asymmetry of the gaps between the arms and the trunk. Assess whether the gap between the left arm and the trunk is different in size or shape than the one between the right arm and the trunk. Make sure you are

standing straight in front of or behind the standing patient, to prevent a distorted view. Here, too, subtle differences are irrelevant for the respiratory system.
You will also need to assess the shape of the thorax as a whole. Important findings are the barrel-shaped thorax (in case of prolonged hyperinflation caused by COPD) and pectus excavatum and pectus carinatum (which are not of respiratory significance, but which are important for the interpretation of thoracic images). Assess the shape of the thorax by looking at the patient from the front, the back and the side.

Inspection of respiratory excursions of the hemithoraxes
Look at the respiratory excursions of the thorax from the front, paying attention to differences between left and right. When you are certain about your findings, you can ask the patient to lie down on his/her back on the examination table, and then re-assess the left-right difference from the foot end of the table.

Condition of the quadriceps
Assess the patient's muscle condition, which can be most easily done by assessing the quadriceps femoris. Pay attention to both shape and size. Be aware that obesity, too, can cause muscle atrophy.

Palpation

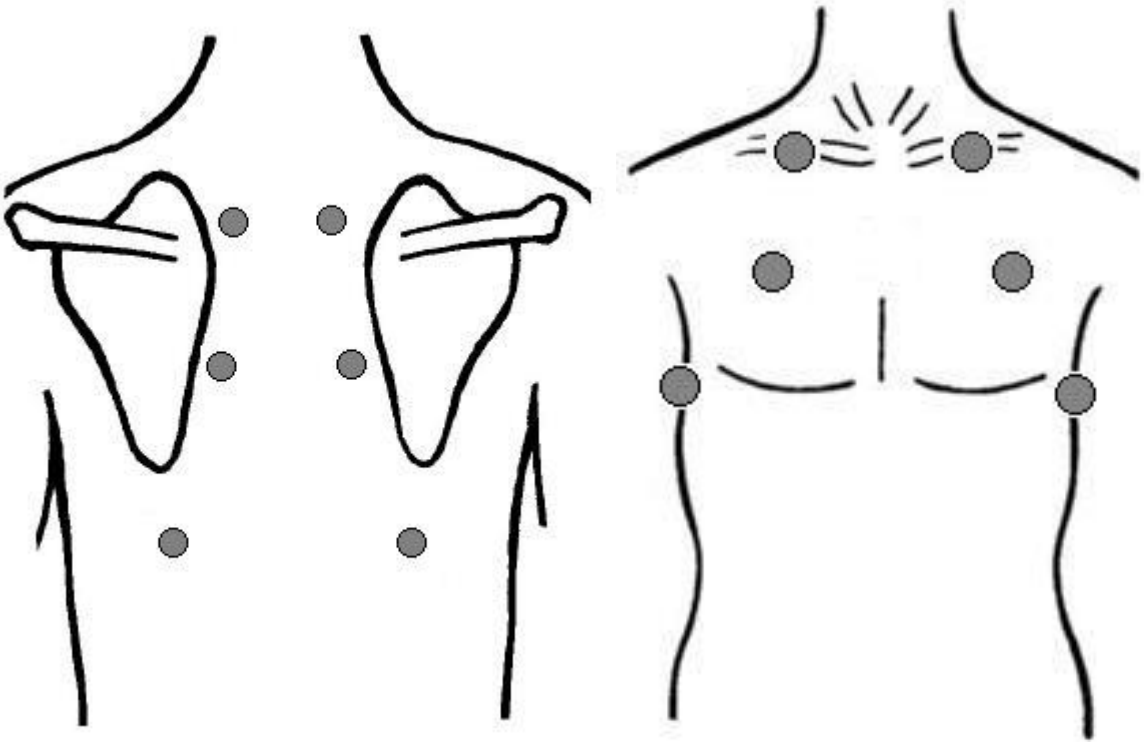


Palpation of the respiratory excursions
Do this preferably with the patient standing. Instruct the patient to keep the arms loosely away from the body. Place your hands laterally on the thorax where the respiratory excursions are most pronounced, i.e. just above the diaphragm attachment.The figure above indicates this location with arrows. Now assess the size and symmetry of the respiratory excursions and determine the position at rest. (E.g.: Does the patient show an inspiration position at rest?) Next, ask the patient to take a deep breath and assess the expansion capacity of the thorax and the symmetry of the respiratory excursion. Also determine whether the patient only uses abdominal breathing or combined chest/abdominal breathing.
If there are any rhonchi (continuous extra sounds), you will often already be able to establish this at this point.

Tactile fremitus
The tactile fremitus can be determined by placing the ulnar sides of your hands on the thorax. Ask the patient to speak and assess the vibrations you feel. Compare the vibrations on the left and the right. The tactile fremitus can be normal, enhanced, reduced or absent. If you detect a difference, you can check your finding by palpating the same sites, but now with your hands crossed. Assess the tactile fremitus at the same sites as when auscultating and percussing.

Percussion
For a screening lung examination it is often not useful to perform percussion in ten places at the back, the front and laterally (although it is described like this in 'Fysische Diagnostiek' (Physical diagnostics)). If a patient is seriously short of breath, you will need to do a comprehensive examination, however. For a general screening for dullness, it will be sufficient to percuss the sites indicated in the picture, i.e.:

- Ventral clavicular, using the clavicula as a plessimeter and tapping on the clavicula rather than your own finger
- Ventral left and right, approximately in the midclavicular line, about halfway between the clavicula and the nipple
- In the flanks (lateral), around 2 cm below nipple height
- Dorsal left and right between the scapulae: high and low
- Dorsal (basal) left and right below the tip of the scapula (corresponds with T8)



Percussion of the lung borders
You can determine the right lung border on the ventral side (which is usually omitted during lung examinations) and on the dorsal side, where the lung is bounded by the liver. The left lung border is really only determined on the dorsal side, as ventral percussion of the border is hampered by the percussion sounds of the heart.
You will determine the borders by percussing well beyond the expected border and then percussing more accurately at the transition. This technique is described in more detail in the training session on the basic skills of physical examination. You will not only want to localize the lung border, but you will also want to assess the mobility of the borders. The lung borders should be determined when the patient is breathing calmly. Then have the patient breathe in as deeply as possible and hold that breath. Determine the lung border again. The mobility is the difference between the two borders.

Auscultation
The patient's upper body will need to be bare, but in case of a check-up or screening examination it will not always be necessary for female patients to take off their bra (unless it impedes the examination). If the patient is ill or short of breath, you will need to do a more extensive lung examination; in that case, use the points indicated in the book 'Fysische Diagnostiek' (Physical diagnostics).
Have the patient stand if possible. Auscultate using the diaphragm of your stethoscope, which you have warmed up with your hands in advance. Auscultate the same sites as where you percuss, except that you should not auscultate on the clavicula but rather above it. Have the patient breathe calmly at his/her own pace, with the mouth open. Make sure the patient does not start to hyperventilate, due to the fixation on his/her breathing. To be able to assess the breathing properly, you will listen to a least one full inspiration/expiration cycle at each auscultation site.

Breath sounds
Assess the breath sounds by paying attention to the duration of the audible part of the inspiration and expiration and to the loudness of the breath sounds. Also watch out for extra sounds. What type of extra sounds you can encounter and how you should interpret them has already been addressed in the theory.
Bronchophony/whispering
The stethoscope can also be used to listen to the sound that is conducted to the thoracic wall when the patient is speaking (bronchophony = low frequency) or whispering (whispering = high frequency). Auscultate the same sites as before, while asking the patient to speak or whisper instead of producing sighs. You can ask the patient to say ‘eighty-eight’, for instance, and whisper ‘sixty-six’. Normally, the whispering cannot be heard on auscultation; in case of increased conduction (such as due to an infiltrate with an open bronchus), you will be able to hear the voice. The bronchophony/whispering does not really provide any additional information compared to the other assessments to be done, and will therefore not usually be performed during a normal lung examination.

Terminology for normal findings:
No abnormal thorax shape, symmetrical respiratory movements
No dullness, good mobility of lung borders left and right
Symmetrical normal breath sounds, no prolonged expirium, no rhonchi (or: no extra sounds)

Appendix 2: Lung examination assignment

Perform the lung examination, paying attention to the following aspects:

Before the examination:
- Explanation to and instructions for the patient
- Clean, warm hands and short nails
- Jewellery off

Inspection:
- Acute shortness of breath?
- Skin colour
- Respiratory rate (count for 30 seconds)
- Thorax shape
- Muscle condition

Palpation:
- Palpation of diaphragmatic excursions
- Tactile fremitus (normally on indication but here as practice)

Percussion:
- Lung regions
- Dorsal lung regions (mark the border at rest and on maximum inspiration during the training session)

Auscultation:
- Lung regions
- Bronchophony/whispering (to be performed as practice during this training session)

Points for attention in terms of communication during lung examination
- General: During auscultation and palpation: Pay attention to temperature of stethoscope and hands.
- Beforehand: Instruction to undress: Bra can often be kept on. During auscultation of the back, undoing the bra strap will suffice.
- During the examination: Breathing instruction, monitoring whether the patient does not become short of breath or dizzy. If the patient experiences dyspnoea, it will sometimes be difficult to reassure him/her effectively. In this case you should allow the patient to breathe at his/her own pace and in his/her own way.
- Position: Standing/sitting.

Appendix 3: Checklist for lung examination

Before the examination
Greeting
Explanation of the examination and reason
Instruction to undress
Remove jewellery, wash hands

Inspection
General
Signs of shortness of breath, skin colour
Shape of the thorax at rest
Movement of the thorax when breathing, muscle condition
Count respiratory rate (count for 30 seconds)
Draw attention away from breathing

Palpation
Palpation of diaphragmatic excursions
Use flat hands at the level of the diaphragm

Percussion
Technique
Correct percussion sites
Dorsal lung borders: mark on the skin

Auscultation
Use of the stethoscope
Auscultation sites

During the examination
Explanation during examination
Instructions on position and breathing
Focused observation
(Eye) contact with the patient
Ability to handle technique and communication with ease

After the examination
Indication that the examination is finished
Instruction to get dressed
Rounding off and presentation of findings
Wash hands

General
Is able to demonstrate knowledge of the skills

PS session:
Examination of peripheral arteries, examination for presence of oedema and measurement of central venous pressure (CVP/JVP)

Size of group
9-12 students

Duration
2 hours

Objective
After the training the student will be able to examine the peripheral arteries, ascertain whether oedema is present and measure the central venous pressure.

Student's tasks
Preparation:
Students are assumed to be familiar with the knowledge acquired during the Bachelor's phase .

- Prepare for palpation of the arteries by studying the pathway of the carotid artery, radial artery, brachial artery, abdominal aorta, femoral artery, popliteal artery, posterior tibial artery and dorsal artery of the foot in the 'Anatomy Atlas'.
- Study the study material.
- Watch the films on oedema and CVP..
- Prepare by considering where oedema can be found in a person who is lying down and in a person who is sitting/standing.

At the session:
Participate in the examination, practise based on the assignments in the appendix.

Study material
Macleod's clinical examination and accompanying film clips (peripheral arteries).

Macleod's clinical examination (oedema) and (JVP).

Student manual; also see under student's tasks.

Assignments: see the appendices.

Appendices

1. Examination of the peripheral arteries
2. Examination for the presence of oedema
3. Measurement of the central venous pressure
4. Training assignments
5. Checklist for examination of the peripheral arteries
6. Checklist for examination for oedema and CVP measurement

Appendix 1: Examination of the peripheral arteries

General
In principle, the examination of the cardiovascular system comprises four elements: inspection, palpation, percussion and auscultation.
When examining the peripheral arteries the order is inspection, auscultation and palpation.
Communication is important during every examination.

Inspection
Inspect the lower legs and feet for skin colour, oedema, ulcers, wounds, infections and trophic changes such as: thin and atrophic skin; reduced turgor; lack of hair on toes, forefoot, lower legs; thicker, deformed, crumbly, slow-growing nails; pigmentation, especially in the area above the ankles. The foot should also be assessed for formation disorders. The combination of poor perfusion and an abnormal foot shape makes cardiovascular patients susceptible to pressure damage and poorly healing wounds. Care should be taken to avoid these effects, therefore.

Auscultation
Murmurs
Vascular sounds may be an indication of a stenosis or aneurysm in the arteries concerned. Vascular sounds can, however, also be 'harmless'.

Heart rate and regularity/rhythm
The heart rate and the regularity of the heartbeat can be determined by means of palpation as well as auscultation. Particularly in small children, auscultation is preferred, as their arteries are difficult to palpate.

Palpation
Palpation of the peripheral arteries is also part of palpation of the cardiovascular system. You can palpate arteries when they run just below the surface. These superficial arteries include: carotid artery, brachial artery, radial artery, abdominal aorta, femoral artery, posterior tibial artery and dorsalis pedis artery.
When performing palpation, left and right are always compared. The radial artery and the dorsalis pedis artery can be easily palpated left and right at the same time. If any differences are found, this may indicate (partial) stenosis proximal to the palpation site with the weakest pulsations. Palpating the carotid arteries on both sides at the same time is prohibited! (Caution: carotid massage!) You should compare by feeling the right and left side separately. In addition to determining the quality of the pulsations, palpation of the arteries can also be used to determine the heart rate and rhythm (regular or irregular). Usually the radial artery is palpated for this purpose.
If indicated, such as for a patient with an irregular heartbeat, it will be better to palpate the carotid artery.

Terminology:

Identify the assessed artery and indicate whether the pulsations are present. Any murmurs? Signs of ischaemia of the skin?
Normal, e.g. pulsations of carotid arteries on both sides, no murmurs

Skills description
Take off any jewellery. Make sure your hands are warm and clean, and that the stethoscope is not too cold. Paying close attention to communication aspects is also an important factor in this training session. This means explaining everything properly and giving clear instructions. For this examination the abdomen must be undressed, but the underpants can stay on.

Auscultation
The intention is that during this training session you will gain an understanding of the sounds of the carotid arteries and the abdominal arteries under normal circumstances. When auscultating the vascular system using the diaphragm.
Start by auscultating the carotid artery, both cranially and caudally. A murmur originating from the heart, e.g. due to aortic valve stenosis, will be somewhat louder on the caudal side of the carotid artery than cranially. A murmur generated in the carotid artery itself, on the other hand, will have its point of maximum intensity cranially.Next, listen to the abdominal aorta
± 5 cm cranial to the navel, ± 2.5-5 cm lateral to this on both sides (renal artery) and above the common iliac artery and the femoral artery on both sides.

Palpation (pages 188-189 of 'Fysische Diagnostiek' (Physical diagnostics))
For palpation of the carotid arteries the subject must keep his/her head slightly to the side and to the back. The sternocleidomastoid needs to stay properly relaxed, however. Rest the hand lightly on the patient again and place three fingers with the fingertips next to one another on the carotid artery. The **carotid arteries** cannot be palpated at the same time. Palpate both sides **consecutively**, so that you can compare left and right. Next, also palpate the radial artery, the brachial artery, the abdominal aorta, the femoral artery, the dorsalis pedis artery and the posterior tibial artery.
When palpating arteries, two to three fingertips should be used. Do not press too hard and consider checking whether you are not feeling the pulsations in your own fingers. This risk exists in particular when palpating softly pulsating arteries (like the posterior tibial artery and the dorsalis pedis artery). It will happen mainly if you use the thumb when palpating, so avoid doing that! For palpation it is necessary for the subject to take off his/her trousers, shoes and socks. Palpation is done with the subject in supine position.
The **radial arteries** are palpated left and right at the same time. They can be felt on the inside of the wrist, lateral to the tendon of the flexor carpi radialis. Next, palpate the radial artery on one side to determine heart rate and rhythm (palpate the carotid artery as well if necessary). The heart rate is determined by counting the number of beats for 15 seconds and multiplying this number by four. At the same time you should pay attention to the rhythm (regular/irregular).
The **brachial artery** can be felt in the cubital fold. Place your fingers on the biceps tendon and let them slide down towards the midline. Compare left and right.
The **descending aorta** can be palpated in the midline, halfway between the navel and the xyphoid process. You will need to palpate deeply for this, possibly with one hand putting pressure on the other. This may cause some discomfort for the patient.
The **femoral artery** is palpated in the inguinal fold. This artery's position is medial to the tendon of the sartorius. This artery is quite deep, so you will need to use some pressure. Bear in mind, however, that the inguinal region is a sensitive area. The palpation site will often be beneath the patient's underwear. The examiner may need to move the underwear somewhat (up to the edge of the pubic hair). Compare left and right.
The **popliteal arteries** are difficult to palpate. Palpating the right and left popliteal arteries at the same time is impracticable and not clinically relevant.
The **posterior tibial arteries** are palpable behind the medial malleolus of the ankle. Left and right should be palpated at the same time.
The **dorsalis pedis artery** is palpable at the top of the foot, lateral to the tendon of the extensor hallucis longus, and proximal to the first metatarsal joint.

Appendix 3: Measurement of the central venous pressure

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Orientation
To measure the central venous pressure, you need to determine the sternal angle. This is the junction of the manubrium and the body of the sternum. You will find this junction by taking your flat fingers perpendicular to the sternum from the jugulum to caudal, until you feel a small ridge that runs horizontally. By following this ridge to the left or right, you will arrive at the second rib, with above it the first and below it the second intercostal space (2^{nd} ICS = space between 2^{nd} and 3^{rd} rib) left and right of the sternum.

Terminology

'CVP R -… cm' (possibly: 'CVP not elevated' if findings are not abnormal)

Appendix 4: Training assignments

1. Auscultation assignment

Listen at the following sites using the diaphragm:

above the carotid arteries cranially and caudally
± 5 cm above the navel
2.5-5 cm lateral to this on both sides
above the common iliac arteries
above the femoral arteries

2. Palpation assignment

Palpate the radial artery on one side and determine the heart rate and rhythm.
Palpate the following peripheral arteries:

carotid artery
brachial artery
radial artery
abdominal aorta
femoral artery
popliteal artery
dorsalis pedis artery
posterior tibial artery

Palpate the dorsal surface of the foot, the region around the inner ankle, shin and sacrum for the presence of oedema.

3. Assignment for measurement of the central venous pressure

Identify the external jugular vein in the neck with the head slightly turned to one side. Determine the level of the blood column in the external jugular vein compared to the sternal angle while the external jugular vein in the neck is occluded.

Appendix 5: Checklist for examination of the peripheral arteries

Before the examination
Greeting
Explanation of the examination and reason
Instruction to undress
Remove jewellery, wash hands

Inspection of the skin of the body parts to be examined particularly limbs
Colour
Skin defects
Hair growth
Nails
Foot shape
Oedema

Auscultation
Auscultation sites
Above carotid arteries high
Above carotid arteries low
Above abdominal aorta
Above renal arteries
Above common iliac arteries
Above femoral arteries

Palpation
Carotid artery
Brachial artery
Radial artery
Abdominal aorta
Femoral artery
Popliteal artery
Posterior tibial artery
Dorsalis pedis artery

During the examination
Explanation during examination
Instructions on position
Focused observation
(Eye) contact with the patient
Ability to handle technique and communication with ease

After the examination
Indication that the examination is finished
Instruction to get dressed
Rounding off and presentation of findings
Wash hands

General
Is able to demonstrate knowledge of the skills

Appendix 6: Checklist for examination for oedema and measurement of the central venous pressure

Before the examination
Greeting
Explanation of the examination and reason
Instruction to undress
Remove jewellery, wash hands

Palpation for oedema
Dorsal side of the foot
Inner ankle
Shin

CVP measurement

Set the slope of the head end of the examination table
Identify the external jugular vein
Occlude the external jugular vein
Read the CVP value

During the examination
Explanation during examination
Instructions on position
Focused observation
(Eye) contact with the patient
Ability to handle technique and communication with ease

After the examination
Indication that the examination is finished
Instruction to get dressed
Rounding off and presentation of findings
Wash hands

General
Is able to demonstrate knowledge of the skills

PS session: Examination of the heart and blood pressure measurement

Size of group
9-12 students

Duration
2 hours

Objective
You will be able to find the main landmarks for the cardiology examination (including the standard auscultation sites). You will know how to apply the basic skills of inspection, palpation and auscultation when examining the cardiovascular system. You can measure a patient's blood pressure. You can describe your findings.

You will be aware that a heart examination is an emotionally charged examination. You will take this into account when performing the examination.

Student's tasks
Preparation: Study the study material.
Students are assumed to be familiar with the knowledge acquired during the Bachelor's phase .

- In order to be able to perform a heart examination properly, female patients will need to remove their bra. In the learning situation too, it is usual for female students playing the role of the patient to remove their bra. For both male and female students this is a situation in which not only professional confidentiality but also professional conduct plays an important role. Privacy can be increased by using curtains and screens. If you have strong objections against participation, please discuss this with the tutor before the training session.
- Prepare for the heart examination by studying the anatomy of the heart and the major blood vessels in the 'Anatomy Atlas' (pay particular attention to the position of the valves in relation to the ribs and sternum).
- Prepare yourself by answering the following questions:
    1. What happens to the heart when a person lies on their left side?
    2. Why is a left lateral position used for palpation and auscultation?
    3. Which sound (first or second) can be heard loudest at each of the four standard auscultation sites and which valve is most clearly heard in the normal healthy heart?
    4. What effect does breathing have on the splitting of the second sound and on the heart rate?

At the session:
Take part in the examination and practise the heart examination and measurement of the blood pressure.

Study material (study it carefully before the PS sessions!)
Macleod's physical examiantion and accompanying film clips.

Learning aids to be brought to the class by the student:
Stethoscope.

Appendices
1. Heart examination
2. Blood pressure measurement
3. Training assignments
4. Heart examination checklist
5. Blood pressure checklist

Appendix 1: Heart examination

Examination of the heart
The examination of the heart also comprises the four elements of inspection, palpation, percussion and auscultation.

Inspection
When inspecting the patient as part of the heart examination you will pay attention to the general impression he/she makes: is the patient dyspnoeic, pale or cyanotic? You can examine the patient for cyanosis by holding a finger(nail) of the patient beside your own fingernail. Cyanosis can be either peripheral or central. In case of peripheral cyanosis, the circulation in the limbs in particular will be insufficient, so that more oxygen will be extracted from the haemoglobin. This will result in a cyanotic appearance (blue discolouration) of the limbs.
In case of central cyanosis, there will be insufficient oxygen saturation of the blood entering the aorta. The cause of this will be related to the heart and/or lungs. There may be an intra-cardiac or extracardiac right-left shunt causing oxygenated blood to mix with deoxygenated blood and/or insufficient oxygen absorption. In patients with central cyanosis, not only the limbs but also the tongue and lips will show cyanotic discolouration.
During inspection you will also look for many possible expressions of cardiac conditions, such as ankle oedema and changes to fingers and fingernails. These aspects will not be addressed at this point, because this training session focuses on performing a systematic heart examination. When normal subjects are inspected in supine position, the location of the apex beat (apical impulse of the heart) can often be seen. Whether the normal apex beat can be observed depends, among other things, on the patient's build and the amount of subcutaneous fat. If the apex beat cannot be found on inspection, it can often be found by means of palpation.

Palpation
To *localize* the heart, you localize the apex beat (= apical impulse) by means of inspection and/or palpation, with the patient in supine position. Once you have determined the apex beat, you can say something about the size and position of the heart. In addition, the apex beat gives you one of the sites where you should auscultate. The apex beat develops because when the heart contracts the cardiac apex moves downward/leftward, so that the most lateral part of the left ventricle taps against the thoracic wall. Under normal circumstances the apex beat can be found in the 4^{th} or 5^{th} intercostal space (ICS) left on or within the midclavicular line.
The *quality* of the apex beat is determined with the patient lying on his/her left side. Under normal circumstances the apex beat will be one to one and a half fingertips wide and easily palpable. In case of left ventricular overload, the apex beat may be wider and strike against the fingers more strongly (forceful or heaving apex beat).
Palpation of the peripheral arteries is also part of palpation of the cardiovascular system. This aspect will be dealt with in the next training session. Palpation of the arteries can be used to determine the heart rate and the rhythm of the heartbeat (regular or irregular). Usually the radial artery is palpated for this purpose.
This is not the best option, however; the carotid artery is often more easily palpable, which is important in case of cardiac arrhythmia. In addition, the carotid artery is closer to the heart than the radial artery, which has a time delay in relation to the ventricular systole of approx. one third of the systole duration. This can be confusing with higher heart rates. In other words: to determine the systole or diastole during auscultation the carotid artery should be palpated.
(Note: Never palpate both carotid arteries at the same time! It may cause bradycardia or asystole.)

Percussion
The heart is a hollow organ, but because it is filled entirely with blood, it sounds like a solid organ on percussion, i.e. you will hear dullness. However, because the heart walls have a convex shape and because lung lobes are partially in front of them, the exact location of the heart is very difficult to determine using percussion.
In practice, the heart borders found during percussion of the supine patient
are often not in accordance with the findings on e.g. an echocardiogram. Percussion of the heart will therefore not be discussed during this training session.

Auscultation
The purpose of auscultation is to assess:
- Heart rate and heart rhythm
- Heart sounds and any murmurs

When auscultating the heart you will alternate between listening with the bell and with the diaphragm. You will always (even on healthy subjects) listen in at least five standard sites:

- 3rd and 4th ICS left (3L and 4L)
- 2nd ICS left (2L)
- 2nd ICS right (2R)
- Apex, also with the patient lying on his/her left side

The auscultation is performed with the patient in supine position first and after that lying on his/her left side. A murmur caused by aortic insufficiency is easiest to hear (and can sometimes only be heard) when the patient is sitting. Murmurs caused by the mitral valve are easiest to hear near the apex when the patient is lying on his/her left side. There are other auscultation sites where you can listen, such as on the patient's back in case of coarctation of the aorta. The extra sounds and murmurs will not be dealt with at this point. This part of the theory will address aspects of the healthy heart. For an elaboration of pathological auscultation findings, see the Medicine student manual, PS session 'Pathological heart sounds'.

Heart rate and rhythm

The heart rate and the heart rhythm can be determined by means of palpation as well as auscultation. Auscultation is more accurate, however. Particularly in small children, auscultation is preferred, as their arteries are difficult to palpate.

Heart sounds

The normal heart valve sounds are produced when the membranous part of the valves is drawn taut – more or less like a parachute at the end of deployment. This occurs after the valve edges meet, which is not audible due to the membranous nature of the valves. The closure of the mitral and tricuspid valves is caused by the increase in pressure in the ventricles at the start of the ventricular systole. The closure of the aortic and pulmonary valves is caused by a pressure drop in the ventricles. In other words, the pressure difference between the artery and the ventricle concerned causes the valve to close, and not the blood flow, as can be clearly seen on an echocardiogram.
The loudness of the sound produced is influenced by the pressure difference across the valve and by the size and flexibility of the valve leaflets.
The first heart sound is mainly generated by the closing of the mitral valve. The tricuspid valve closes almost at the same time, but the sound of this is fully filtered out because the pressure difference across the mitral valve is much greater. The second heart sounds are generated by the closing of the semilunar valves (aortic and pulmonary valves). On expiration, the two tones coincide, while on inspiration they are distinct.
In addition to the first and the second heart sound, under physiological circumstances a third heart sound and an aortic valve ejection sound can be heard as well. The third heart sound is physiological in children and young adults. It is a low-frequency sound that occurs shortly after the second heart sound, at the end of the ventricle's rapid filling phase. It is a sign of good elasticity of the ventricle. If this sound is heard in older patients, this is often a sign of pathology (heart failure, serious mitral insufficiency).

The physiological and pathological third sounds cannot be distinguished from one another by means of auscultation. The aortic valve ejection sound can be heard in 90% of children and youths, and resembles a split first heart sound.
There are various pathological heart sounds, which are not covered in this training session.

The first and the second heart sound divide the heart cycle into two phases:

- Systole: the period between the first and the second sound, in which the ventricles contract and blood is pushed into the systemic and pulmonary circulations
- Diastole: the period between the second and the first sound, in which both ventricles are filled

Murmurs

Various murmurs can be heard. Not all murmurs are signs of abnormalities. There are many so-called 'harmless flow murmurs'. How to make the distinction between pathological and harmless murmurs is not something that will be addressed during this training session.

Skills description
Make sure your hands are warm and clean, and that the stethoscope is not too cold. Take off any jewellery but keep a watch to hand to count the heart rate. Paying close attention to communication aspects is also an important factor in this training session. This means explaining everything properly and giving clear instructions. The patient's upper body needs to be undressed fully for this examination, and female subjects also need to take off their bra to enable proper palpation of the apex beat or auscultation of the mitral valve.

Heart examination

Landmarks
For a systematic cardiac auscultation, it is important to be familiar with certain landmarks on the thorax. Based on these landmarks, the auscultation sites can be determined.
Firstly, you will identify the midclavicular line (MCL). Do this by measuring the centre of the left clavicle. The clavicle starts at the acromioclavicular joint. You will find this joint by palpating the clavicle in the lateral direction, until you notice an indentation. The clavicle ends at the attachment to the sternum. This also feels like a small indentation, which can be found by following the clavicle in the medial direction. The line through the centre of the clavicle, parallel to the sternum, is the MCL. You can indicate the apex beat as, for instance, 3 cm lateral to the MCL. If you have only *estimated* the MCL position, you cannot indicate the apical impulse position in relation to the MCL in centimetres. Therefore it is important that you *measure* the centre. Next, determine the sternal angle. This is the junction of the manubrium and the body of the sternum. You will find this junction by taking your fingertips across the sternum from the jugulum to caudal, until you come across a small ridge that runs horizontally. By following this ridge to the left or right, you will arrive at the second rib, with above it the first and below it the second intercostal space (2^{nd} ICS = space between 2^{nd} and 3^{rd} rib) left and right of the sternum. While palpating, you can move to the other intercostal spaces.

Inspection
Assess the general impression the patient makes, first when standing: is the patient dyspnoeic, cyanotic or pale? Pay attention to the lips, tongue and limbs for this purpose. Next, try to visually locate the position of the apex beat with your subject in supine position. Start by looking at the position where you would expect the apex beat, i.e. medial to the midclavicular line at the level of the 4^{th} or 5^{th} ICS. If you do not immediately see the apex beat there, it may be more lateral. The apex beat is not visible in all people. If it is not, you should determine the position of the apex beat by means of palpation.

Palpation
To determine the *position* of the apex beat (patient in supine position, not lying on left side), use palpation to find the intercostal space where you expect to find the apex beat (4^{th}-5^{th} ICS left). First put your flat (preferred) hand loosely on the thorax to get an indication of the position of the apex beat. In women it will always be necessary to move or lift the left breast somewhat. Localize the apex beat using the tips of the index and middle finger. Then determine the position of the apex beat in relation to the midclavicular line.
To assess the *quality* of the apex beat, the patient will need to move onto his/her left side. The intercostal muscles should not be tense, as that would inhibit the impulse. Therefore, the patient's left elbow must remain below shoulder level and the right arm must be on the abdomen. The patient must keep his/her head bent forward slightly. You will be able to feel best when you keep your hand relaxed and in line with your lower arm. Rest your hand lightly on the patient. Now you can palpate the apex beat with your fingertips. Start laterally and move in the medial direction until you feel the apex beat.
For palpation of the carotid arteries the patient must keep his/her head slightly to the side and the back. The sternocleidomastoid needs to stay properly relaxed, however. Rest the hand lightly on the patient again and place three fingers with the fingertips next to one another on the carotid artery. The carotid arteries cannot be palpated at the same time. You should, however, palpate both carotid arteries separately, so that you can compare left and right (risk of CVA).
The apex beat should nearly coincide with the pulsation of the carotid artery. If the apex beat rises in systole, it is referred to as 'positive'.
If the apex beat and the pulsation of the carotid artery are palpable alternately (i.e. the apex beat retracts in systole, it is referred to as a 'negative' apex beat. A negative apex beat can occur with constrictive pericarditis or tamponade.

Auscultation
The intention is that during this training session you will gain an understanding of the heart sounds that can be heard under normal circumstances. It is important to be able to recognize this normal pattern properly, so that you can adequately identify physiological variants and pathological findings in the future.
Both the bell and the diaphragm are used in cardiac auscultations. (For use of the bell and diaphragm, see the training session on the basis skills of percussion and auscultation.) Start the auscultation with the patient in supine position. The subject's upper body must be fully undressed. Listen at the five standard auscultation sites (see page 45).

When listening at the apex in female patients, it is often necessary to push the breast up a little. First use the bell and then follow the list again with the diaphragm. Identify the first and the second heart sound, so you will know when the systole and diastole occur. There are a number of methods to distinguish which of the sounds is the first and which is the second sound:
In patients with a normal heart rate (60-80 bpm) the systolic phase can be easily heard because it is shorter than the diastolic phase; the first sound can be heard after the long break.
The first sound can be defined by combining auscultation of the heart with palpation of the carotid artery. You will feel the pulse wave in this artery right after the first sound. Palpating the radial artery in this case would be incorrect, because the pulse wave arrives there with a slight delay because of the relatively long distance it needs to cover.
When listening for the first sound, only focus on that sound and try to ignore all other sounds. Next, do the same for the second sound, paying particular attention to the split. The degree of splitting depends on the patient's breathing.

Terminology:

Inspection: no dyspnoea, paleness or cyanosis
Palpation: normal apex beat
Auscultation: heart rate xx regular, normal heart sounds, no murmurs, no extra sounds

Appendix 2: Blood pressure measurement

By measuring the blood pressure you can get a good indication of the systolic and the diastolic pressure. You need a blood pressure monitor for this, and the internal cuff must encircle at least half of the upper arm. (For average adults a cuff of 13 x 30 cm is used.) The cuff will be placed around the upper arm and when the cuff is inflated the brachial artery will be occluded. At that moment no sound can be heard from the brachial artery through the stethoscope. When you then allow the cuff to deflate, you will hear a pulsating sound at some point (Korotkoff sounds), which is caused by the turbulence occurring when normal blood flow resumes. These sounds will change in nature as the cuff is further deflated, and finally they will disappear. These moments of change determine the phases of the blood pressure measurement.

Phase 1: The Korotkoff sounds become audible.	*the systolic blood pressure*
Phase 2: The sounds become less clear and softer as well.	
Phase 3: The sounds become louder again.	
Phase 4: The sounds suddenly become softer.	*the diastolic-1 blood pressure*
Phase 5: The sounds have disappeared.	*the diastolic-2 blood pressure*

The diastolic-1 blood pressure (phase 4) corresponds most with the pressure measured directly in the blood. Generally, use of the diastolic-2 blood pressure (phase 5) as the diastolic blood pressure value is preferred. An exception are pregnant women, for whom the diastolic-1 blood pressure is used, because the diastolic-2 blood pressure can be very unclear due to spontaneous vascular sounds that can occur in pregnant women.
The phase 4 and phase 5 blood pressure values often differ by 5 to 10 mmHg. If the difference is greater, it will be desirable to record both pressure values, e.g. 130/85/60 mmHg. In this case, 85 will be regarded as the diastolic blood pressure.The first time, blood pressure is measured on both arms. If the difference is 10 mmHg or more, the blood pressure will subsequently be measured on the arm where the higher value was found. Usually the blood pressure on the right will be less than 10 mmHg higher than on the left. Record on which arm the blood pressure was measured and in what position (sitting/supine)
The blood pressure is determined by calculating the average of all values found minus the first measurement. Because the blood pressure can vary considerably, sufficient time must be taken to determine whether or not a patient has hypertension. Depending on how high the blood pressure is, the diagnosis of hypertension will be established after three measurements over a period of several weeks (three measurements). The diagnosis of hypertension will be made based on these measurements if the average diastolic blood pressure is ≥90 mmHg and/or the average systolic blood pressure is ≥140 mmHg. An average cuff will be adequate for an average arm.
For slender arms, a more narrow cuff will be needed. With an average cuff the measurement will be too low.
For obese patients you will need a wider cuff. With an average cuff the measurement will be too high.

Execution of blood pressure measurement (peace and quiet during measurement!)

Measure the blood pressure after the patient has been sitting quietly in a chair for around five minutes. Make sure any clothing around the upper arm has been removed. This generally means that upper-body clothing will need to be removed; only wide sleeves made of soft fabrics can be easily rolled up. Ask the patient to sit down in a relaxed manner, with the entire arm resting on a surface. Then put on the cuff, so that the bottom of the cuff is around 3 cm above the cubital fold. Make sure the cuff is against the medial side of the upper arm. Pay attention to the arrow indicating the position of the brachial artery on the outside of the cuff (if present). Localize the brachial artery using palpation (see palpation of peripheral arteries). Inflate the cuff quickly while still palpating the brachial artery. Keep pumping until the pressure in the cuff is around 30-50 mmHg higher than at the moment when you no longer feel any pulsations. If you do not do this, there is a chance that you will underestimate the systolic pressure, because in some people (particularly diabetics, hypertensive patients and patients with atherosclerosis) the Korotkoff sounds start, disappear briefly and start again when the pressure is lower: the so-called ‘silent gap’. The cause of this phenomenon is not known.

Place the stethoscope with the diaphragm on the brachial artery and allow the pressure in the cuff to drop at a speed of around 2 mmHg per second, while listening to the sounds. Read the pressure at the moment when you hear the second beat (with an accuracy of 2 mmHg). This is phase 1, which corresponds with the systolic blood pressure. Allow the pressure in the cuff to go down further at the same speed, and read the meter when the sounds suddenly become softer: phase 4. Also measure at the point when the sounds have disappeared definitively: phase 5.
Then allow the cuff to deflate quickly and remove the cuff.

Terminology: blood pressure xxx/xx mmHg (L/R, sitting/supine)

Appendix 4: Checklist for examination of the heart

Before the examination
Greeting
Explanation of the examination and reason
Instruction to undress (remove bra)
Remove jewellery, wash hands
Hands and stethoscope warm

Inspection
Dyspnoea (at rest, when undressing/dressing), cyanosis, paleness

Fingertips/nails
Lips, tongue
Apex beat (supine position)

Palpation
Apex beat
(first with flat hand for indication,
then localize and assess with fingertips)
Supine for determining position
With patient lying on left side for assessment of quality

Carotid artery (to determine whether the apex beat is positive or negative)

Auscultation
Heart rate and rhythm
1st, 2nd sound, splitting 2nd sound, extra sounds, murmurs (for determination of systole: palpate carotid artery)
Listen using diaphragm
Listen using bell
- Apex: supine position and lying on left side
- 3rd and 4th ICS left
- 2nd ICS right
- 2nd ICS left

During the examination
Explanation during examination
Instructions on position and breathing
Focused observation
(Eye) contact with the patient
Ability to handle technique and communication with ease

After the examination
Indication that the examination is finished
Instruction to get dressed
Rounding off and presentation of findings
Wash hands

General
Is able to demonstrate knowledge of the skills

Appendix 5: Blood pressure checklist

Before the examination
Greeting
Explanation of the examination and reason
Instruction to undress
Remove jewellery, wash hands

Putting on the cuff correctly
Localize brachial artery by means of palpation
Around 3 cm above cubital fold, etc.

Correct execution of the measurement
Quickly inflate cuff during palpation
Brachial artery (or radial artery) (silent gap)
Stethoscope with diaphragm placed on brachial artery
Rate of descent of the mercury column 2-3 mm per second
Read systolic pressure,
Read diastolic pressure
Measure on both arms

During the examination
Explanation during examination
Instructions on position
Focused observation
(Eye) contact with the patient
Ability to handle technique and communication with ease

After the examination
Indication that the examination is finished
Instruction to get dressed
Rounding off and presentation of findings
Wash hands

General
Is able to demonstrate knowledge of the skills

PS session: Abdominal examination

Size of group
9-12 students

Duration
2 hours

Objective
After this training the student will be able to perform the standard physical examination of the abdomen.

Student's tasks
Preparation: Study the study material.
Students are assumed to be familiar with the knowledge acquired during the Bachelor's phase .

At the session:
Participate in the examination, practise.

Study material
Macleod's clinical examiantion and accompanying film clips.

Learning aids to be brought to the class by the student
Stethoscope

Appendices
1. Abdominal examination
2. Checklist for abdominal examination

Appendix 1 Abdominal examination

General
The use of ***examination gloves*** depends on the setting of the examination. Generally, in GP's surgeries and outpatients' clinics, physicians will not wear any gloves during an abdominal examination if the abdominal skin is intact. However, at intensive care departments in a hospital gloves will be used. Where there is an infection risk for the patient or the physician (skin not intact, wound, stitched wound, drain, inflammation), gloves will be worn in any setting.

The **fixed** order for the abdominal examination is as follows:
Inspection
Auscultation
Percussion
Palpation

Why this order of examinations?
This order is different from what you have been used to so far.
The first reason for this is that percussion and palpation activate peristalsis, so that auscultation should precede percussion and palpation. If you auscultate at the end of the examination, you may get the wrong impression of the quantity of the peristalsis and more subtle sounds like vascular sounds may not be noticed.
A second reason for this different order is that palpation is the most painful part of the examination. Auscultation and percussion will already give you an impression of the localization and severity of any pain that is present, so that you can take this into account during your further assessments. ***The most painful part of the examination is done last***, before muscle resistance (active or passive) occurs or the patient may even become uncooperative.

Make sure the examination room is well-lit and well-heated. Your hands and stethoscope should be warm as well. Ask the patient whether his/her bladder is empty: doing the examination when the patient's bladder is full will cause discomfort. Allow the patient to go to the toilet if necessary. During the examination of the abdomen, the patient will be in supine position on the examination table, with the arms beside the body. The abdomen and the chest are bare, but women can keep on their bra. The patient can keep on his/her trousers, but they do need to be lowered slightly, so that the lower abdomen and the groin area are visible as well. Having the patient take off the trousers would be easiest so that he/she won't need to lower them repeatedly. The underpants do not need to be taken off; they can be lowered to bare the lower abdomen and groin when these need to be assessed. The abdominal examination is preferably performed with the examiner sitting down, so you cannot put too much pressure on the abdomen and you do not appear too threatening to the patient. Always examine the patient from the right-hand side. Before the examination starts, you should ask the patient whether he/she has any pain in the abdomen and if so, where. You can take this into account during your examination, by always assessing the painful place(s) last. During the examination, ask the patient to indicate when it hurts and look at the patient's face to see whether the patient is grimacing from pain. Keep explaining to the patient what you are doing and say so if an assessment may be painful.

Table: Abdomen divided into quadrants

Top right	*Top left*
Liver; Gall bladder	Left liver lobe; Spleen
Pylorus	Stomach
Pancreatic head; Duodenum	Pancreas
Right kidney (adrenal gland)	Left kidney (adrenal gland)
Hepatic flexure	Splenic flexure
Ascending colon; transverse	Transverse colon; descending
Bottom right	*Bottom left*
Right kidney, lower pole	Left kidney, lower pole
Caecum; Appendix	Sigmoid
Ascending colon, lower part	Descending colon, lower part
Right ovary; Right ureter	Left ovary; Left ureter
Uterus (enlarged)	Uterus (enlarged)
Bladder (enlarged)	Bladder (enlarged)

Abdomen inspection
When inspecting the abdomen you should pay attention to the following:

General shape: from the foot end of the patient: symmetry, distended, caved in?
Local shape: - navel,
- local swelling visible?
- groin:
Skin
Movements
Pulsations

General shape of the abdomen
The abdomen is inspected sitting at the feet of the supine patient. In most cases, the abdomen's shape will be symmetrical. Clear asymmetry may be caused by a large tumour in the abdomen (e.g. organ enlargement) or by abnormal gas distribution. A symmetrical abnormal shape of the abdomen may be the result of a distended or caved-in abdomen.
If the abdomen appears caved in, this may be a consequence of malnutrition.
A distended abdomen, on the other hand, may be caused by accumulated gas (meteorism), pregnancy or accumulated fluid (ascites). In obese patients, the abdomen appears to be distended, but this is the result of fat deposition in the abdominal wall or in the omentum. The volume of the abdomen as such has not increased.

Flanks
To be able to properly inspect the flanks, you can assess the patient in supine position and while standing. If the flanks 'droop' when the patient stands, he/she probably has ascites. The fluid that accumulates due to ascites can move around the abdomen freely, so that it will always be at the lowest point.You will see, in this case, that the flanks are distended, the contour of the hip is no longer visible and the skin on the flanks looks tense and tight. In obese patients the flanks can appear distended and 'drooped' as well, but the hip contour will usually still be visible and the skin will not appear taut.
Based on inspection alone you cannot determine ascites with certainty: percussion can increase the probability of the diagnosis.

Local shape of the abdomen
Navel: All navels are different. There are many possible shapes and usually it concerns physiological variations. However, if the navel has become flat, this may be an indication of gas or fluid accumulation in the abdomen. If the navel is protruding considerably, the patient may have an umbilical hernia.
Swellings: Possible causes of a visible swelling in the abdomen, whether or not combined with asymmetry, include a hernia, a tumour or an enlarged organ.
Inguinal region: Assess the groin area for swellings and skin lesions. Here, too, it is best to inspect from the foot end of the examination table. Compare left and right, so you will also notice minor abnormalities.
As standard, the inguinal region is inspected for the presence of swellings and skin lesions (inflammation, scratching effects). Swellings in the groin may be swellings in the skin, or swellings of underlying tissue, such as in case of an enlarged lymph node or an inguinal hernia. When inspecting the groin, you may ask the patient to blow on the back of his/her hand or to cough. Due to the increased intra-abdominal pressure this causes, an inguinal hernia may become visible. Sometimes an inguinal hernia will only be visible when the patient is standing

Peristalsis
In case of a suspected obstruction somewhere in the gastrointestinal tract, you will need to pay close attention to visible peristalsis. Sometimes a peristaltic wave will be visible across the abdominal wall, due to rather lively peristalsis occurring immediately before an obstruction. Examples of obstructions are pyloric stenosis and mechanical ileus. Keep in mind that visible peristalsis is not necessarily a sign of pathology; peristalsis can also be visible in patients with a weak abdominal wall or in people who are very thin.

Abdominal skin
When inspecting the skin of the abdomen, pay particular attention to scars of wounds or previous operations (ask for the cause of the scar, as this often yields additional information. The location of

the scar also offers extra information, e.g. a scar in the right upper abdomen is often a scar of an open cholecystectomy), striae, scratching effects, a prominent venous pattern and other skin abnormalities, such as an abnormal skin colour. Spider naevi (angiomas) may be a sign of alcoholic liver cirrhosis. Striae are scars which are perpendicular to the skin lines and which are caused by the skin surface having had to grow too quickly. The growth of the abdomen during pregnancy, for instance, stretches the abdominal skin so much in such a short time that striae may develop. Striae are often also found in the skin on the hips, due to fast growth during puberty or in a period of rapid weight gain. Scratching effects indicate itching and may be a sign of the existence of bile accumulation, for example.

Movements of the abdomen
View three to five respiratory excursions of the abdomen and see whether all parts of the abdomen participate in the breathing movement, or that (part of) the abdomen is kept still. When patients use abdominal breathing, the abdomen comes forward during inspiration.
Most people use combined chest and abdominal breathing. If you notice that a patient is only using chest breathing and keeps the abdomen completely still, this may be a sign of pain on inspiration, for instance caused by irritation of the peritoneum due to peritonitis.

Pulsations: Pulsations of the abdominal aorta are visible in thin, lean patients, right above the level of the navel. Assess whether visible pulsations may also be caused by a pulsating swelling. Physiological pulsations are pulsations in a single plane, whereas a pulsating swelling, such as an aneurysm, is characterized by expansible pulsations, which means that you will notice pulsations in all directions.

Auscultation of the abdomen

General
When auscultating the abdomen, you will use the stethoscope's diaphragm by placing it on the abdomen and fixating it with your hand. To assess the quality and quantity of the peristalsis, it is best to listen just below the level of the navel. Make sure you listen long enough to be able to properly asses the aspects of the (varying) peristalsis. In case of lively peristalsis, 30 seconds will suffice, but if the patient has rare peristaltic sounds, you will need to listen for longer. You can only conclude that there are no peristaltic sounds after having listened in the same place for five minutes.

Auscultation of peristaltic sounds
When listening to the peristaltic sounds of the abdomen you will assess their quality as well as quantity.
Quality: The quality of the peristalsis is the type of peristaltic sounds you hear. Under normal circumstances they are not audible. Abnormal types of peristaltic sounds include metallic-sounding peristalsis or rush sounds. This is referred to as audible or high-pitched peristalsis. If the stethoscope picks up a sloshing sound when you push and release the abdomen a number of times, this is often a sign of abdominal or intestinal distension due to fluid accumulation.
Quantity: The quantity of the peristalsis may vary from absent or diminished to lively or very lively. Normal peristalsis is inaudible and may vary from diminished to very lively. In nervous people, peristalsis is often very lively all the time ('borborygmus'). An abnormal finding is the complete absence of peristaltic sounds ('quiet stomach'), which may be a sign of a paralytic ileus due to e.g. peritonitis. Metallic-sounding peristalsis with discharge sounds and rush sounds may point to a mechanical ileus based on bowel obstruction.

Auscultation for vascular sounds
Vascular sounds indicate the occurrence of vortices in the bloodstream in case of e.g. (relative) stenosis, an aneurysm or a coarse vascular wall. Depending on where you hear the murmur, it may help you detect a stenosis of a large artery, a highly vascularized tumour or an aneurysm of the abdominal aorta. You may also hear a murmur above a pregnant uterus.
In patients with general vascular disease or hypertension, you should auscultate:
Renal arteries: Auscultate the renal arteries at around 5 to 10 cm (depending on the size of the patient) above the navel, left and right of the midline. Listen long enough and try to listen 'beyond the peristalsis'. Generally, a murmur of the renal artery can be heard best on the patient's back. Ask the patient to sit down and auscultate next to the spine at the same level. In case of (suspected) hypertension, you should listen especially for murmurs of the renal arteries. Do the same if the patient has complaints that indicate arteriosclerosis.

Femoral arteries: to auscultate the femoral arteries you will need to localize these by first palpating the femoral arteries. Then you will know exactly where to listen. Determine whether there are any murmurs. If you press too hard with the stethoscope, a murmur may also be heard. If you suspect arteriosclerosis, you should auscultate the femoral arteries in the inguinal region. A murmur of these blood vessels may be a sign of stenosis at this level or of general arteriosclerosis.
Iliac arteries: To listen to the iliac arteries, you will first need to localize the femoral arteries. The iliac arteries lie more or less between the navel and the femoral arteries. Determine whether there are any murmurs. The presence of murmurs may indicate local stenosis or general atherosclerosis.

Percussion of the abdomen

Exploratory percussion
It is important to percuss the abdomen systematically. Systematic percussion can, for instance, be done in a star shape starting from the navel, or top-down, percussing on the left and right, and in the centre of the abdomen. In order to cover the entire abdomen, percuss up to and including the flanks, then cranially to beyond the left and right costal arch and then caudally up to the inguinal region and up to the symphysis, covering the entire abdomen.
The technique for percussion of the abdomen is the same as for percussion of the thorax, keeping the plessimeter finger transverse to the percussion direction again. In this way you will have the best chance of hearing (unexpected) dullness. If you want to define a certain organ using percussion, you must approach it with your plessimeter finger parallel to the expected border. That way, you will hear the transition from tympany to dullness more clearly.

Percuss all abdominal regions, but adjust the order if the patient indicates that an area is painful; painful areas should be percussed last.
In a normal abdomen the percussion sounds are caused by the walls of the (air-filled) bowels and by homogeneous structures like faeces and organs. On percussion, air generates a so-called ‘tympanic’ sound, while a mass generates a duller sound. When percussing the normal abdomen, you will therefore hear varying tympany: air and mass are distributed unevenly.

If you hear hypertympanic sounds across the entire abdomen, this may be an indication of meteorism (gas accumulation). If the entire abdomen generates dullness on percussion, this may mean that the abdominal cavity contains more fluid than usual (blood, bowel content, ascites). Abnormal solid masses in the abdomen will generate abnormal dullness locally: enlarged organs, cancer, urinary retention.
If you find abnormal dullness when performing exploratory percussion, this will be an indication for more focused percussion of this area. Usually, localization and circumscription will help you get an impression of which organ is affected. By also paying particular attention to the area causing dullness during palpation, you will be able to arrive at a more focused probable diagnosis; percussion alone will not be sufficient.
You will need to percuss the flanks in case of suspected ascites, for instance if you suspect liver failure or if the abdomen is distended. Ascites moves freely around the abdominal cavity and will therefore move to the flanks if the patient lies down. In this case you will be able to percuss a concave dullness in both flanks at the same distance from the midline, i.e. you are determining the degree of dulling produced by the fluid level. Once you have found this level, you can confirm the suspected ascites by demonstrating ‘shifting dullness’: if you ask the patient to lie down on his/her side, the fluid will move around the abdominal cavity and therefore the borders of the dullness will also move: one will move more to the centre and the other will disappear. If you can demonstrate this, you will be certain of the presence of excess fluid in the abdominal cavity.

Pain during percussion
Normally, percussion of the abdomen will not be painful. If pain does occur during percussion this may mean that the peritoneum is irritated. Percussion pain in the bladder region does not necessarily mean that the peritoneum is irritated; it will often be a sign of cystitis.

Liver percussion
To determine the lower border of the liver, you will start percussing in the midclavicular line below the level of the lower border you found during your exploratory percussion. When doing this, keep your plessimeter finger parallel to the expected border (lower edge of the liver), which runs parallel to the costal arch.
By taking small steps upwards, you will end up at a point where the tympanic sound of the bowels changes into the dull sound of the liver: this is the lower border of the liver. When the patient takes a

deep breath, the liver will move in a caudal direction; keep this in mind when determining the border. Do not percuss too loudly when looking for the lower border; the edge of the liver is thin and if you percuss too loudly the width may be overestimated.

Normally the lower border of the liver can be found at the level of the right costal arch. If on percussion the dullness of the liver is found below the costal arch, this can mean one of two things: either the liver is enlarged (e.g. hepatitis, congestive heart failure, cancer) or it has moved backwards (e.g. due to a low position of the right diaphragm). Absence of liver dullness can be caused by gas accumulation below the right diaphragm as a consequence of gastric or intestinal perforation or interposition of the colon. The thorax X-ray will show a crescent of air below the right half of the diaphragm. This patient had a gastric perforation.

The liver span, percussed in the right midclavicular line, must be determined if your exploratory percussion shows that the lower border of the liver extends below the right costal arch. This allows you to differentiate between enlargement and displacement of the liver. The liver span is the distance between the upper and lower border of the liver. In case of hepatomegaly the span will be increased. If the liver is displaced in a downward direction, the span will not have increased. Normally the span will be around 10 cm.

Percussion of the spleen

When percussing the spleen you will need to start in the right lower abdomen and go in a diagonal line via the navel to the left upper abdomen. You will do this because if the spleen is enlarged this will have occurred in this direction. Perform percussion in the mid-axillary line from caudal to cranial (as in 'Fysische Diagnostiek' (Physical diagnostics) page 148).

If the spleen has a normal size, the spleen dullness will usually be found at the level of the left costal arch between the anterior and the mid-axillary line, but often the spleen is too small to localize it using percussion.

Normally the spleen will be just below the left diaphragm, dorsal from the anterior axillary line. Enlargement of the spleen occurs in ventral and caudal direction towards the navel. Dullness in the left upper abdomen which extends to below the costal arch may be a sign that the spleen is enlarged. In case of extreme enlargement (for instance due to malignancies such as leukaemia) the spleen may extend as far as the lesser pelvis.

Percussion of the bladder

Percuss the bladder region in small steps from the navel in the direction of the symphysis. If the bladder is full, the tympanic sound of the bowels transitions into the dullness of the bladder. If you are able to determine this bladder dullness, you can measure how many centimetres this dullness reaches above the symphysis.

You will need to percuss the bladder region if the patient may have urinary retention. This may be the consequence of an obstruction of the ureter or of nerve damage due to a spinal cord lesion. Normally, the (convex) dullness of a full bladder will not extend more than 3 cm above the symphysis, but in case of urinary retention the bladder volume may be many times greater than the volume of a normal full bladder. Bear in mind that a pregnant uterus will also generate dullness in the bladder region.

Abdomen palpation

Palpation of the abdomen can be subdivided into the following:

Superficial palpation:
Deep palpation
Liver palpation
Spleen palpation
Kidney palpation
Colon palpation
Palpation of the abdominal aorta
Costovertebral angle tenderness
Palpation of the inguinal region
Other techniques

In patients with a normal, pliable abdomen, a number of resistances/swellings will be palpable. The patient's nutritional status and the development of his/her abdominal muscles largely determine whether you will feel anything and if so, what.
Resistances you may feel in a normal abdomen are:

- (On deep inspiration:) The lower edge of the liver
- The abdominal aorta and the bifurcation
- The right kidney in thin people (it is slightly lower than the left kidney and can therefore be felt more easily)
- Depending on how full the bowels are, you may feel the sigmoid and the descending colon.
- In the caecum region an intestinal loop can sometimes be pressed empty.
- Pregnant uterus

A number of these resistances will need to be searched for expressly during palpation, usually on indication. If you feel an abnormal swelling, it is important to describe it in detail.
Note: Location (which underlying organ may be enlarged?), size and any tenderness experienced (inflammation?), shape, nature of the surface, and consistency; the latter may be difficult due to the composition of the abdominal wall in between.
An abnormal swelling may be an inflamed organ, an infiltrate, an abscess or a (malignant or benign) tumour.

Pain on palpation
Palpation should not be painful on a normal abdomen, but it is often experienced as uncomfortable. If the patient indicates that he/she feels any pain in case of superficial palpation, this will be an indication to further assess the pain to get an impression of the cause. Pain on palpation can be subdivided into:

- Tenderness
- McBurney's sign

Tenderness can be a consequence of the fact that (mild) pressure on the abdominal wall causes extra irritation of the irritated peritoneum.
McBurney's sign can be generated by first putting pressure on a certain spot with the palpating hand, keeping your hand still for a bit until any tenderness has disappeared, and then quickly removing the palpating hand.
McBurney's sign can be regarded as tenderness in the opposite direction: because the pressure is suddenly released the abdominal wall is suddenly moved in relation to the intestines, so that the peritoneum is irritated again. The presence of tenderness or McBurney's sign may be a sign of inflammation combined with peritoneal irritation.
The severity of the pain does not offer a good impression of what is going on, but the location of the pain does: local pain is usually felt above the affected organ. Generalized tenderness and McBurney's sign also exist. In these cases the entire abdominal surface will be painful. Generalized pain is less specific, in other words.

Superficial palpation
Superficial palpation is performed with a flat hand, with the physician only putting gentle pressure on the abdominal wall.
Asses the tone of the abdominal muscles in several places during superficial palpation. The abdomen can be pliable or can become tense (locally or generally) when touched. If the abdomen feels tense, you can try to have the muscles relax by asking the patient to sigh and by making him/her feel at ease. *You may consider asking the patient to pull up his/her legs slightly; if the surface of the examination table is slippery the patient's socks may need to be taken off to prevent the abdomen from tensing up even more.* During superficial palpation a normal abdomen will feel pliable and relaxed. If the abdomen is not pliable, the muscle tone of the abdominal muscles will have increased (muscle resistance). If the tension of the abdomen can be eliminated, you will know that cause was active muscle resistance.
Active and passive muscle resistance
In case of protective muscle spasms (passive muscle resistance), the abdomen will feel very rigid (locally). This tension cannot be eliminated by actively relaxing the muscles, as in active muscle resistance. The distinction between active and passive muscle resistance is not always clear, unfortunately, as active muscle resistance cannot always be eliminated either. In case of active muscle resistance, the patient consciously tenses the abdominal muscles because he/she is nervous or scared that the examination will hurt. In principle, active muscle resistance can be ended by means of distraction and active relaxation. Prevention of active muscle resistance is not clinically relevant. In

case of passive muscle resistance (protective muscle spasms), the muscle tone is involuntarily increased on palpation due to peritoneal irritation. Protective muscle spasms can never be overcome by will power or distraction and are clinically very relevant: they are a sign of peritoneal irritation.

Deep palpation

When performing deep palpation you will systematically examine the entire body, palpating painful areas last. Palpate all quadrants of the abdomen carefully and systematically. During deep palpation you can use two hands, one as a 'feeling' and one as a 'steering' hand. Your bottom hand (your dominant hand) will lie flat on the abdomen and will be used as the feeling hand. Your other hand (the non-dominant one) will lie on top of the bottom hand, will apply pressure and will do the steering. By palpating with two hands you will avoid 'pricking' the abdomen with your fingers when palpating deeply, as your bottom hand will always remain flat.

Liver palpation: Film 'Fysische diagnostiek 6.5; Onderzoek lever en galblaas' ('Fysische Diagnostiek' (Physical diagnostics) 6.5, Examination of the liver and gall bladder) (first part up to 3 minutes 30 seconds) *The CTC has opted for the method mentioned in the film and the book 'Physical diagnostics'*
*for liver palpation***.** Also refer to Figure 6.6 regarding liver palpation in the book.

Start the palpation by placing your right hand on the patient's abdomen, a few centimetres below the level where you found the lower liver border during percussion.
Position your hand in such a way that your index finger is parallel to the costal arch.
Place your left hand on top of your right hand. Use your right hand to feel, and your left hand to apply pressure and to steer.
Start palpating in the midclavicular line.
To be able to feel the liver you will need to create some depth, meaning that you will need to push into the abdomen. If this is difficult because the patient tightens his/her abdominal muscles, it is best to follow the patient's breathing. Ask the patient to breathe in and out deeply, and use his/her exhalation to get a little deeper.
Once you are deep enough into the abdomen, the patient can breathe normally again, while you need to ensure that you do not lose any depth. Sometimes this alone requires force!
Now you can start palpating the liver.
When the patient breathes in deeply, the diaphragm will move the organs caudally in the upper abdomen.
Therefore, have the patient breathe in deeply while keeping your hands in the same place (this will require force) and feeling whether the lower edge of the liver bumps into the edge of your index finger.
If this happens, have the patient breathe in deeply again and hold his/her breath, so that you will have a bit more time to properly palpate the lower edge of the liver.
Feel whether the lower edge is smooth or irregular and whether it is painful.
If you have not been able to feel the lower edge, you can move your hands slightly cranially and repeat the procedure.
You should only move in the cranial direction until you are hampered by the costal arch.
If at this point you are still unable to feel the liver, try – in the same position – to move your hand cranially during inspiration (when the liver moves caudally) in the hope that you will encounter the liver then. This is referred to as a 'scooping' motion, which will require force as the patient's respiratory movement is likely to push your hand out of the abdomen.

A liver edge will normally feel firm and elastic and sharp. A pathological liver may feel bumpy, blunt or even very hard. If you can palpate the liver, indicate in centimetres where the edge is in relation to the costal arch. The left liver lobe should be palpated in the same way in the midline.

Normally the liver edge will not extend below the right costal arch. In healthy people you may only feel a slight edge of the liver during deep inspiration, because then the liver is moved slightly downward due to the movement of the right half of the diaphragm. In newborn babies a small projection of the liver may be palpable physiologically as well. However, often the liver will be displaced (e.g. due to pleural fluid) or enlarged if the edge is palpable. The most common causes of hepatomegaly are liver congestion (for instance due to right heart failure) or types of cancer like leukaemia. When palpating the liver, do not limit yourself to the right liver lobe but also feel for the left lobe. The left liver lobe may be specifically enlarged in case of localized processes such as a left lobe carcinoma, in which case the left liver lobe will be palpable a long way into the left half of the abdomen; in this case you will not feel displacement of the lower border of the liver, as you will determine the lower border of the right lobe as standard.

A number of books and videos show the bimanual liver palpation method. This involves placing the palm of one hand under the patient to slightly lift the thoracic wall. The patient will unconsciously start to collaborate, so that the examination cannot be performed properly. We are not in favour of this bimanual method.

Spleen palpation
The palpation technique for the spleen is equal to that for the liver. You will start in the right lower abdomen and palpate in small steps via the navel in the direction of the left costal arch. If the spleen is palpable, you will feel elastic resistance against your fingers and if the spleen is strongly enlarged, you may even feel the downstroke on the medial side. To be able to determine a slight enlargement of the spleen that does not extend to below the costal arch and can therefore not be identified in supine position, ask the patient to move onto his/her right side. Palpate just below the left costal arch. The spleen is normally not palpable, because the lower edge does not extend to below the left costal arch. The spleen is only palpable if it is at least two to three times larger than normal. This is always pathological. Splenomegaly may be caused by congestion of the spleen or by malignancies of blood and bone marrow. If a palpable spleen is painful due to touch as well, the spleen tissue is probably affected by infarction.

Kidney palpation
The kidneys can only be felt by palpating with two hands. First try to palpate the right kidney. Use the left hand for support and place it in the flank with the fingers parallel to the costal arch, and the little finger against the iliac crest. Place the right hand on the right upper abdomen, with the index finger against the costal arch. Have the patient breathe in deeply and try to grab the right kidney lower pole between your two hands by moving your flat right hand downwards. While the patient is breathing out, you can feel the kidney slip away between your fingers. After this, try to palpate the left kidney as well. Because you are standing to the right of the patient, you will now need to use your right hand for support, with the left hand on the upper abdomen. The rest of the procedure is the same as for palpation of the right kidney.
In adults, palpation of the kidneys is rarely possible. You can try to palpate the kidneys if you think they may be enlarged. Indications for this may be findings during the history-taking (urinary tract infection symptoms, pain in the flanks after a UTI) or findings during the standard examination of the abdomen. In case of increased dullness on percussion in the spleen area, you will need to try and palpate the kidneys.
Palpation of the right kidney: . Bear in mind that if you can palpate the right kidney, this does not necessarily have to be pathological: the right kidney is slightly lower in the upper abdomen than the left kidney, so that in thin people the lower pole of the right kidney is sometimes palpable physiologically.
Palpation of the left kidney: If the left kidney is palpable, this will almost always be a sign of enlargement of the left kidney.

Colon palpation
Palpate the descending colon and the sigmoid and possibly also the ascending colon. During palpation you will keep moving the palpating fingers back and forth in a direction that is perpendicular to the pathway of the colon. Start palpating in the right lower abdomen and follow the ascending colon upwards. Place your hands at the splenic flexure of the colon and palpate the descending colon as far as possible into the lesser pelvis. A colon filled with compacted faeces will feel like a sausage-shaped strand of varying thickness and consistency, which keeps slipping away below your palpating fingers. If the wall of the colon is under pressure due to gas (meteorism), the colon may become as resilient as a fully inflated balloon.
Normally, if the colon is sufficiently full, only the sigmoid and the descending colon will be palpable. The exploratory percussion will have already given you an impression of the extent to which the colon is full. If the patient has complaints indicating intestinal problems, you can perform focused palpation of the colon, so that you can localize any stenosis by determining the bulk faeces in front of the stenosis.
If the patient has a distended abdomen due to gas (meteorism), you will palpate the colon to determine whether the gas is in the bowels or in the abdominal cavity. Abdominal pain and anal blood loss are always indications for palpation of the colon.

Palpation of the abdominal aorta
Carefully palpate the aorta in the midline just above the navel.

You can palpate the area of the abdominal aorta if you suspect an aneurysm of the abdominal aorta, for instance if the patient complains of pain in the midline or if on inspection you noticed a pulsating swelling.

Costovertebral angle tenderness
In case of suspected urological problems such as infections, you will test whether you can induce costovertebral angle tenderness.
First try to induce this tenderness by carefully tapping on both sides of the spine with the ulnar side of your hand, at the level of the kidneys. Ask the patient whether this hurts and watch his/her face. You can examine for costovertebral angle tenderness with the patient in supine position, but it will be easier if the patient sits for a bit.
Costovertebral angle tenderness is really a combination of tenderness and percussion pain. If you can induce this pain in a patient, this will be a sign of a kidney infection: pyelonephritis or glomerulonephritis.

Palpation of the inguinal region
For palpation of the inguinal region you should move the patient's underpants slightly up or down. When palpating the groin, pay attention to pulsations of the femoral arteries, comparing left and right. In addition, feel for the presence of enlarged lymph nodes and other types of swelling.
When palpating the groin, pay particular attention to pulsations of the femoral arteries and the presence of palpable lymph nodes and other types of swelling. A swelling in this area may indicate an inguinal hernia, an enlarged lymph node or a swelling in the skin.

Other techniques
The theory and the corresponding techniques of the digital (recto)vaginal examination, the digital rectal examination and examination for (inguinal) hernias will not be dealt with in this training session, but do form part of the examination of the abdomen. A digital (recto)vaginal examination is indicated if you suspect processes in the lesser pelvis, in case of abdominal pain and if you suspect gynaecological pathology. A digital rectal examination is done in case of abdominal pain, large intestine complaints or rectal bleeding, and in men with prostate complaints or suspected prostate pathology. A focused examination for hernias will be done if swellings are found in the groin or around the navel.

Terminology for normal examinations
Smooth abdominal movement when breathing, no visible peristalsis or pulsations; no scars
Slim/obese
Normal peristalsis
No vascular sounds of the renal artery, abdominal aorta, femoral artery
Varying tympany, pliable abdomen, no tenderness or McBurney's sign
Liver not enlarged, spleen not palpable, no palpable abnormalities
Femoral arteries left = right, normal pulsation
No costovertebral angle tenderness

Checklist for standard examination of the abdomen

Before the examination
Greeting
Explanation of the examination and reason
Instruction to undress / patient position / privacy
Remove jewellery, wash hands

Inspection
General shape: expanded, shrunken
Local shape of the navel: flattened, protruding
Swelling
Groin: swelling, skin lesions
Skin: scars, striae, scratching effects, colour

Movements of the abdomen
- Breathing, abdomen moves with breath? visible peristalsis?
- Pulsations: abdominal aorta, pulsating swelling?

Auscultation
Peristalsis: (just below the navel, listen for a long time)
- Quality: silent, audible, stomach rumbling?
- Quantity: absent, minimal, (very) lively

Vascular sounds: abdominal aorta (above the navel in midline)

Percussion
Exploratory: systematic, painful area(s) last
- Varying tympany: physiological or abnormal
- Pain on percussion: present?

Focused:
- Liver: determine lower border in midclavicular line and in midline
- Spleen: size (determined starting from right lower abdomen)

Palpation
Superficial: systematic, flat hand, painful area(s) last
- Tone of abdominal muscles: relaxed? Active/passive muscle resistance?
- Pain: present?

Deep: systematic, painful area(s) last, two hands
- Liver: midclavicular line and midline, breathing instruction
- Spleen: from navel in direction of costal arch, possibly with patient lying on side, breathing instruction
- Groin: pulsations, swelling
- Resistance: physiological, abnormal, localization, size, painfulness

During the examination
Explanation during examination
Instructions on position and breathing
Focused observation
(Eye) contact with the patient
Ability to handle technique and communication with ease

After the examination
Indication that the examination is finished
Instruction to get dressed
Rounding off and presentation of findings
Wash hands

General
Is able to demonstrate knowledge of the skills

PS session Clinical chemical analysis

Size of group
30-35 students.

Duration
2 hours

Objective

- The student will learn to assess the kidney function in various ways and will learn the pros and cons of each method. The student will learn to instruct the patient on how to collect a 24-hour urine sample.
- Based on practical experience and a number of cases, the student will learn the details and application of qualitative urinalysis, particularly dipstick screening and sediment.
- The student will become familiar with the interpretation of the results of haematological laboratory tests.
- The student will gain an understanding of risk assessment, the likelihood of getting a disease, and cut-off value versus reference value. The student will gain knowledge of the effects of analytical variation on the results of the analysis.
- The student will experience, based on haemolysis, that pre-analytical factors affect the results of laboratory tests.

Student's tasks
Preparation: Read the brief practical manual including references, and answer questions 1.2; 3.2; 4.3 and 5.3.

At the session:
Perform laboratory tests in groups of 5-6 students, passing five different stations.

Study material
Brief practical manual

Learning aids to be brought to the class by the student
White coat and calculator.

Appendix
1. Brief practical manual

Appendix 1: Brief practical manual

There are five different stations and at each station you can work in groups of 5 to 6 students. At each station you will find: an explanation of the test, the backgrounds of the test and/or the tutor will provide an explanation. The tutor will also ask you some questions. At each station one laboratory test will be performed and addressed.

1. Assess the kidney function based on creatinine, eGFR and creatinine clearance. Collect a 24-hour urine sample: learn how to draw up an instruction for the patient.

1.1. Method: Determine the creatinine concentration in the patient's urine and the corresponding plasma.
Calculate the creatinine clearance and eGFR based on the two respective formulas. The test is for a 36-year-old woman. Instruct the tutor and your fellow students on how to collect a 24-hour urine sample. Interpret the results of the plasma creatinine, the eGFR and the creatinine clearance.

1.2. Preparation for students:
Internet/book/NtvG on kidney function and interpretation of creatinine, creatinine clearance and eGFR;
For example: Apperloo JJ et al: 'Schatting van de nierfunctie op grond van de creatinineklaring: bruikbaarheid van enkele formules en correctie bij obese patiënten' (Assessment of the kidney function based on creatinine clearance: usefulness of a number of formulas and correction for obese patients), Ned Tijdschrift Geneeskunde 2007; 151:1016-23.
And response to it: 'Bepaling van de nierfunctie' (Kidney function assessment); Ned Tijdschrift Geneeskunde 2007; 151:1753-61.

2. Qualitative urinalysis:

2.1. Method
A number of portions of urine will be screened using a test strip. You will be wearing gloves. **Because there is a considerable lack of clarity regarding the term 'sediment', a PPT presentation will be shown to explain what happens during the screening using the strip and when the sediment is viewed under the microscope. The urine portions to be screened relate to 2-3 cases which will be discussed in the PPT presentation.**

2.2. Assignment. Try to interpret the result of the screening.

2.3: Preparation for the student: None.

3. Haematology

3.1. Method
A number of cases will be dealt with based on results of the haematology analyzer (Sysmex) and by means of microscopic examination of blood smears (differential count).

3.2. Preparation for the student: Haematology theory, differentiation of red blood cells, anaemia.

4. Diabetes diagnostics

Patient A: A 64-year-old male (height 1.80 m, weight 96 kg) comes to your surgery. He says his mother developed diabetes at a later age. He feels fit but nevertheless would like to have his blood sugar measured. Therefore he has come to the surgery with an empty stomach. He has never really been ill and is not using any medication.

4.1. Question:
Can you estimate his risk of diabetes? Will you perform a glucose measurement?
You will have a choice between a glucose analysis in your practice or referring the patient to a laboratory. We will now show you the pros and cons of both choices.

4.2 Assignment and interpretation:
Measure the patient's glucose in the blood samples three times using the portable glucose monitor. What is your conclusion based on the result? Does this patient have diabetes? How do you assess the analytical variation of this analyzer? Which laboratory tests must be performed for diabetes checks and a risk assessment of diabetes complications?

4.3 Preparation by the student: Theory on type-1 and type-2 diabetes, risk factors and complications.

5. Influence of haemolysis and other pre-analytical factors on the results of clinical chemical parameters

Venipunctures frequently prove difficult because it is hard to find a vein. After moving the needle around a bit you will usually succeed in drawing some blood, but in those cases the blood will often flow into the tube quite slowly. The consequence is haemolysis.
As part of this assignment you will cause haemolysis yourself and we will show you what the effect is on a number of clinical chemical parameters.

5.1 Assignment:
You will cause haemolysis in 1 tube of blood, and the other will be the control tube. You will centrifuge the blood and measure the following in both samples: K, ASAT, or ALAT.

5.2. Questions:
Which results are significantly different? Which data do you need for the interpretation?
Discuss other pre-analytical influences with the tutor.

5.3.: Preparation for the student
K, ASAT, ALAT, knowledge of analytical and biological variation.

CASE Introduction to treatment

You should prepare the case below for the group session 'Introduction to TREATMENT/6-Step' on the TUESDAY of week C1a.

Also study appendices 5 and 6 of Ci-B session 'The consultation (strategy discussion): Cardiovascular problems' on pages 91 to 104 of this manual.
When preparing the case you should use the guideline 'Cardiovascular risk management" and the' British National Formulary (BNF).

Bring the completed 6-Step form to the group session 'Introduction to treatment/6-Step'.

CASE

Setting
GP practice

Patient details
Jan de Drenth, 60-year-old man living in Assen

Medical history
1957: Operation for appendicitis

Medication
None

Reason for making appointment/main health issue
Coming in for blood pressure check

Previous consultations
The patient presented to your surgery because during an occupational health check a blood pressure value of 180/110 mmHg was measured. You repeated the check several times and found values of 180/105, 175/105 and 170/110 mmHg. He was smoking 20 cigarettes a day. You urgently advised him to give up smoking.

Case history
No spontaneous symptoms except occasional headaches. No heart symptoms. His father and uncle also had high blood pressure. Father died of a stroke aged 68.

Physical examination and supplementary lab tests
BP 180/105 H 1.78, W 85 kg, BMI 26.8. Further lab tests no findings.
Investigation into secondary causes (kidney/endocrine) no abnormalities - kidney function, electrolytes and urinalysis normal. Cholesterol 5.6 mmol/L (N < 6.5 mmol/L).

6-Step forms

Ci-A session: The consultation (revision of model consultation and history taking): Heart/lung problems

Size of group
9-12 students

Duration
2 hours

General aim
This session is intended to refresh your knowledge of the consultation obtained during the Bachelor's phase by preparing the study material and participating in the session based on three cases. The emphasis in these weeks C1a and C1b is on phases I and II of the consultation: making initial contact, exploring the care request and asking questions to identify the main health problem (ALECOBO). Moreover, this session will address the structure of the consultation, the transitions between the different phases and communication aspects in the different phases.
Medically speaking this session specifically concerns learning to take the full medical history of a patient with chest pain, and covers the part of the consultation from the beginning up to the physical examination. After the session, the student will be able to indicate roughly which abnormalities may be found during the physical examination and what the strategy for this case would be.
The students will be able to take the full case history and use the context of the patient when determining the strategy to be followed.

Student's tasks
Preparation: Study the study material, particularly the phases of the consultation and conversation skills.
The students must have adequate knowledge of the anatomy and physiology of the thorax and the organs in the thoracic cavity. Revise these subjects as preparation if necessary.

Prepare for the patient role assigned to you, using Appendix 2, 'Patient role preparation form', regarding both the medical aspects and context factors. Prepare for the other two cases as a physician. In the role-playing for one of the two cases during the session you will actually take on the role of physician. Also think about how the consultation would be different if some of the facts were to change (age, sex, social context).

At the session: Take part in role-playing, reflect on it and give and receive feedback. During the sessions the students will alternate between the roles of patient, physician and observer. It is possible that not every student will get to play each role during this session. In that case, any students who have not yet played the role of physician should be given the opportunity to do so in a future session.

Study material:
Appendix 4. The model consultation.
Textbook [Medical consultations], (E.P. Veening et al). This book contains the starting points for the consultations in G2012. The whole of the book, including the appendices, is used as study material in YEAR4, particularly Chapters 1 to 8 inclusive.
It is a good idea to revise the communication skills taught in CST (= Consultation Skills Training) of the Bachelor's degree programme. All basic conversation skills will be addressed in the consultations.

Guideline on Acute Coronary Syndrome
Guideline on Stable Agina Pectoris
Guidelines on cardiovascular risk mangement

Appendices:
1. Cases 1 to 3
2. Patient role preparation form
3. SEGUE feedback form
4. The model consultation.
5. IDID diagram

Appendix 1:

CASE 1:

A 58-year-old woman/man comes to the surgery because she/he is worried about the chest pain she is experiencing.

CASE 2:

At the request of his wife/her husband, you visit a 50-year-old man/woman at his home because he/she is experiencing chest pain after having done some gardening.

CASE 3:

A 37-year-old woman/man is brought to the GP surgery by friends after she/he became unwell at a party. She complains of chest pain.

Appendix 2: Patient role preparation form

You can use this form to prepare for your role as a patient. You yourself can add information that you feel is missing from the case, in line with the working diagnosis. This can concern information in the patient's medical history as well as missing findings from the physical examination.

Working diagnosis:

Differential diagnosis:

Personal details
SES:

Main health issue
What do you say spontaneously?

Exploration of issue
Reason for making appointment:
Background:
Care request / What you expect from the consultation:

ALECOBO dimensions of the main health issue:
Nature
Localization
Severity
Chronology
Origin
Influences
Opinions and perceptions

Additional (general) history
Medical history:
Medication:
Family history:
Intoxications:
Allergies:
Social history:

Verification of hypothesis:
Once you have explained your main health issue and questions have been asked about it, what hypothesis-testing questions can you expect, based on the differential diagnosis? Describe how you would answer these questions.

Finally, formulate briefly what findings the investigation might bring to light and what the strategy would be in this case.

Appendix 3

SEGUE feedback form

STUDENT OBSERVER feedback form
Complete based on SEGUE Framework (see reverse of this form)

Name of physician: Student number of physician:
Name of observer: Student number of observer:
Case patient number:

I. Sets the stage

II. Elicits information

III. Gives information

IV. Understands the patient's perspective

V. Ends the encounter

VI. If treatment is needed during the consultation

Signature of student observer

SEGUE Framework

This evaluation system comes from the USA, where SEGUE is an acronym for ***S**et the stage, **E**licit information, **G**ive information, **U**nderstand the patient's perspective and **E**nd the encounter*.

I. Sets the stage

1. Greets the patient appropriately.
2. Clearly establishes the reason for the encounter.
3. Produces an agenda for the consultation (e.g. "Anything else?", issues, order).
4. Makes personal contact during the consultation (thus going beyond strictly medical issues).
5. Ensures the patient's privacy (e.g. by closing the door).

II. Elicits information

6. Elicits the patient's view of his/her health problem and how it is progressing.
7. Explores physical/physiological factors.
8. Explores psychosocial and emotional factors.
   (e.g. asks about living situation, family relationships, stress)
9. Discusses previous treatments.
   (e.g. self-care, last visit to physician, other medical care)
10. Discusses how health problems affect patient's life.
    (asks about quality of life)
11. Discusses lifestyle issues, prevention strategies (e.g. health risks).
12. Avoids leading questions.
13. Gives the patient the opportunity to talk (e.g. no interruptions).
14. Listens and gives the patient his/her undivided attention.
    (e.g. looks at the patient, verbal and non-verbal acknowledgements)
15. Checks and clarifies information (e.g. summarizes, continues to ask questions).

III. Gives information

16. Explains any investigations (e.g. physical examination, tests).
17. Teaches the patient about his/her own body and situation.
    (e.g. explains examination results, anatomy, diagnosis)
18. Encourages the patient to ask questions, checks that the patient has understood everything.
19. Adapts to the patient's level of understanding (e.g. avoids jargon, explains terms).

IV. Understands the patient's perspective

20. Acknowledges efforts, progress and challenges of or for the patient.
21. Acknowledges waiting time.
22. Expresses caring, concern, empathy.
23. Maintains a respectful tone.

V. Ends the encounter

24. Asks if there is anything else the patient would like to discuss.
25. Reviews next steps with the patient.

VI. If treatment is needed during the consultation

26. Discusses working diagnosis/diagnoses and evaluates any existing treatment.
27. Involves the patient in deciding upon the aim and choice of treatment.
28. Discusses patient-specific factors, the patient's presenting problem and expectations, and arrives at a clearly substantiated treatment proposal.
29. Explains likely effects and any side-effects.
30. Provides instructions for treatment and discusses treatments the patient is currently receiving for other complaints, if any.
31. Makes clear arrangements when rounding off the visit.
32. Checks that the patient has understood everything by asking him/her to repeat back relevant information.

Appendix 4: The model consultation.

Below you will find a summary of the model consultation. For more detailed information, refer to chapters 1 to 8 of the textbook 'Medische Consultvoering' [Medical consultations]; main points and backgrounds (E.P. Veening et al).

Consultation phase	**Medical content**	**Communication**
Phase I: Becoming acquainted; establishing contact and reason for consultation	First impressions; initial hypotheses; use of existing information; main health issue	Making contact
Phase II: Clarification of the problem; exploration of the main health issue	Asking questions concerning the main health issue (ALECOBO)	Exploration; attention to care request and concerns
Phase III: Case history	Specific and general history-taking; review of systems	Asking questions in a way that makes sense to the patient; explanation
Phase IV: Physical examination	Performing physical examination on indication	Prior explanation; instruction to undress; explanation during and about the physical examination
Phase V: Findings; investigation strategy	Conclusion and resultant requests for further testing	Explanation on conclusion and tests; patient's reaction?
Phase VI: Findings; treatment strategy	Drawing up treatment plan (6-Step; IDID); Arranging and implementing the treatment.	Making appointments, drawing up and explaining treatment plan
Phase VII: Rounding off		Has the patient understood?

Phase I – Becoming acquainted; establishing contact and reason for consultation

Medical content:

You should realize that you will obtain information from the moment you see and hear the patient for the first time. A person's appearance can tell you a lot: clothing, personal care, handshake, skin colour, 'impression' (ill versus healthy), voice. This aspect of the diagnostic process starts as soon as the patient comes in.

Communication:

The consultation starts with the physician and the patient getting acquainted. Always introduce yourself and mention your position, insofar as it is not already clear ("intern, which means that I am training to be a doctor"). Next, indicate what the patient can expect: history-taking followed by a physical examination, followed (possibly) by a discussion with your supervisor and then a discussion between the physician and the patient on the strategy to be adopted (the 'agenda' of the consultation).
Then ask an open question to address the patient's symptoms and summarize them; do not interrupt the patient and allow him/her to tell his/her story.
To ensure the success of the history-taking and the consultation it is essential to develop and maintain a good physician-patient relationship. You will help achieve this through your own conduct and attitude and by allowing the patient to speak. You should realize that the patient is also immediately forming an impression of you, so pay attention to your personal care, clothing and attitude: be friendly and polite and show empathy.

Reason for the consultation/referral (and/or admission)

Note that the reason for the consultation as indicated by the referring physician not always corresponds with the reason for the referral as it is experienced by the patient. Ask for this reason explicitly.

- Main health issue
- Any secondary problems
- Reason for consulting a physician for this issue at this moment
- Care request

If you have a referral letter from a GP or specialist, refer to this briefly but then invite the patient to tell his/her own story in his/her own words.

Phase 1 also includes the **personal details of the patient** if you do not already know them (name, address, gender, GP, date of birth, patient number).

Phase I: Becoming acquainted; establishing contact and reason for consultation

Medical content

- Assess the situation: urgent or not.
- If non-urgent, subsequent scenario.
- Establish the main health issue.
- Establish the care request.

Communication

- Speak clearly.
- Introduce yourself: mention name and position.
- Look at the patient.
- Adopt an open and approachable attitude
- Address the patient formally as a rule.
- Observe.
- Tell the patient about the various steps in the consultation process ('agenda').

Phase II – Clarification of the problem; exploration of the main health issue

Further questioning to clarify main health issue

- **Nature**: What is the nature of the complaint? Accompanying symptoms (which according to the patient are related to the main health issue in view of their nature and/or time frame)? In case of pain: type of pain, make suggestions if necessary: stabbing, boring, oppressive, cramping, nagging, etc.

- **Localization**: Where exactly does the problem occur? Deep/superficial? In other places too / does it radiate? Can the location be indicated using one finger or is it a larger area?

- **Severity**: How severe is it (quantify)? Does it affect your daily life / work / sleep / the people around you, etc.? In case of a previous episode: has the severity changed?

- **Chronology** (separating current and previous episodes): Current episode: when did it start, how has it developed and what is the current situation? Previous episode: happened before, when / how often / same as current episode?

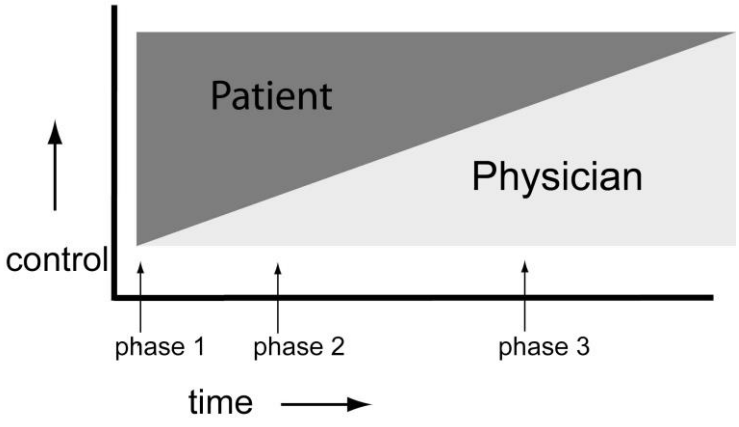
- **Origin**: Situation at onset / trigger moment, clear cause, started acutely or gradually?

- **Influences**: What relieves/aggravates the symptoms? What has the patient himself/herself done about it - result? Previous therapy for this problem: by whom, how long, effect, side effects, compliance? Dependent on posture? At rest or on exertion? Influenced by cold, heat or emotions? Nutrition?

- **Opinions and perceptions of the patient**: The patient's own thoughts/fears/expectations in relation to the health issue. Patient's care request. What does the patient expect from the physician and any treatment? Is the patient worried about the situation?

In this phase of the history-taking you should try to find an answer to the following question: Why did this patient come to visit me (as a physician) at this particular time, and with this problem?
In case of multiple problems: what is the patient's main problem? Personal and emotional aspects may play a significant role when you ask about chronology, influences and particularly the patient's opinions and perceptions.
As an intern you will need to allow the patient to say whatever he/she is worried about and ask any questions he/she may have during this phase. The patient's frame of reference should be used here and open questions should mainly be asked: what symptoms led the patient to decide to come and see you?

You should find the right balance between the patient's story and structuring the history-taking process. During the course of the consultation this balance will shift from patient-oriented to physician-oriented.



Summary and end of phase II
At the end of phase II, summarize the information presented by the patient and verify whether you have understood his/her care request properly. This is the moment when you should check whether you have fully explored the main health issue (including care request) and ask the patient whether he/she would like to add anything. It also gives structure to your consultation and provides you with an opportunity to think about your differential diagnosis for this complaint.

The end of phase II is therefore also a **moment for reflection**. Until this moment you have listened carefully to the patient (the purpose of the ALECOBO is not directly to obtain the diagnosis, but rather to get a good idea of the health issue). Now you need to take some time to think about what the patient's symptoms could be consistent with.
The process in the intern's head needs to be turned around in comparison with the Bachelor student: What diagnosis goes with what symptom, instead of what symptom goes with what diagnosis. Interns first need to focus on the symptom, and the diagnosis will follow later on.

Initial differential diagnosis
Which problems have you found? In most of your consultations during this year there will be one problem forming the main health issue. Highly complex patients may have several concomitant health issues, of course.
What differential diagnosis can you draw up in relation to causes of the patient's health issue? In this phase it is important to take as broad an approach as possible. There are various ways of structuring your differential diagnosis (useful until such time as you are able to reproduce complete lists from memory). The first method is based on **anatomical location**. Where are the symptoms situated? Which structures can be found there? How might they cause the complaint?
The second approach is based on **etiology**: psychogenic; infectious; vascular; auto-immune; neoplasms; degenerative; endocrinological; iatrogenic: toxic/medication; congenital; traumatic.

Empathy and reflection on emotions
Patients may feel guilty about their problems or may have serious concerns or fears about their future. You may need to pay attention to this before the next phase can be initiated. Make sure the patient knows that you have 'heard' the emotions and you are taking them seriously.
Interns sometimes have difficulty finding words to express empathy. Sentences like "How unpleasant for you" or "I can image you..." are regularly added during a conversation because the intern feels that he/she has to say this, even if it is not clear yet what the problems mean for the patient. You can also show empathy by making clear that you are interested and by probing further into the emotions shown or into emotional events. Empathy can also be shown in a non-verbal manner, by pausing for a bit or changing your pitch or posture, for example.

Heteroanamnesis
If a patient is unable to tell his/her story properly (e.g. too ill or confused), it will be important to gather as much information as possible from the patient's companion(s) or carer(s). Be aware of what this means for the patient himself/herself, especially if the information from the anamnesis and the information from the heteroanamnesis are contradictory.

Phase II: Clarification of the problem; exploration of the main health issue

Medical content
- ALECOBO.

Communication
- Why is this patient coming to you now with this care request?
- Maintain a balance between the patient's story and the structure of the history-taking.
- Summary-pause for reflection-differential diagnosis.
- Listen and ask questions with an open mind, without guessing the diagnosis (you cannot listen properly when you are thinking too much).

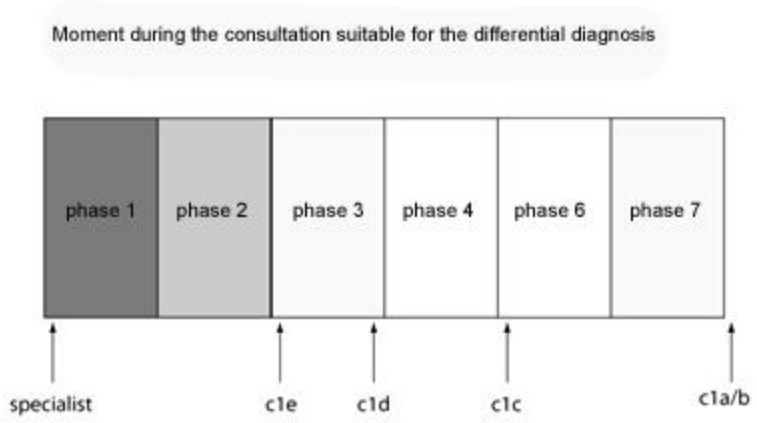
Phase III – History-taking

During this phase the physician will ask questions he/she feels are relevant for the consultation. It consists of specific history-taking, general history-taking (medical history, medication, allergies, nutrition/diet, biographical information, family history), review of systems and current psychosocial context.

This is the first transition in the consultation – from 'clarification of the problem' to 'specific history-taking' – and it is a good idea to point this out to the patient ("I understand what your symptoms are and I would like to ask some specific questions to gain a better understanding of these symptoms"), and to make sure he/she is ready for it. You will notice if a patient needs some more time if they keep sidetracking or repeating things they already mentioned.

Specific history-taking

Which differentiating questions can you ask to work on your DD?
During the history-taking you can increase or reduce the likelihood of diagnoses from the differential diagnosis list by using your knowledge of the incidence of conditions (epidemiology). However, interns have not yet developed experience in recognizing patterns and are therefore unable to quickly come up with a differential diagnosis based on knowledge of clinical pictures combined with epidemiology. Therefore, formulating hypothesis-testing questions based on a DD is also a possibility. For this reason the intern will need to practise obtaining a medical history that is as complete as possible and performing a physical examination that is as complete as possible as well.
As the intern gains more experience (becomes more competent in performing consultations), the moment when he/she has formed a differential diagnosis during the consultation can be moved forward in the consultation.



Differentiating, hypothesis-testing questions relating to the main health issue

- (If possible:) Specific history-talking focused on differential diagnosis
- Asking questions to conduct a review of systems in relation to the main health issue
- Adjacent systems (anatomy) or other relevant systems (e.g. pathophysiological)
- General systemic questions (fever, weight loss, etc.)
- Focused family history (in relation to DD)

During the specific history-taking the main health issue and any related problems are clearly outlined and demarcated. The primary goal of this is to place the patient's complaint in a medical framework and arrive at a probable diagnosis. During this phase you will ask questions based on a medical reference framework. Closed questions may be asked as well now.

The secondary goal is to ensure the patient knows that he/she is being taken seriously, with the physician building trust. You should be aware that the questions you ask will be informative for the patient as well: based on what you are asking about, your questions will influence the patient's thought process. However, this may increase the patient's fears; be alert to this and consider discussing this briefly.

When using a problem-focused approach you will initially mainly try to assess the patient's symptoms as a problem originating from an organ system. The routine questions that would otherwise be asked

as part of the review of systems (see below) about this organ system should in this case be included in the specific history-taking. By using your knowledge of anatomy (e.g. in case of localized pain) and/or pathophysiological mechanisms you will try to further clarify the symptoms. The systems relevant to this problem will need to be reviewed *comprehensively*. You should add general systemic questions to this, concerning fever, appetite and weight changes, for instance. So you should *at least* ask a patient with chest pain *everything* about the circulatory, respiratory, digestive, and locomotor systems (focusing on the thoracic wall) and the general system.

It is clear that knowledge of clinical pictures and modes of presentation is important if you want to perform proper specific history-taking. This is one of the most difficult aspects of history-taking for inexperienced interns. As your knowledge will be limited, it will often be necessary to do a complete review of systems and systematically investigate all tracts in order not to miss any symptoms which may be related to the complaint. We will now give you an example to illustrate this. A patient presents with chest pain caused by narrowing of the coronary arteries, which manifests itself at this point due to severe anaemia resulting from long-term excessive menstrual bleeding. This shows that investigating the urogenital tract can be important for a complaint like chest pain as well.

Tunnel vision
In many cases, history-taking and physical examination provide sufficient basis for a hypothesis, and possibly a probable diagnosis, at an early stage. However, focusing on a probable diagnosis too early on (*tunnel vision*) is not without risk. The result is confirmation bias, which will be reinforced by suggestive questions. For example, a patient has pain in the right lower abdomen and because you are thinking of appendicitis you limit your questions to ones that confirm this diagnosis, and fail to ask any that rule out other causes (e.g. adnexitis), even though this is necessary. Therefore, it is of utmost importance to keep asking yourself whether there are any alternatives. Maintain a broad (extensive) differential diagnosis for as long as possible. It may be useful in this regard to think in terms of systems rather than specific diagnoses; this will help you keep a broad perspective and reduce the risk of overlooking anything.

Sometimes the history-taking process will come to a standstill, often because the intern loses sight of the overall picture. In that case, remember the following:

- Silence during a consultation is not a problem.

Tips to get the history-taking going again:

- Repeat the final part of the patient's sentence.
- Summarize what is now known.
- Start organizing and writing down information (after having listened carefully to the patient and having summarized); for instance, inform the patient that you "need a minute to sort out what I've learned so far".
- Move on to the review of systems.

General history-taking:
Usually, during each junior clerkship there are specific subjects that need to be addressed. This is also discussed during the junior clerkship weeks at the CTC.

Medical history (year, therapy, by GP/specialist/paramedic, still being monitored?)
- Previous physical and mental illnesses
- Current physical and mental illnesses
- Chronic illnesses
- Hospitalisations, surgical procedures, accidents/fractures

Explanatory note:
It is not relevant that a 70-year-old man had a wedge resection to treat paronychia when he was 18.

Medication / Self-medication
Ask for the name (brand or generic), daily dose, dose per administration, and indication. Patients do not always regard the contraceptive pill as medication, so it may be necessary to ask about this specifically. Ask about any over-the-counter self-medication, use of antithrombotic medication, and alternative therapies or treatments.

Allergies

Medication, iodine, plasters, antibiotics, latex, pets, foods, etc. If the patient has an allergy, ask questions about response to allergens.

Nutrition and diet
Variation of meals, whether the patient is on a (non-standard) diet. Cholesterol-reducing (e.g. certain types of margarine), low-salt, vegetarianism, etc.?

Intern: 'Do you smoke?'

Patient: 'No, I don't.'

Intern: 'Oh... Have you ever smoked?'

Patient: 'Yes'.

Intern: 'Oh…'
(so he does)

Patient: 'I quit yesterday, after 45 years!'

In short: keep probing!

Intoxicants
(Quantity, for how long, keep probing even if the patient has given up.)
Smoking, alcohol, drug abuse (*if indicated: coffee, liquorice, tea, chewing tobacco, sal ammoniac-based liquorice).*

Biographical information
Education level / work; family situation / relationships (partner, family, friends); leisure pursuits.
If indicated: socio-cultural situation, economic situation, parental family, life events, religion, nationality.

Family history
(How many people and who, age when the symptoms started.)
Somatic: cardiovascular disease (myocardial infarction, CVA, claudication), hypertension, asthma/COPD, DM, cancer, illness with symptoms corresponding with main health issue (*if indicated: rheumatism, lipid metabolism disorders, congenital metabolic disorders, coagulation disorders, kidney stones, motor defects)*.
Mental: affective disorder, dementia, psychosis.

Keep in mind that if the patient presents with problems occurring more often in his/her family, which have ended badly, anxiety and suppression etc. are certainly quite likely. The older the patient is, the less relevant family disorders become.

Healthcare system
Has medical treatment been necessary before? If so, how intensive was it? Was the patient satisfied with his or her treatment? The patient will compare the current consultation with previous experiences with doctors.
What care does the patient need? ADL, household help, etc. Living circumstances.

<u>Complete review of systems</u>
During week C1c we will address the review of systems and the screening physical examination in more detail. You will find an overview of questions per system on the white 'medical history card' distributed. During a complete review of systems you will systematically investigate all systems, so you will obtain a complete picture of the patient's health. At this point any symptoms that may be relevant for the problem but have not yet been discussed may come up, or any symptoms the patient does not consider to be related to the main health issue.

As has been described before, doing a complete review of systems is important for a future physician, as his/her knowledge of clinical pictures (manner of presentation and epidemiology) may be insufficient and/or there may be a risk of tunnel vision. If the description of a complaint is very general (like 'unfit' or 'tired') of if a department requires this of an intern (Internal Medicine), performance of a complete review of systems will also be important.

The review of systems concerns a long list. It is useful to make a distinction between symptoms you should always ask about and symptoms you will only ask about if indicated.

Intermediate summary – Rounding off of the previous phase *<u>and</u>* transition to the physical examination
Ask whether the patient has any more questions or whether he/she wants to say something that has not been addressed yet.
Summarize the second half of the consultation and actively pay attention to your contact with the patient if necessary.

Now you will announce the physical examination. Give the patient clear instructions on which items of clothing need to be removed. Explain for each part of the physical examination what you will be doing.
Indicate why you want to do certain physical assessments. You may want to do them for diagnostic reasons, but also (with the patient's permission) as part of your training.

Phase III: Case history

Medical content

- (If possible:) Hypothesis-testing questions focused on differential diagnosis.
- Continuation of specific history-taking, i.e. include the system of the main health issue and relevant adjacent systems (anatomical region, pathophysiological), and general system.
- General history-taking: case history, medication, intoxications, family, allergy, psychosocial.
- Consider a complete review of systems ('dragnet' method).
- (If necessary:) Summary, pause for reflection and reassessment of DD drawn up previously; can a working diagnosis be established yet?

Communication:

- Stay in control.
- Remain organized.
- Avoid suggestive questions.

Phase IV – Physical examination

Physical examination is the second diagnostic instrument contributing to a differential diagnosis. A distinction is drawn here between general physical examination and specific physical examination. Many disciplines have additional specific examinations, which need to be done if indicated or based on specific symptoms. During the physical examination you continue the hypothesis-testing approach. During the examination you focus on findings that will reduce or increase the probability of your differential diagnosis. The diagnostic process is cyclical, which means that during the physical examination new information may be obtained that may lead to new questions.
The components of the general (screening) physical examination will be discussed in the manual for the C1c week and will be further addressed during the week.

After the physical examination the student should be able to generate a problem list.
The problem list comprises all health issues with which the patient presents at this visit. Based on the list of problems, hypotheses relating to the causes and consequences of the problems will be formulated. The remaining possible causes form the differential diagnosis, from which a working diagnosis will be chosen.

Phases V, VI and VII – Findings, investigation strategy, treatment strategy and rounding off

In the strategy discussion of the consultation the final three phases of the model consultation come together. In Appendix 5 to the Ci-B session 'The consultation (strategy discussion): Cardiovascular problems' the strategy discussion will be dealt with in more detail. In Appendix 6 you will find practical instructions for writing a prescription.

N.B. In week C1e we will pay more attention to the consultation in acute situations, and to summary and the transfer of patients in general. The information concerned is already available to you as a reader under 'Teaching materials' of 'Week C1a and week C1b' on Nestor.

Two more examples

Intern: “What can I do for you?”
(What could be wrong with her? I hope she won’t notice I’m nervous!)

Patient: “Last night I suddenly got severe pain in my stomach…”

Intern: “I’m sorry to hear that. What kind of pain?”
(Good, I’ve already shown some empathy. Now I need to do the A of ALECOBO, and then the L of…)

Patient (thinking): “Um…”

(…Should I suggest something? I hope I don’t lose my structure!)

Intern: “Was it nagging, stabbing, tearing, cramping?”
(Where was I… L for Localization)

Patient: “Stabbing I think…”

Intern: “And where did you feel that pain?”
(And then the S for severity…)

Patient points to the right upper abdomen: “Here.”

Intern: “OK, and on a scale of 1 to 10, how bad was the pain?”

This intern is focusing too much on structured identification of the main health issue according to ALECOBO. In this example, the intern almost immediately takes control with his/her focused, fairly closed questions. The patient probably feels like she does not get a chance to tell her story and important information on her symptoms, context and care request will not be addressed.
Try to listen, summarize and continue to ask questions to identify the various aspects of the main health issue, and to conclude with a good summary:

Intern: “What can I do for you?”

Patient: “Last night I suddenly got severe pain in my stomach…”

(She does not seem to be in any pain at the moment.)

The intern nods understandingly: “Can you tell me more about this?”

Patient: “Well, I was watching my favourite soap opera and I suddenly got terrible bouts of pain in my right side…”

Intern: “So you suddenly felt severe bouts of pain in your right side. And then what happened?”

Patient: “Well, the pain got so severe that I did not know what to do. I could not stay on the couch so I started walking around the living room. I was a little nauseous as well. My husband gave me some paracetamol straight away, but the pain did not get better… I was about to call a doctor but then the pain suddenly got less… I hope it’s nothing serious, doctor? You sometimes hear such terrible stories!

(Episode of colic-like pain in obese 40-year-old woman… Now emotional. What could she mean by ‘terrible stories’? Cancer?)

Intern: “I notice that you are concerned about this. What do you mean by ‘terrible stories’?”

Patient: “Well, my neighbour once had such terrible pain in his stomach as well. He was taken away by ambulance and it turned out to be appendicitis! Do I have appendicitis?”

(OK, clear. Even though I don’t think it is likely, from a medical perspective, this is not the kind of question to answer at this point.)

Intern: “I can understand that you would think about this after such an event. After our conversation and my examination, once I have all the details, my supervisor and I will address that question as well…”

Patient: “OK, thank you…”

Ci-B session: The consultation (strategy discussion): Cardiovascular problems

Size of group
9-12 students

Duration
2 hours

Objective
At the end of this training the student will be able to conduct a strategy discussion based on a diagnosis. Findings and diagnosis are discussed in a structured manner and in layman's terms. If the patient is to be treated, this treatment will be elaborated and discussed according to the 6-Step model. The student asks whether the patient has any questions, gets the patient to repeat back essential parts of the information, and finishes off by making clear arrangements (including a discussion of warning symptoms). If drug treatment is opted for, the student will be able to write a prescription (which is correct in terms of form as well as content).

Student's tasks
Preparation: Study the subject matter. For all cases addressed in the session, you must complete a 6-Step form and bring it to the session. Use the professional guidelines, and the BNF. At the session, the tutor will check if all students have filled in their treatment plan/6-Step form.

At the session:
Take part in role-playing, reflect on it and give and receive feedback. Evaluation of medical aspects of the cases.

Study material
Appendices 5 and 6 to this manual
Students are assumed to be familiar with the theory on cardiovascular disease from the Bachelor's phase.
Guideline on Cardiovascular Risk Management
Guideline on Angina Pectoris
Guideline on Acute Coronary Syndrome
Guideline on Heart Failure

Appendices
1. Assignment
2. Case 1
3. Case 2
4. Case 3
5. The strategy discussion
6. Practical instructions for writing a prescription

Appendix 1

Assignment

Work on the role of physician for cases 1 to 3 (Appendices 2 to 4). Each student will be physician, patient and observer once. Pay attention to communication when conducting the conversation. As a physician, bear in mind that this is the final phase of the consultation. You have already performed extensive history-taking at this stage of the consultation. Start by briefly summarizing the case history (see case) and base yourself on the diagnosis provided. Make use of the acronym DEPTH to discuss your findings and the diagnosis and follow the 6-Step model to discuss the treatment you are proposing.
Prepare the treatment advice you would give based on the information that is currently available to you. If applicable, you will also write a prescription.
Elaborate the case on a 6-Step form and bring the completed 6-Step form to the session.

Appendix 2

Case 1 *Setting*: GP practice

Personal details
Ms H. Jansen / Mr Herman Raad, age 59, address: Hartstraat 12, Groningen

Medical history
2007 Hypertension, for which annual check-ups by GP. Advice: stop smoking, start metoprolol.
2010 Intermittent claudication (chronic obstructive arterial vascular disease). Advice: stop smoking! Medication supplemented with acetylsalicylic acid and simvastatin, followed gait training with physiotherapist with good result.

Current problem
The patient presented at your surgery with complaints of a pressing pain behind the sternum, which only occurs on great exertion such as cycling. Currently 1 to 2 times a week for about 3 months. The pain subsides spontaneously at rest after about 5 minutes. About 3 minutes later, the complaints have completely disappeared. In the past 3 months, the complaints have not significantly worsened. There are no other complaints. Unchanged stools, once daily, brown, mushy. Does not feel agitated. Still smokes: one pack of cigarettes a day since she was 14.
At your request (when the appointment for today was arranged) the patient had a blood sample taken yesterday.

Supplementary data
An uncle died of a heart attack aged 60.

Current medication
Metoprolol 100 mg controlled-release tablet once daily
Acetylsalicylic acid 80 mg tablet once daily
Simvastatin 40 mg tablet once daily

Physical examination
BP: 138/86 mmHg (same as before), pulse: 78/min regular/even, height 1.75 m, weight 80 kg (BMI: 26.1). Examination of heart and lungs does not reveal any abnormalities. Moderate artery pulsations in feet, cold feet.

Supplementary blood tests

Fasting glucose	5.5 mmol/L	LDL cholesterol	2.1 mmol/L
Serum creatinine	60 mmol/L	(target level	<2.5 mmol/l)
eGFR	> 60 ml/min/1.73 m2	Hb	9.5 mmol/l

Diagnosis
Stable typical angina pectoris in patient with known peripheral arterial disease and hypertension. She smokes and has a positive family history.

Consultation continued:
You conduct the strategy discussion with your patient. You start with a discussion of your findings (medial history and physical examination, blood tests) and your diagnosis, explaining the causes and the expected course. You decide on a treatment plan together with the patient. You discuss lifestyle advice and propose a treatment of the attacks in addition to the current medication.
Supplementary question: If you were to consider maintenance treatment as well, what would your considerations be?

For elaboration, use the guidelines on Stable Angina Pectoris and Cardiovascular Risk Management, and the BNF (for reference purposes).

Appendix 3

CASE 2 Setting: GP practice

Personal details:
Ms H. Jansen / Mr Herman Raad, aged 55. Address: Korte Volte 49, Groningen

Medical history: none.

Supplementary data:
Father underwent CABG aged 59; died of a stroke aged 64.

Current problem:
The patient presented at your surgery one week ago after having had a medical check-up because he wanted to take out life insurance. The examination showed his cholesterol to be too high (total cholesterol 6.7, fasting). During the consultation he told you he does not have any general or cardiac symptoms but that he does have headaches from time to time. Patient smokes (10-15 cigarettes per day, from the age of 13), does not use any alcohol.
You performed a physical examination as well last week: height 1.80 m, weight 95.0 kg (BMI 29.3), BP: 135/90 mmHg (right), 133/88 mmHg (left), pulse 85 regular/even, peripheral pulsations easily palpable.
You gave the patient dietary advice (NHG leaflet, including less fat and less salt) and you requested more extensive blood tests, focused on the cardiovascular risk.

The patient has now come to see you to discuss the results. During today's consultation it appears that the patient is following the diet and is exercising more, but that giving up smoking is difficult.

Current medication:
Paracetamol tablet 500 mg when necessary, max. 6/day

Physical examination:
BP 130/85 mmHg (right), pulse 80 regular/equal.

Supplementary blood tests (fasting):

Total cholesterol	6.4 mmol/l
LDL cholesterol	4.5 mmol/l
HDL cholesterol	1.2 mmol/l
Total cholesterol/HDL ratio	5.3 mmol/l
Serum creatinine	55 mmol/l
eGFR	> 60 ml/min/1.73 m2
Fasting glucose	5.1 mmol/l

Diagnosis:
Primary hypercholesterolaemia; the 10-year CVD risk of mortality/illness is 11-16% with 1 strong risk-increasing factor (1 first-degree relative with premature CVD < 60 years), so that pharmaceutical treatment of the high cholesterol is indicated. Currently no hypertension.

Consultation continued:
You will discuss the results of the laboratory tests and the cardiovascular risk and its causes with the patient. Together with the patient you will think of a plan to give up smoking and you will discuss the further treatment of his high cholesterol.

For your elaboration, use the guideline on Cardiovascular Risk Management and the BNF (for reference purposes).

Appendix 4

Case 3 *Setting*: GP practice

Personal details
Mr P. de Groot/ Ms H. Jansen, aged 74. Address: Torenbrug 4, Winschoten

Context factors
Elderly, forgetful patient. Brought in by daughter who is in the waiting room.

Medical history:
Heart attack (inferior wall) two years ago, no complications, now six-monthly check-ups by cardiologist. The cardiologist initiated the patient's current treatment.

Current problem:
The patient presented at your surgery (brought in by daughter) with gradually developed shortness of breath, especially when climbing stairs. He is tired and feels he's able to do less than before. Also, he gained 2 kilo's in the past weeks. Patient has no angina symptoms or thoracic pain symptoms. He sometimes forgets to take his medication, but his daughter helps him remember. He hasn't smoked anymore since his heart attack. At weekends, he drinks 2 bottles of beer and he loves a salted herring every now and then.
His regular check-up at the cardiologist is scheduled in three weeks, but the patient did not want to wait that long.

Physical examination:
Height: 1.72 m, weight: 72.0 kg (BMI 24.3), BP 130/75 mmHg (right, sitting), pulse 70/min regular/even, respiratory rate 15/min (at rest)
CVP: R -1 cm
Heart: normal sounds, no murmurs
Lungs: fine crepitations over lower lung sections
Extremities: pitting oedema of both lower legs

Further tests (to enable a proper strategy discussion this information is already known):
ECG: abnormalities consistent with previous inferior wall infarction, no arrhythmia or block
Blood tests:

Hb	9.3 mmol/l	Potassium	3.8 mmol/l
Ht	0.420 l/l	Sodium	138 mmol/l
Serum creatinine	90 mmol/l	LDL cholesterol	2.0 mmol/l
eGFR	61 ml/min/1.73 m2	NT-proBNP	7950 pg/ml

Current medication:
Acetylsalicylic acid 80 mg tablet once daily Metoprolol 200mg tablet once daily
Enalapril 10 mg tablet twice daily Simvastatin 40 mg tablet once daily

Diagnosis:
Chronic heart failure (left and right) after previous myocardial infarction, NYHA class II.

Consultation continued:
You discuss the results of the blood tests and the electrocardiogram with the patient. You explain what the diagnosis of heart failure means, how it developed and how this accounts for his current complaints. You start treatment for shortness of breath and peripheral oedema based on heart failure and give lifestyle advice.

For the completion of the assignment use the Guidelines on Heart Failure and the BNF (as reference material).

Appendix 5

The strategy discussion

Contents of this appendix:

1. General practical instructions and recommendations for conducting a strategy discussion
2. Discussion of (the need for) additional diagnostic tests
3. Discussion of findings and diagnosis (DEPTH)
4. Discussion of treatment (6-Step method) – Explanation of the use of 6-Step

Various teaching methods will be used to practice how to conduct strategy discussions. During the weeks of the Consultation module (C1a to C1e) this will be done in the form of Ci-B sessions (role-playing) and in recorded sessions (consultation with a simulation patient). During the CTC weeks of the junior clerkship this will be done in Ci-B and Ci-AB sessions (role-playing) and in the CC sessions (consultation with a simulation patient).
In addition, two group sessions are planned for this year (weeks C1a and C1d), during which therapeutic reasoning will be practised using the 6-Step form. All of this serves to prepare the students for patient contact during the junior clerkships of the entire Master's programme.
Naturally, the severity of the patient's problems will affect what happens during the strategy discussion. In case of urgent/life-threatening situations, quick action will be required. The appendix provides a guideline for strategy discussions in non-urgent situations.

When preparing for strategy discussions in consultations, you will often make use of professional guidelines, like the NICE guidelines (www.nice.org.uk/guidancemenu/conditions-and-diseas) and the BNF.
It is also advisable to use information sources for patients, you can consult websites of patient associations and hospital departments. Referring to sources of information intended for patients will help you translate common medical terminology into language that is understandable to the patient.

1. General practical instructions and recommendations for conducting a strategy discussion

- Provide information in 'bite-size chunks' and in a logical order. Check whether the patient understands what you are saying; the patient's response will determine how the conversation continues. In this way you are adjusting the conversation to the level of knowledge and the needs of the individual patient.
  To enable this you will need to prepare a good structure and logical order for yourself; the acronym DEPTH and the use of the 6-Step method will help you with this.

- Determine at various points during the discussion what the patient already knows and what else the patient wants to know (regardless of what the patient ultimately needs to know).
  After you have told the patient about the diagnosis, you should pause for a moment (to allow the patient to respond), and then you can ask: 'What do you already know about asthma?'

- Avoid jargon or clearly explain it.
  The use of jargon easily creeps into strategy discussions. At those moments you cannot always think of the right layman's terms. By including patient-oriented information sources in your preparation for a consultation, you will gradually get better at avoiding jargon.

- Categorize the information you provide to the patient.
  'There are three things you yourself can do to combat your symptoms. For a start, it is important that you work on a healthier weight…'

- Verify whether the patient can actually remember the information you are providing.
  Offer to write down the information and/or hand the patient leaflets, or inform an informal carer or family member.

- Use visual aids to support your explanation.
  Make use of drawings (e.g. of anatomy), anatomical models or written material to support your explanation. On the website www.thuisarts.nl you will find useful information in this regard as well, including anatomical drawings, for instance.

- Always take into account the views, worries or expectations the patient has expressed (care request).
  Take away the patient's worries where possible. If the patient is highly concerned, he/she will probably want you to do this first, before he/she can be open to further explanations and information. Address views and expectations of the patient with regard to treatment. Why is your advice different?

- Allow the patient to express his/her thoughts, reactions and feelings, also during the strategy discussion.
  After announcing your diagnosis, you can be quiet for a bit to give the patient room for his/her initial response. If there is no response from the patient, you can then ask for an initial reaction. 'What is going through your mind now?'. The same may be important after you have told the patient about the treatment options.

- Involve the patient in the decision-making process as much as you can.
  Where possible, consult with the patient about the choice of a certain treatment. This way the physician will make clear that the patient is allowed to weigh up his/her own interests in relation to the treatment. This is important for treatment compliance; the more the patient feels involved in the choice of treatment, the likelier they are to comply with the treatment. In this context the physician should give the patient sufficient attention, among other things in

terms of the verbal/non-verbal reactions and any remaining hesitations and questions of the patient.
If there are several equivalent treatment options, the physician and the patient should discuss them. On the other hand, there may also be a clearly preferable treatment, e.g. in accordance with a guideline. A physician-patient discussion is also appropriate if the 'lesser of two evils' has to be chosen (for instance, whether or not both breasts need to be removed preventively in a patient with a mutation of both BRCA genes). A discussions with the patient is not always possible, however, particularly in acute situations.

- Try to involve the patient in the planning of the next steps where possible.
  If you do, the patient will be more willing to adhere to the arrangements agreed on.

- Encourage the patient to make suggestions, for instance with regard to lifestyle changes.
  If you advise a patient to exercise more, you can make all kinds of suggestions, like cycling (suggestions the patient might reject for all kinds of reasons), or you can ask the patient the following question: "Now that you know you will need to exercise more, what possibilities do you see to fit this into your daily routine?"

- Ask the patient to repeat the most relevant information in his/her own words.
  This advice is important for reasons of compliance and patient safety, for example. You will also want to make sure that the patient has properly understood the information you have provided, which can be quite complex. However, students sometimes regard this as a difficult question, because it can come across as 'patronizing'. To avoid this, you can introduce the question by saying something like: "For me as a doctor it is important to be certain that you use the medication safely. Therefore I would like to ask you to repeat in your own words which advice I have given you with regard to the use of the medication."

Making sure a patient is well-informed, feels involved in the (choice of) treatment and understands and adheres to the instructions will improve the patient's compliance and safety.

In the strategy discussion during the consultation, phases V (investigation strategy), VI (treatment strategy) and VII (rounding off) of the model consultation come together.

Roughly, there are two possible outcomes of a consultation with a patient presenting with a new problem:

- A strategy aimed at additional diagnostic tests because the diagnosis is as yet insufficiently certain (execution managed by the physician himself/herself or via referral).
  In practice, referral for additional diagnostic tests will often be combined with a request to also start treatment.
- A strategy aimed at explanation of the diagnosis and treatment since the diagnosis is (sufficiently) certain (execution by the physician himself/herself or via referral).

2. Discussion of (the need for) additional diagnostic tests

It is important to tell the patient about the current state of affairs. What is the physician thinking at this point? This explanation is important because the patient needs to be involved in the discussion relating to further testing. Why is this necessary, within what term, what are the consequences of certain findings and which risks are associated with the tests? In this situation it is possible that the physician may already express his/her concern about the symptoms reported, if the physician suspects a serious diagnosis. Watch out for verbal and non-verbal signals given off by the patient: do you notice relief, fright or sadness?
The substantiation of the choice of certain additional tests and the possible results of those tests and their consequences will be elaborated in the 'Diagnostic plan' component of the model file.

Deciding whether or not to discuss your concerns or confirm the patient's worries, and in what way, without being able to draw a conclusion about the diagnosis is a very complex matter. You may not want your patient to get unduly worried. On the other hand, you do not want to keep your patient completely in the dark, if the diagnosis may be serious. In such conversations, assessment of the situation is more important than medical knowledge, and what you need to do will depend on factors such as communication skills and style of the physician, the patient in front of you and his/her context, the nature of the diagnosis to be considered, the degree of clarity and certainty, etc.

The following scenario may occur. These examples are merely illustrations and are not intended to generalize the complex consideration:

Your patient is worried that he/she has a serious condition (cancer) and you share his/her concerns (based on alarming symptoms found in the medical history and/or physical examination).
It is more or less safe to be open about the situation. You can indicate that you share the patient's concerns and explain in concrete terms on which findings you base your concerns. You will need to indicate that the patient should realize that the diagnosis is by no means definite, but that further tests will need to be done first.

The patient is worried but you are not.
It is important that you indicate in concrete terms the arguments (findings of the medical history and physical examination) based on which you see no reason to worry. Do pay attention to the patient's verbal and non-verbal reactions, however. Sometimes a patient will still want further tests done for reassurance. You may consider going along with this. This can sometimes also be a complex consideration.

Your patient is not worried (or has not expressed any concerns), but you are.
It may be a good idea to initially remain noncommittal. You may indicate that you do not know exactly what is the matter but that you would like to investigate further. If the patient subsequently asks "But what are you thinking of, doctor?" you can initially indicate that you are concerned about a certain (alarming) symptom from the medical history and/or the physical examination. If the patient asks further questions after this, you can outline the diagnoses you are thinking of. If these include a serious diagnosis, you can explain to the patient that he/she will also "need to take into account that it may be cancer".
If a diagnosis is (sufficiently) certain, the strategy can be focused on explaining the diagnosis and, if necessary and possible, treatment. It is also possible, by the way, that treatment will be started even if a full, specific diagnosis cannot be made yet, but due to the presentation of the symptoms a strategy of 'watchful waiting' combined with treatment for reassurance and some symptom alleviation is appropriate.

3. Discussion of findings and diagnosis with the patient (DEPTH)

When discussing your findings, diagnosis and strategy, it can be helpful and necessary to apply some structure. When it concerns a discussion of your findings and diagnosis, the acronym DEPTH can be used for this purpose.

D (Diagnosis): Discuss which findings obtained during the history-taking and the physical examination have led you to this diagnosis. Show the patient your train of thought, as it were. If the patient has a question relating to concerns about the symptoms, you may want to answer this questions straight away. Can you already reassure the patient? If there are any concerns, these need to be addressed first. What you say here should also tie in with the ideas, worries and expectations of the patient (**H**: 'Hulpvraag' (care request)).

Intern: "Mr Jansen, I can reassure you. You do not have colon cancer." (pauses for a minute)

Patient: (sigh of relief) "That is such a relief…" (silence)

Intern: "I will explain to you why I think your symptoms are caused by something else - irritable bowel syndrome, that is…"

E (Etiology): Explain how the symptoms have developed and/or what the underlying causes are. Use visual aids if applicable, as referred to above.

P (Prognosis): Discuss the possible consequences for the patient in terms of physical, psychological and/or social functioning. What is the natural course of the condition to be expected? Can the patient expect progression or spontaneous remission? Can he/she expect any permanent limitations or loss of function? In what way can the treatment you can offer affect these consequences?

This is followed by the **T** for Therapy, phase VI of the consultation, which will be further elaborated using the 6-Step method.

An example. *"You told me you have been having a sore throat and a fever for about three days. When I examined you I saw that the tonsils in your throat are red and swollen. So as you suspected yourself, you do have some type of throat infection (D). A throat infection is almost always a consequence of a viral infection, and I suspect that this is true in your case as well (E). Antibiotics don't work against a viral infection (*care request*). I expect that your own body will combat the throat infection and that the fever and sore throat will disappear spontaneously within a day or two (P).* Next, you can give the patient some non-pharmaceutical advice for a sore throat and you can discuss alarm symptoms (T).

4. Discussion of treatment – explanation on the use of the 6-Step method

The 6-Step method is a therapeutic reasoning model in which several forms of treatment are compared with regard to efficiency, safety and effectiveness. Ultimately a specific choice will be made for the patient and his/her own context. If a pharmaceutical treatment is opted for, the 6-Step method will contribute to the principle of 'good prescribing'[1]. A prescription is written in about half of all medical consultations[2]. The completed treatment plan serves as a medical basis for the treatment component of the strategy discussion. In this part of the strategy discussion, the 6-Step structure can be largely maintained and, in principle, all steps of 6-Step will be discussed with the patient; the only exception to this rule is step 3, because this is typically something the physician considers in his/her head. 6-Step provides you with a structure so you can discuss the treatment in a logical order and in a systematic manner. This applies both to patients getting a new treatment and to those whose treatment is being evaluated. Even if the decision is made not to treat the patient, the 6-Step method should still be followed: you will substantiate *why* you have decided against further treatment.

You will practise the therapeutic reasoning process by completing the 'treatment plan' for *all* cases in preparation for the sessions and by conducting strategy discussions. This therapeutic reasoning process will be evaluated by the tutor based on the elaboration in the tutor manual.
You will come across the 6-Step method in all teaching methods and tests within all disciplines/departments of the UMCG and all affiliations and satellite locations. By following this model, the communication between peers and between students and tutors on the treatment of patients will also be made easier.

When completing the treatment plan it is always important that you imagine the patient sitting or lying in front of you. Think of what you would like to say to the patient, what you would like to ask, and write this down in a list, using simple language. Also think of what the patient may say in response and what questions he/she may ask you.
When completing the plan, use this 'explanation' of the 6-Step method, professional guidelines, the 'Farmacotherapeutisch Kompas' [Dutch National Formulary] and information sources for patients.

The 6-Step method is a means to elaborate the treatment **p**lan for the **p**atient's **p**roblem in **six steps**.

1 Identify the patient's problem(s) (working diagnosis (DEPTH)) + (if applicable:) evaluate existing treatment.
2 Establish the goal of the treatment.
3 Investigate the relevant treatment options (based on indication).
4 Discuss the patient-specific choice.
5 Execute the treatment to be started/adjusted.
6 Follow up, do check-ups and conduct appointments.

[1]: 'Diagnostiek en Therapie' [Diagnostics and therapy] (2013-2014, BSL), Chapter 37 'Het voorschrijven van geneesmiddelen' [Prescribing medications]; A.F.A.M. Schobben, T. Schalekamp
[2]: Guide to Good Prescribing – A Practical Manual, World Health Organization; T.P.G.M. de Vries et al

6Step **Treatment plan**

1 Patient's problem	Working diagnosis *(severity, cause, possible consequences)*:
	Evaluation of current treatment *(efficacy, safety, compliance)*:

Step 1 - Working diagnosis
The working diagnosis indicates the direction of the treatment and legitimizes the strategy to be adopted. The term 'probable diagnosis' is sometimes more appropriate: the most likely diagnosis based on the symptoms observed and the relevant epidemiological aspects, which can be amended as the therapeutic effect becomes known or the clinical course of the condition has resulted in more clarity.

To discuss the findings and the working diagnosis you can use the acronym **DEPTH** to apply structure to this phase (see earlier).

Evaluation of existing treatment
Evaluate the working diagnosis and, if necessary, any other problems *(co-morbidity).* Did the patient comply with previous (non-)pharmaceutical advice? (Effectiveness, safety and therapy compliance.)

2 Treatment goal	*(symptomatic, curative, and/or prophylactic)*

Step 2 – Treatment goal *Working diagnosis*
Indicate the desired therapy goals and make them concrete if possible:

- Make them quantifiable by specifying target values/results.
- Aim for a certain level of improvement in the patient's general daily activities.
- In case of pain: improvement of the VAS score (clinical setting, e.g. post-operative).

Naturally, the patient's subjective well-being can be important for the evaluation as well. When setting treatment goals it is important to take the patient's care request into account.

The goal of treatment can also be '*explanation and reassurance'*, which sometimes results in a 'therapeutic conversation'. A request to alleviate symptoms is often accompanied by a request for reassurance (care request).

Sometimes treatment contributes to the *diagnostic process*. If a GP is unsure about the nature of a red, scaly skin condition in a child (fungal infection or eczema), he/she may decide on a trial treatment with a harmless fungicidal cream (miconazole). If this treatment is effective, this will confirm the diagnosis of fungal infection. If not, a low-strength steroid cream may prove effective.

3 Relevant treatment options	non-pharmaceutical options:
	pharmaceutical, both new and existing treatment *(prioritize based on effectiveness, safety, suitability, cost)*:

Step 3 – Relevant treatment options
List all suitable non-pharmaceutical and pharmaceutical treatment options: which effective treatments are available?
If a number treatment options are available, prioritize them based on efficacy, safety, applicability and cost. Professional guidelines will generally assign priorities, among other things based on the above-named aspects. Also investigate which considerations included in the guideline: Do they apply to your patient as well?

Non-pharmaceutical treatment options may include: 4

- Waiting and observing the clinical course of the condition, whether or not in combination with treatment of symptoms
- Lifestyle recommendations
- General advice to alleviate symptoms
- Therapeutic conversation (e.g. reassurance)
- Surgical procedure
- Radiological intervention (e.g. embolization of an arterial haemorrhage)
- Referral to a colleague for treatment
- Referral to a paramedic: speech therapist, physiotherapist, etc.
- Referral to a social worker, psychologist, psychiatrist, etc.

Not all treatment options included in the treatment plan need to be mentioned to the patient. The writing up of the treatment plan is mainly useful for evaluation of the case. In practice, the physician will consider the treatment options and suggest a treatment to the patient in step 4.

4 Patient-specific selection	Choose from the above:
	Explain your choice *(e.g. severity of complaints , patient-specific data, wishes, etc.)*

Step 4 – Patient-specific choice
Choose the most suitable treatment (pharmaceutical or non-pharmaceutical) for the patient concerned from the treatment options (listed in step 3), taking account of all relevant patient details. If possible, make a decision together with your patient. **Justify** your **choice** in this step and substantiate your chosen dose, frequency, mode of administration and duration.

Patient details that may affect your choice include:

- Severity of the symptoms
- Co-morbidity: *e.g. asthma when considering β blockers, serious heart failure when considering a complex surgical procedure*
- Pharmacokinetic changes: *liver and kidney function disorders, gastrointestinal function disorders (absorption, distribution, metabolism, secretion problems)*
- Physiological situations: *age, pregnancy/lactation, etc.*
- Interactions: existing *therapy, self-medication, alternative therapy*
- Intoxications: *alcohol, drug abuse, smoking, diet*
- Hypersensitivity/allergy
- Compliance (to be expected)
    - Patient's wishes / care request
    - Previous instances of compliance
    - Side effects and ease of use (mode of administration, frequency of usage)

At this point the patient must be asked for any missing information. Think of the possibility of the patient being pregnant or urinary problems in elderly men, subjects which may not have come up yet during the consultation. With specific regard for the medication, you can ask about any hypersensitivity to drugs / drug groups.

The **discussion** with the patient usually takes place in step 4. If there are several treatment options, a decision will be made jointly with the patient. At this point the pros and cons (expected side effects) of the different options will be discussed, also paying attention to patient details which may be relevant for the choice to be made. Costs and ease of use can be discussed as well.

In this step a comparison can also be made between surgical intervention and prescribing medication, for example. If you plan to prescribe medication, it will be your responsibility to check the main absolute and relative contra-indications and interactions with other drugs that may occur. This information can be found in the 'Farmacotherapeutisch Kompas' [Dutch National Formulary] (**http://www.fk.cvz.nl)**.

5 **Execution**	Substantiate the choice made in step 4 (non-pharmaceutical):
	– pharmaceutical *(strength, formulation, dose)*:
	Strategy for current treatment other than diagnosis/diagnoses:
	Patient data *(therapeutic effect, side effects, instructions, warnings)*:

Step 5 – Execution of treatment to be started/adjusted
Specify the choices made with regard to:

- (In case of non-pharmaceutical treatment:) treatment, frequency and duration.
- (In case of a prescription for pharmaceutical treatment:) dosage, mode of administration, frequency, dose intervals and duration of treatment (if applicable: escalation and reduction scheme); also see Appendix 6, Practical instructions for writing a prescription

Strategy with regard to existing treatment *Current problem + <u>other problems</u>*

- For each problem: decide whether to continue, adjust, reduce or stop.

Patient information *Compliance and patient safety*
It is important to explain the treatment properly to the patient. This is not just to improve therapy compliance and patient safety, but it is also related to the physician's obligation to provide information as set out in the Medical Treatment Contracts Act (WGBO).

- *Effects:* Which effects; when; how long the effect will last; if necessary, how it works in relation to etiology **(E)**.
- *Side effects*: Which, what to do, transitory/permanent.
- *Instructions for use:* Method of administration/use, dose, when to use, how long it should be used, if applicable: escalation and reduction scheme, how to store the medication, shelf life, taking meals into account (on empty stomach, shortly before, during or after a meal).
- *Warnings:* Maximum dose (if necessary), interactions, reactivity/activities, need to complete the treatment.

For medication, the product information leaflet (required by law) can be referred to. There are two types of product information leaflets: those provided by the pharmacist and those provided by the manufacturer. The patient may be informed about the fact that the manufacturer is obliged to mention all known side effects, even if they rarely occur.
Many side effects are transitory: signs that the body is adapting to the medication. It is a good idea to tell the patient about this. If the side effects do not disappear, it will be useful to advise the patient on what he/she can do about this himself/herself, or perhaps that a change of medication may help.

During the consultation you will usually discuss just the three or four most common side effects and, if they do not disappear, what the patient can do about them. You will also discuss which side effects require immediate intervention, for instance immediately terminating the treatment and contacting the physician.
In principle, all medications affecting the central nervous system will have an effect on reactivity/activities and interact with alcohol. You will need to mention this during your consultation. The pharmacist will also include this on the label or place a sticker on the medication's packaging.

The patient must be told how to use the medication and what to take it with. The time of use can be important as well, and whether meals need to be taken into account (taken on an empty stomach, shortly before, during or after a meal). Moreover, it is important to tell the patient why a course of treatment needs to be completed. Only tell the patient how to store the drug if this is very important or different than 'normal': in a cool, dark place. Sometimes it will be necessary to discuss the medication's shelf life, especially if it is very short (like with oral liquid antibiotics). All medications should be stored out of the reach of children, of course.

It is clear that compliance is of great importance not only for the patient himself/herself but also for the people around the patient. If drugs are taken the wrong way or in the wrong quantity, this may have all kinds of consequences for the patient and others. Compliance is therefore essential and this can only be achieved by means of good explanations, by consulting with the patient and by jointly deciding on treatment. You cannot round off the consultation until all these steps have been taken.

6 Follow-up	Checks *(efficacy, safety, compliance)*:
	By whom:
	Via *(surgery, telephone, writing, e-mail):*
	When:
	Feedback to *(GP, team of pharmacists, specialist, home care provider, other):*

Step 6 – Follow-up
Formulate parameters to verify efficacy, safety and compliance, and make an arrangement to check these aspects. At the end of the consultation an arrangement will always have been made, even if there is no follow-up appointment (after all, this also constitutes an arrangement, and a follow-up appointment is not always necessary).

Possible follow-up appointments are:

- At the patient's initiative, with you explaining to the patient when to contact you: *e.g. insufficient improvement, alarm symptoms, side effects, etc.*
- Telephone consultation, intervening period
- Follow-up visit to the surgery, intervening period

Whichever type is applicable, always discuss the **warning symptoms** that may occur in the meantime and require immediate contact with a physician.

If additional tests were done, specify when the results can be expected and how these will be communicated to the patient. In case of a referral, explain in concrete terms when the patient can expect to be seen (depending on urgency and waiting times). How and when will the patient be informed about this appointment? In short, what will the referral procedure be like?

Conclude by summarizing what has been discussed and asking whether the patient has any additions, comments or questions.

Appendix 6.

Practical instructions for writing a prescription

Figure 1. A prescription will at least contain the following information:

name, initials, capacity of the prescriber full address telephone number	prescription date
R/ substance or brand name*, strength/dose/concentration mode of administration (da, dtd no) number of units to be dispensed S. use: dose, instructions, warnings iter … times (if repetitions are permitted)	
name and address of patient for a child: include date of birth/age and weight	initials or signature

* brand name: only to be provided if it is demonstrably necessary for the patient to receive the particular brand.

Two examples

In example 1 below, hydrochlorothiazide is prescribed for the first time (for 14 days) to a patient who is already being treated with alendronic acid for a different indication. The patient needs a repeat prescription for the latter medication (for 90 days). It is common practice when a patient is started on a new medication to prescribe a quantity for two weeks on the first prescription. Including multiple drugs on a single prescription is permitted if they are not subject to the Dutch **Opium Act**.

Example 1 V. Oorschrijver, physician UMCG Hanzeplein 1 9700 RB Groningen (telephone number)		(date)
R/	Hydrochlorothiazide 25 mg Disp. 14 tablets	
S.	1 dd 1 tablet, take in the morning	
R/	Alendronic acid 70 mg da 12 tablets	
S.	1 tablet once per week Take the tablet in its entirety and with a full glass of water immediately after getting up, at least half an hour before the first food or drink or the first medication dose of the day. Do not lie down for < 30 mins. after taking the tablets, and after that only after having had something to eat.	
Mr. Metamesis Korenstraat 13 9674 AP Groningen		(initials or signature)

Example 2 V. Oorschrijver, physician UMCG Hanzeplein 1 9700 RB Groningen (telephone number)		(date)
R/	Morphine retard ten [1] mg Disp. twenty [2] tablets	
S.	2 dd 1 [5] iter twice [3]	
Mr. H.E. Metamesis Korenstraat 13 9674 AP Groningen [4]		(complete signature) [8]

In addition, a prescription for a drug which is subject to the Opium Act must meet the following conditions:

1. Write the strength of the preparation in full and in letters.
2. Write the number of units to be dispensed in full and in letters.
3. Write the number of repetitions (if applicable) in full and in letters.
4. Always include the name, initials and full address of the patient.
5. Indications like ‘use known’ and ‘when necessary’ cannot be used: use must be described in an unambiguous manner (how much the patient will use per 24 hours)
6. Only one drug can be prescribed per prescription.
7. The prescription must be written in ink.
8. The complete signature of the prescriber must be included on the prescription.

Table 1. Preferred quantities to be prescribed, taking into account the usual packaging contents or volume

Mode of administration	**Quantities**
Drink, suspension	50, 100, 200, 300, 500 ml
(Eye, nose, ear) drops	5, 10 ml
Tablets, capsules, powders	10, 15, 20, 30, 60, 90 (or multiples of 30)
Cream, ointment	10, 15, 30, 50, 100 g
Suppositories	6, 12, 24 pieces

Table 2. Common acronyms/abbreviations on prescriptions and their meanings

Abbreviation/acronym	Latin expression	
R/	**recipe**	**take**
subling.	sublingualis	under the tongue
supp.	suppositorium	suppository
tab.	tabula	tablet
caps.	capsula	capsule
dd	de die	per day
d.t.d.	da tales doses	dispense these doses
no.	numero	number
1 dd	semel de die	once daily
S.	**signa**	**write down (include on label) manner of use**
a.c.	ante coenam	before a meal
a.n.	ante noctum	before night-time
p.c.	post coenam	after a meal
a.u.e.	ad usum externum	for external use
iter …x	itera …x	repeat … times
s.n.	si necesse (sit)	when needed
(d.) i.m.m.	(da) in manu medici	(dispense) in physician's hands

Other information that is important for the future physician
The 'Nederlands College ter Beoordeling van Geneesmiddelen' [Medicines Evaluation Board] distinguishes the following classes of medication:

- Opium Act medication
- Prescription medication: only available on prescription
- Non-prescription medication: medication for which a prescription is not necessary, i.e.:
    - Pharmacy-only medication
    - Pharmacy and chemist-only medication
    - Over-the-counter medication: medication which can be bought anywhere without a prescription

The authority to prescribe medicines is laid down in the **Wet Beroepen in de Individuele Gezondheidszorg (BIG)** [Individual Healthcare Professions Act]. In the Dutch **Geneesmiddelenwet** [Medicines Act], a prescription is defined as "…a document drawn up by a professional (as referred to in the BIG) mentioned by name and work address, on which a prescription is given to a person (pharmacist or dispensing general practitioner) to supply a drug indicated by its substance name or brand name, in the quantity, strength and method of use indicated, to a patient to be identified…".

Electronic prescription is essential for the proper monitoring of interactions between drugs and of contra-indications for the use of drugs. Since 1 January 2014, physicians and other prescribers are therefore only permitted to prescribe drugs electronically.

To prevent unlawful prescriptions via the Internet, the Medicines Act stipulates that it is not permitted to "prescribe drugs via the **Internet** to a person whom the prescriber has never met in person, or whom the prescriber does not know or whose medication history is not available to the prescriber". Source: 'Diagnostiek en Therapie' [Diagnostics and therapy] (2013-2014, BSL), Chapter 37 'Het voorschrijven van geneesmiddelen' [Prescribing medicines]; A.F.A.M. Schobben, T. Schalekamp.

Ci-A session: Abdominal symptoms

Size of group
12 students

Duration
2 hours

Objective
Consultation: Practising of the various phases of the consultation, paying particular attention to questioning of the patient to identify the main health problem (ALECOBO). Moreover, structure of the consultation, the transitions between the different phases and communication aspects in the different phases.
Medical content: Review of the history of a patient with abdominal symptoms. This is the part of the consultation from the beginning to the physical examination.
The students should be able to describe in broad terms what abnormalities would be found during a physical examination and what the strategy would be in this case, even though this session is restricted to the first part, i.e. taking the history of an abdominal problem. The students are able to take the full history and use the context of the patient in the strategy to be followed.

Student's tasks
Preparation: Study the study material, particularly the phases of the consultation and conversation skills.
You should have sufficient knowledge of the anatomy and physiology of the abdomen and the abdominal organs. Revise these subjects as preparation if necessary. Prepare your own patient role, and work on the medical and context factors of the role (Appendix 2: Patient role preparation form). During your preparation you can already be thinking about how the consultation would be different if some of the facts were to change (age, gender, social context).

At the session: Take part in role-playing, give and receive feedback. During the sessions the students will alternate between the roles of patient, physician and observer.

Study material:
Appendix 4. The model consultation.
Textbook 'Medical consultations (E.P. Veening et al). This publication contains the starting points for consultations in G2012. The whole of the book, including the appendices, is used as study material in YEAR4, particularly Chapters 1 to 8 inclusive.
Macleod's clinical examination.

Appendices
1. 3 cases
2. Patient role preparation form
3. SEGUE feedback form
4. IDID discussion

Appendix 1:

CASE 1:

A 50-year-old car salesman presents to his/her GP with episodes of retrosternal pain.

CASE 2:

A 25-year-old teacher presents to his/her GP with severe abdominal pain. He has just vomited.

CASE 3:
An 18-year-old student presents to her/his GP with abdominal pain and nausea.

Appendix 2: Preparation form

You can use this form to prepare for your role as a patient. You yourself can add information that you feel is missing from the case, in line with the working diagnosis. This can concern information in the patient's medical history as well as missing findings from the physical examination.

Working diagnosis:

Differential diagnosis:

Personal details
SES:

Main health issue
What do you say spontaneously?

Exploration of issue
Reason for making appointment:
Background:
Care request / What you expect from the consultation:

ALECOBO dimensions of the main health issue:
Nature
Localization
Severity
Chronology
Origin
Influences
Attitude and perception

Additional (general) history
Medical history:
Medication:
Family history:
Intoxications:
Allergies:
Social history:

Verification of hypothesis:
Once you have explained your main health issue and questions have been asked about it, what questions can you expect to test the hypothesis, based on the differential diagnosis? Describe how you would answer these questions.

Finally, formulate briefly what findings the investigation might bring to light and what the strategy would be in this case.

Appendix 3

STUDENT OBSERVER feedback form
Complete based on SEGUE Framework (see reverse of this form)

Name of physician: Student number of physician:
Name of observer: Student number of observer:
Case patient number:

I. Sets the stage

II. Elicits information

III. Gives information

VI. Understands the patient's perspective

VII. Ends the encounter

VI. If treatment is needed during the consultation

Signature of student observer

SEGUE Framework

This evaluation system comes from the USA, where SEGUE is an acronym for ***S**et the stage, **E**licit information, **G**ive information, **U**nderstand the patient's perspective and **E**nd the encounter*.

I. Sets the stage

1. Greets the patient appropriately
2. Clearly establishes the reason for the encounter.
3. Produces an agenda for the consultation (e.g. "Anything else?", issues, order).
4. Makes personal contact during the consultation (thus going beyond strictly medical issues).
5. Ensures the patient's privacy (e.g. by closing the door).

II. Elicits information

6. Elicits the patient's view of his/her health problem and how it is progressing.
7. Explores physical/physiological factors.
8. Explores psychosocial and emotional factors.
   (e.g. asks about living situation, family relationships, stress)
9. Discusses previous treatments.
   (e.g. self-care, last visit to physician, other medical care)
10. Discusses how health problems affect patient's life.
    (asks about quality of life)
11. Discusses lifestyle issues, prevention strategies (e.g. health risks).
12. Avoids leading questions.
13. Gives the patient the opportunity to talk (e.g. no interruptions).
14. Listens and gives the patient his/her undivided attention.
    (e.g. looks at the patient, verbal and non-verbal acknowledgements)
15. Checks and clarifies information (e.g. summarizes, continues to ask questions).

III. Gives information

16. Explains any investigations (e.g. physical examination, tests).
17. Teaches the patient about his/her own body and situation.
    (e.g. explains examination results, anatomy, diagnosis)
18. Encourages the patient to ask questions, checks that the patient has understood everything.
19. Adapts to the patient's level of understanding (e.g. avoids jargon, explains terms).

IV. Understands the patient's perspective

20. Acknowledges efforts, progress and challenges of or for the patient.
21. Acknowledges waiting time.
22. Expresses caring, concern, empathy.
23. Maintains a respectful tone.

V. Ends the encounter

24. Asks if there is anything else the patient would like to discuss.
25. Reviews next steps with the patient.

VI. If treatment is needed during the consultation

26. Discusses working diagnosis/diagnoses and evaluates any existing treatment.
27. Involves the patient in deciding upon the aim and choice of treatment.
28. Discusses patient-specific factors, the patient's presenting problem and expectations, and arrives at a clearly substantiated treatment proposal.
29. Explains likely effects and any side-effects.
30. Provides instructions for treatment and discusses the strategy in terms of any treatments the patient is currently receiving for other diagnoses
31. Makes clear agreements when rounding off the visit
32. Checks that the patient has understood everything by asking him/her to repeat back relevant information.

Ci-B session: Lung problems

Size of group
9-12 students

Duration
2 hours

Objective
At the end of this training the student will be able to conduct a strategy discussion based on a diagnosis. Findings and diagnosis will be discussed in a structured and easy-to-understand manner. If the patient is to be treated, this treatment will be elaborated and discussed according to the 6-Step model. The student asks whether the patient has any questions, gets the patient to repeat back essential parts of the information, and finishes off by making clear arrangements (including a discussion of warning symptoms). If drug treatment is opted for, the student will be able to write a prescription (which is correct in terms of form as well as content).
After this training session the student will:

- Know which treatments and forms of administration there are for COPD and asthma
- Be aware of the pros and cons of the different drugs
- Be able to give information, explanations and instructions on inhaling and the use of powder inhalers and metered dose aerosols with spacer, and to check the use by the patient, and possibly correct it.

Student's tasks
Preparation:
Study the student manual: see study material. It is assumed that the students are familiar with the material concerning pulmonary disease belonging to the learning questions from the Bachelor's phase.
Study the instructions on the use of inhalers (Appendix 1).
Watch films on inhaling with inhalers.
Complete the 6-Step treatment plan for all cases discussed in the session. Use the relevant guidelines and the BNF as reference material for your preparation (see study material).

At the session:
The tutor will check that the students have drawn up their treatment plan / 6-Step form for all cases (whether or not using P-scribe) and that they have watched the film on Nestor. In each case the physician and the patient will practice inhaling and the use of an inhaler during the consultation.
The observer will write down observations and feedback on the feedback form, using the instructions on 'Use of inhalers' for the inhalation part. All three inhalers will then be covered in each group.
Make sure the mouthpieces of the inhalers are cleaned with gauze and chlorhexidine after use.
In addition, refer to the student's tasks for the Ci-B session 'the consultation (strategy discussion): Cardiovascular problems'.

Study material:
Appendix 1, Use of inhalers.
Week C1a, Ci-B 'The consultation (strategy discussion): Cardiovascular problems', Appendix 5 (Strategy discussion) and Appendix 6 (Practical instructions for writing a prescription).
Guideline on Asthma in adults.
Guideline on COPD.

Appendices
1. Use of inhalers
2. Assignment
3. Case 1
4. Case 2
5. Case 3

6-Step forms

Appendix 1: Use of inhalers

General information
Powder inhalers can be used by asthma patients aged 7 and older for inhaling both beta-sympathomimetics and corticosteroids.
They are not suitable for patients with poor inspiratory strength, however,
as strong, deep inhalations are required. This is necessary to allow the particles to go into the airways as deeply as possible, to prevent them from staying in the mouth and pharynx. If a patient's inspiratory strength (measured with a spirometer) is around 30 l/min, a metered dose aerosol with a spacer needs to be used.

Contrary to powder inhalers, for use of a metered dose aerosol it is important to inhale slowly. The coordination between 'spraying' and inhaling can pose a problem, however, particularly in case of an acute episode or in young children. This problem is solved by using a spacer.

Basic rules for inhalation using a powder inhaler:

Instruction	**Explanation**
cough up phlegm	make sure particles are not trapped
sit/stand up straight	clear airway
keep head tilted backwards slightly	maximum trachea opening
breathe out deeply (not in inhaler)	
place mouthpiece between teeth, then enclose it with lips	to prevent particles getting caught behind teeth
breathe in forcefully and deeply through inhaler	
remove inhaler from mouth	
hold breath 5-10 seconds	important for maximum effect
breathe out through nose, not through inhaler	moisture causes any remaining particles to cling together
(in case of a coughing fit, take a sip of water and repeat)	
for corticosteroids: rinse mouth and throat, don't swallow water	to prevent local and systemic side effects

Comments:
For beta-sympathomimetics, too, rinsing the mouth can be recommended, to reduce the chance of this being forgotten when using inhalation corticosteroids.
Do not cover the air holes when breathing in.

The various powder inhalers need to be prepared for use in different ways. Details can be found in the instruction booklets included.
Powder inhalers must be stored in a dry place, i.e. not in the bathroom.

Important: The physician demonstrates the use of the inhaler and provides instructions and explanations. Then he/she asks the patient to repeat everything and corrects where necessary.

Basic rules for inhaling with a metered dose aerosol + spacer with flap mechanism – in this case a Volumatic®

The basic rules for inhalation using a metered dose aerosol are largely similar to those for a powder inhaler, but what is different, as mentioned above, is that the patient needs to inhale very slowly. This is why it is wise to always have the patient use a spacer!

Preparation

- Assemble the spacer (also referred to as 'inhalation chamber').
- Check by shaking whether the spacer's flap mechanism is working properly (it should rattle).
- Hold the spacer in a horizontal position.
- Shake the metered dose aerosol well.
- Place it onto the spacer with the opening facing downwards.
- Inhale through the spacer once, while depressing the aerosol completely.

Next:	**Explanation**:
cough up phlegm	make sure particles are not trapped
sit/stand up straight	clear airway
keep head tilted backwards slightly	maximum trachea opening
breathe out deeply	
place mouthpiece between teeth then enclose it with lips	to prevent particles depositing on the teeth
breathe in and out calmly 5 times; each time a tick is heard the medication is being inhaled	
remove spacer from mouth	

Comments:

- The medication 'cloud' remains in the spacer for 20 seconds. The patient needs to inhale as soon as possible after insertion of the medication: preferably within 5 seconds.
- Fill the spacer with one puff at a time, even if several inhalations are prescribed.
  - The metered dose aerosol needs to be shaken before use each time: the time before inhalation after each insertion becomes longer.
  - Research has shown that spraying a second puff into the spacer immediately after the first causes the particles of the first puff to be displaced by the particles of the second, causing them to deposit on the wall of the spacer.
- When the patient breathes out, no respiratory air enters the inhalation chamber due to the closed flap.
- The spacer should be cleaned once a week using water with a teaspoon of washing-up liquid. Rinse the mouthpiece with water afterwards. Allow it to air-dry.
- Check whether there is enough medication left in the metered dose aerosol: spray onto a mirror and allow it to dry: If enough medication is left, you will see a round white patch on the mirror. Some new metered dose aerosols have a counting feature.

Important: The physician demonstrates the use of the inhaler and provides instructions and explanations. Then he/she asks the patient to repeat everything and corrects where necessary.

Appendix 2: Assignment

Before role-playing starts:
25 minutes: Tutor demonstrates inhaling 'live' with the various types of inhalers and 'patients' prepare for role-playing.

Make sure the mouthpieces of the inhalers are cleaned with gauze and chlorhexidine after use.

Prepare for the role of physician for cases 1 to 3. Each student will be physician, patient and observer once. Pay attention to communication when conducting the conversation. As a physician, bear in mind that this is the final phase of the consultation. You have already performed extensive history-taking at this stage of the consultation. Start by briefly summarizing the case history (see case) and base yourself on the diagnosis provided. Follow the 6-Step model during your treatment consultation. Prepare the treatment advice you would give based on the information that is currently available to you. If applicable, you will also write a prescription. In addition, refer to the BNF.
Elaborate the case on the 6-Step form and bring it to the session.

Appendix 3: CASE 1

Setting
GP practice

Patient details
Ms. R. Doeglas / Mr Johanna Bijlsma, DOB 17/11/72, address: Bronchusstraat 12, Groningen

Medical history
Hypertension
Allergic to house dust

Medication
Metoprolol tablets, 100 mg, 1 tablet 1 x daily

Reason for making appointment / main health issue
Shortness of breath and wheezing in the chest

Why is the patient seeing you now?
Has always been slightly sneezy every now and then; symptoms have worsened recently and has had two dyspnoea attacks.

Care request
Wants something for the attacks.

Case history
Symptoms and shortness of breath have worsened over the past months. Out of breath quickly. Was short of breath as a child; it was discovered that she was allergic to house dust. Symptoms have spontaneously improved since then. Smokes 10 cigarettes a day.

Physical examination and further tests
BP 140/90 mmHg. During lung auscultation extended expiration with some wheezing and whistling over the lungs.

Diagnosis
Exacerbation of bronchial asthma

Guidelines: Asthma in adults.

Appendix 4: CASE 2

Setting
GP practice

Patient details
Ms Johanna Bijlsma, / Ms. R. Dougla, DOB 30/06/86, address Mijtstraat 7b, Groningen

Medical history
Infantile eczema

Medication
Salbutamol metered dose aerosol, 200 mcg, 1 puff as needed

Reason for making appointment / main health issue
Shortness of breath

Why is the patient seeing you now?
Symptoms have increased: now 2-3 x per week

Care request
Wants to be able to play sports.

Case history
Has asthma in spring and autumn. Worsens on exertion, which is a problem as she plays in her local field hockey club's first team. Oversensitive to cats. Currently lives in a student house which is not clean and is damp.

Physical examination and further tests
On auscultation slightly extended expiration, otherwise normal.

Diagnosis
Asthma with anamnestic indications of allergy and aspecific hyperreactivity and effort-related symptoms.

Appendix 5: CASE 3

Setting
GP practice

Patient details
Mr. G. de Vries / Ms Johanna Bijlsma, DOB 08/02/28, address Groenstraat 122, Leek

Medical history
Long-term COPD

Medication
Salbutamol 'inhaler' (metered dose aerosol) ,100 mcg, 1-2 puffs as needed, max. 4 x daily
Ipratropium bromide inhaler (metered dose aerosol), 20 mcg, 1 puff 4 x daily

Reason for making appointment / main health issue
Shortness of breath

Why is the patient seeing you now?
Symptoms have significantly worsened since he caught a cold.

Care request
Wants medicine.

Case history
Has suffered from coughing and expectoration of sputum and shortness of breath for many years, initially on exertion, later also while at rest. Feverish and coughing up green sputum for several days.

Physical examination and
further lab tests
Temp. during examination 37.9°C. Low lung borders with relaxed vesicular breath sounds and diffuse rhonchi that can be cleared by coughing.

Diagnosis
COPD exacerbated by (viral) infection.

Guidelines on COPD