LAMK Lahden ammattikorkeakoulu
Lahti University of Applied Sciences

Patient Clinical Examination of Adults

Learning Videos in English

LAHTI UNIVERSITY OF APPLIED SCIENCES
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BAYER, LAURA: Patient Clinical Examination of Adults: Learning Videos in English

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ABSTRACT

This functional thesis with its title "Patient Clinical Examination of Adults: Learning Videos in English" was done for the international nursing students studying at Lahti University of Applied Sciences (LUAS). In cooperation with a teacher of LUAS teaching courses about patient examination, the topic and content have been established.

The purpose of this thesis was to provide learning videos about patient clinical examination of adults, which can be used to facilitate students' learning. Due to the changes the modern nurse experiences, nurses take more and more over physicians' tasks, including patient clinical examination.

The aim of the introductory guide was to emphasize the importance of the knowledge on how to clinically examine patients. The given information in form of the videos is providing the students with further hand-on tools, before actual practicing on real patients. The videos were given to one teacher of LUAS, who will use them for the courses.

Theoretical information has been gather by using nursing and medical books and articles. Out of the theoretical part, two videos about examination of the respiratory and cardiovascular system have been made. A feedback questionnaire was conducted in order to discover how the videos facilitate the students' learning. The results of the questionnaire suggested that the videos are clear and helpful for students' learning.

Keywords: patient examination, anamnesis, nursing, assessment, respiratory examination, cardiovascular examination, learning styles, potilaan tutkiminen

Lahden Ammattikorkeakoulu
Hoitotyön koulutusohjelma

BAYER, LAURA:

Aikuisen potilaan kliininen tutkiminen: Englanninkieliset opetusvideot

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TIIVISTELMÄ

Tämän toiminnallisen opinnäytetyön on tehnyt kansainvälisen hoitotyön koulutusohjelman opiskelija Lahden ammattikorkeakoulussa (LAMK). Opinnäytetyön aihe on aikuisen potilaan kliininen tutkiminen: Englanninkieliset opetusvideot. Opinnäytyön tarkoituksena oli tehdä kaksi opetusvideota englanninkielisen sairaanhoitajakoulutusohjelman opiskelijoille potilaan kliinisestä tutkimisesta.

Sairaanhoitajat saavat nykyään enemmän vastuulleen lääkäreiden tehtäviä. Tarkoituksena oli tarjota opiskelijoille työkalu potilaan tutkimista koskevalle opintojaksolle. Opinnäytetyön aihe ja sisältö on valittu yhteistyössä hoitotyön koulutusohjelman opettajan kanssa. Videot tulevat jatkossa koulutusohjelman opettajien käyttöön.

Teoreettista taustaa aiheesta etsittiin hoitoalan tieteellisestä kirjallisuudesta englanniksi ja suomeksi. Videot tehtiin teoreettisen tiedon pohjalta. Palautekyselyllä selvitettiin opiskelijoilta, kuinka videot vastasivat opiskelijoiden tarpeeseen. Kyselyn tulokset viittaavat siihen, että opiskelijoiden mielestä videot olivat hyödyllisiä ja selkeitä.

Asiasanat: patient examination, anamnesis, nursing, assessment, respiratory examination, cardiovascular examination, learning styles, potilaan tutkiminen

CONTENTS

1 INTRODUCTION

What we call today “nursing process” is the result of decades of research and consequent evolution that began with theories from late 1950s by Ida Jean Orland (Fennessey & Wittmann-Price 2011, 46). During the following decade it developed as a separate and independent process within the healthcare professions. The "nursing process" became then, a new entity with five clear steps: assessment; diagnosis; outcome identification and planning; implementation; and evaluation (Crouch & Meurier 2005, 53-54). These five steps were institutionalized in 1973 by the American Nurses Association’s (ANA) when the Congress for Nursing Practice established "Standards of Practice" for direct nursing performance. (Taylor, Lillis & Lemone 2005; as cited in Fennessey & Wittmann-Price 2011, 45-46.) The new "Standards of Practice" attributed nurses a new role: patient clinical examination.

To understand the overall condition of a patient, nurses need to perform a comprehensive assessment (Crouch & Meurier 2005, 52) which includes a complete health history and a detailed physical examination (Jarvis 2012, 2). Clinical examination is the very first step of the “nursing process”, without a doubt it is a key component in the assessment, together with anamnesis and psychosocial evaluation (Fennessey & Wittmann-Price 2011, 45). These clinical examination skills have been described as the collection of patient’s data through inspection, palpation, percussion and auscultation (Bickley & Hoekelman 1999, as cited in Coombs & Moorse 2002, 202; Crouch & Meurier 2005, 136; Taylor et al. 2005, as cited in Fennessey & Wittmann-Price 2011, 47; Jarvis 2012, 115)Nurses evaluate changes in the body’s normal functions to identify potential health problems, therefore being able to determine the nursing interventions required for each case with the aim of achieving positive health outcomes (Crouch & Meurier 2005, 52; Collins 2013, 122).

The modern changes that the health care systems are experiencing, continues to extend the role of modern nurses (Fennessey & Wittmann-

Price 2011, 45-46), today collecting patient history and conducting physical examinations are not only doctors' but also nurses' responsibilities and skills involved in such endeavor have become critical and indispensable for working life (Crouch & Meurier 2005, 148-150).

The following thesis is a functional thesis, including a theoretical and a practical part. The theoretical part consists out of information on patient clinical examination, which then has been used to create the practical part: video material about physical examination of the respiratory and cardiovascular system for the international nursing students of Lahti University of Applied Sciences.

2 THESIS PURPOSE, GOALS AND OBJETIVES

The purpose of this thesis is to create learning videos on how to examine adult patients, which will be used by Lahti University of Applied Sciences. Three main areas about clinical examination, as well as anamnesis are covered, to not exceed the circumference of this Bachelor's thesis. The three examination areas are respiratory and cardiovascular system, as well as abdomen. However, only two videos have been made – examination of the respiratory and cardiovascular system – to not exceed the circumference of a Bachelor's thesis.

In the theoretical part of the thesis, anamnesis and the three areas will be detailed described. This will include subjective and objective data, which includes abnormal findings. Abnormal findings however are not included in the videos, because the videos would be too long. In the videos, nursing students will be familiarized with the most common techniques of patient clinical examination used to examine the repiratory and cardiovascular system.

Due to the changes in Nursing all over the world, students need more knowledge on how to examine patients. The thesis and its learning videos are supposed to ensure that nursing students get more information on physical examination and its techniques. Furthermore, the videos facilitate the learning from theory to practice following making working in Finnish primary care, as well as in international settings easier.

While looking for a thesis topic, no further theses have been found concerning the same topic. One thesis in Finnish language was found that provided learning videos for students about the ABCDE-approach. However, it did not go as much into detail concerning physical examination as such and is – as already mentioned – in Finnish language.

3 THEORETICAL BACKGROUND

3.1 Nursing Students' Learning

Learning style has been defined as "characteristic cognitive, affective, and psychological behaviors that serve as relatively stable indicators of how learners perceive, interact with, and respond to the learning environment". (Keefe 1979.)

Learning styles vary from individual to individual. "Auditory, visual, auditory-verbal, tactual, and kinesthetic" (Rundle & Dunn 2008, as cited in Beischel 2013, 228) learners are existing and mixed together in classes. Auditory learners learn best when listening to new information, whereby visual learners want to see and read about the new material in order to keep it in mind. Auditory-verbal learners prefer to discuss about the new topic, tactual learners prefer taking notes and kinesthetic learners learn by doing. (Beischel 2013, 228.) Therefore, as a teacher it is difficult to support each student's individual learning style.

In a study conducted by Hallin (2014, 1446), final year nursing students' learning preferences have been compared. Results showed that 74,1% of the students had a high preference for structure in their learning. 31% of the students highly preferred auditory learning and 8% highly preferred visual learning. Changes in preference for auditory or visual learning depended on the group the students were in. Furthermore, students having clinical experiences between less than a year and three years, as well as students, who had undertaken an individual program during upper secondary school preferred visual learning. (Hallin 2014, 1446.)

Both theory and practice are needed for nursing students to become nurses. Without good theory as a base, implementation and understanding care is more difficult. (Sandvik, Eriksson & Hilli 2014, 290.) Furthermore, lectures that are unable to add practical examples to theory were seen as limiting learning (Falk, Falk & Jakobsson Ung 2016, 17).

Giving nursing students the possibility to use study methods according to their learning preferences increased motivation and thus better grades were achieved. (Billings & Cobb 1992, as cited in Hallin 2014, 1443.)

Based on those studies, the author of this thesis provides learning videos for nursing students with auditory and/or visual learning preference, which can be used additionally to lectures and skill labs at Lahti University of Applied Sciences.

3.2 Nurse's Role Development Process

The nurses' role is continuously expanding depending on the country. Already in 1997, the Royal College of Nursing in London did a telephone survey calling 89 intensive care units. The nurses said that they were experiencing huge changes in their nursing role. However, they said that they felt like they were able to cope with the new demands. (The Royal College of Nursing 1997, as cited in Coombs & Moorse 2002, 201.) Rushford et al. (1998), as cited in Coombs & Moorse (2002, 201), states that at that time physical assessment skills in the UK included recording vital signs such as temperature, heart rate, blood pressure and respiratory rate. In the USA, Canada, as well as Australia however, physical assessment skills of nurses have been defined a bit broader including auscultating the lungs and the heart, as well as palpating the abdomen (Coombs & Moorse 2002, 201-202).

Coombs & Moorse (2002, 202) did furthermore some research by offering a 12-week course called "introduction to physical assessment and history taking". Nurses from acute medical settings, children's care settings, mental health settings took part in it, as well as community nurses. The aim was to detect normal and abnormal health state of the patient to improve early referral to needed and experienced healthcare professionals. After the course the nurses had to solve two intensive care cases, which pointed out that resolving patient issues is all healthcare

providers' responsibility and that more skills, as well as critical care practice is vital. (Coombs & Moorse 2002, 202-210.)

In the United States, the Education Law (139/2010, 6902 §) defines nursing in paragraph 1 as the following:

"The practice of the profession of nursing as a registered professional nurse is defined as diagnosing and treating human responses to actual or potential health problems through such services as case finding, health teaching, health counseling, and provision of care supportive to or restorative of life and well-being, and executing medical regimens prescribed by a licensed physician, dentist or other licensed health care provider legally authorized under this title and in accordance with the commissioner's regulations. A nursing regimen shall be consistent with and shall not vary any existing medical regimen."

In order to diagnose good physical examination and health assessment skills are needed (Djukic & Kovner 2011, 15). Furthermore, Djukic and Kovner (2011, 15) state that physical assessment such as auscultating lung, heart and abdominal sounds; assessing cranial nerves, eyes and ears using ophthalmoscope and otoscope; testing vision and hearing; performing breast examination; testing range of motion and muscle strength of upper and lower extremities are performed by registered nurses. Furthermore, also history taking is performed by registered nurses as well as physicians (Djukic & Kovner 2011, 15).

Birks et al. (2013, 27) found out that Australian nurses learn 120 skills on how to examine a patient, however only about 34% of these are used routinely. Nurses used every time they worked inter alia palpation of the distal pulse for circulation, inspection of the abdomen as well as assessment of the mental state. Frequently or occasionally they inspected the oral cavity, inspected and palpated the external ear, inspected the external eyes, assessed the visual acuity, inspected the shape of the chest, palpated the chest wall, percussed the lungs, auscultated lung sounds, inspected for jugular pulsation, inspected muscles and extremities

for size and symmetry, palpated extremities for tenderness, palpated joints for tenderness, observed the range of joint motion, auscultated abdomen for bowel sounds and palpated abdomen for tenderness or swelling. Rarely the nurses were using skills including inspecting internal nasal cavity with light, inspecting the internal ear with an otoscope, auscultating the chest for heart sounds, auscultating the carotid artery, estimating the jugular venous pressure and percussing the abdomen for abdominal sounds. However, the frequency the Australian nurses were using the skills was dependent on the nurses' role, as well as on time and availability of other health care professionals such as physicians. (Birks et al. 2013, 28-31.)

Forecast show that by the year 2025 85% more Nurse Practitioners are going to supply primary care, whereby only 3% more physicians will be working in primary care settings. (Auerbach et al. 2013, 1937.) This shows that nurses will have to take over more tasks such as thorough physical examination. In some states of the USA for example, nurses manage primary as well as preventive care on their own (Shalala 2014, 3).

In general, nurses are nowadays increasingly encouraged to carry out person-centred care (Crouch & Meurier 2005, 55), which includes history taking and physical examination.

4 THE INTERVIEW

4.1 Communication Process

Before the interview can start, a couple of things need to be kept in mind. As an interviewer, it is important to think of sending and receiving messages, as well as internal and external factors before starting taking the history.

4.1.1 Sending and Receiving Messages

Messages in general include verbal and nonverbal ones. The examiner and the patient constantly send to and receive from each other those messages during the interview and examination. Therefore, it is important to be able to read and understand these messages. Since interpretation of messages is dependant on experiences, cultural background, self-conception, physical and emotional state of the receiver, a lot of things can go wrong. This is especially the case in non-verbal messages, since they can be completely misunderstood. (Jarvis 2012, 30.)

4.1.2 Internal Factors

Internal factors are factors that the nurse should bring into the anamnesis and examination. These include respectfulness, empathy and listening.

First of all, treating a person respectfully is one of the ground rules when treating a patient. This means treating every patient the same way even though different background, status or achievenments are present. (Crouch & Meurier 2005, 96.) In order to respect patients, an examiner has to like people in general, which in return gives the patients the feeling of complete acceptance (Jarvis 2012, 30).

Empathy is skill needed when interviewing (Crouch & Meurier 2005, 118). This means feeling with a person and understanding the person, but not feeling like the person (Cox 2010, 8), since it would make the examiner get

lost to his or her own expenses (Crouch & Meurier 2005, 135; Jarvis 2012, 30).

In the end it is important to be able to listen. Listening is not done passively, but rather actively to get most information and data out of the interview (Crouch & Meurier 2005, 118). This skill gives the examiner the chance to figure out missing or unsaid things that can be later asked for. (Jarvis 2012, 30.)

4.1.3 External Factors

External factors unlike internal factors mean the preparation of the setting, where the interview and examination take place. These include privacy and confidentiality, physical environment, dressing and note-taking.

It is important to be in a separate room that ensures privacy and avoids interruptions so that the patient feels comfortable and trusts the nurse, thus talking more openly about his health concern (Jarvis 2012, 30-31; Berman & Snyder 2013, 202). Privacy furthermore means that nobody can listen to history taking or watch when examining. Confidentiality at the first glance seems to have a similar meaning as privacy, but it goes much further than that. Confidentiality includes privacy during the interview and examination. Besides, it includes that the gathered subjective and objective data is kept confidential and is only discussed with other health care professionals that are also part of the patient's care pathway. (Crouch & Meurier 2005, 98-101.)

The physical environment should be at good temperature, so that the patient is not too cold or hot (Crouch & Meurier 2005, 104). Also lightning, noises, objects that might distract the patient, distance and seating between patient and examiner should be taken into consideration (Berman & Snyder 2013, 202). Providing an environment that makes the examiner feel comfortable also makes the patient feel comfortable (Jarvis 2012, 31).

In addition, street clothes are good to wear in order to make the patient feel comfortable, since the uniform could intimidate the patient (Crouch & Meurier 2005, 139). However, in a hospital it might not be appropriate and hygienic to wear street clothes. That is the reason why street clothes and a uniform coat on top is the best option. (Jarvis 2012, 31.)

Note-taking is important to do when interviewing. History-taking can take some time, therefore the interviewer cannot only rely on the memory, but rather needs notes. However, it is important to still focus on the patient in order to give him the feeling that he has got full attention (Jarvis 2012, 31).

4.2 Communication Techniques

Several communication techniques are needed to lead a good interview. These include verbal and nonverbal skills, which will be further explained in the following subchapters. Besides, ten nonproductive verbal skills – also called verbal traps – are discussed.

4.2.1 Productive Verbal Skills

There are two different kinds of questions that can be asked: open-ended and closed questions. In the beginning it is helpful to use open-ended questions so that the patient starts talking about the health concern (Crouch & Meurier 2005, 134). Whenever the examiner needs more information, more open-ended questions can be asked about the topic. However, when a specific information is needed, a closed-ended question is used in order to get quickly an exact detail (Crouch & Meurier 2005, 133). It is vital to only ask one question at a time and not to ask about two different things in one question to avoid confusion. (Jarvis 2012, 32-33; Berman & Snyder 2013, 201.)

4.2.2 Nonverbal Skills

Nonverbal skills are another important component during the interview. Due to Argyle (1990), communication consists 80 to 90% out of non-verbal messages and is more meaningful than spoken words. As mentioned earlier in chapter 3.1.1 nonverbal messages go both ways: the ones that the interviewer sends to the interviewee and the other way round (Jarvis 2012, 30 & 36). Nonverbal factors during an interview include physical appearance, posture, gesture and facial expression, eye contact, voice and touch (Crouch & Meurier 2005, 130).

Physical appearance tells a lot about a person (Crouch & Meurier 2005, 130-131). No good self-care may indicate that a patient feels too sick to maintain personal hygiene. Furthermore, it can give information about the "status" of a patient and/or the attitude. (Jarvis 2012, 36.)

Posture can be open and relaxed or closed and defensive. Open and relaxed is a person extending the large muscle groups. On the other hand, somebody with crossed arms or legs is closed, not relaxed and won't be giving a lot of information. As am examiner it is important to have a relaxed and open position so that the patient feels welcome and gets the feeling of trust, so that he can talk about the issue or concern. (Jarvis 2012, 36.)

Different gestures are expressing different messages like fear, acceptance or pain. Also facial expressions can tell a lot about a patient's health condition. Fear, anger, suspiciousness or pain are only some to name. The interviewer should show through facial expressions interest and attentiveness and should not show that he or she is bored, distracted, disgusted or disbelieved, which could make a good report difficult or even impossible. (Jarvis 2012, 36-37.)

An easy look at the patient is good to show interest and attentiveness (Crouch & Meurier 2005, 133). Looking away indicates shyness, confusion, withrawness, boredom, intimidation, depression, withdrawal or

apathy. This applies to the patient as well as to the examiner. (Jarvis 2012, 37.)

The voice of a person can indicate “sarcasm, disbelief, sympathy, or hostility” (Jarvis 2012, 37) depending on the tone, the pitch, the speed and intensity a person is speaking with. Whenever long pauses are done before giving an answer, the nurse must reckon with dishonesty. Furthermore, when a patient is doing long and frequent pauses, and has a weak and silent voice, it could indicate depression. (Jarvis 2012, 37.)

Touch in western culture expresses love and affection, that is why an interviewer should only touch the patient when knowing him or her very well, thus knowing the patient does not misunderstand it. (Jarvis 2012, 37.)

4.2.3 Nonproductive Verbal Skills

An interview is not as easy to lead as it loosk like, since there are several possibilities for going into verbal traps, which may lead to increased anxiety leading to closure of the patient. Nonproductive verbal skills include the following: giving incorrect assurances or encouragements, making unwanted suggestions, taking advantage of the own authority, using avoidance language, distancing, using technical terms, asking biased questions, taking too much, interrupting, as well as asking “why”-questions.

The first trap is to do incorrect assurances or reassure the patient, even though it is not appropriate. By doing so, a patient would shut oneself off from the nurse, thus no further communication can take place. The inappropriate assurance would enhance the patient’s anxiety. On top of it, incorrect assurances or encouragements bring something promising with them that may not come true. That is why a health care professional should not do so. (Jarvis 2012, 35.)

Another nonproductive verbal message is to make unwanted suggestions. Quite often patients seek for professional advice, which is normal.

However, attention needs to be paid to how and when to give advice. When e.g. a diagnosis is made and the patient is asking for advice on how to treat it best, straight advice can be given. On the other hand, sometimes patients are asking a health professional for advice, even though they have to make their own decision. In such case it is better and more helpful to ask a question that would make the patient reflect about the advantages and disadvantages, thus come to an own decision. (Jarvis 2012, 35.)

A common error is to show authority towards the patient. Trying to level down on about the same level as the patient makes it easier to communicate and allows the patient to feel equal, more confident, thus he is able to open up. (Jarvis 2012, 35.)

A fourth trap is to use avoidance language. People tend to use avoidance language talking about a difficult topic such as “death” and think they can evade the issue. However, this only leads to suppression of the fear, resulting in making the patient even more fearful. For that reason, talking openly and directly is the right way to deal with fear. (Jarvis 2012, 35.)

Distancing is used by patients from time to time to get distance between the threat and themselves. A “threat” in this context could be a disease or a lump. As a health care professional it is important to not do the same and rather name the so-called threat directly to decrease anxiety. (Jarvis 2012, 35.)

Another trap is to use professional terms (Crouch & Meurier 2005, 139; Cox 2010, 7) after a patient has used them. Patients sometimes think they know the meaning of a specific technical term, but in reality it means something different. This could lead to bad communication thus leading to e.g. wrong or insufficient medication intake. (Jarvis 2012, 35-36.)

Trap number 7 means using biased questions during the interview. A biased question is e.g.: “You do not use alcohol on a daily base, do you?” With this kind of question, the patient has two choices to answer. The first one is to either answer that he doesn’t use alcohol on a daily base, just to

please the health professional. The other choice is to say the truth in expectation to disappoint the nurse and thus feeling guilty. (Jarvis 2012, 36.)

The eighth trap is to talk too much as an interviewer. Instead of talking all the time, an important rule should be kept in mind: “listen more than you talk” (Jarvis 2012, 36). With this statement the eighth trap can be easily avoided.

Interrupting is another nonproductive verbal message that an interviewer should avoid (Cox 2010, 8). By assuming what the patient might say, the examiner interrupts the patient and might hinder the patient on mentioning important information for eventual further examination. Preoccupation, additionally, goes hand in hand with interrupting and means that the interviewer already thinks about what to ask next without actually listening to what the patient is saying at that moment. (Jarvis 2012, 36.)

The last trap that should be avoided is to use “why”-questions. The reason for that is that the question is implying blame on the patient. Once the patient feels guilty, he is looking for an excuse, which in return contributes incorrect information to the health history. Instead of using a “why”-question it is better to start a sentence by saying “Oh I see…”, following “What was happening…?”. (Jarvis 2012, 36.)

5 ANAMNESIS

Anamnesis (ān'ām-nē'sĭs) is defined as “accumulated data concerning a medical or psychiatric patient and the patient’s background, including family, previous environment, experiences, and, particularly, recollections, for use in analyzing his or her condition” (Anderson 1998, 83). Anamnesis (medical history) is one the oldest diagnosis tools known in healthcare and 70 to 90% of diagnoses can be concluded based on the patient’s history (Muhrer 2014, 31-32). This shows the importance of anamnesis in nursing field as well as in medical field in general.

Health care services are in permanent evolution; decades of research have proven the importance of treating patients as active participants on their own health care. This is done by collecting subjective data, which describes sensations or symptoms (Crouch & Meurier 2005, 54; Jarvis 2012, 2; Berman & Snyder 2013, 197). Open-ended questions and careful listening are helpful to gather as much information as possible. The patient should be able to describe the sensations and symptoms in his own words. This is done to avoid confusion and mistaken conclusions that can lead to a wrong diagnosis and thus wrong treatment. Getting as much information as possible will allow healthcare professionals to perform a focused clinical examination that will enhance the diagnosis process (Cox 2010, 7). (Muhrer 2014, 34.)

However, a health history can be also done in healthy individuals for lifestyle assessment including “exercise, healthy diet, substance use, risk reduction, and health promotion behaviors” (Jarvis 2012, 49).

A “whole” or a “partial” health history can be done, depending on the situation. If there is enough time available, a complete health history can be done. However, in emergency situations, only information is gathered that is needed to treat the severe condition. (Crouch & Meurier 2005, 88.)

5.1 The Opening

A history form can be handed out before the actual interview to give the patient the time to think about the answers (Jarvis 2012, 49). Such forms that include the main points of the history-taking can be found in many health care settings, which safes time and makes it easier for the nurses (Crouch & Meurier 2005, 89).

To start the interview, the nurse should introduce herself and start with an introduction senctence mentioning why the interview is being held (Crouch & Meurier 2005, 132). After that, date and time of the interview should be recorded (Jarvis 2012, 49), before the actual interview can start.

5.2 The History-Taking

5.2.1 Personal Information

First of all, personal information, biographics and demographics are asked for, if these haven't been filled in a form already in advance. These include name, age and date of birth, address and contact number, marital status, ethnic origin, profession, as well as gender, height and weight. (Crouch & Meurier 2005, 89; Jarvis 2012, 49; Berman & Snyder 2013, 198.)

5.2.2 Reason for Seeking Care

The second part of the interview is the reason for seeking care rather than the chief complaint (CC) (Cox 2010, 8), since it only includes need for health issues and not for wellness. Once the examiner asks the patient for the reason they came, the patient usually describes in a few sentences symptoms and signs as well as their duration (Crouch & Meurier 2005, 89; Berman & Snyder 2013, 198). An example could be "lower abdominal pain for one day". However, sometimes it is possible that patients mention more than one reason for their visit, which is why it is important to stay focused and ask what is the actual reason for this visit. (Jarvis 2012, 50.)

5.2.3 History of Present Illnesses

After the reason for seeking care has been identified, the history of present illnesses (HPI) should be taken (Cox 2010, 9). In a healthy person the HPI is said in one sentence, whereby in a sick person it includes the reason for seeking health, the time when the first symptom started until the time when the patient is sitting in front of the nurse. When asking about the present illness(es), special attention needs to be paid to the following points: location, character or quality, quantity or severity, timing, setting, aggravating or alleviating factors and patient's perception. (Crouch & Meurier 2005, 90; Cox 2010, 9; Jarvis 2012, 50-51; Berman & Snyder 2013, 198.)

The location of the pain should be described exactly as well as whether it is radiating or localized, superficial or deep. For describing character or quality, adjectives like buring, sharp or dull are used. However, whenever the patient is not able to describe the character, it helps to use comparisons to illustrate the character of the signs or symptoms. (Crouch & Meurier 2005, 90; Jarvis 2012, 50-51.)

For identifying quantity or severity of the health issue on the other hand, no adjectives are used. How the issue affects the patient's daily life is the right way to get information about severity. The next characteristic is timing, which means when exactly the issue first started. Furthermore, it is important to get information about what the patient was doing when the symptom first started. As a health professional, it is also important to ask the patient about the pharmacological and/or non-pharmacological means that helped to relieve the pain and under what circumstances the pain got worse. Finally, the health professional should as the patient what he or she is thinking, what the reason is for the health issue. By doing so, fears of having a severe or even untreatable disease may be alleviated. (Crouch & Meurier 2005, 90; Jarvis 2012, 50-51.)

5.2.4 Past Medical History

After the examiner has asked about the HPI, questions concerning the past medical history (PMH) are asked (Cox 2010, 9). Past health history includes childhood illnesses and complications, accidents or injuries, serious or chronic illnesses, hospitalizations, surgical history, immunizations, allergies and medication (Crouch & Meurier 2005, 90; Jarvis 2012, 51; Berman & Snyder 2013, 198).

Childhood illnesses refer to measles, mups, rubella, chickenpox and pertussis and on the one hand, serious illnesses such as e.g. rheumatic fever and scarlet fever (Berman & Snyder 2013, 198). Accidents and injuries are self-explanatory and include fractures, injuries of the head, burns, big wounds and car accidents. Serious and or chronic illnesses include common illnesses such as asthma, hypertension, diabetes, and depression, but also HIV, hepatitis, cancer or epilepsia. (Jarvis 2012, 51-52.)

Any stays at a hospital need to be recorded, too, by naming the cause and length of stay as well as how it was treated (Berman & Snyder 2013, 198). Operations also need to be written down including the type of surgery, when it was done and how the patient recovered from it. In the end of PMH immunizations should be checked by type and date of immunization. When asking about allergies, a note should be made about the allergen as well as the reaction. Current medication including not only prescribed medication, but also so called over-the-counter medication as well as vitamins and minerals or birth control pill (Berman & Snyder 2013, 198). These can be easily not seen as medication by the patient and therefore important to ask for. Name, but also dose and frequency of intake should be established. (Jarvis 2012, 51-52.)

5.2.5 Family History

A family history can detect risks for diseases the patient may get in the future. These include cancer and heart conditions. (Cox 2010, 18.) For that

only blood relatives are checked for diseases (Crouch & Meurier 2005, 91). These include parents, grandparents and siblings, as well as spouse and children. Latter are important for aspects such as smoker in the close family, since the smoke affects all of the family members. The medical condition of each family member should be written down, because they can eventually pass onto the next or next generation but one. Special attention should be paid to “heart disease, cancer, diabetes, hypertension, obesity, allergies, arthritis, tuberculosis, bleeding, alcoholism, and any mental health disorders” (Berman & Snyder 2013, 198) that are running in the family. (Jarvis 2012, 52 & 54.)

5.2.6 Personal and Social History

Personal or social history also have their impact on health and illness and should be therefore also considered (Cox 2010, 9). That is why information should be collected about personal habits, nutrition, sleeping pattern, exercise, relationships, alcohol or drug consumption (Crouch & Meurier 2005, 90) and finally how to cope with stress. (Jarvis 2012, 57-58; Berman & Snyder 2013, 198.)

5.2.7 Cultural and Spiritual History

Cultural and spiritual history should be assessed, too, since they may differ from patient to patient. It is for example important to ask the patient if blood can get administered, since for Jehovah’s Witnesses it is prohibited due to their religion. (Jarvis 2012, 54.)

5.2.8 Review of Systems

TABLE 1. Review of systems (Crouch & Meurier 2005, 92)

Systems	Checklists
• Integumentary (skin, hair, nails) system	• General state of health. History of skin diseases, changes in skin colour, rashes, bruises, moles or lumps, pruritus, abnormal growth of hair (hirsutism). Loss of hair (alopecia), changes in nails, dry or moist skin
• Musculoskeletal system	• Joint stiffness/pain, back pain, limitation of movement, arthritis, fractures and swelling
• Nervous system	• History of altered consciousness, headache, convulsions, speech problems, inco-ordination, weakness or paralysis, loss of memory, head injury, change of sensation, irritability, mood changes, depression, anxiety and sleep disturbances • *Ears*: Hearing deficits, use of hearing aid, vertigo, tinnitus, infection, discharge and earaches • *Eyes*: Wearing spectacles. History of eye problems
• Endocrine system	• Endocrine problems: diabetes, hypothyroidism, thyrotoxicosis
• Respiratory system	• *Nose*: Epistaxis, sinusitis, allergies, frequent colds and obstruction • *Throat*: Hoarseness, frequent sore throats, pain/stiffness, goitre and tonsillectomy • Dyspnoea, sputum, cough, wheezing, asthma, haemoptysis
• Cardiovascular system	• Chest pain, hypertension, dyspnoea, oedema, anaemia, myocardial infarction and varicose veins
• Immune system	• Vaccination history • Infections
• Gastrointestinal system	• Bleeding/swollen gums, mouth sores, dentures, toothache and sore tongue • Nausea or vomiting, loss of appetite, loss of weight, diarrhoea, constipation, usual bowel habits and blood in the stools
• Urinary system	• Frequency, urgency, nocturia, haematuria, changes in urine colour, incontinence, dribbling and suprapubic pain
• Reproductive system	• *Female*: Menstrual history (e.g. last menstrual date, regularity, menorrhagia), bleeding following intercourse, last smear test, vaginal pruritus, discharge, number of pregnancies, number of children, type of contraception, menopause, hormone replacement therapy. Breast disease, etc. • *Male*: History of erectile dysfunction, prostate problems, infections, etc.

In the review of systems, the interviewer asks about diseases or illnesses of all different body systems. The reason for that is evaluation of the past and present state of health, to gain missing information, and to see how the patient promotes his health. (Jarvis 2012, 54.) The review can be done during the examination and should include positive and negative results

(Crouch & Meurier 2005, 91) that the patient states subjectively (Jarvis 2012, 54). Table 1 shows a systematic review of the body systems and helps what to pay attention to.

5.3 The Closure

The interview should end smoothly and not abruptly by asking the patient, whether there is anything missing or still to add. If everything is said, the examiner should summarize to which conclusions of the health state and the health issue(s) both – nurse and patient – came. Finally, the patient should be informed about what kind of physical examinations will be following. (Jarvis 2012, 37; Berman & Snyder 2013, 204.)

6 CLINICAL EXAMINATION

A clinical examination is described as the process of collecting objective data that are demonstrated by signs by examining the body (Crouch & Meurier 2005, 54; Jarvis 2012, 49). Examination includes inspection, percussion, palpation, auscultation (Bickley & Hoekelman 1999, as cited in Coombs & Moorse 2002, 202; Crouch & Meurier 2005, 136; Taylor et al. 2005, as cited in Fennessey & Wittmann-Price 2011, 47; Jarvis 2012, 115) and smelling (Crouch & Meurier 2005, 149).

Inspection means having a close look at the person using sight and smell (Crouch & Meurier 2005, 152); first the whole person and later on each specific body system (Crouch & Meurier 2005, 136-137; Jarvis 2012, 115).

Palpation usually follows inspection to get more information on “texture, temperature, moisture, organ location and size, as well as any swelling, vibration or pulsation, rigidity or spasticity, crepitation, presence of lumps or masses, and presence of tenderness or pain” (Jarvis 2012, 115). Palpation can be done by using the fingertips, backside of the hands or fingers, base of fingers or by grasping e.g. an organ with fingers and thumbs to detect its size. There is light and deep palpation, whereby light palpation should be always done first with one hand or finger as well as no deeper than 1cm. Deep palpation, by contrast, is done with both hands (bimanually) leading to a depth of 4-5cm. (Crouch & Meurier 2005, 152-153; Berman & Snyder 2013, 578).

Percussion means tapping on someone’s skin to get more information about underlying structures. Through vibration and sounds size, position and consistency of the organs can be discovered (Jarvis 2012, 116-117). Percussion can be done directly or indirectly. Direct percussion means tapping directly with one or two fingers on the skin. In indirect percussion on the other hand, the middle finger of the dominant hand is placed on the skin and the middle finger of the other hand is tapping on the middle finger of the other hand. (Crouch & Meurier 2005, 154.) Table 3 shows the

different kinds of percussion sounds and on which body part what sounds can be heard (Crouch & Meurier 2005, 153).

TABLE 3. Different percussion sounds (Crouch & Meurier 2005, 153)

Percussion sounds				Normal and abnormal findings	
Sound	**Intensity**	**Pitch**	**Quality**	**Normal location**	**Abnormal location**
Flatness	Soft	High	Flat	Bone (sternum), muscle (thigh)	Lungs (severe pneumonia, collapsed lung)
Dullness	Medium	High	Thud	Liver, diaphragm	Lung (pleural effusion, atelectasis)
Resonance	Loud	Low	Hollow	Lungs	No abnormal location
Hyper-resonance	Very loud	Very low	Booming	Child lungs	Emphysema
Tympany	Loud	High	Musical	Gastric air bubble	Air-distended abdomen, severe pneumothorax

Auscultation finally is used to listen to sounds that the body has produced. This is done by using a stethoscope, which consists out of a diaphragm - for listening to high-pitched sounds - and a bell - for listening to low-pitched sounds. (Crouch & Meurier 2005, 154; Jarvis 2012, 115-118.)

Physical examination gives a nurse more information about the client's actual ability, as well as supplements or confirms the data that has been collected during history-taking. However, sometimes objective data is different from what the patient is saying and therefore further investigations need to be done. The set of clinical data collected by nurses, will allow them to create a nursing diagnosis and a care plan. (Crouch & Meurier 2005, 54.) Once the nursing diagnosis and the care plan are established, continuous re-evaluation is needed, thus clinical assessment is needed to be able to do so (Crouch & Meurier 2005, 149). (Berman & Snyder 2013, 576.) The inability to produce quality patient assessment based on medical history and clinical examination, on the

other hand, can delay diagnosis, the provision of required health care treatment, resulting in negative outcomes (Thomas et al. 2004, 469–472; Crouch & Meurier 2005, 54).

There are three types of physical examination: complete assessment, assessment of body system (Crouch & Meurier 2005, 150) or body area (Berman & Snyder 2013, 575). In this thesis, the health assessment is done according to body systems.

During physical examination, the nurse should always explain, what is happening next and what a result means, since clients are quite often anxious about the results and about what the nurse is doing next (Berman & Snyder 2013, 576-577). Furthermore, standard hygiene precautions should be considered during physical assessment, especially when dealing with bodily fluids or wounds (Crouch & Meurier 2005, 151).

6.1 General survey

General survey is done first in order to get a quick all-over impression of the patient. It includes appearance, mental status, posture (Crouch & Meurier 2005, 154) and temperature.

General appearance includes as stated in table 4 the following components: age, general state of health, signs of distress, height and build, nutritional status and body build, general appearance of skin, facial features and dress, grooming and hygiene. All of them can be seen and assessed within the first couple of minutes and give an allover image of the patient.

TABLE 4. General appearance (Crouch & Meurier 2005, 155)

Components	Assessment and rationale
• Age	• Compare chronological age with apparent age. Chronic disorders, chronic alcoholism, manual labour and genetic syndromes may make clients look older. Endocrine disorders may cause dwarfism or delayed puberty, which may make clients look younger
• General state of health	• Does the client appear well, acutely ill or chronically ill? This may help to decide on the immediate needs of the client
• Signs of distress	• Any evidence of cardiac or respiratory distress, pain, anxiety or depression
• Height and build	• Is the client tall or short, slender or muscular? Does the body appear symmetrical? Very short stature is seen in Turner's syndrome, childhood renal failure, achondroplastic and hypopituitary dwarfism
• Nutritional status and body build	• Is the client emaciated, thin, plump or obese? Changes in weight may provide important diagnostic data. Calorific intake, changes in body fluid, body fat and muscle mass may all influence weight. Cachexia may result from cancer or advanced cardiac or pulmonary disorder. Cushing's syndrome causes abnormal distribution of fat in the face, trunk and posterior neck. Psychological disorders such as anorexia nervosa may cause severe emaciation
• General appearance of skin	• Observe the skin for pallor, cyanosis, jaundice, rashes and bruises. The skin may be a 'window' for a number of systemic disorders
• Facial features	• Observe facial expression when the client is at rest, smiling, talking and during physical examination. Facial features are symmetric with movement. In Parkinson's disease, the face is expressionless. Stroke and Bell's palsy may cause weakness on one side of the face. A depressed person has a flat or sad affect. The person may have a starry eye in hyperthyroidism. Decreased eye contact may be observed in depression, anxiety or in certain cultural groups
• Dress, grooming and hygiene	• Are the clothes clean, well-fitting and appropriate for weather? How do they compare with clothing worn by people of comparable age, culture and socio-economic status? Note any body odour or odours of urine or faeces. These observations may provide clues to the client's mental state, changes in weight, signs of neglect or incontinence

Mental status can be easily assessed by paying attention to whether the patient is conscious or unconscious, oriented, alert and/or responsive. Whenever conscious level is not normal, further investigations should be done. Speech is another part of assessing the mental health status. If the patient speaks unclearly, excessive alcohol consumption or neurological

issues could be the reason for it. For instance, a patient that has just recently had a stroke might have difficulties speaking in a clear manner. (Crouch & Meurier 2005, 154.)

Posture can be assessed whilst the patient is entering the room, but also when sitting or changing the position. Abnormalities may be due to diseases of bones, muscles or the neurosystem. Such disorders could be scoliosis, Parkinson's disease, arthritis or stroke to name only some of them. (Crouch & Meurier 2005, 156.)

A core temperature between 36.0°C and 37.5°C is constantly needed that the cells can work most efficiently (Childs et al. 1999, as cited in Crouch & Meurier 2005, 156). Different sites can be used for measuring the body temperature: mouth, axillary, ear and rectum. However, temperature may vary up to 0,6°C depending on the site used for the measurement (Jamieson et al. 2002, as cited in Crouch & Meurier 2005, 156). Abnormal findings include hyperthermia – also called fever – or hypothermia. Hyperthermia is present in patients having a core temperature above 38°C. Hypothermia on the other hand is defined as having a body temperature below 35°C. (Crouch & Meurier 2005, 156-158.)

6.2 Respiratory System

To examine the respiratory system, thorax and lungs have to be assessed. The thoracic cage consists out of the sternum, 12 pairs of ribs, 12 vertebrae and the diaphragm (Jarvis 2012, 411). Figure 1 shows an anatomic overview of the anterior thorax and lungs. Ribs as well as the rib interspaces can be seen. Special attention has to be paid to the right location of the rib interspaces. The second rib interspace is as seen as in figure 2 below the second rip. Furthermore, figure 2 is showing the anterior and posterior thoracic cage.

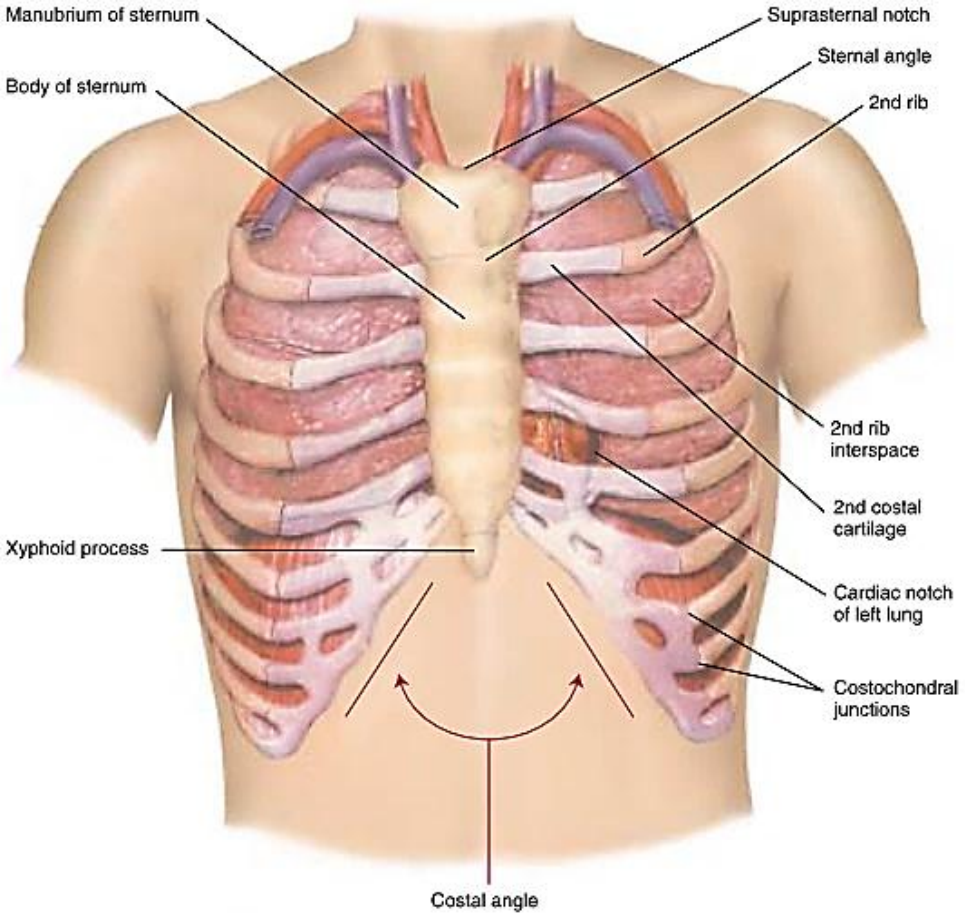

FIGURE 1. Thorax and Lungs (Bickley 2003, 209)

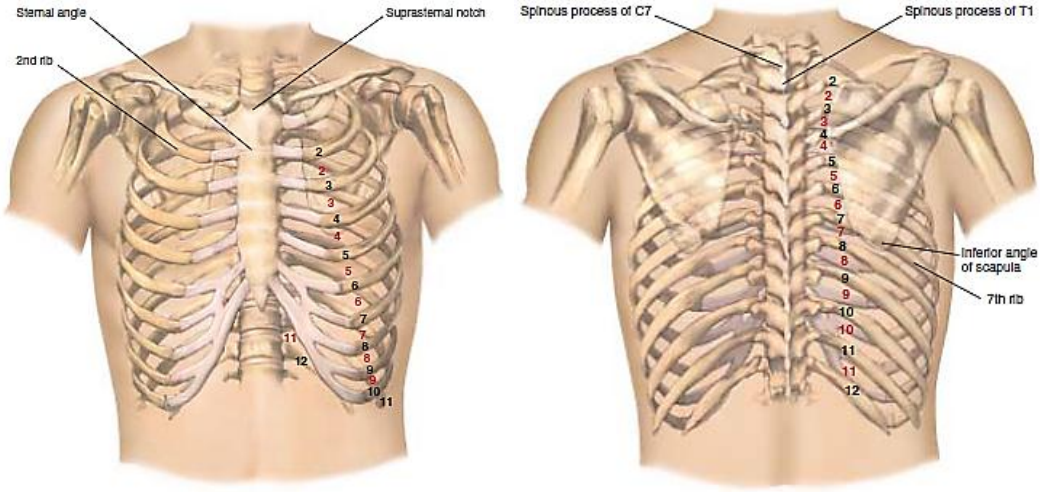

FIGURE 2. Anterior and posterior thoracic cage (Bickley 2003, 210-211)

6.2.1 Subjective Data

Subjective data should be collected (Crouch & Meurier 2005, 168) to get a clue about possible respiratory conditions. Subjective data include questions about the following: cough, sputum, dyspnea, hemoptysis, chest pain, history of infections of the respiratory system, smoking history, environmental exposure and self-care (Crouch & Meurier 2005, 168; Jarvis 2012, 418). However, smoking history won't be further explained in this chapter, since it has been discussed already in chapter 4.2.6.

Cough. Bickley (2003, 217-218) states that "cough is a reflex response to stimuli that irritate receptors in the larynx, trachea, or large bronchi." The stimuli could be mucous, pus, blood, but also dust, foreign bodies or very hot or cold air (Bickley 2003, 218). There are two types of cough: acute and chronic cough. Acute cough lasts for 2-3 weeks (Jarvis 2012, 418) and is usually caused by a viral infection of the upper respiratory tract. Chronic cough on the other hand lasts for more than 2 months (Jarvis 2012, 418) and is usually common in patients having chronic obstructive pulmonary disease (COPD), cancer of the lungs or other diseases of the

lung tissue. However, also gastro-oesophageal reflux can cause chronic cough. (Faruqi et al. 2014, 1-4.)

Is the patient coughing continuously, acute illness is present. Coughing in the afternoon and evening, on the other hand, indicates irritable agents at work. Coughing at nighttime indicates sinusitis and coughing early in the mornings is an indication for chronic inflammation of the bronchus – as in smokers. (Jarvis 2012, 419.)

Furthermore, the sound of the cough can give information about the cause of it. In mycoplasma pneumonia the cough has a hacking sound. In early heart failure the cough is dry, in croup barking (Cox 2010, 84) and in colds, bronchitis or pneumonia congested. (Jarvis 2012, 419.)

Sputum. Also the colour of the sputum can give information about the cause of the cough. Sputum – when having a cold or viral infection – is clear or white. Bacterial infection-borne sputum is green or yellow. Rusty coloured sputum is an indication for tuberculosis or pneumonia and pink sputum may be the cause of pulmonary edema. (Jarvis 2012, 419.)

Haemoptysis is defined as “the coughing up of blood from the lungs” (Brickley 2003, 218). It can be blood-streaked or frank blood and is often seen in patients with cystic fibrosis (Bickley 2003, 218). Causes can be:

- “carcinoma of bronchus
- pulmonary embolism
- mitral stenosis
- tuberculosis
- bronchiectasis” (Cox 2010, 12).

Wheezing is referred to “musical respiratory sounds” and is an indicator for partial obstructed airways (Crouch & Meurier 2005, 169). The obstruction could be due to secretion, inflammation of the tissue or a foreign body (Bickely 2003, 217).

Dyspnea. Dyspnea – shortness of breath (SOB) (Crouch & Meurier 2005, 169) – is defined as “difficult or labored breathing” (Berman & Snyder 2013, 8), is not painful but uncomfortable (Bickley 2003, 217).

Dyspnea can occur at rest (Bickley 2003, 217), when exercising (Bickley 2003, 217; Jarvis 2012, 419), being supine (orthopnea) or by getting in touch with allergens or irritants (Jarvis 2012, 419). For this reason, it is important to define the exact amount of activity that has been done before experiencing SOB (Bickley 2003, 217).

Is the dyspnea in association with sweating at night, it is called diaphoresis. When it is in association with cough, pain in the chest and bluish lips and nails, health professionals are talking about cyanosis, which is a sign of hypoxia. (Jarvis 2012, 419.)

Chest pain or also called chest discomfort may not only be originated in conditions of the heart, but also in conditions of the respiratory system. Chest pain may occur due to bronchitis, reflux esophagitis, esophageal spasm (Brickley 2003, 216) or muscle sore due to constant coughing or pneumonia. (Jarvis 2012, 420.)

History of infections of the respiratory system is important to ask the patient about. However, not the normal colds are important, rather the severity and frequency of the past infectionns. Furthermore, risk factors should be assessed such as e.g. asthma, allergies or tuberculosis. (Jarvis 2012, 420.)

Environmental exposure should also be considered when taking history of the respiratory system. Pollution or irritants of different kinds – pesticide, asbestos, radon – can lead to conditions of the repiratory system. In general symptoms as reaction to environmental conditions include cough and/or shortness of breath. However, also dizziness, headache or fatigue might be present in patients exposed to a dirty or toxic environment. (Jarvis 2012, 420.)

Self-care in this context does not mean hygienic self-care and how often the patient takes a shower. It rather means vaccinations such as influenza vaccination or tuberculosis test and chest x-ray. (Jarvis 2012, 420.) These should be also considered when taking history.

6.2.2 Objective Data

Examination of the respiratory system includes inspection, palpation, percussion and auscultation of the thorax (Bickley 2003, 220; Crouch & Meurier 2005, 169). For this assessment, only a stetoscope is needed (Berman & Snyder 2013, 622). Table 5 gives the most important observations while assessing the thorax and lungs by means of inspection, palpation, percussion and auscultation.

TABLE 5. Examination of the posterior and anterior thorax (Crouch & Meurier 2005, 170)

Techniques	Observations
• Inspection	• *Shape*: note any deformities or asymmetry, abnormal retraction of the interspaces • *Movement*: note impaired chest movement on one or both sides. Respiration rate, depth and regularity
• Palpation	• *Tenderness*: palpate any area where pain has been reported or where there are bruises or other obvious lesions • *Tactile fremitus* or palpable vibrations (the bony part of the palms is used on both sides of the patient's back and ask the patient to repeat fairly loudly the phrase 'ninety-nine'. This will cause a vibration). Fremitus is decreased or absent in COPD, pleural effusion or pneumothorax
• Percussion	• Identify five resonant notes. Normal lungs are *resonant*. *Flat* sounds occur in large pleural effusion, *dullness* in lobar pneumonia, *hyper-resonance* in emphysema or pneumothorax and *tympany* in large pneumothorax
• Auscultation	• Four types of normal breath sounds can be detected. *Tracheal* breath sounds are harsh and high-pitched and are heard over the trachea. *Bronchial* sounds are loud and high-pitched and are heard next to the trachea. *Vesicular* sounds are soft and low-pitched and are heard over most of the lungs. *Bronchovesicular* sounds are heard next to the sternum between the scapula. They are medium in loudness and pitch. Noisy breathing may be heard without use of a stethoscope and is indicative of blocked airway • Abnormal breath sounds are *crackles* (soft, high-pitched and very brief; may indicate abnormalities of the lungs or airways), *wheezes* (high-pitched and have a hissing quality, and suggest narrowed airways due to asthma-induced bronchoconstriction), *rhonchi* (low-pitched and have a snoring quality, and suggest secretions in lung airways). *Grunting* (noise heard on breathing out, usually in infants who have severe breathing problems) may also be present. *Crepitation* may also be audible with stethoscope (Sadik & Elliot, 2002)

Inspection of the Posterior Chest. First, the posterior chest is being assessed. To do so, the patient should be in a sitting position (Bickley 2003, 220; Crouch & Meurier 2005, 169). Inspection includes, as

described in table 5, shape and movement, but also posture and color. The nurse should check whether the thorax is symmetric or not, as well as compare anterioposterior and transvere diameter. Normal findings are a symmetric thorax and a ratio of the diameters of 1:2. Abnormal findings on the other hand are asymmetry and barrel chest. In a barrel chest the anteroposterior diameter is increased. (Berman & Snyder 2013, 622.)

Deformities of the thoracic cage — should be checked having the patient stand. Normally the curvature of the spine is vertically align. However, abnormal findings can be kyphosis (thoracic spine exaggerated posteriorly) (Jarvis 2012, 441) or lordosis (lumbar region of the spine is excessively concave) (Berman & Snyder 2013, 14). To check the patient for scoliosis (S-shaped thoracic and lumbar spine) (Jarvis 2012, 441), the nurse should inspect the patient from behind, while he is bending forward. Normal finding would be a straight spine, as well as shoulders and hips at the same height. (Berman & Snyder 2013, 622.) All of the deformities may lead to a limited excursion of the thoracic cage (Jarvis 2012, 422).

Furthermore, it should be noted in which position the person is breathing. COPD patients are often sitting in a forward leaning position, having hyperthrophied neck muscles to make expiration easier. Skin color and condition may also give a hint about conditions such as hypoxia of the tissue, which is indicated by cyanosis. (Jarvis 2012, 422.) Patients being hypoxic tend to be irritable, anxious or restless (Jarvis 2012, 430).

Palpation of the Posterior Chest. Patients having no respiratory troubles can easily get the posterior chest palpated by checking temperature and skin integrity. Normal findings include intact skin and a normal core temperature as stated in chapter 5.1. Abnormalities include broken skin and hyperthermic areas. However, patients having complaints should get palpated the whole posterior thorax. (Berman & Snyder 2013, 622.) While doing so, tender areas (Bickley 2003, 221), as well as lumps and movable areas should be identified (Berman & Snyder 2013, 622).

Palpation for thoracic expansion should be done by putting both thumbs and palms, as shown in image 1, on each side of the spine at T10 (see figure 2). Once the patient is breathing in, the hands should symmetrically move apart 3-5cm (Berman & Snyder 2013, 623). If there is asymmetry, one of the following conditions could be possible: pneumonia, pleural effusion, broken ribs or pneumothorax. (Bickley 2003, 222; Jarvis 2012, 422-423.)

IMAGE 1. Assessment of chest expansion (Bickley 2003, 222)

Futhermore, palpation includes assessment of tactile fremitus. Fremitus refer to “palpable vibrations transmitted through the bronchopulmonary tree to the chest wall when the patient speaks” (Bickley 2003, 222). These vibrations can be palpated by putting the ball (palm at base of the fingers) onto the spots shown in image 1 while the patient is saying “ninety-nine” or “blue moon”. Whenever there is decreased fremitus, bronchus could be obstructed; or pleural effusion, emphysema or pneumothorax could be present. Increased fremitus on the other hand is associated with

compressed lung tissue as in lobar pneumonia. (Jarvis 2012, 423; Berman & Snyder 2013, 623.)

Percussion of the Posterior Chest. Percussion should be done in the order shown in figure 3 by percussing the intercostal spaces every 5cm (Berman & Snyder 2013, 624). It will give information about the underlying tissue; whether it is filled with air, fluid or solid material. Percussion will only go 5-7cm deep (Jarvis 2012, 426) and should be done by pressing the top of the left middle finger onto the skin and the right hand's middle finger should quickly strike the other hand's middlefinger's top. (Bickley 2003, 223-224; Berman & Snyder 2013, 623.) The patient should "bend the head and fold the arms forward across the chest "(Berman & Snyder 2013, 624) to facilitate percussion. Resonance should be heard in the neck area as a "low-pitched, clear, hollow sound" (Jarvis 2012, 425). However, hyperresonance – too much air – could indicate emphysema or pneumothorax (Cox 2010, 91). Dull sounds – as in liver area – on the other hand may be associated with pneumonia, pleural effusion or tumor. (Jarvis 2012, 425.)

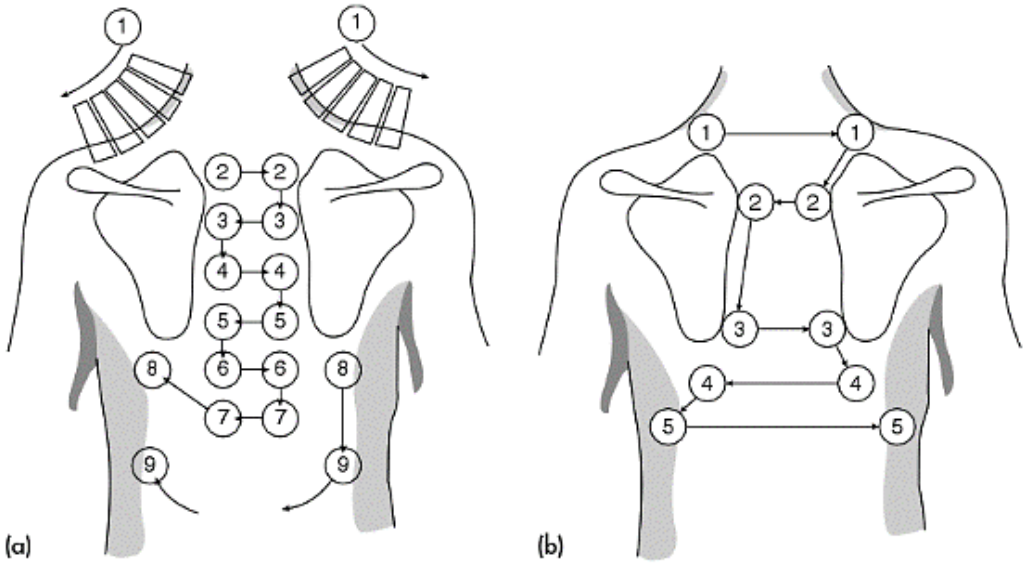

FIGURE 3. (a) Percussion sequence (b) Palpation & Auscultation sequence (Cox 2004, as cited in Crouch & Meurier 2005, 171)

Auscultation of the Posterior Chest. By auscultating the posterior chest, breathing sounds can be heard. Figure 3 shows the spots and order in which to auscultate the posterior chest. This is done by putting the diaphragm of the stethoscope onto the chest wall and listening to a full in- and expiration on each auscultation location before moving on to the next one (Jarvis 2012, 433; Berman & Snyder 2013, 624). At the same time the patient is breathing in and out deeply through the mouth (Bickley 2003, 233). Absent breathing sounds could be the consequence for obstruction of the bronchus due to e.g. secretion, mucus or foreign bodies. Furthermore, emphysema, thickening pleura, pneumothorax or pleural effusion may lead to decreased breathing sounds. (Bickley 2003, 227; Jarvis 2012, 428.) On the other hand, breathing sounds can be also louder than normally. This might be the reason when something is consolidated as in pneumonia. Also compression, such as fluids in the intrapleural space, can lead to increased breathing sounds. (Jarvis 2012, 429.)

The breathing sounds can be, as already stated, decreased or increased. Furthermore, there can be also added sounds to hear. These can be

crackles, wheezes or rhonchi. Crackles are intermittent and nonmusical – similar to dots – and can be heard due to “air passing through fluid or mucus in any air passage” (Berman & Snyder 2013, 621). Wheezes are high-pitched sounds with hissing or shrill character and are present in constricted airways due to increased secretion, swelling or tumor. Rhonchi are – unlike wheezes – low-pitched sounds that sound like snores and can be heard when secretions, swelling or tumors are narrowing the airways. (Bickley 2003, 228, Berman & Snyder 2013, 621.)

Inspection of the Anterior Chest. To examine the anterior thorax, the patient should be supine (Bickley 2003, 220; Crouch & Meurier 2005, 169). It should be inspected for its breathing patterns (Berman & Snyder 2013, 624) as well as shape and movement (Bickely 2003, 230).

Breathing patterns should be assessed including the following aspects: respiratory rate, depth and rhythm (Crouch & Meurier 2005, 161). Respiratory rate is assessed by counting the rising and falling of the chest wall for one minute (Ahern & Philpot 2002, 49). Normal values range from 10-18 breaths per minute (Silfvast et al. 2016, 18). Depth of the breathing can be seen by inspecting how high and low the chest is moving (Crouch & Meurier 2005, 161). Altered breathing can be tachypnea, bradypnea, Kussmaul’s breathing or Cheyne-Stokes breathing. Tachypnea occurs when the respiratory rate is above 20, whereby in bradypnea the respiratory rate is below 12 breaths a minute (Bennett 2003, 47). Kussmaul’s breathing is defined by Berman & Snyder (2013, 14) as “hyperventilation that accompanies metabolic acidosis in which the body attempts to compensate (give off excess body acids) by blowing off carbon dioxide through deep and rapid breathing”. Finally, Cheyne-Stokes respiration means that the patient alternately has a phase of “hyperventilation and apnea” (Cox 2010, 83).

Shape of the anterior chest means inspecting the costal angle (see figure 1). Normal findings are that the costal angle is less than 90 degrees.

However, costal angle wider than 90 degrees is associated with COPD. (Berman & Snyder 2013, 624.)

Palpation of the Anterior Chest. General palpation of the anterior chest should be done the same way as palpation of the posterior chest by checking temperature, skin integrity, tenderness and abnormal movements. As during the palpation of the posterior chest, the anterior chest needs to be examined for symmetric expansion of the chest. (Bickley 2003, 230; Berman & Snyder 2013, 624.) Image 2 shows how to place the hands for checking thoracic symmetry. Abnormal findings are extremely wide expansion during inspiration and insufficient expansion. Increased expansion is a sign for emphysema, whereby decreased expansion is associated with atelectasis or pneumonia. (Jarvis 2012, 431.)

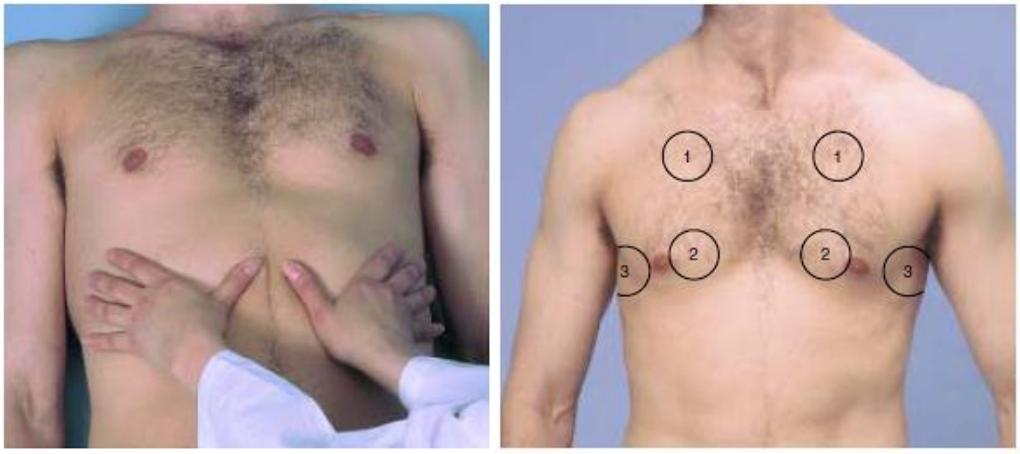

IMAGE 2. Palpation of the anterior chest for symmetric chest expansion (left) & for tactile fremitus (right) (Bickley 2003, 230-231)

Also tactile fremitus of the anterior chest should be assessed by palpating the spots shown in image 2 while the patient is saying “ninety-nine” (Bickley 2003, 230; Jarvis 2012, 432). If the patient has large breasts that can not be moved, this part of the palpation is excluded (Berman & Snyder 2013, 625).

Percussion of the Anterior Chest. Percussion of the anterior chest is done systematically as shown in image 3 by comparing the right lung with the left one (Berman & Snyder 2013, 625). The area where the heart is located, cardiac dullness should be heard. However, when hyperresonance is heard where the spot of cardiac dullness usually is, chronic emphysema might be present. Sometimes the cardiac dullness may no be heard at all, because of the hyperresonance in patients having COPD (Bickley 2003, 231). Besides, dullness at the area of the right breast is associated with pneumonia of the right middle lobe. (Jarvis 2012, 432-433.)

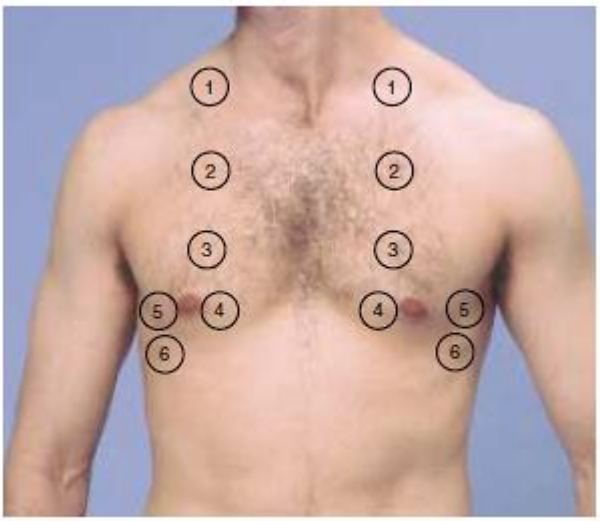

IMAGE 3. Locations for percussion and auscultation of the anterior chest (Bickley 2003, 231)

Auscultation of the Anterior Chest. Auscultation of the anterior chest finally is done the same way as auscultation of the posterior chest. The stetoscope should be put with the diaphragm onto the locations shown in image 3 while the patient is breathing in and out deeply through the mouth. Listening to symmetric or asymmetric sounds, as well as added sounds is part of this assessment as mentioned already under

“Auscultation of the Posterior Chest” in this chapter. (Bickley 2003, 233; Jarvis 2012, 433.)

Measurements of Pulmonary Function. There are several measurements that help to assess pulmonary function. The peak flow meter measures the peak expiratory flow (PEF), which indicates “the patient's maximum ability to expel air from the lungs” (Wang et al. 2013, 172) after a complete inhalation (Natarajan et al. 2016, 904).

A spirometer can give further information about pulmonary functioning. The patient should inhale deeply, take the spirometer into the mouth and exhale as fast as possible. Two results will be achieved: FVC and FEV1. FVC stands for forced vital capacity and means the total exhaled volume. FEV1 stands for forced expiratory volume in 1 second and measures the exhaled volume within the first second. Normal values of FEV1/FVC are 75% or more. Lower ratio indicates mild, moderate or severe pulmonary obstruction as, for instance, asthma. (Jarvis 2012, 434.)

Pulse oximeter also gives information about the pulmonary function (Jarvis 2012, 434). It gives information about how much oxygen is binding to the red blood cells in the blood (Crouch & Meurier 2005, 160). Normal levels range from 95-98%, whereby levels lower than 90% can indicate respiratory failure or are “just” the consequence of COPD (Trim 2005, as cited in Crouch & Meurier 2005, 160).

6.3 Cardiovascular System

To examine the cardiovascular system, heart, neck vessels and peripheral vascular system need to get assessed. The heart and the blood vessels together build the cardiovascular system, which delivers vital oxygen to the tissues and removes carbon dioxide from them. (Berman & Snyder 2013, 1461.) Furthermore, it delivers nutrients to the cells and removes not only carbon dioxide, but also waste products (Crouch & Meurier 2005, 171-172). Figure 4 gives an overview of the heart, its location and structures.

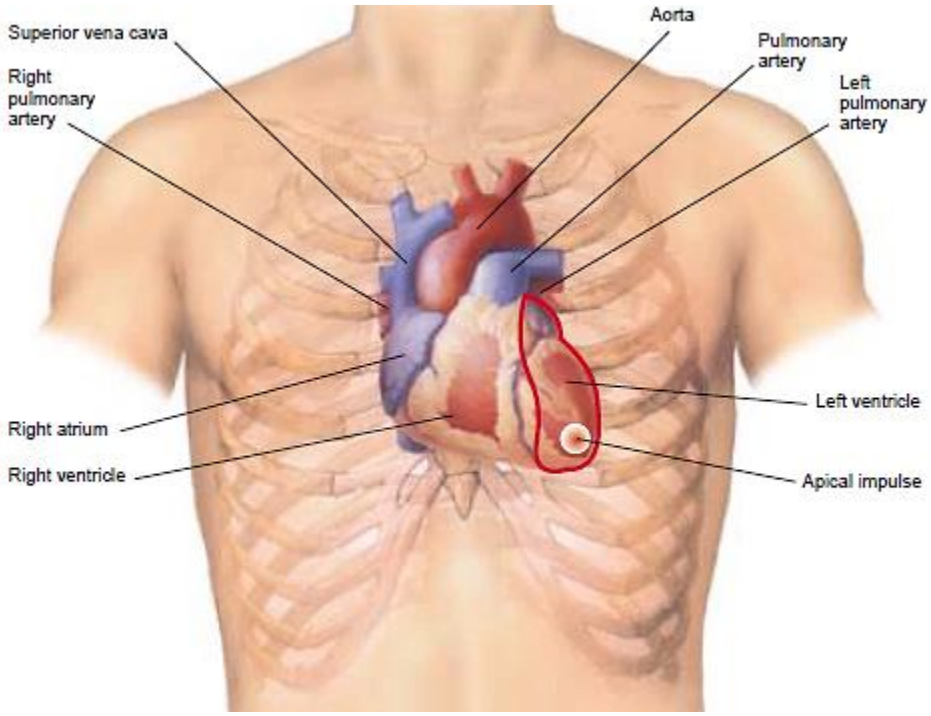

FIGURE 4. The heart (Bickley 2003, 244)

6.3.1 Subjective Data

Anamnesis of the cardiovascular system includes chest pain, dyspnea and orthopnea, cough, palpitations, syncope (Saha et al. 2009, 190-196), fatigue, cyanosis or pallor, nocturia, edema and personal risk factors (Jarvis 2012, 467).

Chest pain has been already defined, as well as partly described in chapter 5.2.1, since chest pain can have its origin in pulmonary or cardiovascular conditions (Crouch & Meurier 2005, 172). Table 6 shows the most common causes of chest pain – amongst other things ischaemic heart diseases, pleuritic pain, anxiety or panic attacks.

TABLE 6. Most common causes of chest pain (Cox 2010, 11)

The most common causes of chest pain are:
- *ischaemic heart disease*: severe constricting, central chest pain radiating to the neck, jaw and left arm; *angina*: pain frequently precipitated by exercise or emotion and relieved by rest; *myocardial infarction*: the pain may come on at rest, be more severe and last hours
- *pleuritic pain*: sharp, localized pain, usually lateral; worse on inspiration or cough
- *anxiety or panic attacks*: a very common cause of chest pain. Enquire about circumstances that bring on an attack

When the heart's blood supply does not keep up with the demand anymore (Jarvis 2012, 467) – as in atherosclerosis when the coronary artery gets constricted – less oxygen can be delivered to the heart, which results in the sensation of chest pain (Saha et al. 2009, 190). Usually the tightness occurs during stress situations and activity and lasts for some minutes. The pain eases after stopping the activity, lying down or taking nitro. (Mustajoki et al. 2013, 74.) Cold weather can also cause chest pain, due to decreased circulation, leading to increased vessel resistance (Kuisma et al. 2013, 335). Usually the pain is centrally located at the chest, radiates to the jaw or to the left arm (Mustajoki et al. 2013, 74) and feels like "a squeezing clenched fist" (Jarvis 2012, 467). These sensations of pain normally don't ease as quickly as the pain caused by angina pectoris (Saha et al. 2009, 192).

Dyspnea is associated with a decreased systolic pumping diastolic refill disturbances of the left chamber. The insufficiency of the left chamber can quickly worsen and lead to pulmonary edema, which worsens the dyspnea. People experiencing dyspnea usually make a wheezing sound. (Saha et al. 2009, 193.) A forward leaning sitting position eases the shortness of breath (Mustajoki et al. 2013,159), whereby a lying position increases the blood within the chest and the insufficiently working heart cannot handle the load (Jarvis 2012, 467). This may lead to orthopnea –

dyspnea when lying flat – or paroxysmal nocturnal dyspnea – waking up with dyspnea – which both occur when having left heart failure (Cox 2010, 11).

Cough. The insufficiency of the left chamber can lead to an irritating cough (Crouch & Meurier 2005, 173), which is worse after physical effort. Patients with pulmonary edema can cough foam or have hemoptysis. (Saha et al. 2009, 194.) However, cough can be also due to increased mucus or pus production (Jarvis 2012, 468).

Palpitations are defined as “unpleasant awareness of heart beat” (Crouch & Meurier 2005, 172). They can be caused by irregular heart rhythm, fast acceleration or slowing of the heart rhythm (Crouch & Meurier 2005, 172) or single thumps (Cox 2010, 11). Patients can feel atrial or ventricular extrasystoles that are usually described as “the heart skipped a beat”, which occurs usually when they are at lying position (Saha et al. 2009, 195). Paroxysmal tachycardia – a sudden palpitation attack – comes and goes abruptly (Cox 2010, 11).

In atrial fibrillation (AF), the P-wave in an electrocardiogram (ECG) can’t be seen, the base line is uneven and the QRS-complex appears irregularly (Kuisma et al. 2013, 357).

Syncope – also known as sudden blackout - follows a sudden decrease or complete interruption of blood supply to the brain (Saha et al. 2009, 195). To find the real cause of syncope, 4 classification groups can be helpful: “1) reflex neurally mediated; 2) cardiac causes; 3) orthostatic hypotension; and 4) unexplained” (Mehta et al. 2011, 174).

Fatigue may occur when the cardiac output is decreased due to cardiac failure. In this case not enough oxygen can get delivered to the tissues, resulting in fatigue. (Crouch & Meurier 2005, 174.) Fatigue usually worsens during the evening. Fatigue – caused by depression – by contrast lasts for the whole day. (Jarvis 2012, 468.)

Cyanosis is a bluish coloring of the skin and mucous membranes, because not enough oxygen can get bound to the hemoglobin (Crouch & Meurier 2005, 173). It is associated with “myocardial infarction or low cardiac output” due to low tissue perfusion (Jarvis 2012, 468). **Pallor** means ashen skin color (Jarvis 2012, 468) and is a result of shock or anemia (Crouch & Meurier 2005, 173).

Nocturia is defined as “voiding two or more times at night” (Berman & Snyder 2013, 16). Lying down stimulates excretion in patients having cardiac failure, who are mobile during the day (Jarvis 2012, 468).

Edema is defined as “the presence of excess interstitial fluid in the body that makes skin appear swollen, shiny, and taut, and tends to blanch color” (Berman & Snyder 2013, 8). There are two types of edema: dependent and pulmonary. Dependent edemas are the results of increased capillary pressure in the limbs caused by congestive heart failure (Crouch & Meurier 2005, 173). An example for dependent edema are swollen ankles, which are caused by congestive (right) heart failure (Cox 2010, 11).

Pulmonary edemas are due to increased capillary pressure in the lungs caused by a left-sided heart failure. Edema can furthermore lead to weight changes due to the accumulation of fluids in the interstitial space. (Crouch & Meurier 2005, 173-174.)

Skin changes may occur in the peripheral area, which is due to decreased blood supply. The skin gets thinner, shiny and ulcer may form. (Crouch & Meurier 2005, 174.)

Personal risk factors. Risk factors for heart conditions can be traditional or nontraditional. Traditional factors include heredity, age and gender that can’t be influenced by the lifestyle. Nontraditional risk factors include metabolic syndrome, which includes waist obesity, elevated triglycerides, decreased HDL cholesterol, hypertension, elevated fasting glucose levels, smoking (Berman & Snyder 2013, 1468-1470), high alcohol intake, physical and mental stress (Mustajoki et al. 2013, 74) and insufficient

exercising (Crouch & Meurier 2005, 175). Table 7 describes further detailed the risk factors for coronary diseases as well as how to assess them.

TABLE 7. Assessment of coronary heart diseases risk factors (Crouch & Meurier 2005, 175)

Risk factors	Description	Assessment
• Smoking	• Cigarette smoking greatly increases the risk of CHD. Carbon monoxide from cigarette smoke may cause microscopic trauma in blood vessel walls, activating the inflammatory response and attraction of lipid material (Timby *et al.*, 1999)	• Do you smoke? How many cigarettes a day? When did you start?
• High fat intake and/or hyperlipidaemia	• The risk of cardiac disease increases as the level of low-density lipoproteins (LDL) rises (Foxton, 2004). LDL has the ability to invade the intimal wall of arteries, triggering the development of atheroma	• Do you take any animal fats and dairy products? How much?
• Exercise pattern	• Diminished exercise is associated with CHD and increase in weight	• Do you exercise? How often?
• Family history	• A genetic predisposition is linked to the development of heart disease	• Is there a history of heart disease, hypertension, high blood cholesterol level or diabetes in your family?

6.3.2 Objective Data

Before starting with the actual cardiovascular assessment, pulse and blood pressure should be assessed. For that a blood pressure cuff, stethoscope and watch are needed.

Pulse can be palpated where the arteries are close to the skin surface. The arteries that allow pulse to palpate include the following: carotid, brachial, radial, femoral, popliteal, posterior tibial, as well as dorsalis pedis

artery. Figure 5 shows the different sites to get a better understanding of where the pulses can be palpated. (Crouch & Meurier 2005, 158-159.) Heart rate, rhythm, and volume can be assessed by palpation of the pulse.

Heart rate can be identified by measuring how many beats the heart is beating within one minute. Usually the radial pulse is assessed, however in emergency situations the carotid or femoral pulse is measured. Normal heart rate in adults is between 60 and 100. Heart rate above 100 beats is called tachycardia and below 60 bradycardia. Whenever the rhythm is regular, only 30 seconds have to be counted and then multiplied by two. However, if arrhythmia is present, it is better to count for one full minute to have more time to assess the rhythm. The volume of the pulse can also be assessed by palpating the pulse. Is the pulse not palpable, no pulse is available. Is it difficult to palpate and easy to obliterate, a weak pulse is existing. Is the pulse strong and not possible to obliterate, it is called bounding pulse. (Crouch & Meurier 2005, 160-161.)

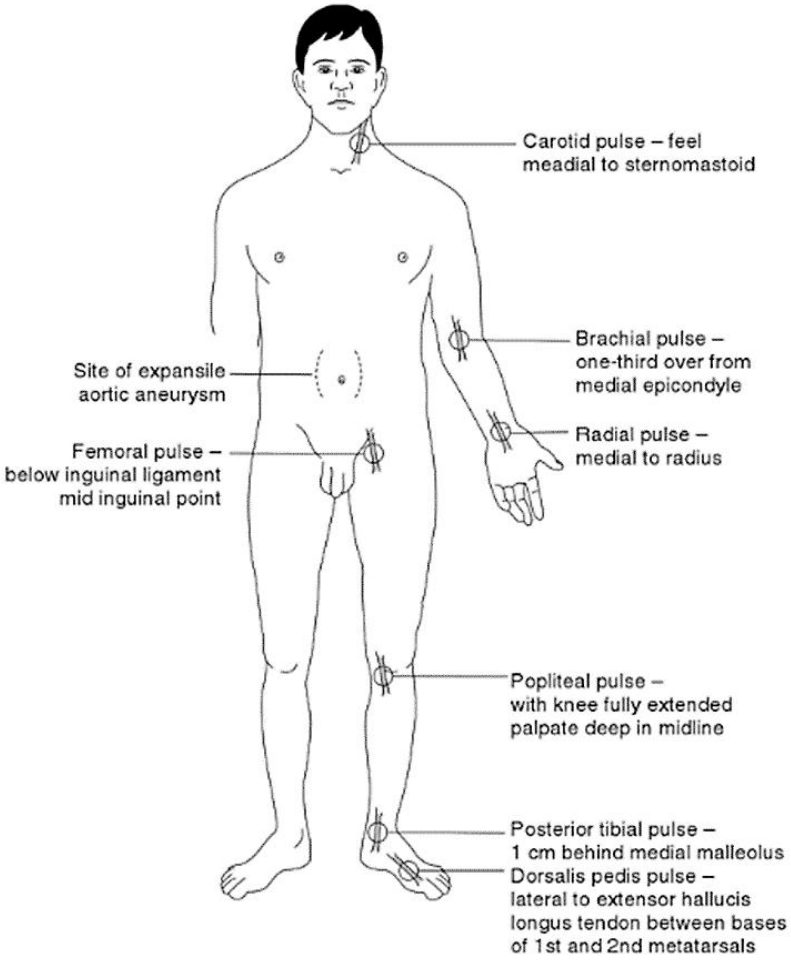

FIGURE 5. Different sites of pulse (Crouch & Meurier 2005, 159)

Blood pressure is defined as “the force exerted by the blood through the wall of blood vessels and is a product of cardiac output and peripheral resistance” (Crouch & Meurier 2005, 161). The blood pressure consists out of systolic and diastolic arterial pressure. The systolic one is audible when the left ventricle of the heart is contracting. Diastolic pressure is the pressure measured in the arteries when the heart is relaxing. For measuring blood pressure, a stethoscope as well as a sphygmomanometer are needed. Normal systolic pressure levels are between 100 and 140 mmHg. Diastolic blood pressure levels range from 60 to 90 mmHg. Abnormalities in blood pressure can be hypertension – high blood pressure – or hypotension – low blood pressure. (Crouch &

Meurier 2005, 161-163.) Hypertension means a systolic blood pressure over 140mmHg and/or a diastolic blood pressure over 90mmHg. Hypotension is present in patients having a systolic blood pressure of less than 100mmHg. (Berman & Snyder 2013, 12.)

For examining the cardiovascular system, a small centimeter ruler and stethoscope are needed (Jarvis 2012, 470 & 506). Several landmarks need to be known before examination can start. These are shown in figure 6.

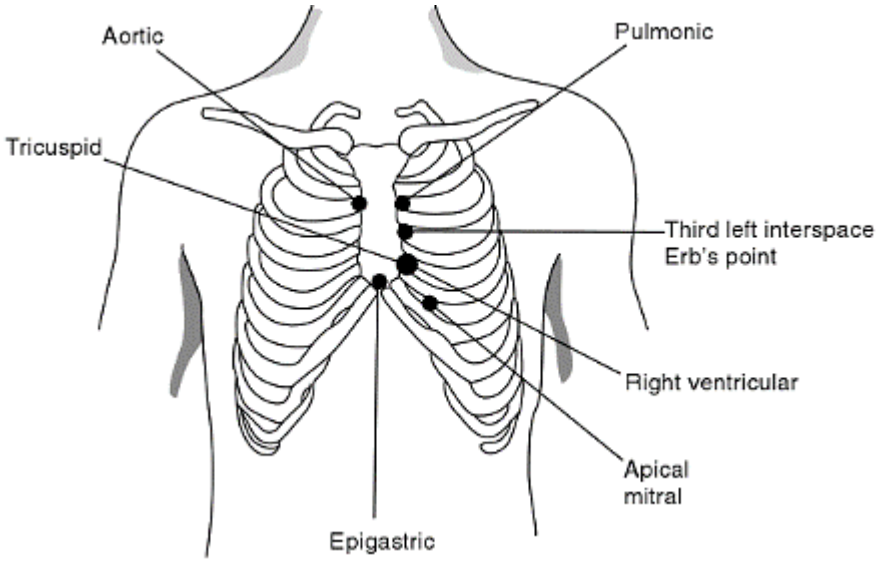

FIGURE 6. Locations for auscultation of the heart (Crouch & Meurier 2005, 176)

Inspection and Palpation of the Precordium. The precordium is “the area of the chest overlying the heart” (Berman & Snyder 2013, 627). It should get inspected and palpated at the same time for abnormal pulsations. First the whole precordium should get inspected and palpated with the palm. The nurse should start with the apex, continue with the sternal border on the left side and end with the base. Normally, no additional pulsations or thrills (palpable murmurs) (Cox 2010, 63) can be

seen and palpated. However, if so, it is associated with turbulent blood flow and murmurs that can be heard later during auscultation. (Jarvis 2012, 474.)

The apical impulse can be inspected, as well as palpated with one finger tip between either fourth or fifth intercostal space on the heart's apex (see figure 4). The person should be in a lying position, exhale and hold the breath to make it easier to locate the apical impulse. If needed, the examiner can ask the patient to roll to the left side to facilitate locating the apex. However, this may lead to the apex being even more on the left side. Unfortunately, the apical impulse can not be palpated in overweight people or people with thick chest walls. (Cox 2010, 62; Jarvis 2012, 474.)

Auscultation of the Precordium. Finally, the precordium can also get auscultated. The patient should be in an elevated position between 15-45° degrees. Both, diaphragm and bell should be used to listen to the sounds. Figure 6 shows the locations for auscultation. Special attention should be paid to the first (S1) and second (S2) heart sounds as mentioned in table 8, however each sound should be listened to separately. (Berman & Snyder 2013, 630.) Table 8 shows a checklist about how to auscultate the heart and what sounds should be paid attention to.

TABLE 8. Auscultation of the heart (Crouch & Meurier 2005, 177)

Auscultation	• *Heart sounds*: auscultation of the heart sounds can be done with the client lying supine with the head of the bed raised to 30–40°, sitting up or lying on the left side. You need to listen over the precordium, starting at the apex or base and moving in a zig-zag pattern • **Lub**: this is the first heart sound or S_1. It is loudest over the mitral area at the apex of the heart. It is low-pitched and dull and corresponds to the closure of the mitral and tricuspid valves • **Dub**: this is the second heart sound or S_2. It is loudest over the aortic area at the base of the heart. It is high-pitched and corresponds with closure of the aortic and pulmonary semilunar valves • **S_3**: this is a third heart sound and is abnormal, but is normally heard in infants. In adults, it is called ventricular gallop and may be a sign of congestive cardiac failure. It may be due to vibrations caused by ventricular distention and resistance • **S_4**: this is an abnormal sound and is called atrial gallop and may be heard over the tricuspid or mitral areas. It is caused by increased resistance to ventricular filling and may be heard in patients with previous myocardial infarction or elderly patients • **Murmurs**: these are abnormal signs and may be heard during systole or diastole. They may result from stenosis or insufficiency of the aortic, pulmonary, mitral or tricuspid valves • **Pericardial friction rub**: this is a scratchy sound that can be heard in patients with pericarditis. It is best heard using the diaphragm of the stethoscope with the patient sitting upright, leaning forward and exhaling

Palpation of the Carotid Arteries. The carotid artery can be palpated by "sliding the second and third finger of either hand along the side of the trachea at the level of the thyroid cartilage" (Goldberg 2015). The patient should turn the head slightly to one side during palpation of the artery on the other side. Only one carotid artery should be palpated gently at a time. Applying too much pressure on artery while palpating, which leads to carotid sinus hypersensitivity. This condition in return decreases the heart rate, blood pressure and thus leads to a shortage of blood supply to the brain leading to sudden loss of consciousness. (Jarvis 2012, 470-471.) Normal findings are symmetrical pulse volume and pulsation, as well as elastic aterial walls. Abnormal findings include asymmetric pulse volume, decreased or increased pulsation, as well as thickened, hard or non-elastic walls. Asymmetric pulse volume can be due to stenosis or thrombosis.

Decreased pulsation may be due to insufficient left cardiac output. Latter, the walls may be thickened, hard or non-elastic due to arteriosclerosis (Berman & Snyder 2013, 630-631).

Auscultation of the Carotid Arteries. The head of the patient should be slightly turned to the side, which will not be examined in order to auscultate the other artery. Normally no sounds should be heard. If bruits can be heard, this may be an indication for occlusive artery disease. (Berman & Snyder 2013, 631.)

Inspection of the Jugular Veins. The patient should be still sitting in a 15-45° degrees position in order to inspect the jugular veins. Normal findings are that no veins are visible. Abnormal findings on the other hand are visible veins, which indicate cardiopulmonary condition. If the veins are visible, jugular venous pressure should be assessed as explained below. (Berman & Snyder 2013, 631.)

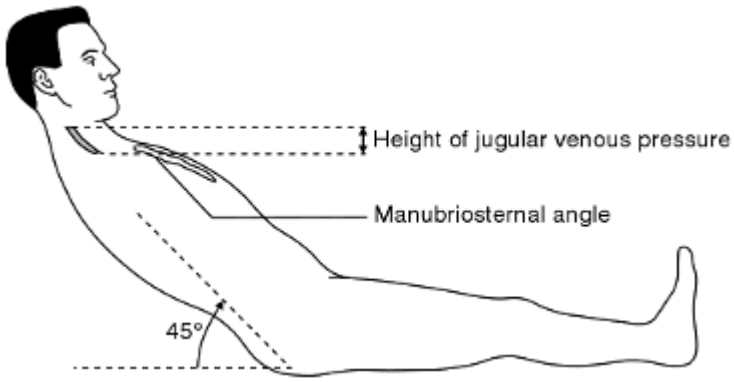

FIGURE 7. Measurement of jugular venous pressure (Crouch & Meurier 2005, 176)

Assessment of Jugular Venous Pressure (JVP). The highest available spot, where the internal jugular vein can be seen, should get located. Furthermore, the sternal angle should get located. After that two imaginary horizontal lines should be made as shown in figure 7. The difference

between the two lines should be measured in cm and is called the jugular venous pressure. Measurements on both side above 3-4cm mey be an indication for right-sided heart failure. Unilateral extension, on the other hand, may be due to local obstruction. (Jarvis 2012, 473; Berman & Snyder 2013, 631.)

Inspection and Palpation of the Arms. The arms should be checked for skin integrity, capillary refill time and symmetry. Skin integrity includes color, temperature, edema (Berman & Snyder 2013, 633), as well as scars and ulcers (Jarvis 2012, 506). Normal findings are a pinkish skin color, normal skin temperature, no edema and an intact and moisturized skin. Abnormal findings include cyanosis due to insufficient venous workload. Cold skin is associated with arterial insufficiency. (Berman & Snyder 2013, 633.) Pale, cold and moist hands in addition to a capillary refill time of more than 1-2 seconds are associated with vasoconstriction or insufficient cardiac output. Capillary refill time gives information about the perfusion in the peripheral area, as well as the cardiac functioning. This is measured by holding the patient's hand at the heart's level and pressing the back of the hand until blanched. After releasing, the normal skin color should return within 1-2 seconds. Longer refill time is – as mentioned already – associated with vasoconstriction or insufficient cardiac output. Furthermore, the arms should be symmetric. If not, this is due to edema because of obstruction of the lymphatic drainage. (Jarvis 2012, 506.)

Inspection and Palpation of the Legs. The legs should be inspected and palpated for skin integrity, symmetry and edema. Skin integrity includes color, temperature (Berman & Snyder 2013, 633), scars and ulcers (Jarvis 2012, 509). Findings are the same as mentioned already in this chapter under "Inspection and Palpation of the Arms". Furthermore, the legs should be also checked for symmetry. Asymmetry is associated with lymphedema or deep venous thrombosis (Jarvis 2012, 510). Also edema should be assessed when assessing the legs. This can be done by pressing the back of the foot for 5 seconds. After the releasing, normally no impression should be visible. However, if impression is visible, it is

called pitting edema. Edema in both legs – bilateral edema – is due to “heart failure, diabetic neuropathy, and hepatic cirrhosis” (Jarvis 2012, 513). Unilateral edema, on the other hand, is associated with an occluded deep vein. (Jarvis 2012, 513.)

6.4 Abdomen

The abdomen is defined as “a large, oval cavity extending from the diaphragm down to the brim of the pelvis” (Jarvis 2012, 527). Inside this cavity, there are several organs (Jarvis 2012, 527); some of them can be seen in figure 8.

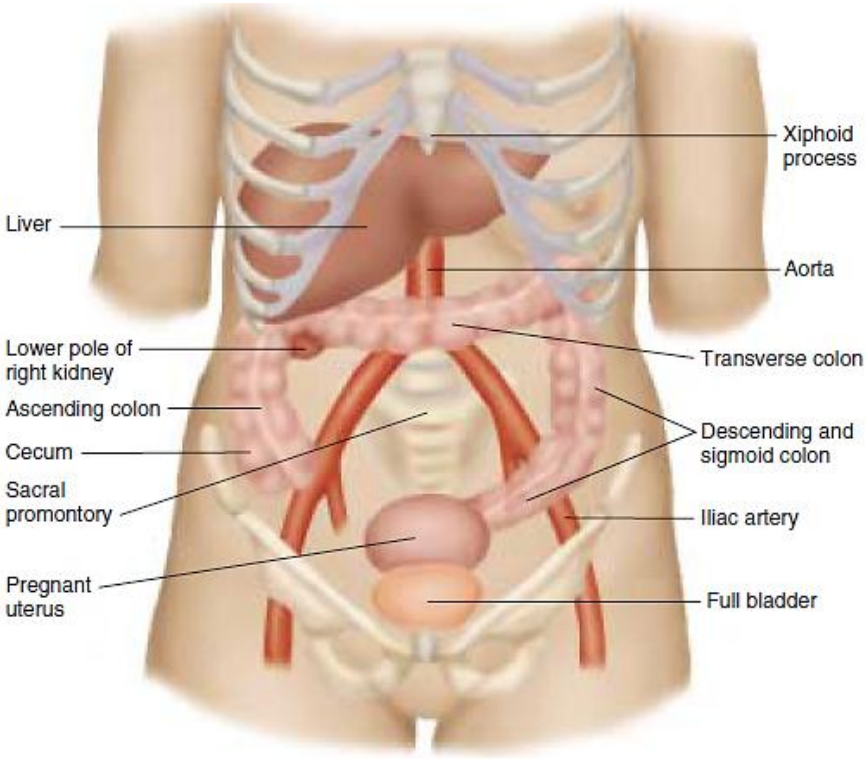

FIGURE 8. The Abdomen (Bickely 2003, 318)

6.4.1 Subjective Data

Before examining the abdomen, subjective data should be collected. This includes several areas that are listed in table 9.

TABLE 9. Relevant health history of abdomen (Crouch & Meurier 2005, 196)

- usual dietary intake
- ability to chew food and swallow
- presence of indigestion, nausea, vomiting
- anorexia or recent weight loss
- presence of pain or discomfort such as indigestion or with defaecation
- normal bowel pattern and any recent changes
- frequency of elimination
- colour and consistency of the faeces
- use of laxatives and any recent increase in frequency or dosage
- past medical and family history of problems or surgery associated with the digestive system.

Risk factors for abdominal conditions also need to be taken as well into account. These include increasing age and hepatitis B virus exposure. With increasing age – especially above 50 years – the risk for bowel cancer increases. (Crouch & Meurier 2005, 196.)

6.4.2 Objective Data

Abdominal physical examination is done the following: inspection, auscultation, percussion and palpation. Before starting the examination, the patient should empty the bladder completely. (Berman & Snyder 2013, 639-640.) To make examination possible the patient should lie flat, having the head placed on a pillow. The arms should lie relaxed on each side of the body and the legs should be bent in order to ensure relaxation of the abdominal muscles. (Cox 2010, 101.) Only a stethoscope is needed for examining the abdomen (Berman & Snyder 2013, 640).

Inspection of the Abdomen. Inspection is done by standing at the patient's feet first. The abdomen should be symmetrical and convex; falling

and rising with each inspiration and expiration. The nurse should look for signs of peristaltic movement. After that the nurse should go to the right side and look for the following: scars, silver striae from losing weight or stretch marks from pregnancy, jaundice, rashes, lesions, flatulence, swellings, symmetry or asymmetry. Latter can be due to air, stool, fetus, fat or fluids – such as in an ovarian cyst. Besides, any discolorations on the sides or around the navel, nodules, peristaltic movements, pulsation and any sort of hernia should be noted. (Cox 2010, 101-102.) Visible peristalsis in skinny patients may be associated with bowel obstruction (Berman & Snyder 2013, 641).

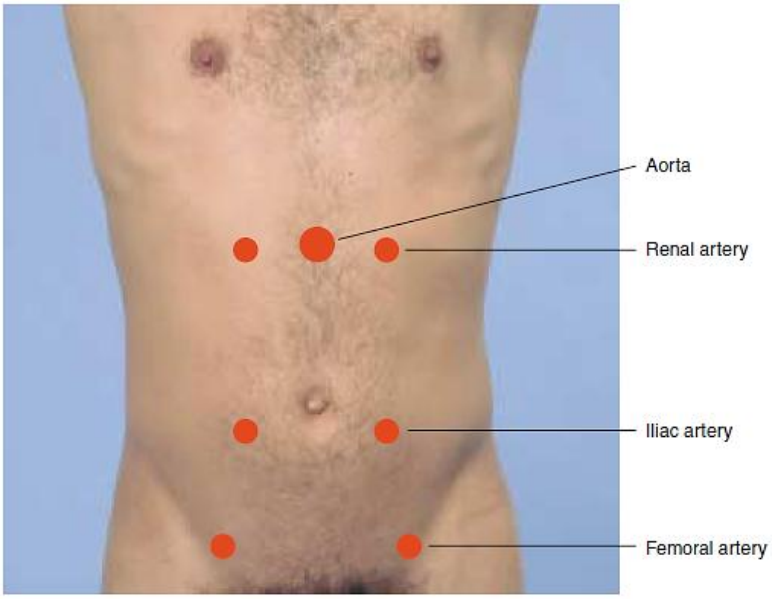

IMAGE 4. Auscultation sites of the Abdomen (Bickely 2003, 334)

Auscultation of the Abdomen. After inspecting the abdomen, auscultation is following instead of palpation in order to ensure no alteration of bowel sounds. Auscultation should be started on the right upper spot (see image 4) and then move on in clockwise direction. All in all, the auscultation should last for about 5 minutes to ensure that the

bowel sounds can be heard. (Crouch & Meurier 2005, 197.) Table 10 states normal and abnormal findings that can arise during auscultation.

TABLE 10. Auscultation of the Abdomen (Crouch & Meurier 2005, 200)

Assessment	Normal findings	Deviations/abnormalities
• Auscultation for bowel sounds. Note intensity, pitch, frequency	• High-pitched irregular gurgles in all 4 quadrants. Occur between 5–30 times per minute • May be hyperactive (loud and prolonged gurgles known as borborgymi)	• *Absent*: possibly due to intestinal obstruction, peritonitis, abdominal surgery following handling of the gut • *Underactive*: following abdominal surgery, late stage of bowel obstruction, constipation • *Hyperactive*: might occur in early stage of bowel obstruction, diarrhoea, gastroenteritis

Percussion of the Abdomen. The Abdomen should be percussed systematically in all four quadrants (see figure 9). Percussion should start in the right lower quadrant and then continue in clockwise direction. Special attention should be paid to tympany and dullness. Tympany is heard during percussion of the air-filled stomach and bowels. Dullness, on the other hand, is heard over liver, spleen and a full bladder. If there are large areas of dullness, tumor or fluid-filled areas may be present. (Jarvis 2012, 549; Berman & Snyder 2013, 643.)

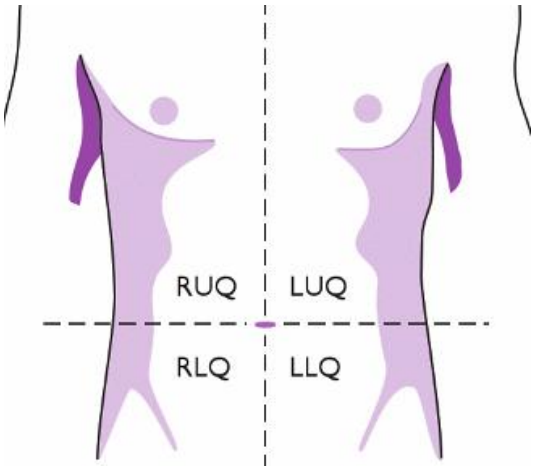

FIGURE 9. The four quadrants of the abdomen: right upper quadrant, left upper quadrant, right lower quadrant and left lower quadrant (Cox 2010, 48)

Palpation of the Abdomen. After percussion, the abdomen can be finally palpated to find tender areas and/or muscle tonus. This is done by light palpation that goes only about 1cm deep all over the abdominal area. Normal findings include no tenderness and a normal relaxed muscle tonus. Abnormalities on the other hand, include tender and hypersensitive areas, as well as areas with elevated tension. (Jarvis 2012, 545; Berman & Snyder 2013, 643.)

Assessment of the Anus and Rectum. Furthermore, also anus and rectum have to get assessed. The nurse should wear gloves to do this examination. To do so, the nurse should constantly ensure privacy and dignity, since patients usually feel quite uncomfortable about this examination. To facilitate examination, the patient should lie on the left side with the right leg bent at the knee and hip. The buttox should be furthermore as close to edge of the bed as possible. (Crouch & Meurier 2005, 197.) Table 11 states assessment areas of anus and rectum as well as normal and abnormal findings.

TABLE 11. Physical Assessment of the Perianal Area (Crouch & Meurier 2005, 200)

Assessment	Normal findings	Deviations/abnormalities
• **Perianal region** Inspect by separating the buttocks with gloved hands. Note colour, presence of swelling, lumps, fissures or discharge, infection	• The anal opening is hairless, moist and tightly closed	• *Swelling or lump*: may be due to cancer, haemorrhoids, perianal haematoma, sexually transmitted disease (e.g. anal warts) or rectal prolapse • *Pain and redness*: possible causes include thrombosed haemorrhoid, perianal abscess, fissure and fistula • *Pruritus +/– redness*: might be caused by fungi or worm infestation • *Ulceration*: may indicate Crohn's disease • *Discharge*: Faecal soiling – possible causes include tumour, incontinence amd haemorrhoids; mucus may be due to inflammatory change in rectal or anal mucosa, or haemorrhoids; pus – possible causes include abscess, fissure in ano and infection
• **Sacrococcygeal region** Note colour, presence of hair	• Smooth and free from hair. No redness	• *Pilonidal disease*: lesion located in the midline of the natal cleft with one or more openings; may be covered by a small tuft of hair. Redness, pain and possibly pus

7 THESIS METHODOLOGY

7.1 Functional Thesis

A functional thesis includes a product and a written report (Virtuaali AMK 2006) with the aim of providing practical guidance in the realization of a particular task that demands a certain level of expertise (Vilkka & Airaksinen 2003). The product or in general the implementation of the theoretical knowledge is a concrete product such as e.g. a book, information pack, guide, portfolio, fair or presentation material, or an event. Usually the functional thesis is done for or in cooperation with a company or enterprise. (Vilkka & Airaksinen 2003, 51.) In this case the learning videos are used as learning material at Lahti University of Applied Sciences (LUAS).

This Bachelor's thesis aims to produce, as its final product and function, two learning videos on patient clinical examination for nursing students at Lahti University of Applied Sciences. Since clinical examination is a very wide and in depth field of medicine in general, this thesis was limited to the level of knowledge required by nurses in their specific working environment. This way, nurses are given the basic tools to do a complete health history and perform general, non-specialized clinical patient examination of the respiratory and the cardiovascular system.

The author chose to make a functional thesis because patient clinical examination is a very practical-based topic, which can be learned and understood best by watching and doing. By providing learning videos for students, teachers can use them for e.g. skills lab before giving the students the chance to actually practice.

7.2 Data Search and Collection

This section explains the data search and collection utilized for writing this thesis and the information sources consulted in the process. Data was

collected with searches in different scientific databases. Text books on the topic were mainly used as sources of information for chapter 4-6. This was done, since interviewing skills, the content of anamnesis and examination techniques have been remained same for decades. The final result of both sources of information, traditional and electronic, were combined as one in the theoretical background.

A traditional data collection method using medical books and nursing books was carried out. The electronic data retrieval of relevant scientific articles was performed in the following databases: CINAHL, EBSCO, Medic, Sage, Google Scholar, Masto-Finna by Lahti University of Applied Sciences and Primo by Edinburgh Napier University. The keywords were: patient examination, anamnesis, nursing, assessment, respiratory examination, cardiovascular examination, learning styles, potilaan tutkiminen. Any relevant articles and books published in English or Finnish between 1976 and 2016 have been used. However, the author tried to always find a second, newer source, when taking an old source. The books utilized are available at Fellmannia Library, Masto-Finna Ebrary, as well as several internet sources as public e-books. The articles from Primo by Edinburgh Napier University have been printed out to ensure access to them for the supervisor.

7.3 Ethical Considerations, Validity and Reliability

Ethics mean “the rules or prinicples that govern right conduct” (Berman & Snyder 2013, 9). This means in the context of this thesis that the gathered data has been understood correctly, avoiding misunderstanding and misinterpretation of the content. In respect of the authors of the used sources, right citation technique has been used. The author has cited according to the Guidelines on Graduation Theses by Lahti University of Applied Sciences Ltd. Only sources with open access or access proved by LUAS or Edinburgh Napier University have been used. Furthermore, all references have been double-checked in December and the articles have

been saved to ensure access to them, if they should – for some reason – not be available anymore.

Validity means “the degree to which an instrument measures what it is intended to measure” (Berman & Snyder 2013, 26). This thesis includes mainly information that has been needed for its final product: the learning videos. However, also information on interviewing process and techniques, as well as anamnesis and examination of the abdomen has been provided. The reason for that is that the author of this Bachelor’s thesis has identified that nothing is taught about interviewing for history-taking at LUAS. This includes how to lead an interview and what things need to be taken into consideration, which is why these are included in this thesis. Furthermore, anamnesis and examination of the abdomen are included, since they are parts of the examination that can not be left out.

Reliability is defined as “the degree to which an instrument produces consistent results on repeated use” (Berman & Snyder 2013, 21). Reliable sources of medical and nursing books have been used, as well as scientific articles, to justify this thesis’ content. As often as possible, more than one source was found for a topic in order to increase and ensure reliability. More articles could have been used. However, since examination techniques have not experienced changes over the years and persited the same, the reliability is given nevertheless.

8 THE LEARNING VIDEOS

8.1 The Content of the Videos

The content for the videos has been mainly chosen by comparing nursing textbooks to ensure that the content includes patient clinical examination for nurses and not medical doctors. In addition, also medical textbooks have been used, but only to the extend that applies to nursing clinical examination, after the supervisor helped the author back on track by reminding that it is a nursing thesis and not a medical thesis.

Furthermore, the plan in the beginning was to make 5 videos: history-taking; and clinical examination about respiratory system, cardiovascular system, abdomen, as well as ears, nose and throat. However, after talking to teachers and students, who have done video projects earlier, the amount of videos has been decreased to 2 videos: examination of the respiratory and cardiovascular system. Otherwise it would have extended the scope of this Bachelor's thesis. In addition to the clinical examination of the respiratory and cardiovascular system, clinical examination of the abdomen has been added. This chapter has been written already before detailed plans about the video-making were done. Besides, it is an important part of patient clinical examination as such, since a lot of diseases and complaints have their origin in the abdomen.

In the beginning, anamnesis, examination and abnormal findings were planned to be part of each video. However, the videos would have gotten too long, that is why the anamnesis of each examination part was only listed and the abnormal findings were not included. Questions that facilitate identifying abnormal findings are, however, included in the videos.

8.2 The Video-making

It was planned that the videos would be made during the summer 2016. However, the information gathering took longer due to certain circumstances. That is why the video-making was finally done in the beginning of December 2016. In the beginning, no video-maker has been found, but finally one was found. A colleague of the author offered to be the patient for the videos after hearing about the thesis' topic.

After the amount of videos was set, the screenplay was written. In the beginning it was written very briefly and checked by the supervisor teacher, who said it was good. However, while making the videos, the author realized that the screenplay should have been more detailed. Appendix I and II show the screenplays that have been modified during and after the video-making. The meaning of the different font and color will be further explained in this paragraph:

- All the text in the brackets "><" show that the text within is also shown in the videos,
- *Italicized text* means that nurse was doing those things while filming,
- Blue font in "quotation marks" is the text that has been recorded and added after the filming has been done,
- "– CUT –" finally stands for "cut" of the video-making.

The author prepared the classroom and the needed utilities on the day of the filming. Once everything was set, the actual filming started. Before every small clip, the author briefly explained to the video-maker, as well as to the "patient", what is going to happen next. This way, the filming went quite smooth and was done within 1,5 hours.

After that the actual work started. First of all, the right video-clips had to be put together and their sounds had to get removed. After that, the chosen texts were added. Font has been chosen neutrally in black to not distract from the actual picture. However, in the second video in the end the texts

are framed due tu dark background. Then, the records were recorded to ensure clear narration. For the first video, it did not go that smooth, because the exact narration has not been written down. After realizing that it did not go smoothly, the author decided to first write down the exact sentences and only afterwards start recording to avoid mistakes and stuttering. After that, the recording went well. The records had to be added to the video by checking that the records start and end at the correct time. Finally, too long parts of examination were speed up to keep the video short.

The editing of the second video went smoother; first of all because it is shorter in general, but also because the system was the same as in the first video, as well as the records have been written down in advance.

The main aim was to have two videos no longer than 5 minutes. The first one, examination of the respiratory system, lasts 5:47 minutes and the second one only 3:37 minutes.

All in all, the actual video-making was done within 1 day, however it was a very intense day and with better groundwork, it would have been done more smoothly and faster.

8.3 Students' and Teacher's Feedback

On the 12th of December 2016, the two videos have been shown to Finnish students during their Skills Lab about respiration and circulation. After watching each video, a feedback questionnaire (see appendix III) was handed out. The feedback was written in Finnish or English language. The first video shown was about clinical examination of the respiratory system.

Question number 1 was the following: "What do you think of the video's content? Are there all the important aspects included that you have learned during your lectures and skill labs?" Students mentioned that the

choice of the topic is great and the content is clear and includes the main things that have been gone through in classes already.

The second question was: “How does the video support your learning in addition to skill labs and lectures?” The students’ opinion is that the videos support their learning by showing how to the examination. They mentioned that they have learned it already in theory, but the videos show them first of all how the examination is done in real life, as well as reinforces the learned theory.

The third question was: “What is the best part about the video? (content, picture, audio,..)” Concerning the best part of the video, students wrote that the clear picture and content, as well as the clear narration were best.

The last question was the following: “How can the video get improved in your opinion?” There was only one improvement suggested. The student suggested to add some music, when only the examination is shown without any further oral comments or texts.

The second video shown was the video about examination of the cardiovascular system. After watching it, the same feedback questionnaire got handed out to the students.

As already mentioned earlier, question number 1 was the following: “What do you think of the video’s content? Are there all the important aspects included that you have learned during your lectures and skill labs?” The students answered that the content is good, well justified and clear.

Question 2: “How does the video support your learning in addition to skill labs and lectures?” The students pointed out that the video shows how to examine and include the things that should be paid attention to suring examination. Furthermore, the video is based on the learned theory and shows shortly how to actually do the examination.

The third question was: “What is the best part about the video? (content, picture, audio,..)” Students brought up that the video’s best part is that it is easy and clear to understand due to the audio and picture.

The last question was: “How can the video get improved in your opinion?” As mentioned already as a suggestion of video 1, a student said that music could be eventually added when there is no talking. Furthermore, it should be added that the nurse always informs the patient about the next step of the examination.

The teacher gave verbal feedback. She mentioned that the videos are clear, comprehensive and include the main aspects. However, in the second video (examination of the cardiovascular system), the different sites of pulse assessment could have been also shown in the video, as it is included in the theoretical part.

8.4 Evaluation

The purpose of this thesis was to create, as its final product, learning videos for the nursing students of LUAS. The goal was to make two learning videos – that can be also used as teaching material – which has been come into action. The videos should facilitate nursing students’ learning at LUAS.

When looking at the student’s feedback, the conclusion follows that the purpose and goals have been met. The videos seem to be clear, include the main aspects and help to see how examination is done on a patient before practicing it in skills lab. Also the teacher’s feedback was good, besides the small added comment mentioned in chapter 8.3. However, the amount of students and the teacher giving feedback was too small in order to use it generalized for all of the international nursing students at LUAS.

9 DISCUSSION AND FURTHER SUGGESTIONS

The thesis did not proceed as planned at first. The thesis topic was created by three students, however due to ceveral circumstances, only one student continued with the topic, by changing it from making a guide about examination from head-to-toe to making two videos. Furthermore, the topic was narrowed down to “Patient Clinical Examination of Adults”. However, the final endresult is satisfying for the author, as well as for the students and teacher asked for feedback.

Further suggestions for development include videos about examination of further body systems. These could be done by other students of LUAS, so together they would show the examination from head-to-toe. Furthermore, this thesis includes only examination of adults; however, nurses also have to know how to examine children and elderly, since there are several aspects to keep in mind. Additional videos could be done for examination of children and elderly.

As the students further suggested, music could be added at some parts to avoid moment of gapping void. Also the sites of the pulse could be shown, as the teacher suggested. However, no editing could be done afterwards, due to time pressure.

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APPENDIX II: Screenplay for Video “Examination of the Respiratory System”

>Examination of the Respiratory System<

!!!Prepare stethoscope, PEF measuring instrument and oximeter!!!

Welcome the patient!

Start interviewing!

“First of all, you should welcome the patient and then collect subjective data as following:”

>Subjective Data:

- cough
- sputum
- haemoptysis
- wheezing
- dyspnea
- chest pain
- history infections
- environmental exposure
- self-care>

– CUT –

>Collection of Objective Data<

Disinfect hands!

Start inspecting!

“Examination of the posterior chest includes inspection for posture, color, movement and shape. Is the patient sitting in a forward-leaning position or not? This could indicate COPD. Are there any signs of hypoxia? Is the movement even and symmetric? And are there any deformities such as kyphosis, lordosis or scoliosis?”

>The Posterior Chest

Inspection:

- posture
- color
- movement
- shape<

– CUT –

Start palpation!

“Furthermore, the posterior chest includes palpation for temperature, skin integrity, tenderness, chest expansion and tactile fremitus. Are there any signs of hyperthermia? Is the skin intact or broken? Are there any tenderness’s? Is the chest expanding symmetrically? Furthermore, tactile fremitus is checked by letting the patient saying out loud “99” and palpating with the palm of the hand. Is there decreased or increased tactile fremitus?

>Palpation:

- temperature
- skin integrity
- tenderness
- chest expansion
- tactile fremitus<

– CUT –

Start percussing!

“Percussion of the posterior chest is done as showed. Special attention should be paid to any kind of dullness’s or hyperressonances.”

>Percussion<

– CUT –

Take stethoscope and start auscultating!

“For auscultation a stethoscope is needed to listen to the breathing sounds. Are the breathing sounds symmetrically? Are there any added sounds?

>Auscultation<

– CUT –

Start inspecting!

“Inspection of the anterior chest includes breathing pattern, as well as movement and shape. Are there any signs for tachypnea, bradypnea, Cheyne-Stokes breathing or Kussmaul’s breathing? Is the costal angle at a 90° degrees angle or less?”

>The Anterior Chest

Inspection:

- breathing pattern
- movement
- shape<

– CUT –

Start palpating!

“Palpation of the anterior chest includes the same aspects as palpation of the posterior chest. These include temperature, skin integrity, tenderness, thoracic expansion and tactile fremitus

>Palpation:

- temperature
- skin integrity
- tenderness
- thoracic expansion
- tactile fremitus<

– CUT –

Start percussing!

“Percussion identifies dullness or hyperresonance of the underlying tissues and is done as showed.”

>Percussion<

– CUT –

Take stethoscope and start auscultating!

“Auscultation finally is done by using the stethoscope. Findings include symmetry or asymmetry, as well as possible added sounds.”

>Auscultation<

– CUT –

“Pulmonary function tests include PEF, which stands for peak expiratory flow, spirometer and pulse oximeter.”

Take PEF measuring instrument and let patient do the test!

>Pulmonary Function Tests:

- PEF
- spirometer

Take oximeter and apply it to the patient’s finger!

- pulse oximeter<

APPENDIX II: Screenplay for video “Examination of the Cardiovascular System”

>Examination of the Cardiovascular System<

!!!Prepare watch, blood pressure cuff, stethoscope and centimeter ruler!!!

Welcome the patient!

Start interviewing!

“First of all, you should welcome the patient and then collect subjective data as following:”

>Subjective Data:

- cough
- palpitations
- syncope
- fatigue
- dyspnea
- chest pain
- cyanosis
- nocturia
- edema
- skin changes
- personal risk factors<

– CUT –

>Objective Data>

Disinfect hands!

“Start with the disinfection of the hands and continue with the assessment of the pulse the following: *> text pops in <.* Are there any signs of tachycardia or bradycardia? Is the heart rhythm regular or are there arrhythmia? Is the pulse palpable or difficult to palpate?

Take the watch and start assessing the pulse!

>Assessment of the Pulse:

- heart rate
- heart rhythm
- volume>

– CUT –

Take blood pressure cuff and apply it to the patient’s arm!

“After that the blood pressure should be measured. Is the blood pressure value normal? Does the patient have hypertension or hypotension?

>Assessment of the Blood Pressure<

– CUT –

Start inspecting and palpating!

“The precordium should be inspected and palpated. First, general inspection and palpation should be done. After that, the apical impulse should be inspected and palpated for thrills.”

>The Precordium

Inspection & Palpation<

– CUT –

Take stethoscope and start auscultating!

“For auscultating the patient should be sitting in a 15-45° degree position. The nurse should listen especially to the cardia sound S1 and S2. Are there any murmurs or pericardial friction rub to hear?”

>Auscultation:

- S1
- S2<

– CUT –

Start palpating!

“The carotid arteries should be palpated when the patient’s head is slightly turned to one side. Check for symmetric volume and pulsation.”

>The Carotid Arteries

Palpation:

- Symmetry<

– CUT –

Take stethoscope and start auscultating!

“The carotid arteries should be furthermore auscultated for sounds. Are there any bruits present?”

>Auscultation<

– CUT –

Start inspecting!

“Inspect the jugular veins for their visibility. If the veins are visible, jugular venous pressure should be assessed.”

>The Jugular Veins

Inspection:

- Visibility<

“This can be done by making an imaginary horizontal line at the highest point of the visible jugular vein. The second horizontal line is at the sternal angle. The space between the two imaginary lines can be measured with the ruler. A difference of more than 3-4cm is associated with right-sided cardiac failure.”

Take centimeter ruler and measure the jugular venous pressure!

>Assessment of the Jugular Venous Pressure<

– CUT –

Start inspecting and palpating the arms!

“The arms should be inspected and palpated for skin integrity, capillary refill time and symmetry. Capillary refill time should be no more than 1-2 seconds.”

>The Peripheral Area

Inspection & Palpation of the Arms:

- Skin integrity
- Capillary refill time
- Symmetry< – CUT –

Start inspecting and palpating the legs!

“Inspection and Palpation of the legs includes the following:”

>Inspection & Palpation of the Legs:

- Skin integrity
- Symmetry
- Edema<

“To identify edema, press the legs for 5 seconds.”

APPENDIX III: Feedback Questionnaire

Patient Clinical Examination – Learning Videos

Feedback questionnaire

1. What do you think of the video's content? Are there all the important aspects included that you have learned during your lectures and skill labs?

2. How does the video support your learning in addition to skill labs and lectures?

3. What is the best part about the video? (content, picture, audio,..)

4. How can the video get improved in your opinion?

Thank you for your feedback! ☺