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Communication and Interaction of Trauma Team

Functional thesis

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SEINÄJOEN AMMATTIKORKEAKOULU
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Thesis abstract

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The purpose of this thesis was to focus on the importance, quality and promoting communication and interaction of multidisciplinary trauma team. Communication and interaction was explored based on previous studies and contemporary requirements of South Ostrobothnia Central Hospital District.

The aim of the thesis was to create a educational video which orientates new employees for new work assignment and enables old employees to iterate information. The final product is released for the use of Seinäjoki Central Hospital and later on it will be added to internal network where it is available for all employees.

As a method an educational video was chosen, which forwards all the information in the best possible way. The product is based on trauma alarm guideline, and therefore, the progress can be easily followed.

The thesis did consist from the written part and the product. The trauma alarm guideline was processed in detail.

Keywords: Trauma, Trauma team, Communication

SEINÄJOEN AMMATTIKORKEAKOULU

Opinnäytetyön tiivistelmä

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Opinnäytetyn tarkoitus oli kuvailla moniammatillisen trauma tiimin kommunikoinnin sekä vuorovaikutuksen tärkeyttä, laatua ja sen edistämistä. Kommunikointia ja vuorovaikutusta tutkittiin aikaisempien tutkimusten ja Etelä-Pohjanmaan sairaanhoitopiirin nykyisten vaatimuksien perusteella.

Opinnäytetyön tavoitteena oli tuottaa opetusvideo joka perehdyttää uusia työntekijöitä uuteen työtehtävään ja mahdollistaa vanhojen työntekijöiden tietojen kertaamisen. Valmis tuotos luovutetaan Seinäjoen keskussairaalan käyttöön ja myöhemmin tuotos lisätään sairaanhoitopiirin sisäiseen verkkoon kaikkien työntekijöiden vapaaseen käyttöön.

Menetelmäksi sairaanhoitopiiri oli pyytänyt opetusvideota jolla kaiken tiedon välittäminen on parhaiten mahdollista. Tuotos perustuu Traumahälytysohjeeseen joten sen etenemistä videolta on helppo seurata.

Opinnäytetyö koostui kirjallisesta osuudesta ja tuotoksesta. Kirjallisessa osuudessa Traumahälytysohje puretaan osiin ja käydään läpi yksityiskohtaisemmin.

Asiasanat: Trauma, Traumatiimi, Kommunikaatio

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Terms and Abbreviations

AMI	Acute Myocardial Infarction
CT	Computer Tomography
EPSHP	South Ostrobothnia Central Hospital District
GCS	Glascow Coma Scale
MRN	Medical Record Number
MRI	Magnetic Resonance Imaging
VAS	Visual Analogue Scale
WHO	World Health Organization

Tables, Figures and Pictures

1 INTRODUCTION

In hospitals, there are guidelines for treating severely injured patients, which expedites the help that the patient gets and promotes patient´s surveillance and healing. These guidelines decrease the amount of days a patient stays in hospital. Predetermined evidence based guidelines facilitate trauma team´s work and keeps the treatment level a patient receives high.

"There are three mortality peaks regarding to severely or multiple injured patients: Immediately decedent in accident (severe primary injuries), decedents within first hours and decedents after 7 to 10 days to infection or multi-organ failure (secondary injuries)". (Jousmäki et al. 2013) Two subsequent groups are the ones whose outcome can be influenced with effective action. (Jousmäki et al. 2013)

"The first hour after the onset of out-of-hospital traumatic injury is referred to as the “golden hour”". (Craig ,2010) It is said that if the trauma patient can get proper medical treatment in this “golden hour”, the subsequent problems and mortality due to injuries can be reduced. Fluency of trauma care is of primary importance inside of the multi-professional team, because the treatment provided in this "golden hour" defines the surveillance of the patient. (Craig ,2010)

Treatment which influences efficient outcome is initiated at the destination and this includes primary care which a patient gets and also fast transfer to the hospital for further care. Treatment, that has happened at the destination and on the way to the hospital is conveyed to the trauma team. The trauma team prepares the trauma room and necessary equipment for the patient to continue advanced care required by patient´s condition. Primarily, a trauma surgeon and trauma nurse implement necessary equipment and a triage nurse evaluates the possible need of extra personnel (e.g. medical specialties). (Jousmäki et al. 2013)

The trauma alarm guideline is updated and functionalized based on experience. Guideline constructs basic frame, although every action changes according to the patient´s condition, injuries and needs of care. Predetermined approach accelerates the procedures that patient needs and transfers further care e.g. for surgery. (Jousmäki et al. 2013)

Advance notification gives time for the trauma team to prepare necessary equipments needed and plan patient´s care before the patient arrives. The moment the hospital gets the notification that trauma patient is arriving, trauma team is organized and trauma patient is transferred to trauma care room. The trauma team consists of anesthesiologist, anesthetic nurse, radiologist, radiographer, biomedical laboratory scientist, trauma nurse, trauma surgeon, specializing doctor, K1-nurse, K2-nurse and triage nurse. The alarm made based on advance notification, alerts the team members to start the preparations for patient´s arrival to emergency care department. (Jousmäki et al. 2013)

All employees are ascending to same guidelines and each one of them has clear understanding of their role and action during the trauma situation. This promotes the surveillance of the patient and it is also cost effective treatment from the patient´s and hospital´s point of view, e.g. laboratory test, are not carried out several times.

As a product of this thesis, an educational video is produced describing communication and interaction in a trauma situation. The focus of the product is the importance and clear way of communication.

A trauma situation is always hectic and there can be over 10 people working at the same time. In this kind of situation, the transmission of right information is highlighted because inadequate or absent information transmission can be fatal. Trauma situation is always unexpected on both the patient and the hospital's point of view.

Clear guidelines promote patient safety. Patient safety means principles and actions of functional units and organizations whose purpose is to ensure the safety of care and protect patient from damage. Patient safety is the correct treatment at the correct time and carried out in the correct way. Trauma treatment involves minimal harm from patient´s point of view. (Terveyden ja hyvinvoinnin laitos, 2014) Good patient safety requires co-operation between different operators. The patient has an important role in a situation of promoting patient safety. The patient and his/her closed ones have to be taken into consideration when promoting treatment safety. (Helsingin ja Uudenmaan sairaanhoitopiiri)

The aim of this Bachelor thesis is to describe optimal interaction in functions of the trauma team. The objective is to provide new researched knowledge for registered nurses to implement clear communication in trauma team situations. The thesis is produced with Seinäjoki Central Hospital and follows the trauma treatment guideline (dated 28.6.2013).

2 CENTRAL CONCEPTS

Main concepts in our thesis are trauma, trauma team, teamwork, interaction and communication. Central concepts are used also in keywords in the thesis process.

2.1 Trauma

Trauma is a serious injury to the body. Trauma can be defined as an emotional or physical problem. In this thesis, the focus is mainly on the physical side of trauma. There is no accurate definition to what specific injuries are called trauma, since every physician will define it their own way. (Garlow, Day & Payne, 2015)

Trauma patients are brought in to the trauma center, which are usually located in a local major hospital. Trauma patients are usually in a critical state and require a combination of treatments. Many trauma patients are hospitalized for an extensive time in intensive care unit and surgical wards before discharge. (Garlow, Day, & Payne, 2015)

Haemodynamic instabilities such as increased blood pressure, pulse rate, respiratory rate and deterioritation of Glascow Coma Scale scores can be caused by hospitalization, pain, stress, long term disability, fear of death and unknown environment. Anxiety in these situations can cause apprehension, affecting the nervous system, catecholamine release, cause dysrhythmias, increase basal metabolism rate, produce changes in basic vital signs, myocardial ischemia, harms at a psychological level, heart failure, delirium, delay in recovery of infections and injuries, decrease physical well-being and sleep. This all can lead to a prolonged hospitalization of the patient or may lead to death. (Hatefi, Jaafarpour, Khani, Khajavikhan and Kokhazade, 2015)

2.2 Trauma team

The trauma team is a medical team of health care professionals who are treating patients who have developed a physical trauma. Trauma team consists of doctors

and nurses from different areas. The main key of a successful trauma team is understanding teamwork, communication and physical factors of trauma and cooperating in order to provide the best medical care possible in trauma situations. (Speck, Jones, Barg & McCunn, 2012)

Elements like communication and leadership can influence clinical outcomes of trauma team. Because of this, well organized trauma team with a clear and experienced leader can be life-saving. Every trauma team has their own attributes which are defined by those individuals working in that trauma team. These teams have certain protocols to follow, but individual factors will still influence the effectiveness of the team. (Speck et al. 2012)

2.3 Teamwork

In health care, teamwork is process which contains two or more professionals acting together to achieve a common goal. Human factors of these individuals define how well the teamwork is progressing and it may affect the outcome of that work. Teamwork contains attributes from all of its individuals. Team works effectiveness consists of individuals understanding the teamwork and factors influencing it, for example communication, leadership and seeking help when needed. (Speck et al. 2012)

2.4 Interaction

By interaction, we understand the action when individuals or groups communicate with each other which produces an effect. Interaction is one of the key components of teamwork and it is one of the main outcomes of communication. In health care, interaction is found to be in a key role to achieving the best possible outcome of medical care. (Speck et al. 2012)

In health care, interaction can be noticed between all the professionals who participate in providing care. Also patient's interaction with health care professionals is a key factor to achieving goals of the care that is provided. (Speck et al. 2012)

Professional independence enabled individuals to work cohesively together under pressure. In situations where members of the trauma team were unknown to one another, the coordination of activities within a professional group contributed to team efficiency and performance.

The changing dynamics of a team is seen to influence its adaptability, e.g. high turnover and short-term attendance of team members inhibited team performance. Effective team work consists of the ability to anticipate team members´ needs, adaptability, ability of the physician to create a good work environment, work space, team familiarity, team familiarity with procedures and technical competency. According to Courtenay, Nancarrow and Dawson (2013) valued commodities (including technical skills and knowledge, equipment, clinical territory) were identified as forming the basis of exchange in interprofessional interactions and facilitating collaboration. (Courtenay, Nancarrow & Dawson, 2013)

2.5 Communication

Communication is a way to transfer information between individuals or groups. This information can be provided in various forms, for example speech, signs and expressions. Speech is the most common and easiest to understand, since signs and expressions can be unique with every individual. (Kelly, 2005)

When communicating with other individuals, there is always a chance for misunderstanding of information that has been given. By speaking, this chance is not too high, but when given signs and reading expressions, the chance for misunderstanding rises very quickly. Also volume and tone in which the information is given, can change how another individual interprets this information. (Kelly, 2005)

Communication is considered primary to the team´s successful performance during a trauma call. (Cole & Crichton, 2005) According to Cole and Crichton (2005), the acuity of the patient affects the team communication. In trauma situation, most important and obvious is checking back on a co-worker when given a command. This is mainly used between the team leader and the nurses. (Cole & Crichton, 2005)

In nursing, communication is a very important part and communication skills are required from every health-care professional. (Kelly, 2005). In many cases, communication is interrupted by some reason. In these cases it is really important to gather all the pieces of information before making any rash decisions. Communication can be improved by making certain rules on how to pass information and how to respond after an individual has gotten the information. The usage of these rules decreases the chance for error, especially in emergency situations. (Kelly, 2005)

3 ROLES OF THE TRAUMA TEAM

In trauma situations, the “big picture” forms from several individual roles and their correct performances. (Speck at al. 2012) The next chapter introduces these roles, their tasks and responsibilities. This thesis project is based on Seinäjoki Central Hospital’s Trauma alarm guide, and, due to this, all roles and responsibilities presented in trauma situations, are reflected based on South Ostrobothnia Central Hospital District’s guidelines.

3.1 Trauma surgeon

The trauma surgeon is a team leader in a trauma situation and leads exploration and treatments of multi-trauma patients. The trauma surgeon plans where the patient will be placed, treatment equipment and the need of extra staff members, like specialized doctors or a surgeon. (Jousmäki et al. 2013)

When the trauma alarm is launched, the trauma surgeon will get the advanced information straight from the triage-nurse, and if necessary will check the received information from paramedics. After receiving the trauma alarm, the trauma surgeon will proceed to the emergency unit to wait for the patient’s arrival and to listen to the trauma nurses report concerning advanced information. (Jousmäki et al. 2013)

In a trauma situation when the patient has arrived to the trauma room, the trauma surgeon urgently makes a fast first patient assessment with the anesthesiologist. First assessment is quick and lasts about 30 seconds, to check for imminent life threatening conditions. The surgeon will use ABCDE -protocol (airway, breathing, circulation and disability) as a frame to this exploration. By confirming airways, sufficient breathing, circulation and level of consciousness, the surgeon accompanied by the anesthesiologist can prevent imminent problems. If patient’s condition after the quick assessment, does not require immediate action, the surgeon is able to listen to the oral report given by the paramedics before the initial treatments. If patient’s condition requires immediate treatment, the trauma surgeon will be given

the oral report simultaneously while they´re already performing first treatments. (Jousmäki et al. 2013)

After report the patient is transferred to the trauma room's treatment table, where first treatments will be provided. The surgeon will continue with a more accurate exploration of the patient`s entire body. Explorations proceed from the most vital areas, and move towards the less vital areas. Using RIVALAISER -protocol (thorax-stomach-hip-head-back-limbs) the surgeon is able to perform an accurate exploration. Mandatory Fast ultrasound examination follows the external examinations and will provide information about possible internal bleedings and their extent. Based on received knowledge the trauma surgeon will also make decisions concerning possible other examinations and patient placement. (Jousmäki et al. 2013)

3.2 A resident doctor

Resident doctor is the emergency department's operative duty officer. In a trauma situation, the resident takes the responsibility for the care of trauma patients` and follows the trauma surgeon`s tasks according to the trauma protocol until the more experienced surgeon or anesthesiologist arrives to take the lead. If the on call surgeon is not able to arrive, due to e.g. ongoing surgery, the resident will proceed according to the protocol until more experienced surgeon or anesthesiologist arrives. (Jousmäki et al. 2013)

In case of a trauma situation, the resident has to alert the on call duty officer or to ensure that the alert has been made. In trauma situations the main task of the resident is to ensure that emergency patients in the emergency department are able to safely wait for the time of the trauma situation and also make the imaging request to the software for radiology department. If the patient situation allows, the resident may participate in the beginning of the trauma situation together with the trauma surgeon, by observing or, sometimes if the trauma surgeon insist and chooses to concentrate on the team leadership, by performing explorations and treatments under supervision. (Jousmäki et al. 2013)

Residents tasks in trauma situation are the same as trauma surgeons. After the trauma situation the resident gathers the information of the incident, procedures and findings, then narrates the information for documentation. (Jousmäki et al. 2013)

3.3 Trauma nurse

The trauma nurse is the emergency outpatient clinic's registered nurse, who coordinates the trauma team's activities, keeps in touch with radiology department, laboratory and takes care of documentation. Trauma nurse does not take part in direct patent's care during trauma situations. (Jousmäki et al. 2013)

After the trauma alarm, the trauma nurse starts to fill out the trauma care form with received information and if necessary, specifies the information from the ambulance crew. According to the trauma packet, the trauma nurse orders required laboratory tests and reserves 4 units of red blood cells for the patient in accordance with the trauma protocol. If required by the doctors, the trauma nurse places the order for other necessary laboratory tests according to the patient's condition and needs. (Jousmäki et al. 2013)

At the patient's arrival, the trauma nurse notifies all the other team members to quiet down and gather around to listen for the paramedics report. After the report the patient will be moved to the trauma bed inside the trauma room, in this procedure, the trauma nurse takes part in action and assists the trauma team. Trauma situations are hectic and the team members need to be able to work in peace. After the transfer, to protect the team's working peace, the trauma nurse takes care of possible spectators and extra personnel in the near proximity. (Jousmäki et al. 2013)

The trauma nurse observes and records everything on the trauma care form. This includes vital signs, medication, treatments and examinations. Trauma nurse informs the radiology department if the patients transfer delays unreasonably. The trauma nurse is also in contact with other departments in connection with patient`s continued care. (Jousmäki et al. 2013)

Before transferring the patient to the to radiology department, the trauma nurse copies the trauma care form for specializing doctor´s narration. When patient is transferred to radiology department, the trauma nurse follows the patient and stays with them until the continued care place, where the report will be given by the trauma nurse. (Jousmäki et al. 2013)

3.4 Anesthesiologist

The anesthesiologist of the trauma team usually functions as a doctor of Intensive Care Unit or as a on call anesthesiologist. The triage nurse of the emergency care unit does the trauma alarm. The anesthesiologist arrives to the trauma room to receive the report before the patient comes. The anesthesiologist works as the leader of the trauma team until trauma surgeon or on-call surgeon takes the lead. (Jousmäki et al. 2013)

The anesthesiologist is responsible for securing basic vital signs (airway, gas exchange, fluid resuscitation, blood transfusions). In addition, the anesthesiologist recognizes and treats the life threatening injuries and strives to find and evaluate other injuries, their degree and difficulty together with the trauma surgeon. (Jousmäki et al. 2013)

The anesthesiologist takes care of the maintenance of anesthesia and sufficient analgesia. The anesthesiologist also reports the given medication to the anesthetist and informs possible changes of basic vital signs to trauma surgeon and other members of the trauma team. (Jousmäki et al. 2013)

The patient will be transferred to the operating room or Intensive Care Unit to receive immediate treatment if necessary. The anesthesiologist evaluates patient´s transportation condition, possible actions and treatments of stabilization condition, if situation requires transport to another hospital. (Jousmäki et al. 2013)

In every case it is evaluated which procedures (cannulation, intubation, nasogastric tube) have to be carried out immediately in Emergency Care Unit and which can be postponed without compromising the patient´s condition. (Jousmäki et al. 2013)

3.5 Nurse anesthetist

The nurse anesthetist of the trauma team is a registered nurse of Intensive Care Unit or anesthetist of operating room, who works as a pair with the anesthesiologist. When the triage nurse of Emergency Care Unit makes the trauma alarm call, the anesthetist a.k.a. A-nurse arrives to the trauma room of the emergency care unit and prepares required equipment. Necessary equipment and medicines needed in assisting the anesthesiologist are found in the drawer, cart and the fridge of the trauma room, warm liquids are found in an incubator. (Jousmäki et al. 2013)

When the patient has arrived, A-nurse assists in patient´s transfers and disarmament, connects patient to monitoring devices and places oxygen mask together with K1- and K2-nurses. The a-nurse assists the anesthesiologist with patient´s medication, cannulation, intubation, setting nasogastric tube and in treatment of breathing. Given fluid and medication are reported to the trauma nurse who records information to trauma care form. After trauma care, the a-nurse moves with the patient to radiology department and continued care, to operating room or Intensive Care Unit. (Jousmäki et al. 2013)

3.6 K1-nurse

The K1-nurse is an experienced nurse from emergency unit and works with the trauma surgeon. After trauma alarm has been given, K1-nurse arrives to trauma room and starts to prepare equipment for surgical procedures. These equipment contain catheter set, pleural drain set and suture set. (Jousmäki et al. 2013)

When the patient arrives to trauma room, the K1-nurse will listen to the report given by paramedics. After hearing the report, the K1-nurse will take part in the patients transfer onto the trauma bed. The K1-nurse will cut the patients clothes if necessary and will connect the patient to monitor. The K1-nurse will assist the trauma surgeon on procedures and if necessary will take part on drug care. The K1-nurse will also take care of the patient’s temperature. The K1-nurse announces

given treatment to trauma-nurse who will documentate these procedures. The K1-nurse will follow the patient to x-ray and continued care. (Jousmäki et al. 2013)

3.7 K2-nurse

K2-nurse is responsible for doing plastering in emergency clinic. The K2-nurse assists in surgical procedure and is responsible for splinting. When the trauma alert is issued, the nurse named K2-nurse arrives to trauma room. After this, the K2-nurse prepares the instruments for surgical procedure: catheterization instruments, if necessary pleural drain-, saturation instruments and splinting instruments. (Jousmäki et al. 2013)

When the patient arrives, K2-nurse takes the report with the rest of the trauma team and takes part in the transfer of the patient to the trauma bed. After the transfer, K2-nurse takes off or cuts the patient's clothes and connects patient to follow-up monitor. After this, depending on the patient's condition, K2-nurse takes part in therapeutic procedure, takes care of the patient's thermal condition and in particular fractures tiling. K2-nurse informs its part what care has provided in trauma room to trauma nurse. K2-nurse follows the patient if necessary to X-ray, continued treatment place and takes part in the transfer. (Jousmäki et al. 2013)

3.8 Triage nurse

"Triage nurse works in emergency care units triage workstation. In trauma care situations, the triage nurse´s task is to launch the trauma alarm and take care of other action happening in the unit". (Jousmäki et al. 2013) In Emergency Care Unit triage nurse receives advanced notification of the incoming patient from paramedics, fills the advanced notification report and enters the preliminary information to the system. Based on received information triage nurse together with on call surgeon makes the decision of whether or not to launch a trauma alarm." (Jousmäki et al. 2013)

Tasks of a triage nurse includes to alert the members of the trauma team according to the trauma alarm chart and to appoint Trauma-, K1- and K2-nurses' from the emergency units own staff. The trauma alarm chart needs to be followed without exceptions to leave out the possibilities of uncertainties and deficiencies. "Triage nurse delivers patients personal information, to the ward secretaries to order old medical records. Triage-nurse forwards advanced notification information to the trauma nurse." (Jousmäki et al. 2013)

After previously mentioned steps, the triage-nurse returns to her station and proceeds to work in the background. After trauma alarm triage nurse assesses emergency units manning and patient situation and according to that information defines the possible need and organizes additional labor. In trauma situations relatives may arrive to the emergency ward. Receiving and possible organizing of mental first aid relies to the responsibilities of triage nurse. (Jousmäki et al. 2013)

3.9 Radiologist

A radiologist is a doctor who specializes in medical imaging and treatment based on imaging. Today's medical imaging uses various different methods e.g. ultra sound, x-rays and nuclear magnetic resonance. Procedures benefiting from imaging make efficient treatments possible without surgery. (Suomen radiologiyhdistys)

In trauma situations after receiving the trauma alarm, the radiologist has the following information: incident details, number of victims and arrival time. The radiologist informs the radiology department about the arrived alarm. The radiologist and radiographer move to Emergency Care Unit´s trauma room to wait for the arrival of the patient. When the patient arrives, the radiologist performs Fast-ultra sound examination as soon as possible to determine possible internal bleedings and report possible findings to the trauma surgeon. (Jousmäki et al. 2013)

When the patient`s condition allows, they will be moved to radiology department joined by the radiologist and radiographer for a trauma computer tomography (Trauma-CT) examination. CT-scan is widely used to diagnose multi trauma pa-

tients`. With this examination, possible injuries in head-, thorax-, abdomen-, venous-, spinal-, and pelvic areas can be pointed out. (Jousmäki et al. 2013)

Following the Trauma-CT examination radiologist will give a quick oral statement to the trauma surgeon and dictates the information to patient database. After thorough evaluation of images, the radiologist will indicate new findings if such occur to the trauma surgeon. The radiologist works with and is assisted by a radiographer in trauma situations. (Jousmäki et al. 2013)

3.10 Radiographer

A radiographer is an expert of diagnostic and therapeutic radiography, radiation and medical imaging. Radiographers` specialized field includes ultrasound-, x-ray, magnetic-, radiation-, and isotopic examinations and procedures. A radiographer is an expert in use of radiation and ensures that the radiation strain of patient, staff and environment stays in approved levels. The radiographer is in charge of preliminaries of examinations, preparing the patient, preparing research materials and equipment and operational readiness as well as quality of machines and equipment. (Suomen röntgenhoitajaliitto)

In trauma situations, the radiologist informs the radiographer and the radiology department of the arrived trauma alarm and let them start preparing for the patient’s arrival. After pre-alarm, the radiographer companied by a radiologist moves to the Emergency Care Unit´s trauma room to wait for the patient´s arrival. The radiographer moves and prepares the ultrasound operational and to its right place inside the trauma room. Radiographer assists and works with the radiologist in trauma situations and is responsible of the technical implementation of treatments. When the patient`s condition allows, they will be transferred to radiologist department joined by the radiologist and radiographer for a Trauma-CT examination carried out by the radiographer. (Jousmäki et al. 2013)

3.11 Paramedics

Paramedics in health care act as specialists of acute care. Their specialized field is acute illnesses and patient's need of urgent care. They need the ability to rapidly assess the patient's condition and need of help, in order to make treatment decisions in unexpected and quickly changing and evolving situations. (Työ- ja elinkeinoministeriö)

Paramedics assess patient`s state in the scene, classify patients in order by urgency, start, maintain and protect the vital signs and if needed hastily transport patients to receive further care. The time use to decision making and starting the treatment is always limited. (Jousmäki et al. 2013)

In trauma situations, the patient`s received treatment start at the scene by the paramedics before the transportation. Paramedics intend to keep and improve patient`s state of health with treatment equipment, medication and treatment procedures in consultation with the doctor. (Jousmäki et al. 2013)

In trauma situations paramedics report the patient's condition to a triage-nurse who together with the on-call surgeon takes the decision to make an trauma alarm. During paramedics report of the incident the triage nurse fills out advance notification report for further use. (Jousmäki et al. 2013)

3.12 Biomedical laboratory scientist

Formerly known as laboratory technician, takes samples, guide patients and staff with questions related to laboratory examinations (e.g. blood-, secretion-, or cell samples). Biomedical laboratory scientists` do laboratory examinations, take samples, ensure the reliability of the tests, the preservation, and transportation and processing of the tests, assure the quality of the tests, analyze the tests and reports of results of the tests. Biomedical laboratory scientist is the one in charge of examinational equipment and machine initialization. (Työ- ja elinkeinoministeriö)

In trauma situations biomedical laboratory scientist rapidly takes test required in the trauma packet (Paragraph 4) and possible other tests required by the physi-

cians. The patient´s needs and condition do effect the additional testing of the patient. Because of the urgency of trauma situation some test may need to be done with quick tests` and all the tests need to be analyzed urgently. (Jousmäki et al. 2013)

4 TRAUMA PACKET

Trauma packet is a standard blood test packet taken by the laboratory workers immediately after the patient has arrived to the emergency unit. Trauma patients usually need e.g. blood, red blood cell or plasma packets for blood loss or other critical conditions or for operation according to the severity of their trauma and for those supplements mandatory B-Xtest needs to be taken along with other mandatory tests and possible other tests required by the treating doctors. (Jousimäki et al. 2013)

There are several mandatory laboratory tests taken from the patient. The B-Xtest by which the patient's compatibility to blood transfusion is checked. Treating staff needs to know if the patient has clinically relevant antibodies in their blood for the blood transfer. When taking this test the blood group of the patient should be known and even if the blood group is known it will also be tested, but from a different sample of blood than the B-Xtest. Only in emergency situations can the both test be done from the same sample. When taking blood tests the laboratory staff must always verify the patient's identify. After these tests are taken, may blood transfusions' be ordered for the patient in emergency situations will blood products be ordered on the phone simultaneously when blood tests are prepared to be analyzed. According to the trauma packet, 4 units of red blood cells equivalent to the patients' blood group or in emergency situations emergency blood (type 0-) if the anesthesiologist demands that action. (Jousimäki et al. 2013)

B-Pvk (basic blood count): test will give an overall picture of blood cells (Red cell index, B-Eryt and B-Hkr), white blood cells (fB-Leuk) and hemoglobin (Hb). The thrombocytes (B-Trombin) in the blood flow usually are not required in this test, but many laboratory machines automatically count and inform their value when they analyze the basic blood count). (Terveyskirjasto)

Hemoglobin (Hb) value is usually decreased in anemic stages. Anemia alias shortage of blood can be created in many ways, most common way is lack of iron. (http://www.terveyskirjasto.fi/terveyskirjasto/tk.koti?p_artikkeli=snk03031) In emergency situations it may occur caused by significant internal or external blood loss. In situations where a case of anemia is stated the reasons behind the cause are

always determined with further examinations. The Hb count can also be increased due to prolonged decreased of oxygen supply. (Terveyskirjasto)

B-Eryt shows the amount of red blood cells in one liter of blood. The test is rarely needed because the same information is found with the Hb test, but the test is used is in practice to count down red blood cell indexes. (Terveyskirjasto)

B-Hkr, hematocrit shows how big amount of blood consists of red blood cells. The value changes simultaneously with the Hb value. It is useful for example in establishing excess amount of red blood cells which may be caused by blood-, pulmonary- or cardiac diseases. (Terveyskirjasto)

The principal purpose of white blood cells (leucocytes, B-Leuk) in blood flow is to fight against infections. In case of an infection the amount of leucocytes increase. (Terveyskirjasto)

Slightly increased values are usual and occur for example in cases of pregnancy, physical or psychical strain, eating a meal and smoking. Because there are different kinds of leucocytes, if the amount has increased further tests to determine which type of leucocytes have increased. (Terveyskirjasto)

B-Tromb determines the amount of thrombocytes. Thrombocytes take part in blood coagulation process. Naturally there are more thrombocytes than is necessary required in the blood stream, which means that a small decrease in their amount does not affect the body, but significant loss to thrombocyte count will increase the risk of hemorrhage and the cause of the loss should be determined. (Terveyskirjasto)

Other mandatory test are INR, Crp, gluk, K, Na, CK, TnT and Krea. INR international normalized ratio which implies the coagulation propensity of blood, the greater the values the decreased is the ability of coagulation. (Terveyskirjasto)

CRP alias C-reactive protein. CRP is a protein that is produced by the cells of the liver. The CRP value decreases significantly is various inflammations and tissue damages (e.g. myocardial infarction). (Terveyskirjasto)

Glucose test measures the glucose value in plasma. Decreased glycemic value (hypoglycemia) may cause different kinds of symptoms. Slightly decreased values may cause weakness, sweating, feel of hunger and pulsations of the heart. Significantly decreased values start causing central nervous symptoms for example vision disturbance, speech disorders, cramps and reduction of consciousness. (Terveyskirjasto)

K alias potassium value measures the changes in blood salts. Decreased amount of potassium (hypokalemia) exposes heart to arrhythmias and if hypokalemia is significant the muscles become powerless. Excess potassium value (hyperkalemia) is related above all to renal failure and can cause similar symptoms as hypokalemia. (Terveyskirjasto)

Na alias sodium indicates the sodium values in the blood. Decreased sodium (hyponatremia) vales cause similar symptoms as hypokalemia. Increased sodium value (hyponatremia) is a rare condition and can only be achieved when enough water is not received to replace the water loss. (Terveyskirjasto)

P-CK analyzes the creatine kinase value. From muscles creatine kinase leaks in to the blood stream and gives the standard value, when the muscle is damaged it increases the value. The greater the damage is the more significant is the CK value. (Terveyskirjasto)

P-TnT is the trombone T value. Trombone is a structural protein that can be found from both the heart and skeletal muscles and it takes part in muscle contraction. This specific blood test analyzes the count of heart muscles trombone T which can indicate heart failure the severity, extent and the area of damage. The value can also be increased in other than heart related conditions such as pulmonary embolism, sepsis and renal failure. In these conditions the TnT value chances are minimal and stay within the same values unlike cardiac patients whose value increase and later decrease indicate acute cardiac heart failure. (Terveyskirjasto)

P-Krea indicates creatine value in plasma, which is used to assess renal function. Value can be increased in acute or chronic renal failure, renal circulatory depression (related to cardiac malfunction, shock or dehydration) or as a cause of postrenal secretory obstacle. (Terveyskirjasto)

During the first assessment specialized doctors may order other tests and examinations. These tests usually are ECG and laboratory tests ion-Ca (ionized calcium), Hb-CO (carbon monoxide value) and A-Astrup (e.g. oxygen, carbon dioxide, pH) (Terveyskirjasto)

ECG means electrocardiogram which indicates heart functions through the skin and draws a curve on paper which shows arrhythmias and other cardiac diseases or changes and the marks left by them. (Terveyskirjasto)

5 ABCDE-ASSESSMENT

"The airway, breathing, circulation, disability, exposure (ABCDE) approach is a systematic approach to the immediate assessment and treatment of critically ill or injured patients." (Thim, Krarup, Grove, Rohde & Løfgren, 2012) This approach is used in all kinds of clinical emergencies. ABCDE approach provides e.g. life-saving treatment. (Thim, Krarup, Grove, Rohde & Løfgren, 2012)

The ABCDE approach is clinical tool which includes both pre-hospital first-aid and in-hospital treatment. It seeks in determine the seriousness of a condition and to prioritize immediate clinical interventions. (Thim et al. 2012)

The ABCDE approach is competent for all kinds of patients, both children and adults. Usually clinical signs of critical conditions are same kind regardless of the underlying cause. This make it unnecessary to know the underlying cause when conducting the initial assessment and management. The ABCDE approach should be used in every situation when critical illness or injury is suspected. The initial assessment should be done in the first 10-20 seconds. (Thim et al. 2012)

5.1 Airway (A)

Airway management is key component of emergency care. It´s primary objective is to diagnose an obstructed airway, to clear the obstruction and keep the airway clear. The loss of an adequate airway is more immediately life-threatening than medical emergency or short of a complete cardiopulmonary arrest. (Mock et al. 2004)

The airway, breathing and circulation (ABC) are the first steps in the first assessment and management of any critically ill patient. Airway management should be the first priority when assessing acutely ill or injured patient. Establishing and maintaining a clear airway and ensuring adequate ventilation and oxygenation are essential skills when assessing patient with airway obstruction. (Mock et al. 2004)

"Airway obstruction leads to hypoxia and if untreated can cause damage to the brain, heart and kidneys and lead to cardiac arrest (Nolan 2005)". Airway obstruction can be cause of central nervous system depression caused by drugs. Bleeding can also cause patient a risk of airway obstruction. These kind of patients will require supplementary oxygen to maintain sufficient arterial oxygen saturation. Level of consciousness, arterial saturation and respiratory should be included in patient assessment. (Younker, 2008)

If the airway is open, the patient will respond with normal voice. Although airway obstruction can be complete or partial. Increased breathing effort, noisy breathing and changed voice are signs of partially obstructed airway. Snoring is common sign of partial airway obstruction in the unconscious state. With complete airway obstruction, there is no respiration. Head-tilt and chin-lift are used to open the airway. Supplementary oxygen should be provided to all critically ill patients as soon as possible. (Thim et al. 2012)

5.2 Breathing (B)

The ability to assess a patient for respiratory distress and adequacy of ventilation is essential. (Mock et al. 2004) Breathing problems can cause insufficient oxygenation of the blood and may eventually lead to cardiac arrest if untreated. Breathing inadequacy may occur as a result of problems with respiratory drive, respiratory effort or lung disorders. (Younker, 2008)

Common breathing problems include central nervous system depression (opioids, general anesthetic agents) and inadequate reversal of neuromuscular blockade. Patients may also have underlying pulmonary disease that impairs breathing and prolongs the post anesthesia recovery period. (Younker, 2008)

The primary treatment for breathing problems is oxygen therapy. (Mock et al. 2004) Lung auscultation should be performed if stethoscope is available. Pulse oximetry should be also applied. (Thim et al. 2012) Patients may also require further support with mechanical ventilation {Nolan et al 2005, Carbery 2008). Patient assessment should include level of consciousness, pulse oximetry and respiratory

rate. A fast respiratory rate, higher than 30 times per min, is an early indication of breathing problems (McBride et al 2005). (Younker, 2008) Breathing problems can lead to rising carbon dioxide (hypercapnia) and decreasing pH (respiratory acidosis). (Mock et al. 2004)

Assessment of the adequacy of additional oxygen is based on clinical examination. Supplemental laboratory measurements such as arterial blood gas concentration and monitoring oxygen saturation through pulse oximetry provide useful information. Arterial blood gas will provide information about ventilation, for example partial pressure of carbon dioxide and pulse oximetry gives an indication of arterial oxygen saturation. If ventilation is inadequate, it can be supported manually e.g. self inflating bag–valve–mask or mechanically e.g. ventilator. (Mock et al. 2004)

It is very important to provide ventilator support until the arterial blood gas test are normal and the patient is breathing on his/her own. (Younker, 2008) Assisted ventilation must be performed by giving rescue breaths if breathing is insufficient. (Thim et al. 2012)

5.3 Circulation (C)

Circulation problems can be caused by primary heart disease, including myocardial infarction, heart blocks and some drugs. The most common cause of cardiac arrest is an arrhythmia caused AMI (acute myocardial infarction). Circulatory problems may also be the result of heart abnormalities such as airway obstruction or apnea, tension pneumothorax or severe blood loss. In hypothermia, severe septic shock, hypoxia and anemia, cardiac function will also be impaired. The patient should be treated appropriately for hypertension and arrhythmias. (Younker, 2008)

Circulatory problem can be identified for inspection of the skin. Signs of decreased perfusion are color changes, sweating and a decreased level of consciousness. Heart auscultation should be performed if a stethoscope is available. Basic measurements such as ECG and blood pressure should be taken as soon as possible. By this manner hypotension can be identified which is an important adverse clinical sign. (Thim et al. 2012)

5.3.1 Assessment of shock and control of external hemorrhage

The ability to assess a patient for the presence of shock is very essential. The only resources needed are a clock or watch with second hand, a stethoscope and blood pressure cuff, and the relevant training. Control of external hemorrhage through manual pressure and through the application of a pressure dressing is essential in emergency care. (Mock et al. 2004)

5.3.2 Fluid resuscitation

Fluid volume replacement in the trauma patient is often obligatory. Selecting the right fluids at the proper time can make distinction between life and death. In decision when administering fluids for trauma patient, it is very important to understand the type of intravenous fluids. (Gonzales, 2008)

Intravenous access should be obtained as soon as possible and NaCl- infusion should be infused. (Thim et al. 2012) Fluid resuscitation capabilities include the equipment, the fluids themselves and the skills to administer them, monitor the response, including accurately monitoring fluid intake and output, and treat potential complications. (Mock et al. 2004)

Blood is given when anemia and continued hemorrhage occurs. Blood products e.g. fresh frozen plasma and platelets must be used when justified by clinical picture and laboratory values. (Gonzales, 2008)

5.3.3 Monitoring

The capability for monitoring a patient in shock for response to fluid therapy is important. This includes an understanding of the stages of shock. Laboratory results bring out the presence of shock, the degree of bleeding and response to resuscitation. Laboratory test include the measurement of electrolytes (sodium, potassium, chloride, bicarbonate), blood urea nitrogen, creatinine, glucose, lactate and arterial blood gases. Most of the above affect to the most common cause of shock in a

trauma patient, hemorrhagic shock. Other causes contain cardiogenic shock, neurogenic (or spinal) shock and septic shock. (Mock et al. 2004)

5.4 Disability (D)

Changes in level of consciousness can be caused by airway, breathing or circulation problems. A fast method of assessing the patient´s consciousness level is "AVPU": A - The patient is awake and alert, V - The patient is responsive to vocal stimuli, P - The patient is responsive to painful stimuli, U - Unresponsive to all stimuli. (Younker, 2008)

Level of consciousness can be assessed by using the Glasgow Coma Scale (GCS). Potential signs of lateralization should be evaluated to inspect limb movements. Stabilization of the airway, breathing and circulation is the best treatment for the patients with a primary cerebral condition. Airway patency must be obtained when the patient is pain responsive or unresponsive, by placing the patient in recovery position. Eventually, intubation may be needed. Pupillary light reflexes should be estimated and blood glucose measured. With oral or infused glucose, low blood glucose can be corrected. A decreased level of consciousness is due to low blood glucose. (Thim et al. 2012)

5.5 Exposure (E)

"Signs of trauma, bleeding, skin reactions (rashes), needle marks, etc., must be observed. Bearing the dignity of the patient in mind, clothing should be removed to allow a thorough physical examination to be performed. Body temperature can be estimated by feeling the skin or using a thermometer when available." (Thim et al. 2012)

The importance of pain assessment is augmented when taking care for critically ill trauma patient. Pain can cause systematic problems in the body such as ventilation and perfusion discrepancy in connection with muscle splinting, increased myocardial workload which can lead to tachycardia and hypertension and decreased

gastrointestinal motility. Trauma patient have pain which results from illness or injury. It is very important to remember that the unconscious patient has simply lost the ability to communicate and continues to experience pain. (Lome, 2005)

"Pain can be difficult to assess because of its subjective nature and the potential limited communication in critically ill patients". (Lome, 2005) Patient´s self-report is the most reliable indicator of existence and intensity of the pain. The Visual Analogue Scale (VAS) and the 0 to 10 numeric pain intensity scale are two pain assessment tools which are often used in the critical care. The VAS is a line used to measure pain where the right end is "intolerable distress" and the left is "no pain". The numeric scale allows the patient to rate the pain on a scale from 0 (no pain) to 10 (intolerable pain). (Lome, 2005)

Opioids are the most commonly administered drugs for pain management in the critical care. Patient controlled analgesia (PCA) is preferred method of opiate administration for an awake and aware patient. The PCA method allows the patient to determine the need and frequency of analgesic doses since patient is the best evaluator of pain and pain relief. In critical care setting, medication is administered intravenously or through epidural catheter. (Lome, 2005)

Hypothermia in trauma patient has substantial influence to mortality and morbidity. It also has significant physiological influences. Prevention of hypothermia is critical and should be started before the patient arrives to the emergency department. Ambulance personnel are trained to prevent and manage hypothermia. " This is performed initially by limiting exposure of the patient to areas being treated and the completely covering the patient with blankets or some other warming device". (Moore, 2008)

32°C or less core body temperature is related nearly 100 % of mortality. Hypothermia also has effects on the capabilities of monitoring. Mild hypothermia can already influence pulse oximetry reading. If patient is hypothermic, many drugs may remain in the body system for extended time because drug metabolism and elimination are also temperature dependent. In general, hypothermia extends the duration of action e.g. benzodiazepines and muscle relaxant. (Moore, 2008)

6 RIVALAISER

In clinical examination reiteration or changing the order might be necessary. A patient is examined from thorax to limbs.

6.1 Chest/Thorax (RI)

Stabilization, breathing movements subcutaneous emphysema and contusions are checked when examined thorax. (Jousmäki et al. 2013) Management of chest injuries include capabilities for the emergency insertion of a chest tube, oxygenation and respiratory support. Most chest injuries are managed without surgical operation. Additionally to the physical availability of the medications, adequate pain control signify the skills needed to understand the importance of pain control in a patient with a chest injury, the ability to assess a patient for pain and its effect on their respiratory status, and the ability to assess adequate response to analgesia. Useful adjuncts include regional anesthesia and epidural analgesia. (Mock et al. 2004)

6.2 Abdomen (VA)

Flexibility and possible resistances are checked when examined abdomen. (Jousmäki et al. 2013) Such physical examination needs supplementation with assisting diagnostic tests in unclear cases. This is normally fulfilled by diagnostic peritoneal lavage, ultrasound or CT scan. Ultrasound shows significant promise in the diagnosis of haemoperitoneum. CT scanning increases usefulness in the evaluation of the injured abdomen, especially as regards the retroperitoneal structures. (Mock et al. 2004)

Abdominal trauma procedures can be roughly categorized into intermediate and advanced. Intermediate signifies operations such as exploration, recognition of injured structures, hemostasis through packing, splenectomy, hepatic packing and suturing, repair of perforated bowel, and bowel resection and anastomosis. Ad-

vanced signifies operations in the retroperitoneal, hepatic resection and other more difficult procedures. (Mock et al. 2004)

6.3 Pelvis (L)

Stabilization and contusions are checked when examined pelvis. (Jousmäki et al. 2013) Immobilization technique and resources for wrapping pelvic fractures are deemed essential even at the basic level of care as this can be performed with a piece of cloth and may save many lives by minimizing blood loss in unstable fractures of the pelvis. A spectrum of procedures is required for definitive management of fractures, both those presenting acutely and those with delayed presentation. These include closed manipulation and casting, skeletal traction, external fixation (and its functional equivalent, pins and plaster), internal fixation, and irrigation and debridement (toileting) of complex extremity wounds, including open fractures. X-ray facilities are generally designated essential for the diagnosis, treatment and successful outcome of skeletal injuries. (Mock et al. 2004)

6.4 Brain (Al)

Possible fractures, deformation and impressions are checked when examined brain. (Jousmäki et al. 2013) The assessment of neurological status, including determination of level of consciousness using the Glasgow Coma Scale, recognition of lateralizing signs, and determination of pupillary size and reflexes are examined when assessing the patient. (Mock et al. 2004)

7 ISBAR DIAGRAM

"Communication is an essential aspect of all areas of healthcare delivery." (Marshall, Harrison & Flanagan, 2012) Because of the importance of communication, especially telephone communication, ISBAR information structure was created. ISBAR structure is planned for clear communication. ISBAR perceives five components of communication framework: "Identity of patient", "Situation", "Background", "Assessment" and "Recommendation". (Marshall, Harrison & Flanagan, 2012)

7.1 Identity of patient (I)

Briefing patient information is usually a short but essential part. It gives information who is patient and where the patient is. "Name/Age/MRN/ward/team" are information that should be included in identifying patient. Name, age and MRN (Medical record number) are basic information of the patient. Medical record number gives information about patient´s previous visit in the hospital. Medical record number can be replaced by social security number that is used in Finland. (Thompson, Collett, Langbart, Purcell, Boyd, Yuminaga, Ossolinski & Susanto, McCormack, 2011)

7.2 Situation (S)

Situation means patient´s status in that certain time. Time can be extended to close past if there has been radical chances in patient´s condition or it has been unchanged. Patient’s symptoms and problems is given shortly and clearly but widely enough that it gathers all important areas. ABCDE and RIVALAISER are used to give extended information about patient´s symptoms. As important as symptoms and problems are patient´s situation and stability. If situation is urgent and needs fast action, it must be pointed out. (Thompson et al. 2011)

7.3 Background (B)

Background information is extended information about patient medical history and situation where patient has been. It includes previous diagnoses and operations as well as medications that are in use and when they are taken last time. (Thompson et al. 2011)

7.4 Assessment (A)

"What do you think is going on?" (Marshall, Harrison & Flanagan, 2012) Using information of health care worker´s own knowledge and patient´s symptoms, worker can make his/her own impression of situation and how the patient has responded to the situation. (Thompson et al. 2011)

7.5 Recommendation (R)

Depending of the situation, "R" can mean recommendation, request, response or rationale. If there is something what nurse want to do for the patient or if there is a need for some information, they are done last. Also what is done or need to be done are last information in ISBAR structure. (Thompson et al. 2011)

8 TRAUMA ALARM CHART

8.1 Before the patient arrives

Paramedics give advance notification of arriving patient to the receiving hospital before the patient arrives the hospital. Advance notification should be given if the patient is critically ill or injured and whose treatment should be continued in the emergency department immediately. It can be given also in the situation that patient's care requires special arrangements from emergency department (for example, infection patient who needs to be isolated) (Kuisma et al. 2013). It gives time for emergency department to prepare for receiving the patient better. (Kuisma et al. 2013)

When giving advance notification, it is good practice to use a structured reporting method (Kuisma et al. 2013), e.g. ISBAR (Identify, Situation, Background, Assessment and Recommendation). It has been suggested that a structured method of communication would improve the quality of information exchange (World of Irish Nursing & Midwifery, 2013). ISBAR method is used in many countries´ health care system, and it has also been introduced in some Finnish hospitals. (Kuisma et al. 2013) Finnish nurse association has published a translated version of the ISBAR method. Using a structured method makes it possible to organize essential information in a clear and concise format (Kuisma et al. 2013)

Advance notification's recipient should use advance notification format to which write essential things. Common systematic report method makes sure the important things in the transition of communication situations and reduces the amount of human error and forgetfulness (Kuisma et al. 2013)

It is also important to give the advance notification in good time. If the advance notification is given too early, emergency department cannot know the patient's arriving time very precisely and if the advance notification is given too late, emergency room's staff might not have enough time to prepare. Mostly, the advance notification that is given around 15-20 minutes before the patient's arriving gives enough time for emergency department to prepare (Kuisma et al. 2013). Advance

notification may be given either through the official network or the phone reserved for the advance notification in the emergency department. (Kuisma et al. 2013)

8.2 In the emergency department

In the emergency department, triage nurse receives the advance notification and writes down the received information. Triage nurse also makes trauma alarm to gather trauma team member´s to emergency care department.

Usually the process initiated by advance notification requires to call the several different professionals to emergency department and to prepare the treatment space and equipment. In the trauma team, there are trauma surgeon, anesthetist, triage nurse, trauma nurse, A-nurse, K1-nurse, K2-nurse, radiologist, radiographers and laboratory nurse. (Jousmäki et al. 2013)

8.3 When the patient arrives the emergency department

When paramedics bring patient to emergency department, they give report about the patient and the care responsibility shifts to emergency department's care staffs (Kuisma et al. 2013). It is vital that proper communication between paramedics and emergency department staffs occur during a short period so that transfer of care can occur in a responsible manner (Jeremy et al. 2015). The lack of the communication skills on the part of both paramedics and emergency department's staffs can lead to frustration and inaccurate communication of vital information that in turn influences the quality of patient care (Jeremy et al. 2015). Paramedics often have the information about patient and situation place that is difficult or impossible to figure out from emergency care department. Emergency care department is often busy and complicated working environment where workers are working under high pressure therefore it may lead to the lack of active to listen to the report and the disruption of concentration in the report's receiving situation (Kuisma et al. 2013). Lack of active listening by emergency department staff results in a need to repeat the report and delays the provision of care (Jeremy et al. 2015). Reporting situation should be calm and the recipient must listen actively. It's important to

have 1 to 2 minutes of silence while giving a report. The emergency department staffs need to listen to the paramedics report before starting their assessment and care. If the patient is not having immediate emergency situation, whole care group listen the paramedic's report when the patient is still on the ambulance's stretcher. If the patient has the life-threatening situation that requires immediate medical care (e.g. air way problems), it should prioritized (Kuisma et al. 2013). It is also important that the report between the paramedics and emergency department staff is clear, systematic and according to the same approach. Using structured reporting method (e.g. ISBAR) has benefit but deployment requires both sides' familiarization. (Figure 1. Trauma alarm chart)

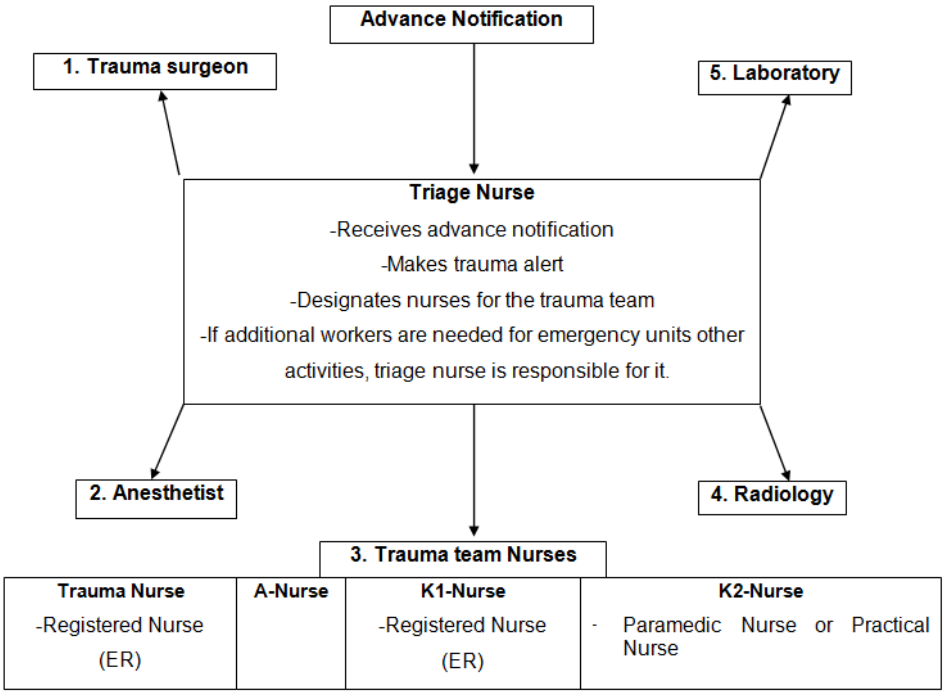

Figure 1 Trauma alarm chart

9 THE AIM AND OBJECTIVES

The aim of the Bachelor thesis is to describe optimal interaction in functions of the trauma team. The objective is to produce new researched knowledge for registered nurses to implement clear communication in trauma team situations.

The product of Bachelor thesis is to make a simulation video for trauma unit of Seinäjoki Central hospital. The purpose of the simulation video is to act as orientation material for new employers and also repetition material for older employers. The video goes through a trauma situation step by step concentrating on communication and interaction within the multiprofessional team.

Basic research and information behind the video are from trauma unit itself, trauma alarm guideline, and other materials from scientific sources. Video will be compatible to reality meaning that everything will happen according to reality and dated guidelines of the unit and the trauma team. Filming area, equipment and props will be carefully chosen. This way veracity and expediency to reality of the situation will stay intact.

Research project focuses on the following:

1. What is clear and efficient communication within the trauma team?

2. What are the central concepts in functional trauma team?

10 DATA COLLECTION METHOD

The data collection method was done by using systematic literature review and inductive content analysis. Data collection was done to obtain reliable and topical information from scientific articles for the thesis process. The goal of data collection was to obtain data from multiple articles and to reflect that data in the thesis process. Data was collected from different sources for different parts of the thesis. Data collection covered communication in different various countries and cultures.

10.1 Literature review

For this thesis, authors chose systematic literature review to have understanding of the recent scientific research of trauma team's communication and interaction. In this literature review, articles were collected and a summary was done based on these articles. Literature review was conducted in four parts: topic, collection research material, analysis of research material and the summary. Research questions were formed as a part of literature review. In addition, inclusion and exclusion criteria were defined to help deciding accepted material. (Cronin, Ryan & Coughlan 2008)

Using systematic literature review as a tool in the thesis project ensures that information is gathered from multiple sources and the results are not too shallow. Literature review allows researchers to review parts of information and construct new context as a whole. Reflecting the literature review on video production can affect aspects which were not considered before. (Aveyard, 2010)

10.2 Search of knowledge

Medical, scientific nursing and governmental authors were used to find material and information for different areas of the thesis. These authors covered the information for literature review and theoretical framework. For the theoretical framework other reliable sources were used simultaneously. Some information for the

theoretical framework came from World Health Organization (WHO) and South Ostrobothnia Central Hospital District.

To find articles, Ebscohost/CINAHL with full text was used with keywords: "trauma", "team", and "communication". Results were framed and only material produced between years 2005 to 2015 were admitted. Articles found with this criteria was 28. From these articles nine was selected by title, four by abstract and three by reading the text. These three articles were included in inductive content analysis. Also keywords "fluid resuscitation", "pain management", "hypothermia prevention", "pain measurement", "ABCDE approach", "emergency care", "interaction" and "multidisciplinary" were used when searching material for theoretical background.

Same criteria were used also while searching articles from Medic, MedPlus and PubMed. From MedPlus none suitable articles arrised with the keywords.

To find articles, Medic was used with keywords: "trauma", "team" and "communication". Results were framed and only material produced between 2005 to 2015 were admitted. Articles found with this criteria was 19. From these articles two was selected by title and one by abstract. The article selected by abstract was not available with free full text. Due to this article found from Medic was not included in inductive content analysis.

To find articles, PubMed with free full text was used with keywords: "trauma", "team" and "communication". Results were framed and only material produced between years 2005 to 2015 were admitted. Articles found with this criteria was 31. From these articles seven was selected by title, four by abstract and three by reading the text. These three articles were also included in inductive content analysis. Also keywords "physiological effect", "interaction" and "multidisciplinary" were used when searching material for theoretical background.

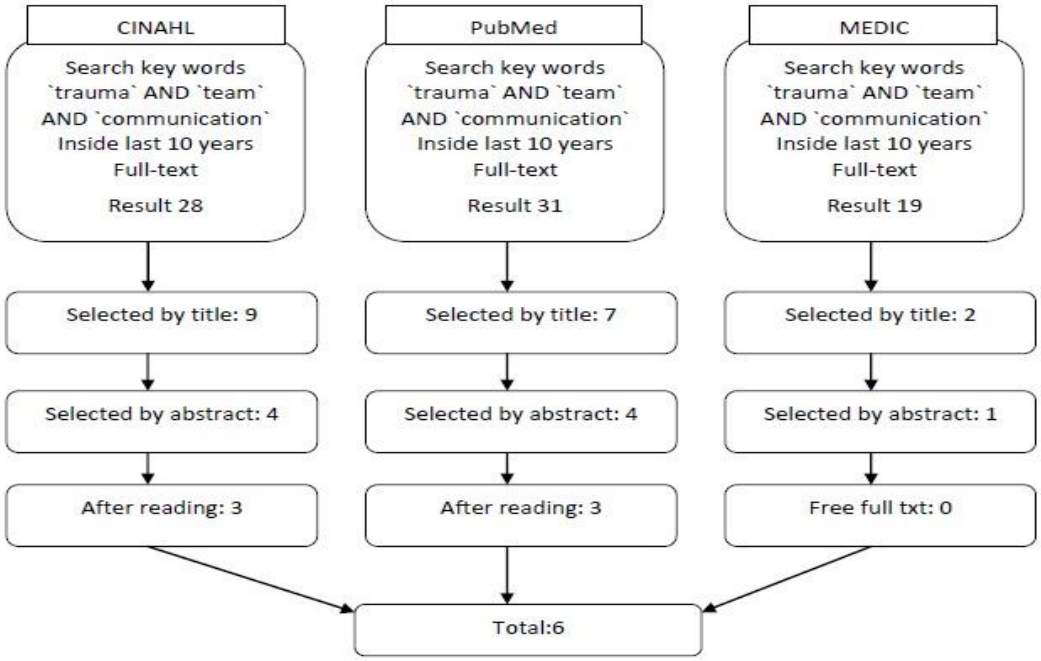

Figure 2 Data collection process

10.3 The Inclusion and exclusion criteria

After literature review, relevant data was determined by using inclusion and exclusion criteria, as shown in table 1. All research articles used, were available in abstract and free full text. Only English and Finnish articles were included. Articles from year 2005 to 2015 were utilized. "Communication", "trauma" and "team" were the keywords used, and titles containing one or more of these keywords were accepted in data collection process. Articles describing communication between health care professionals in ongoing trauma situations were included and communication involving patient was excluded from the process. After applying these criteria's, 6 scientific research articles were included in content analysis.

Table 1 Inclusion and exclusion criteria

Inclusion	**Exclusion**
English and Finnish sources	Non-English sources expect Finnish
Articles published less than 10 years ago	Articles published more than 10 years go
Articles available with full text	Articles not available in full text
Title containing one or more keywords	Titles containing no keywords
Peer-reviewed articles	Educational text books

11 INDUCTIVE CONTENT ANALYSIS

The data analysis method for the communication and interaction of the trauma team was an inductive content analysis. According to Elo and Kynnäs (2007, 109-111), inductive content analysis process consists from three main phases which are preparation, organizing and reporting. The preparation included open coding from data, creating categories and abstraction. While reading materials through several times, notes and headings important to the study were written down. The written content is again read through, headings describing all important aspects of the study were highlighted. The highlighted headings are collected to coding sheet and categories are freely generated at this stage. After open coding, the headings are categorized in generic groups and main group based on their features. (Elo & Kynnäs, 2007).

Reviewing content analysis helps to answer research questions stated. When a content analysis is complete, main points of fluent communication can be identified from research articles. Grouping up these main points helps to identify and understand different aspects on communication. These aspects were reflected on the final production of the thesis. (Elo & Kynnäs, 2007).

In Figure 3 is presented the process of grouping data. While reading through the materials, reoccuring themes arrised which are introduced in Figure 3. These themes are important aspects of fluent communication. Themes were marked from the articles and core idea was written down. These core ideas form the sub categories. While listing down the core ideas, two clear themes emerged forming the generic categories "individual attributes" and "team attributes".

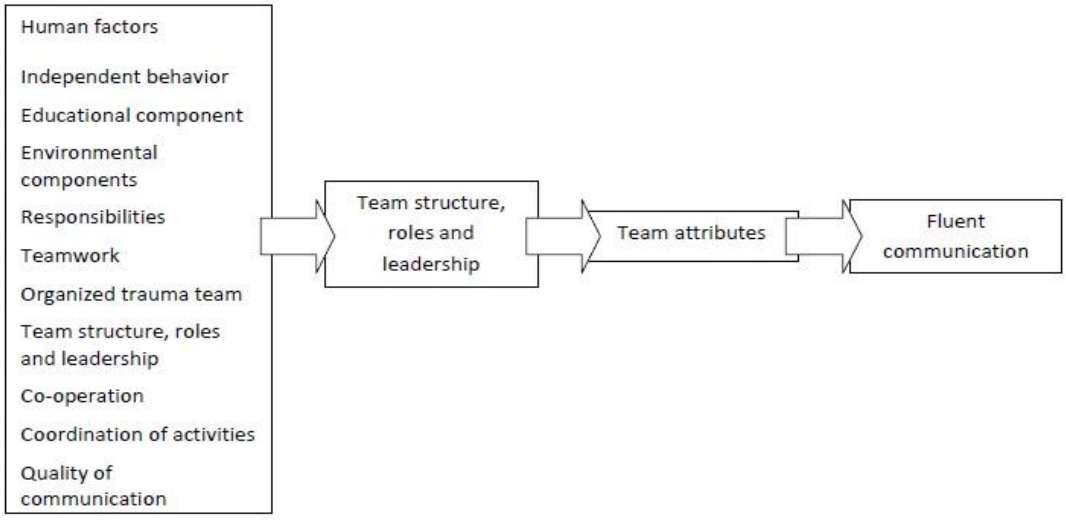

Figure 3 Processing of grouping data

In Table 2 is shown abstraction process where the categorization of all the material used for the literature review is presented. The main category was listed in two generic categories "Individual attributes" and "Team attributes". Generic categories were cleared to sub categories.

Table 2 Abstraction process

Sub categories		Generic group		Main category
Human factors		Individual attributes		Fluent communication
Independent behavior				
Educational component				
Environmental component				
Responsibilities				
Teamwork		Team attributes		
Organized trauma team				
Team structure, roles and leadership				
Co-operation				
Coordination of activities				
Quality of communication				

12 EDUCATIONAL VIDEO AS FUNCTIONAL THESIS

The product of the Bachelor thesis will be a written work and a 10 – 15 minute long video, which will demonstrate the communication, interaction and roles of a working trauma team. The video can be used to familiarize new nurses and doctors with the trauma team. Written material will be done in English and the video will be in Finnish. The video will be shot in SeAMK Koskenalantie's simulation practice class.

12.1 Educational video

Video is a versatile meaning of transferring information. In educational purposes, video can be used to enhance the learning process and can give new interesting aspects to students. Educational video is an excellent way to demonstrate actions and interactions in different situations. In this thesis process, video production was chosen, because describing all of the aspects of communication and interactions it can be hard to understand only by using the written text. (Keränen, Lamber & Penttinen, 2015)

When planning an educational video, original script is in a key position to ensure the wanted outcome of the video. In educational video, a narrator is used to describe the situation and give additional information for the viewers. With a narrator and written text in a video, viewers can catch up to the original situation and confusion can be avoided more easily. Video can be stored in, for example CD, internal server or website. In this case viewers can go back and watch the video again if needed. (Keränen, Lamber & Penttinen, 2015)

Authors of this thesis shot a video describing communication and interaction within a trauma team. In this video, authors acted a fictional situation of a working trauma team to demonstrate a working interaction within a trauma team. Video was produced for South Ostrobothnia Central Hospital District. Educational video can be used in orientation of new nurses and doctors who will be working with/in a trauma team to get familiar on the communication going on in trauma situation. In addition, video will give an overview of an ongoing trauma situation. Original script was writ-

ten by the authors and the video was produced at Seinäjoki University of Applied Sciences.

12.2 Functional thesis

This thesis is done as a functional thesis. Functional thesis describes the thesis, when a result of a thesis is an educational video. Functional thesis is a versatile creation of both theoretical and practical knowledge. Thesis also gives students and authors a good image on their future area of expertise. (Vilkka & Airaksinen 2003)

When a thesis is produced for hospital or organisation, it allows the authors to connect themselves with working-life organisations and can help students in employment. In addition, students can reflect their work with working-life environment and be able to receive specialized guidance in their thesis. (Vilkka & Airaksinen 2003)

12.3 Execution of the thesis

Thesis reflects communication on fictional situation in trauma room. Topic of the thesis was ordered from Seinäjoki Central Hospital's intensive care unit and emergency unit. Original thesis topic was activities in trauma situations, but the topic is limited to communication and interaction in trauma situations. Main source for information used in execution of the thesis was trauma alarm guideline from Seinäjoki Central Hospital and the video is fully based on actions and activities described in trauma alarm guideline.

12.4 Planning of functional thesis

Topic was chosen based on author´s mutual interest on acute and trauma care. When thesis topic was chosen, authors started on planning what kind of execution the thesis would have. Educational video was chosen to be the final product with

written work. Preliminary thesis plan was introduced to supervisors in thesis process. Next step was to introduce the thesis plan to supervisors in Seinäjoki Central Hospital to ask for suggests of improvements on the preliminary plan. When preliminary plan was ready, authors moved on to gather information.

Information gathering started by authors familiarising with scientific research done on the subject and on different kinds of trauma situations. Sources for information were gathered from scientific research databases CINAHL, MedPlus and Medic. Professional websites such as Terveysportti and Duodecim were used as a source. All the information were gathered to support trauma alarm guideline from Seinäjoki Central Hospital which was used as a basis in this thesis process.

Planning of the video was done in co-operation with nurses from Seinäjoki Central Hospital and supervisors of the thesis project. Planning of the video included a theoretical framework on the topic and original script of the video. The script describes the trauma situation, activities and lines for each role. Script was completed according to requests from Seinäjoki Central Hospital.

12.5 Orientation of video production

Production was planned previously on planning phase of the thesis and educational video was shot on 7.12.2015 at Seinäjoki University of Applied Sciences. Filming was done by a professional photographer. Four students from other groups were used as actors in the video. One of them was describing the patient.

Before shooting, a classroom was prepared to act as a set for the video. Equipment were gathered and organized therefore shooting could start after actors were ready. Script was gone through before the shooting with all actors and with the photographer. While photographer planned the actual shooting, all the actors were individually instructed on their part. At this point, actors rehearsed the situation before filming.

Filming begun according from start of the script. Patient bed, stretchers and medical equipment available at school´s storage were used as props in the shooting of the video. Scenes were shot from multiple angles to achieve more usable material

on the video. Extra footage was filmed to have enough footage for transitions of the video. During the shoot, actors were instructed to focus on communicating with each other and to speak loudly and clearly. Video was edited by the photographer after the shooting.

13 RESULTS

As results when researching fluent communication, the arising themes could be divided into two categories according to their features. Main category “fluent communication” includes two generic categories “individual attributes” and “team attributes”. “Individual attributes” includes sub categories “human factors”, “independent behavior”, “educational component”, “environmental component” and “responsibility”. “Team attributes” includes sub categories “team work”, “organized trauma team”, “team structure, “roles and leadership”, “co-operation”, “coordination of activities” and “quality of communication”.

13.1 Clear and efficient communication within the trauma team

Clear and efficient communication within the trauma team in trauma situation needs to be fluent. Fluent communication is considered fundamental to successful team performance during trauma situations. The main factors effecting and promoting trauma team´s performance are team attributes and individual attributes. Trauma situation are always stressful, the communication and interaction turn in nature to automatic, pre-rehearsed and in a way militaristic. This is when the result of education and orientation appears. (Cole & Crichton, 2005)

13.1.1 Team attributes

In trauma care, team work is essential for clinical outcomes and the most successfully carried out by an organized team. (Speck et al. 2012) The size and psychological composition, group processes of dynamics and leading of the group influence in interprofessional team performance. (Courtenay, Nancarrow & Dawson, 2013)

In world of trauma care, "the big picture" sees the importance of everyone in their roles and sees the whole team work together for the best possible clinical outcome. Possible inconsistencies, perceived roles and composition of the team can be problematic and could negatively impact patient outcome. (Speck et al. 2012)

The importance of maintaining the stability of core trauma team members, and the implementation of measures influence the quality of communication between trauma team members when role changes occur. (Courtenay, Nancarrow & Dawson, 2013)

In trauma team where team members are unknown to one another, the efficiency and performance may be affected by coordination of activities. (Courtenay, Nancarrow & Dawson, 2013) The responsibility of initially treating trauma patient, lies within hospital´s trauma team. When working as a team, such skills as communication, co-operation and leadership are seen as major challenges. (Hjortdahl, Ringen, Naess and Wisborg, 2009)

A good leader needs to coordinate the team work as well as improve individual performances with support, guidance, encouragement and motivation. (Cole and Crichton, 2005) A good leader also seems confident and has the ability to stay calm under stress and most importantly respect the team members and their abilities. (Speck, Jones, Barg and McCunn, 2012) Most effective influence of team function lies in team leadership as the leader is responsible for team member's activities and their direction. (Courtenay, Nancarrow & Dawson, 2013)

13.1.2 Individual attributes

In all team work human factors such as leadership, role competence, conflict, communication, environment and patient status, influence team structure, communication and collaboration. (Speck et al. 2012) Individual attitudes and behaviours, such as shouting, can create hostility and inhibit communication. (Cole & Crichton, 2005)

Trauma situation is seen as a high-risk environment where the health care errors are due to occur as a result of poor understanding and communication. (Courtenay, Nancarrow & Dawson, 2013) The leader of functional trauma team has a great responsibility for team members. (Cole & Crichton, 2005)

13.2 The central concepts in functional trauma team

Functions of trauma team revolves around communication, interaction and teamwork. All of the concepts are influencing one another and cannot be ignored.

Team work is a major factor influencing professional co-operation. The progress of team work is highly dependent on individual skills and attributes. Outcome of team work can be influenced by single individuals. All team members need to contribute resources in order to achieve a successful result.

Interaction between professionals is one of the key components in functional trauma team. Interaction is a major concept influencing the quality of care when working in a team of medical professionals. Constantly changing team composition can be influencing team's efficiency, because of team familiarity with each other. In these cases, higher amount of resources needs to be contributed in interaction and communication between the individuals.

Transferring information is a crucial part of trauma team's interaction. Communication between individuals must be understandable and chance for misunderstanding must be minimized to achieve the highest quality of care. Communication between team leader and team members needs to be fluent. Response to a command can be asked if a team member will not respond to a command automatically. In trauma situations, communication can be interrupted easily by other individuals and it will create a challenge for the trauma team. Using protocols and rules in communication is commonly used to lower a chance for errors in trauma situations.

14 CONCLUSION AND DISCUSSION

14.1 The importance of communication and interaction in trauma team

The importance of communication and interaction is highlighted in hectic and changing environment and influences the surveillance and good care from patient´s point of view. Guidelines and getting discussion, decreases duplicate functions, misunderstanding and an information gap in an expansive multidisciplinary team. It is important that new employees learn clear communication from the beginning. From this emerged a need for an educational tool by which new employees are orientated to a new work assignment and to be a part of the trauma team. It is also a refresher tool for older employees.

14.2 The purpose of the educational video

The educational video was made as an order from Emergency Care Department and Intensive Care Unit of the Seinäjoki Central Hospital. The video adheres the trauma alarm guideline of South Ostrobothnia Central Hospital District made in 2003 and also wishes of the departments. The video was produced with additional instructions and wishes. The final benefit of the educational video appears when it is in use of orientation on the Emergency Care Department of Seinäjoki. The final product is assigned to be used in Seinäjoki Central Hospital and later on it will be added to the internal network where it is available for all employees.

14.3 Development objects

When the trauma video is updated next time, the product should be produce in real working environment with the right equipment. This would help new staff members in orientation and bring new possible working styles in action.

The other development point could be producing a trauma video for every emergency department in Finland which has the capability to receive trauma patients. That way the best possible outcome would be enabled country wide.

A tight schedule brings always additional challenges. Competent producers from school of culture were not available with this tight schedule and the absence of funding brought more challenges to organize filming and producing.

14.4 Ethics and reliability

Firstly, for scientific research to be ethically acceptable and reliable and its findings credible, the conduct of research must conform to good scientific practice (The National Advisory Board on Research Ethics). According to the National Advisory Board on Research Ethics, for good scientific practice, researchers should follow modes of action endorsed by the research community. In this research, research communities are Seinäjoki central hospital and Seinäjoki University of Applied Sciences. Secondly, thesis was made from ethically sustainable data-collection, research and evaluation methods conforming to scientific criteria, and practice openness intrinsic to scientific knowledge in publishing the thesis results. Third, taking due account of other researchers' work and achievements, respecting their work and giving due credit and weight to their achievements in carrying out their own research and publishing its results. Fourth, research is planned, conducted and reported in detail and according to the standards set for scientific knowledge.

Participation in research should be voluntary and based on informed consent. Research subjects can give consent orally or in writing. An exception from the principle of voluntary consent can be made when research is conducted on published and public information and archived materials. Research concerning official registries and documents and carried out without the consent of research subjects is governed by legislation (Finnish Advisory Board on Research Integrity).

In this research are used the trauma alarm guideline of Seinäjoki Central Hospital and also published and public articles. Although the published and public articles are exceptions from the principle of voluntary consent, ethical priciples have to be

taken account when using the trauma alarm guideline. In this case, Seinäjoki Central Hospital is the co-researcher of the thesis. Thus, autonomy does not have to be considered. Furthermore, participants are needed when the video is shot. Nursing students are sought from Seinäjoki University of Applied Sciences, as participants who play the role in the video and a video producer is also one of the participants. The participation should be voluntary and informed consent. Participant have the right to withdraw from a study at any stage. It is explained to the participants about the research, the purpose of the video shooting, who are going to watch the video, how long the video shooting will take and the protection of participants' privacy/right and make promise that participants don't spread any information concerning with the research outside of the research group (Seinäjoki central hospital staff, video shooting members and authors). And consent will be given in writing way concerning participants' privacy, right and research data protection. Possible harm resulting from research can stem from the collection of data, the storage of data and consequences following the publication of studies (Finnish Advisory Board on Research Integrity).

If a study includes interaction with subjects (participant observation, experimental study, interviews), subjects must be treated politely and with respect for their human dignity (Finnish Advisory Board on Research Integrity). In this research, any data is not collected from the participants as research subjects. A subject's annoyance, embarrassment, fearfulness or physical fatigue can be sufficient grounds for the researcher to discontinue the study as far as the subject is concerned, even if the subject does not expressly refuse to continue (Finnish Advisory Board on Research Integrity).

Financial and social harm are avoided from participants. Research publications can have harmful consequences for subjects. The risk of harm is greatest if results are presented judgmentally, in a prejudiced way or disrespectfully. Researchers and editors are responsible for compliance with ethical principles in research publications (Finnish Advisory Board on Research Integrity). Consideration from privacy of the participant is ensured when the video is completed and shown to hospital's staffs. And both of the actors (students) and shooter should not get any financial harm concerning with this research.

The protection of privacy is a right protected by the Constitution of Finland. Data protection forms the most important area of privacy protection regarding the collection and processing of research data and the publication of results (Finnish Advisory Board on Research Integrity).

In this research data is not collected from the participants. The guideline from Seinäjoki central hospital is considered as a research. The video is also considered as a research data, when video shooting is started. Every research members and also the participants who play the role in the video and the video shooter cannot spread any information concerning with the research outside of the research group.

Every research members have to store in the safe place and protect the guideline that data from the guideline is not spread outside of the research group. Guidelines and the video are not used for purposes other than this research. After the research, the research data is put through shredder and disposed.

The video is published to Seinäjoki central hospital trauma team staff members and Seinäjoki University of Applied Sciences teachers and students for education. The video is not published it to public. The video does not expose any personal information of the participants to the video other than their name.

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APPENDICES

Appendice 1: The script

Appendice 2: Advantage notification form

APPENDIX 1. THE SCRIPT

Roolit:

Triagehoitaja

Ambulanssikuljettaja

Kirurgi

Anestesialääkäri/a.lääkäri

Anestesiahoitaja/ a.hoitaja

K1-hoitaja

K2-hoitaja

Traumahoitaja

Röntgenlääkäri

Röntgenhoitaja

Laboratoriohoitaja

Potilas

Scene 1.

Triagehoitaja istuu tuolissa kirjaamassa tietokoneelle. Pöydällä on papereita ja traumahälytyskaavio on pöydällä tietokoneen vieressä. Ennakkoilmoitus-kaavioita on telineessä/lokerossa pöydällä.

Triagehoitaja vastaa puhelimeen jonka jälkeen taustalla kuuluu ensihoitajan ääni.

Keskustelun alettua hoitaja ottaa esiin Ennakkoilmoitus-lomakkeen ja alkaa täyttämään lomaketta.

Ensihoitaja:

"EP113, Sairaanhoitaja Herranen. Meillä on täällä kriittisesti vammautunut potilas. Tulemme Annalan suunnalta. Potilaan nimi Anna Mäkinen. Henkilötunnus 120690-123A. Hän on ajanut ulos tieltä ja törmännyt puuhun. Tilanteessa auton keula on mennyt kasaan. Turvavyö oli törmäyksen aikana kiinni ja turvatyyny oli lauennut törmäyksessä. Hän on 80-alueella todennäköisesti ajanut ylinopeutta. Ohikulkija on ohi kulkiessaan huomannut auton ja ilmoittanut hätäkeskukseen. Löytöhetkellä potilas oli tajuton. Hoitoyksikön paikalle tullessa potilas oli sekava ja huonosti vastaileva. Hengitys on vaikeaa ja hengitysäänet poikkeavat toisistaan siten että vasemman puolen hengitysäänet ovat hiljentyneet. Saturaatiotaso on 85% ja hengitystaajuus 20 kertaa minuutissa. Oikeassa sääressä avomurtuma joka vuotaa runsaasti. Haavaan laitettu paineside jolla vuoto rauhoittunut. Kaularankaa aristaa palpoidessa ja kevyesti liikuttaessa. Verenpaine 110/75 ja syke 107. Arvioitusaapumisaikamme on noin 10 minuuttia."

Kun ensihoitajan vuoropuhe loppuu. Triagehoitaja lopettaa puhelun ja alkaa soittamaan traumatiimille.

Triagehoitaja soittaa näennäisesti traumatiimille, puhelusta ei kuulu puhetta, ja samalla tulostaa potilasranneketta ja labroratoriotarroja. Kuva himmenee ja seuraavaksi tilanne kyseinen hoitaja vie ennakkoilmoitus- lomakkeen traumahuoneen seinälle ja kirjoittaa taululle toimenkuvien nimet.

Ottoja kun traumatiimin jäsenet saapuvat traumasaliin ja saliin tullessa jäsenet ilmottautuvat traumahoitajalle ja laittavat oman etunimensä taululle oman toimenkuvansa viereen sekä ottaa traumatiimin liivin päälle. Kuvaa valmistautumisesta.

Kirurgi tarkastelee ennakkoilmoitus-lomaketta jonka jälkeen katsoo K1-hoitajaa.

Kirurgi: ”varaudutaan pleuradreenin laittoon. Onko meillä välineet siihen?”

K1-hoitaja: ” On, Meillä on tämän kokoisia dreenejä”

Anestesialääkäri keskustelee A-hoitajan kanssa, keskustelu tarkentuu loppu keskusteluun.

A.lääkäri: ”Valmistaudutaan laittamaan arteriakanyyli ja vedetään valmiiksi Oxanest.”

A.hoitaja: ” Selvä. Riittääkö Oxanestiä ampulli?”

A.lääkäri: ”Riittää. Onko varalle Rapifeniä?”

A.hoitaja: ”Löytyy”

A.hoitaja lähtee vetämään lääkkeitä ruiskuihin ja letkuttaa tippaletkuja.

Kuvaa röntgenhoitaja ja –lääkäri ilmottautuvat traumahoitajalle ja menevät valmistelemaan röntgenlaitetta.

Potilas ja ensihoitajat saapuvat huoneeseen. Potilas makaa rankalaudalla ja tyhjiöpatjassa paarien päällä. Potilas puhuu jotakin epäselvää puhetta.

Traumahoitaja:

"Hei, tiimi kuulolle."

Kirurgi, anestesialääkäri, anestesiahoitaja, traumahoitaja, K1- ja K2-hoitaja siirtyvät paarien luokse ja paarit ajetaan hoitopöydän luokse. Anestesia lääkäri tarkistaa nopeasti vitaalitoiminnot (hengitys, syke, tajunnan taso) potilaalta. Pieni keskustelun puhe on päällä kun tiimi kokoontuu paarien luokse.

Traumahoitaja:

"Huomio tänne, kuunnellaan raportti."

Ensihoitaja:

"Potilas on Anna Mäkinen. 25-vuotias nainen. Ei allergioita, eikä kroonisia sairauksia tiedossa. Ollut ulosajossa ja törmännyt puuhun. Ollut todennäköisesti ylinopeutta 80-alueella. Törmäyksessä auton keula painunut kasaan. Törmätessä potilaalla oli turvavyö kiinni ja turvatyyny laukesi törmäyksessä. Saturaatio ollut 85%, jonka jälkeen saanut happea 8l/min maskin kautta ja arvot nousseet 93%.

Hengitys taajuus n.20 kertaa minuutissa. Hengitysäänet vasemmalta puolelta hiljaisemmat. Verenpaineet 105/72 ja syke 110. GCS pisteet 2-2-3, pupillit normaalit. Oikeassa sääressä avomurtuma, haava ulkoreidelle ja haavalla paineside. Jalka lastoitettu ja reponointu matkalla tänne. Kipuun on annettu o,25mg Rapifeniä"

Traumahoitajan käskettyä huomio tiimin huomio keskittyy ensihoitajaan ja hiljentyvät kuuntelemaan. Kun ensihoitaja lopettaa raportin kirurgin johdolla tiimi irrottaa potilaan tyhjiöpatjasta ja rankalaudasta, ja siirtävät potilaan hoitopöydälle. Irroituksen aikana a.lääkäri antaa kipulääkeitä.

A.Lääkäri: ”Annetaan 5mg Oxanestiä.”

Traumahoitaja: ”Sain”

Anestesialääkärin huolehtiessa potilaan päästä siirron aikana. Tyhjiöpatja ja rankalauta otetaan pois siirron yhteydessä.

K2-hoitaja leikkaa potilaan vaatteita auki, jonka jälkeen hän ottaa potilaalta pika-Hb:n. Hän ilmoittaa tuloksen saatuaan traumahoitajalle tuloksen, sillein että kirurgi kuulee tuloksen myös.

K2-hoitaja: ”Potilaan pika-Hb on 97.”

Kirurgi: ”Tilataan punasoluja varalle.”

Traumahoitaja: ”Tilataan punasoluja varalle.”

Traumahoitaja soittaa ja huikkaa huoneen ulkopuolelle ja pyytää hakemaan veret.

Heti kun vaatteita on leikattu auki kirurgi alkaa tutkimaan potilasta ABCDE-protokollan mukaisesti aloittaen rintakehän tutkimisella ja hengitysäänien kuuntelemisella.

Kirurgi:

"Vasemman puolen hengitysäänet kuuluu. Pleuradreeniä ei tarvitse."

Siirron jälkeen K1-hoitaja alkaa laittamaan EKG-laitetta kiinni (kun K2-hoitaja on leikannut vaatteet auki) kuten myös verenpainemittarin ja pulssioksimetrin. Kun hän on saanut kaikki kiinni, hän ilmoittaa arvot traumahoitajalle voimakkaan ääneen.

K1-hoitaja:

"Verenpaine 106/70 ja syke 112. Saturaatio 90%"

Traumahoitaja:

"Verenpaine, syke ja saturaatio sain."

Tutkittuaan lantio alueen, röntgenlääkäri tulee tekemään röntgen kuvauksen. Kaikki poistuvat huoneesta ja palaa huoneeseen.

Anestesialääkäri samalla tarkistaa pupillit, ja hengityksen.

Anestesialääkäri tarkistettuaan hengitys:

"Vitaalitilanne hyvä"

Traumahoitaja

"Vitaalitilanne hyvä sain"

Tämän jälkeen anestesialääkäri siirtyy potilaan oikean käden luokse "laittamaan" arteriakanyyliä. A-hoitaja avustaa a-lääkäriä.

Laboratiohoitaja tulee huoneeseen.

Laboratoriohoitaja:

"Hei tulimme ottamaan verikokeet potilaasta."

Laboratoriohoitaja ottaa verinäytteen ja poistuu.

Samaan aikaan anestesialääkäri on laittamassa arteriakanyylia anestesiahoitajan kanssa. Kuvaa tekokäteen kanyylinlaitosta vilaus, potilaalle laitetaan kanyyli esittämään oikeaan kohtaan hyvin teipattuna

Tämän jälkeen K2-hoitaja lähtee hakemaan lämpökatetri kärryä.

K2-hoitaja sanoo voimakkaalla äänellä, että trauma- ja K1-hoitaja kuulevat :

"Laitetaan lämpökatetri numeroa 14"

Traumahoitaja:

"Laitetaan lämpökatetri numeroa 14 sain."

Kirurgi: "Potilas siirtovalmis röntgeniin omasta puolestani"

Anestesialääkäri antaa potilaalle kipulääkettä ja sanoo:

"Annettu oxanest 4mg jonka jälkeen minunkin puolesta valmis siirtoon"

Tähän traumahoitaja komentaa K1- ja anestesiahoitajan sekä a-lääkärin mukaan ja lähtevät viemään potilasta pois huoneesta.

APPENDIX 2. ADVANTAGE NOTIFICATION FORM

Etelä-Pohjanmaan sairaanhoitopiiri

Seinäjoen keskussairaala
Päivystyspoliklinikka

27.10.2014

Traumapotilaan ennakkoilmoituskaavake

Päivämäärä	Sairaankuljetusyksikkö	Nimi ja henkilötunnus

Tapahtumatiedot/vammamekanismi

Potilaan vammat/yleistila

Hoito/tehdyt toimenpiteet

Verenpaine	Syketaajuus	HT/SpO2	Tajunta/GCS	Ilmatie
				Oma hengitys ☐ Intuboitu ☐ Avustetaan ☐

Arvioitu saapumisaika	Tehdäänkö traumahälytys? Kyllä ☐ Ei ☐

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