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SURGICAL SITE SKIN DISINFECTION

A desired guideline

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Bachelor's Thesis
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Degree Programme in Nursing
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Abstract

The main goal of our bachelor's thesis was to produce an instructive poster about surgical site skin disinfection. The poster is meant to be used with nursing students specializing in perioperative nursing and it is also a supportive teaching aid for the staff.
The poster is used in Central Finland Central Hospital operating units and Jyväskylä University of Applied Sciences.
As a result of this thesis we produced two guiding posters about laparotomy skin disinfection. One in Finnish and the other in English.
The thesis is concentrated on skin disinfection equipment and technique, and it also tells about microbes and infections from perioperative nursing point of view.

The theory base of the thesis is based on the guidelines of Central Finland Central Hospital and it is done in co-operation with an aseptic nurse who has also checked and approved the posters.

Keywords
Perioperative, nursing, disinfection, infection, aseptics

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Tiivistelmä

Opinnäytetyömme päätavoite oli tuottaa informatiivinen posteri aiheesta leikkausalueen desinfektio. Posteri on tarkoitettu käytettäväksi perioperatiiviseen hoitotyöhön suuntaavien opiskelijoiden ohjauksessa ja se antaa tukea henkilökunnalle opiskelijaohjaukseen.
Posteri tulee käyttöön Keski-Suomen keskussairaalan leikkausosastoille sekä Jyväskylän ammattikorkeakouluun.

Tämän opinnäytetyön tuloksena tuotimme kaksi posteria laparotomisen leikkausalueen desinfektiosta. Toinen postereista on suomeksi ja toinen englanniksi.
Opinnäytetyö keskittyy ihon desinfektio välineisiin ja tekniikkaan sekä kertoo mikrobeista ja infektioista perioperatiivisen hoitotyön näkökulmasta.

Opinnäytetyön teoria pohjautuu Keski-Suomen keskussairaalan säädöksiin ja se on tehty yhteistyössä sairaalan hygieniahoitajan kanssa, joka on myös tarkastanut ja hyväksynyt posterit.

Avainsanat (asiasanat)
Perioperatiivinen, hoitotyö, desinfektio, infektio, aseptiikka

Muut tiedot

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1 INTRODUCTION

”A disinfectant is an agent that frees from infection; usually a chemical agent that destroys disease germs or other harmful microorganisms or inactivates viruses”(Block. 2001. 19). ”The inactivation of microorganisms by chemical agents forms the basis of antisepsis and disinfection” (Russel, Hugo & Ayliffe, 1999, 5).

Healthcare as well as nursing care has been practiced throughout the human history. Its evolvement has been vigorously connected to the development of human kind in general. Questions and the awareness concerning hygiene have been specified around the fields of microbiology, medicine and nursing science. The knowledge of infectious diseases and its spreading has been advancing among the development of the three fields mentioned. Hygiene is an extensive concept and one of its fields is called hospital hygiene. Hospital hygiene stands for preventing procedures of disease in health- and nursing care, including implementations, procedures and methods in preventing infections.

Today’s hospital hygiene is carefully guide lined and advanced. In order to understand the guidelines of today, it is important to understand the history of disinfection and antisepsis. Ignac Semmelweis (1818-1865) established hand washing in chlorine as a mandatory procedure in Wien birth clinic in the 1800’s in order to prevent infectious fever in newborn babies and mothers. (Korte, Rajamaki, Lukkari & Kallio. 2000, 162.)

Joseph Lister (1827-1912) was the initiator of antisepsis. As a surgeon he paid attention to the purity of the air in the operation theatres and disinfected it with carbolic acid. Diluted carbolic acid was used in disinfection of the surfaces of the operation theatres. (Stucke, 1993, 6.)

The first public guideline in preventing hospital infections was in 1962 in Finland in the magazine Sairaanhoitaja. The guideline contained directions on protective gowns, instruments, hygiene, linen administration and hand washing and clothing of the staff. These guidelines were inclusive and modern, and are still quite valid today. (Korte & al. 2000, 163.)

According to our experiences, when working in a hospital environment it is important to form specific patient care guidelines to improve cooperation of the staff and students, patient safety, and reduce the possibility of malpractice. In the operation theatre environment in our opinion, these rules are mandatory to follow. If these agreed guidelines are not followed properly in the operation theatres, the consequences can be extremely severe.

This bachelor's thesis is aimed for students and staff in the perioperative field. Students and nurses in the field of instruments are considered to find our thesis most beneficial. Our Bachelor's thesis is a literature report. The outcome of this thesis is a guideline on surgical site disinfection in form of a poster supporting our written theory. The poster will be displayed in the operation wards and in the JAMK University of Applied Sciences School of Social and Health Care as well. The poster is aimed for student guidance in particular. Its purpose is to provide supporting learning material to students specializing in perioperative care as well as to support student guidance amongst perioperative staff. The poster is aimed to support written knowledge of surgical site disinfection, providing a visual guideline to help the actual implementation.

Our desired outcome of the poster is to be simple, easy to follow and understand, and sharp and clear images which are easy to remember afterwards. The poster should be valid and ready-to-use. The written

work should be easy to comprehend.

Surgical site disinfection is an extensive subject. Our mutual decision was mainly to concentrate on the basics of disinfection. Our study includes a review to microbiology and hospital hygiene as well, however we want this thesis to concentrate on surgical site disinfection and its technique and equipment. When considering the poster, we wanted to narrow the concept down even further. We decided to concentrate on laparotomy site disinfection.

Also Vilkka and Airaksinen (2003, 18) say that it is important to think thoroughly what are the main goals and objectives of the thesis and to consider personal resources before making the subject too widespread. Our purpose is to demonstrate the disinfection in the simplest fashion, and we believe that using the laparotomy site benefits us in this decision the most. In the written report we concentrate on the basics of surgical site disinfection and discuss laparotomy site disinfection after familiarizing the basic concepts.

Central Finland Central Hospital's operating ward requested us to implement a bachelor's thesis on the subject of surgical site disinfection. We want to bring forth an extensive, yet compact package of theory not only on surgical site disinfection, but on poster making as well. The phases of the poster making and implementation are in the end of this thesis. We will add a scale model of the actual poster as an appendix to this thesis as well.

2 AIMS AND PURPOSES

The purpose of this thesis was to produce a guiding poster for perioperative nursing students to use in their training both at school and at their practical placement in the operating theatres. The poster is also to be used as a supporting teaching aid among the staff and mentors.

Our aim was to promote the technical learning progression of perioperative nursing students and to deepen the knowledge concerning aseptics and hygiene.

3 SURGICAL SITE INFECTIONS

Post-operative infections include surgical site infections appearing in the incision wound or in the operation area. Other post-operative infections include pneumonia, urinary tract infection, sepsis and intra venous catheter infection. (Rantala & Huotari, 2010, 212.; Rantala, 2008a, 120.) According to Rantala (2008a, 121.), surgical site infections cause approximately 25% of all hospital acquired infections and the financial losses for the society are 100-200 million euros annually. Mostly these extra expenses collect from prolonged hospital stay, medical and intensive care costs and re-surgeries. Infections are an effective factor in up to 60% of post-operative deaths. The occurrence of post-operative infections is most numerous in gastro-enterological surgery where the cleanliness classification is lower. The most insignificant number of post-operative infections occurs in orthopaedic surgeries and other surgeries classified as clean. (Rantala, 2008a, 121.)

Surgical site infections are divided into three categories by the CDC (Centers for Disease Control and Prevention) according to the depth of the infection; superficial incisional, deep incisional and organ/space surgical site infections. Superficial incisional infections affect the skin and subcutaneous tissue, deep incisional infections fascial and muscular layers and organ/space infections appear in organs or spaces manipulated or otherwise opened in the operation. (Mangram, Horan, Pearson, Silver & Jarvis, 1999, 252.; Rantala. 2008a, 122.) The diagnose of a surgical site infection is made by a doctor according to the clinical symptoms which include pain, swelling, inflammation, fever and wound secretion (Rantala, 2008a, 122.)

The most important tool to prevent hospital-acquired infections is aseptics. Aseptics are all procedures and policies used to stop infections from transmitting. Aseptics is the main key to prevent microbes from reaching the patient, instruments, staff and environment. Every nurse should ensure they follow the aseptic principals in all nursing duties and if necessary update their aseptic conscience to agree with evidence based nursing practice. (Karhumäki & al. 2009, 59.)

3.1 Microbes

An infection is caused either from endogenous or exogenous pathogen. Endogenous means that the pathogen is from the normal flora of the patient and exogenous pathogens access the body from outside for example from another person or animal via an infection route. An infection route is a portal for microbes to enter the human body. Usually an infection route is formed when the skin or mucous membranes are harmed because of cuts or medical procedures such as surgeries, injections or intravenous catheters. Also mouth can act as an infection

route if bacteria transmit through inflamed teeth to other parts of the body via circulation.

Possible ways for the microbe to transmit are touch, droplet- and airborne infection. The microbes can also transmit directly or indirectly. Direct infections are caused when microbes transmit from human to human via skin, mucous membrane or body secretions such as blood or sputum. Indirect infections are born when microbes transmit for example via water, food or different surfaces in the hospital.

When a baby is born it is sterile. After birth breathing, eating, drinking and the rest of the environment transmit microbes around the human body and they stay to live on skin and mucous membranes creating human's normal flora. Normal flora is especially numerous in folds and gaps of the skin and in the mouth, intestines and vagina and it acts as a part of the defensive mechanism. For example in the intestines the bacteria of the normal flora produce different B-vitamins and vitamin K, which is needed in the blood clotting. On the mucous membrane of vagina, lactic acid bacteria decrease the pH level and therefore protect the mucous membrane from other microbes. Normal flora consists mostly of bacteria but can include also yeast fungi. (Karhumäki & al. 2009, 31, 35-36.)

The most important cause of surgical site infections are endogenous bacteria from the patient's own normal flora rather than transient exogenous bacteria coming from the environment. (Rantala, 2008b, 123.) Even though the normal flora is a part of the defensive mechanism, if some of the microbes end up to an unfamiliar part of the body, they can cause an infection. For example often in clean surgeries a wound infection is caused by one of staphylococci bacteria (most commonly Staphylococcus aureus), which are the most common bacteria of human

skin. It is found on the mucous membrane of nose and on the skin of arm pits and perineum. It transmits via touch or air. In gastro-enterological, gynaecological and respiratory surgeries the possible effective factors of infections are also the bacteria from the surgical site. In these cases the microbiology of the infections varies widely according to the flora of the operated site. (Rantala, 2008b, 123.; Karhumäki & al. 2009, 31-32)

If an infectious agent has reached a human body it does not necessarily mean that it causes an infection. A number of factors affect the forming process of an illness, for example the features of the microbe and the defensive measures of the patient. (Karhumäki & al. 2009, 35.)
Another big factor to remember, when assessing the risk factors of a possible infection with a certain patient, is to conclude the cleanliness classification. The classification system, which has four categories, tells us how much microbes there are in tissue on the time of the operation. Aseptic failures during operation do not change the cleanliness classification but the classification can alter for example if a previously unknown infection is discovered during surgery. (Rantala, 2008b, 123.)

1. Clean	Surgeries that do not penetrate gastrointestinal-, urinary- or pulmonary tracts
2. Clean contaminated	Surgeries that penetrate gastrointestinal-, urinary- or pulmonary tracts
3. Contaminated	An infection on the site of surgery that has not spread
4. Dirty	An infection that has spread on the site of surgery

TABLE 1. The cleanliness classification system of operations

3.2 Environmental factors

In addition to patient's own normal microbe flora causing the infection, contamination from outside is also possible, though quite rare in today's operations. Errors in aseptic technique, for example flaws in skin and instrument disinfection or breaking of surgical gloves can cause microbes to transfer into the wound. (Rantala, 2008b, 124.) In operating theatre environment, the nursing and medical staff are the main source of direct exogenous infections and that is the reason why proper hygiene control among the staff is important. Hands have the most numerous amounts of microbes. For example under a person's nails can be found a number of microbes equal to the population number of Finland. Rings and other jewelry enhance microbe growth because they collect humidity, which acts as an effective substrate for microbes.

From environmental factors proper air ventilation, staff activities in the theatre and traffic to theatre and out are very important factors in infection prevention. Opening the theatre doors multiple times affects the theatre ventilation and therefore increases the risk of airborne contamination. (Rantala et al. 2010, 222) Microbes can travel surprisingly long distance in small droplets, dust particles and dandruff (Karhumäki & al. 2009, 37).

3.3 Other factors

Before surgery, the patient's constitution needs to be evaluated. If the patient is in good health, it is likely that the defensive mechanism works properly. Smoking, alcohol, stress, obesity and chronic illnesses are just a few of the risk factors affecting patient's constitution and defensive mechanism. Most common diseases that expose the patient for an infection are diseases affecting the respiratory and circulatory systems because they provide the oxygen and nutrition intake to the tissue and that are important for the defensive mechanism. Also diabetes and malign tumors are risk factors for infections. (Karhumäki & al. 2009, 39.)

The risk of surgical site infections can also be increased due to protracted duration of operation. In long surgeries the possibilities for contamination increase as the wound periphery dries. Rantala (2008b, 124) says that factors regarding operating technique have a big effect on infection appearance. For example inadequate hemostasis, faults in wound closure and large tissue damage and bleeding cause poor tissue oxidation, which is a big risk factor in surgical site infections (Rantala, 2008b, 124).

Also disturbances in vital functions cause poor tissue oxidation. Especially in big surgeries temperature, pain and adequate liquid intake observation are important to prevent post-operative infections.

Microbe prophylaxis is useful and very effective in infection control when the medication is correctly chosen and administered instantly before surgery. (Rantala, 2008b, 124-125). Microbe medication can decrease the risk of infection and shorten the duration of possible infections. Unfortunately microbe medication also diminishes mucous membrane defensive mechanism because it cannot differentiate pathogens from normal flora so it destroys all microbes, also the essential ones.

Age is an affective factor in infection vulnerability. A newborn baby has a natural immunity and during growing process the child develops a new immunity. The infection defense is at its best in adult years until old age causes the cells to renew slower and respiration and circulation decreases and nutrients no longer absorb as effectively as with young people. (Karhumäki & al. 2009, 39-40.)

4 SURGICAL SITE DISINFECTION

Surgical site disinfection is implemented when the patient has been set to the surgical position exactly before the procedure. The instrumental nurse is able to begin the implementation when the site is lit with surgical light and the surroundings have been covered to prevent wetness. Before disinfection of the site, it is important to make sure the surgeon has marked the surgical site with a marker and ensure the skin is undamaged.

Surgical site disinfection is implemented abiding on the principles of safety, individuality and asepsis. Disinfection techniques base on the position of the patient and on the procedure executed. (Korte, Rajamaki, Lukkari and Kallio, 2000, 387-390). The purpose of surgical site disinfection is to decrease the number of patient's own microbe flora and to prevent postoperative infections. (Rummukainen, 2008, 33.)

Preoperative nursing care includes ensuring that the patient has showered either previous evening or in the morning prior to the operation. Mouth, nails, genital area and belly button are cleaned with intensified thoroughness. Antiseptic full body wash is not necessary because it is not proven to affect the number of surgical site infections. Normal liquid soap is enough. The patient's skin should also be monitored preoperatively to make sure that it is intact. Cuts and other abnormalities may be a reason to postpone the surgery. (Rantala et al. 2010, 219-220.)

4.1 Laparotomy disinfection

Disinfection of the surgical site is based on the position of the patient and of the procedure planned. We decided to concentrate on a procedure type called laparotomy. Laparotomy position considers the stomach and the incision is a generous mid-line incision. During disinfection and the whole procedure, the patient lies in supine position on the operating table. Supine position is the most common position. Many surgeries concerning the gastro-enterological area are done in laparotomy position for example appendectomy and cholecystectomy. (Choudhury, 2008, 139.)

4.2 Disinfectants

The purpose of disinfectants is to destroy harmful vegetative microbes and therefore prevent infections on the site of operation. After skin disinfection spores of microbes can still be alive. Used disinfectants are methylated 80% ethanol alcohol (A 12 t) or chlorine hexidine of which methylated ethanol is mostly used in operation site disinfection. Chlorine hexidine has a wide efficacy rate but it might absorb through skin or mucous membranes making it a toxin. Chlorine hexidine is not inactivated by blood. Methylated alcohol used in operation theatres can be colored or clear. It has small toxicity and does not cause microbe resistance but it dries the skin. It affects widely on a variety of bacteria, viruses and fungi when used according to guidelines. Ethanol disinfectants are never 100 % because a small amount of water in the disinfectant accelerates membrane destruction, protein denaturation and obstructs cellular metabolism.

Preoperative hygiene control is important because dirt inactivates alcohol disinfectant. (Laitinen, Vuento & Ratia, 2010, 520, 528-529; Perttunen, 2006.) Ethanol acts rapidly as a disinfective agent but it has poor residual effect so the effect lasts only until the alcohol has evaporated. It is important to let alcohol-based disinfectant to dry completely before the beginning of operation, because when used with the combination of diathermy or other electric equipment the risk of fire is present. (Manley & McNamara, 2010. 57; Perttunen, 2006.)

Natrium chlorine 0,9% is used to disinfect wounds that are under 24 hours old and wounds that extend to joints or intestines. It is also used to clean the skin and mucous membranes around urethra before catheterization. Desinfektol H® is used in the disinfection of mucous membranes and surgical site skin disinfection with patients under one year old because it does not burn. (Rummukainen, 2008, 33.) Desinfektol H® includes under 10 % of ethanol alcohol and sethylpyridium chlorine (Berner. Käyttöturvallisuustiedote, 2007, 2).

4.3 Equipment

The disinfection procedure is done with clean swabs, clean dish and clean gloves. Usually the washing equipment is packed ready into a kit and only disinfective agent is added. When disinfecting abdominal area, clean cotton sticks are used to disinfect the belly button.

When accessing operating room all staff needs to wear an appropriate uniform and a cap to cover their hair. (Rantala, Huotari, Hämäläinen & Teirilä, 2010, 221; Rummukainen, 2008, 33.) During disinfection a mask is used to cover mouth and nose from transmitting bacteria to the surgical site via breathing or saliva (Routamaa & Ratia, 2010, 158.)

4.4 Technique

Hair removal from the operation site is not necessary concerning infection control but if it is needed because of the nature of the surgery, it should be done with clippers or scissors rather than a razor to avoid skin breakage and infection. Hair removal can be done before disinfection process either preoperatively in the ward the previous day or in the operating theatre just before surgery. The timing of hair removal does not increase infection risk if it is done correctly. (Erämies & Kuurne, 2010, 334; Rantala & al. 2010, 220-221.) Hair removal is justifiable for example when the hair is where the drapings or wound dressing should be attached. The glue in the drapings and dressings will attach to hair instead of skin and therefore expose the wound to infections.

When the patient is in the right position and anaesthesia is ready, skin disinfection can be started. Before and after gathering the equipment

hands need to be disinfected. After the disinfection kit is ready, clean gloves are used in the process. Belly button is disinfected first with cotton sticks and ethylated alcohol, if the site to be operated is near it. The disinfection begins from the site of incision and continues with parallel strokes at three times making the area of disinfection smaller each time if possible. Disinfection should start from the further side of the nurse and continue to the nearer side. In laparotomy disinfection the area to be disinfected extends from mammillae level to the pubic bone and as far down of both sides as possible. It is wise to prepare as large area as possible in case the planned surgery extends and wider incision or drainage incisions need to be made. Used swabs should never be taken to the disinfected area again.

Important factors to remember are to proceed from clean to dirty, for example pubic area and arm pits are areas to be disinfected last, to observe the running direction of the disinfectant and to use brisk movements to promote mechanical cleansing. The swabs should be properly wet but if they are too wet, excess disinfectant is pressed to a garbage bin, not to the disinfecting kit. The disinfectant should not be allowed to pool under the patient, tourniquets or neutral electrode because it might act with diathermy and cause chemical burns.
The disinfectant needs to be let dry without wiping before placing the protective cloths to maximize the effectiveness of the agent. The disinfective effect lasts until the alcohol has vaporized. (Rantala et al. 2010, 221; Rummukainen, 2008, 33; Perttunen, 2006.)

5 THE POSTER

5.1 Content of the poster

When planning on implementing a poster, it is extremely important to handle the basic knowledge of what a poster actually means. A poster is a printed sign consisting of words and pictures and it differs from regular advertisements and announcements because of its comprehensive information. A poster is a visual aid, which gives the reader an unambiguous idea of the issue presented. The word poster (posteri) has been established in the Finnish language as an actual word. (Iivanainen & Hjerppe, 2008, 42.)

Health promotion is an action based on values, which promotes good health and prevents disease. Health promotion includes preventive and promotive forms of activity. The results can be seen for example as practice development. The influences of actions are shown in form of well- being and good health of the individual and community. (Tuominen, Savola & Koskinen-Ollonqvist, 2005, 7.) When producing learning material in the field of health care, the most common objective is to produce a piece that answers to the needs of the target group. A quality invested health promotion piece is a tool, which maintains empowerment and health of the individual. According to Rouvinen-Willenius, our thesis and poster is a promotive approach, because it pursues to empowerment of the individual.

The quality criteria of health promotion material are supposed to act as a tool for assessment and development. It increases the quality of the

material in the target group's point of view. It supports the coherent assessment of the material as well. The assessment standards are divided into two groups: presentation of aspects and the qualification of the material of the target group. In these groups there are several standards. The material should have concrete and clear objectives and should provide information on procedures that produce change on behavior. The material should be empowering and motivating and should service the needs of the target group. The material should rise interest and trust and should produce a positive atmosphere. The format of the publication and the form and content of the material should be taken into consideration in order to fulfill the criteria of health promotion material (Rouvinen-Wilenius, 10.)

In order to produce a functional poster and a written thesis we need to establish the target group. We need to consider to whom the publication is intended. Who or what group is the target? We need to consider what kind of people is the target group consisting of. The more constricted the target group, the more sufficient it is to focus on the wanted message. Generally the publisher is forced to lean on common sense and on his or her own knowledge of the target group (Pesonen, 2007, 3). Without the target group it would be relatively impossible for us to provide information with purpose and thought. (Vilkka & Airaksinen, 2003, 38-39.) Our poster is designed for nursing students. Students specializing in the perioperative field especially are able to gain full benefit from our poster. Mentors and teachers in the perioperative field are able to use our poster as a visual aid to provide back up to written theory.

The objective of the poster is to promote the usage of asepsis in the operation theatres and develop the learning process of nursing students. The usage of the poster should be adequate and effortless to the students and to the operation theatre staff as well. The poster should be

ready-to-use and speak for itself. There should be no need of additional explaining of the pictures and the text.

5.2 Appearance

The phrase ”looks are important” is an extremely noteworthy phrase when it comes to implementing an information poster. The poster should most importantly include a headline of the project you are researching and the names, titles and degrees of the authors as well. The length of the headline is recommended to consist of a maximum of ten letters in the English language. An interesting headline gets the attention of the spectator. In addition to the headline and the authors, the poster should include the purpose of the research presented. An outcome and a short discussion should be included as well.

The outlook of the poster should be taken into careful consideration. Colors should be used considerably making the poster serene. (Iivanainen & Hjerppe, 2008, 42.)

Typography is something we understand without reading. It means the tone, atmosphere and style of the publication. It is said that one picture says more than a thousand words. The same phrase reflects typography. It is not insignificant what font format and design is used in the publication.

Important facts that should be taken into consideration are the use purpose of the letters and the readability of the font. When choosing fonts less is more: commonly the most sufficient and co-ordinated ensemble is created with few fonts. The usage of multiple fonts in the publication creates an uncontrollable atmosphere. The layout brings balance and consistency to the publication. A layout model is a plan of

dividing the page and surface of the publication. The model determines marginal, columns, and the width of the columns. In addition it is possible to determine supportive lines that enable you to insert pictures, headlines or captions.

A picture is a powerful tool. Pictures create conceptions, claims and moods. With one glance, a viewer is able to perceive the central message of the picture. A picture draws attention, orientates the reader and helps to characterize and understand the written theory. A picture can be informative or decorative. Our pictures in the poster are informative because it creates new information in addition to the text. Most commonly a picture is a demonstrative photograph as in our poster. Sometimes it is important to consider if the picture needs vignettes or other icons to demonstrate an action as we did in our poster using for example arrows (Pesonen, 2007, 3-55).

5.3 Purpose of the poster

The purpose of our poster is to create a useful package of information to nursing students specializing in the field of perioperative care. We want to provide visual aid to teachers and perioperative mentors to support the written and spoken theory. Photographing actions and procedures help integrate nursing practice and it increases the know-how.

The disinfection of the operation site is an everyday procedure in the operation theatres. We want to provide a poster with valid information, which fulfills the standards of today's nursing practice.

We believe our poster would help remembering the stages of correct disinfecting, helping the students perform better in practice and in the

long run save costs in materials. The poster is planned to present proper and valid operation site disinfection from phase to phase, in case there is no one available to provide guidance.

5.4 Implementation of the poster

According to Abdullah and Hübner (2006, 30.) a mind map is an adequate action to brainstorm ideas. We used a mind map when planning the implementation of our poster. We listed the factors we wanted to present in the poster and combined them with the desired outcomes of Central Finland Central Hospital and JAMK University of Applied Sciences School of Social and Health Care.

The first issues to solve were to determine the photographer, the patient and the nurse. We came to the conclusion that we wanted to use a male model to create a more realistic situation. With the male model we were able to expose the whole upper body. The photographer was a friend of ours and one of us acted as the scrub nurse. Our school provided the equipment and a class room where the pictures were taken.

The most difficult part about the poster was to produce the visual appearance of the poster. Finally, we decided to use a neutral background and text and give the pictures full attention. We also wanted the poster to say as much as needed but also not to be too full of information so we had to limit the number of pictures and the length of the text. At the same time we had to keep in mind that the poster should be self-informative and give its viewers the needed information without having to read the theoretical part of our thesis. When we made the first version of the poster, we gained feedback from our teachers and the

aseptic nurse of Central Finland Central Hospital and based on that feedback we were able to make it more appropriate for its purpose.

6 DISCUSSION

6.1 Assessment of the process and outcomes

The working process of the thesis has been challenging in multiple means. The thesis has been produced while both of us have been working full time. This has been extremely problematic because of our different schedules. Working simultaneously has however brought experience and practical knowledge which has made it easier to examine the material more critically.

The fact that we live in a different city than our school is has brought difficulties as well. Arrangement of tutoring with our teachers was energy consuming because we did not have the benefit to gain the support from them as quick as needed. This was a fact we considered before we moved to a different city and were fully prepared for it. Fortunately our teachers were extremely flexible. The working process was divided unevenly making us more prone to slacken on occasions. It was hard to orientate on our reading and writing again after an intense working period.

Due to our positions in Hospital district of Helsinki and Uusimaa, we were fortunate enough to familiarize ourselves with different techniques considering skin disinfection. This caused difficulties in limiting our working process. Our thesis is directed only to Central Finland Central Hospital where the procedures and equipment are different.

Since the theoretical material we found about microbes and hospital acquired infections was mainly concerning the nursing procedures done in the wards, we had to direct our thoughts and limit the information to consider only perioperative nursing. Other factors such as work stress and stress in general, our intensive working in different environments and haste brought its own difficulties as well.

We were also concerned about the poster. The poster should have had more practical display and testing. Unfortunately it was not possible under the circumstances. The actual composition of the poster was extremely difficult because none of us is a graphic designer. Adjusting pictures to text was difficult. Still, we decided to compose the poster ourselves, making it precisely our own. The poster will be printed in Helsinki University Print.

The most time consuming process of our writing was the translation of the reference material. Most of the material was in Finnish. We were not able to use much of reference material of the English language because of the differences in practices and material used in English hospitals. The terminology translation was most time consuming of all. Although the reference material was mostly in Finnish and we found it challenging to translate, we feel that all of our material is current and up-to-date.

The subject of this thesis was chosen because we wanted to concentrate more on a matter that we both found interesting and that could also support our career development. We both are specialized in perioperative nursing so choosing a subject concerning the operative nursing care field was natural. When deciding the subject of our bachelor's thesis we both wanted to gain as much information on our field as possible. We feel that we gain more confidence in our working environment after completing the thesis. We want to gain more skills and

know-how in the field of written work because in our profession, learning and reporting is constant. In the future we want to be able to act as mentors as well and this thesis and the posters will provide us the tools to success.

The subject came as a request from Central Finland Central Hospital and they wanted an informative poster to be used as a visual aid with nursing students to support the learning process. Our own experiences from practical training in Central Finland Central Hospital gave us the idea of doing the poster also in English since the number of international students is so high. Since our own studying career was in the international degree programme, we found it important to take into consideration the learning of international students as well.

We thought that a functional thesis would be suitable for us because it would motivate us better when the outcome could be used in working life as well instead of doing it only for the school's purposes. Doing functional thesis also enabled us to co-operate with a contact person from Central hospital and actually reflect the theory to today's working life and its needs. (Vilkka & Airaksinen, 2003, 17.) We wanted to narrow our poster as much as possible. We decided to concentrate only on laparotomy disinfection in our poster because it is the most explicit procedure to put on pictures.

6.2 Professional growth

We chose this particular subject because we are both interested in perioperative nursing and although it was challenging and time consuming, we both found it pleasant. We feel our thesis helps us to orientate on our future working life. It gives us the tools to apply and deepen our knowledge on the subject. It has become a pleasant new fact, that we have noticed ourselves to be more aware of our working environments. We notice ourselves to be concentrating more on our own aseptic working and awareness.
Taking part in writing a thesis like ours, demands full devotion and responsible behavior. We feel that both of the virtues above describe a professional person, interested in his or her work and its outcomes. We feel we are able to proceed to working life as professional, registered nurses and step out of our role of students.

It has been productive to work as a pair and we both have found it more challenging than if we would both have produced a thesis alone. It has been rewarding to work with our applicant Central Finland Central Hospital and its staff. It is extremely pleasant to receive positive or constructive feedback from professional point of view. The picture material helped us in producing our poster to support our written guideline. It was easier to describe the procedure with fewer words with the help of the pictures.

In our opinion, it was challenging to step into a beginners shoes so to speak. Most of the subjects dealt in our thesis and especially the disinfection procedure was familiar to us. We needed to concentrate on what a beginner thinks when he or she examines the poster. We wanted

to make sure it is understandable to a student but also, that it was adequate enough to the mentor. It was interesting to be able to step into a mentor's role for a change. A little preview in student guidance is extremely important considering our future as professional nurses and possible mentors.

The process of our thesis helped us develop skills and know-how in project managing, careful planning and setting deadlines and creating timetables. We gained a lot of confidence in teamwork as well. Even though we study our degree in English, we feel we have improved our language skills, especially in written English as well as enriching our terminology.

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ATTACHMENTS

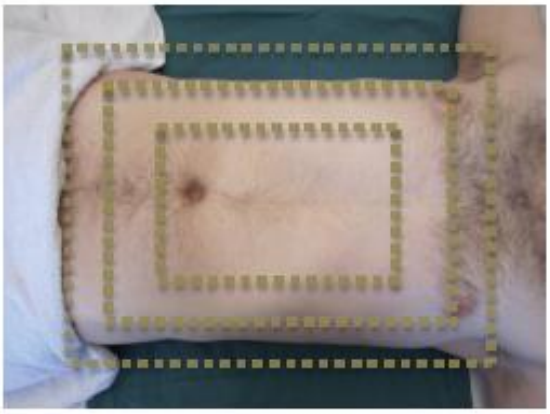
ATTACHMENT 1 Laparotomy disinfection poster

LAPAROTOMY DISINFECTION

REMEMBER TO DISINFECT YOUR HANDS BEFORE AND AFTER COLLECTING OF THE EQUIPMENT

1. ALL EQUIPMENT NEEDED FOR DISINFECTION ARE TAKEN CLOSE AT HAND: WASHING KIT, COTTON SWABS AND DENATURATED ETHANOL 80% (A12T). MAKE SURE A TRASH CAN IS CLOSE AT HAND AS WELL. ALL SWABS IN THE KIT ARE POURED WET WITH ETHANOL

2. ADEQUATE EQUIPMENT FOR SURGICAL SITE DISINFECTION INCLUDE A SURGICAL CAP, A NOSE-MOUTH MASK AND CLEAN GLOVES



3. THE LAPAROTOMY SITE EXTENDS FROM THE MAMILLARY AREA TO THE PUBIC AREA AND AS LOW FROM FLANKS AS POSSIBLE. THE SITE IS DISINFECTED THREE TIMES. THE SITE SHOULD BE NARROWED DOWN WITH EVERY WASH.

4. THE NAVEL AREA IS CLEANED WITH SWABS DIPPED IN ETHANOL.

5. START THE DISINFECTION FROM THE SITE OF EXPECTED INCISION. WIPE AWAY FROM YOURSELF, WITH PARALLEL MOVEMENTS. CONSIDER THE DIRECTION OF THE FLOW OF ETHANOL

HAIR REMOVAL OF THE SITE IS DONE BEFORE DISINFECTING, IF IT IS FOUND NECESSARY.

REMEMBER TO WORK FROM CLEAN TO DIRTY. DO NOT WIPE AN ALREADY WASHED AREA WITH A USED SWAB

JENNI ALA-LUHTALA & EVELIINA KAASALAINEN. MAY. 2011

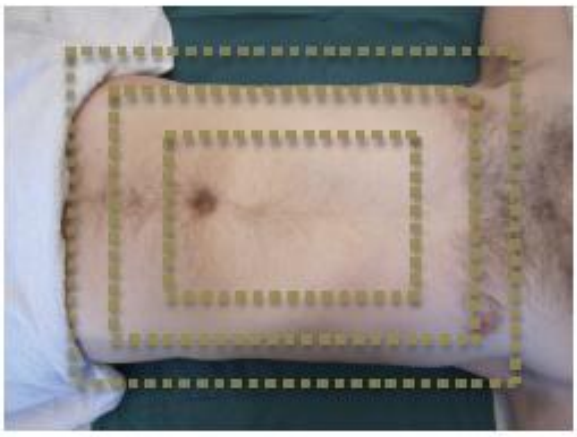
ATTACHMENT 2 Laparotomia desinfektio posteri

LAPAROTOMIA DESINFEKTIO

MUISTA DESINFIOIDA KÄTESI ENNEN JA JÄLKEEN TAVAROIDEN KERÄÄMISEN

1. DESINFEKTIOSSA TARVITTAVAT VÄLINEET: PESUPAKKAUS, VANUPUIKKOJA JA DENATUROITU ETANOLI 80% (A12T) KASTELE SYKERÖT ETANOLILLA. OTA ROSKA-ASTIA LÄHELLE.

2. VARUSTAUDU DESINFEKTIOON PUKEMALLA PÄÄLLESI LEIKKAUSMYSSY, SUU- JA NENÄSUOJUS JA TEHDASPUHTAAT KÄSINEET



3. LAPAROTOMIA ALUE ULOTTUU MAMILLA-TASOSTA HÅPYALUEELLE JA KYLJISTÄ MAHDOLLISIMMAN ALAS. ALUETTA PESTÄÄN KOLME KERTAA JA PIENENNETÄÄN JOKA PESUKERRAN JÄLKEEN.

4. NAPA PESTÄÄN ETANOLIIN KASTETUILLA VANUPUIKOILLA

5. ALOITA DESINFEKTIO OLETETUN VIILLON KOHDALTA. PESE ITSESTÄSI POISPÄIN, YHDENSUUNTAISIN VEDOIN. OTA HUOMIOON DESINFIOINTIAINEEN VALUMISSUUNTA.

6. KARVAT POISTETAAN JOS SE ON LEIKKAUKSEN KANNALTA VÄLTTÄMÄTÖNTÄ

ETENE PUHTAASTA LIKAISEEN. ÄLÄ VIE KÄYTETTYÄ SYKERÖÄ JO PESTYLLE ALUEELLE

JENNI ALA-LUHTALA & EVELIINA KAASALAINEN.
TOUKOKUU 2011