



# INSERTING A PERIPHERAL VEIN CANNULA

An educational video for English-speaking nursing students

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**Laurea University of Applied Sciences**

**INSERTING A PERIPHERAL VEIN CANNULA: An educational video for English-speaking nursing students**

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Nursing degree  
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Nursing degree

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Peripheral vein cannulation is a common procedure in healthcare, because it allows quick and easy access to veins, allowing fluid and drug treatment, and giving blood products and parenteral nutrition solutions to patients.

This functional thesis aimed to create an educational video in English, for English-speaking nursing students. While the information is accessible in Finnish, there is a noticeable lack of educational materials for peripheral cannulation in English that follow Finnish healthcare guidelines, especially in video-form material, addressing peripheral cannulation. The purpose of this thesis is to help English-speaking nursing students to learn about peripheral vein cannulation, through an educational video. The theoretical framework of the thesis contains evidence-based information on peripheral cannulation, patient safety, audiovisual learning.

The educational video was produced using a script written by the authors utilizing evidence-based literature, and the duration of the video is about 3.5 minutes. It contains indications for peripheral cannulation, preparations, cannulation techniques, and necessary equipment.

The collaborating partner is Laurea University of Applied Sciences. Once completed, the educational video will be published by Laurea UAS. The educational video was assessed by having nursing students answer a questionnaire anonymously. Afterwards, the authors analyzed the feedback by using chart bars.

Keywords: peripheral vein cannulation, students, educational video, nurses

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## 1 Introduction

Peripheral cannulation is a common procedure in modern-day health care. It provides direct access to the vein or the artery to give fluids and medication. Although the procedure is very effective, it carries risks for complications such as infections, nerve damage, bleeding, and hematoma formation. (Ropponen 2019, 22.) Peripheral cannulation is a method of treatment done only by qualified healthcare professionals such as registered nurses, medical practitioners, first aid personnel, public health nurses, or midwives. Healthcare professionals are required to have basic knowledge to perform the procedure with minimal risk. (Rautava-Nurmi, Westergård, Henttonen, Ojala, & Vuorinen 2020, 162.)

The authors initiated their background research by studying prior works related to the topic and discovered that previous bachelor theses exist on this subject, such as the Perifeerinen laskimon kanylointi opetusvideo conducted at Jamk University of Applied Sciences (Raatikainen & Ylitolva 2021) and Perifeerinen kanylointi opetusvideo made by nursing students in Metropolia University of Applied Sciences (Heiskanen, De La Chapelle & Henell 2020). Although the information is available in Finnish, there is a notable gap in knowledge of educational materials in English following Finnish healthcare guidelines, particularly in the form of video content, focusing on peripheral cannulation. The purpose of this functional thesis is to create an educational video for English-speaking nursing students following Finnish healthcare guidelines. The educational video provides essential support to degree nursing students, considering that most of the relevant information about peripheral cannulation following Finnish guidelines is only available in Finnish.

The educational video is done by following step-by-step instructions on peripheral cannulation, and it equips students with the latest evidence-based knowledge, aligned with Finland's healthcare guidelines. It is presented visually and demonstrated practically. Aiding students by ensuring a comprehensive and efficient understanding of peripheral cannulation. Furthermore, the video serves as a valuable tool for degree nursing students, allowing them to continuously review and enhance their skills. The working life partner for this thesis is Laurea University of Applied Science. The completed video will be made available primarily for degree nursing students from Laurea University of Applied Sciences. After the evaluation, the educational video was published on Laurea UAS site. In this bachelor's thesis, ChatGPT has been used to edit the language of the text and enhance the overall fluency of the text. The educational video was evaluated by the working life partner who was working as a Laurea UAS representative.

## 2 Theoretical framework

### 2.1 Peripheral vein cannula

A peripheral vein cannula, referred to as an intravenous (IV) cannula or IV catheter, serves the purpose of delivering medications, fluids, or treatments directly into a patient's bloodstream through a vein. This approach is particularly beneficial when there's a need for swift onset of treatment effects and precise control over drug concentrations. It's especially valuable in situations where oral administration might not be viable or effective. (Rautava-Nurmi, Westergård, Henttonen, Ojala & Vuorinen 2020, 162.)

Administering IV fluids, nutrition, drugs, and blood transfusions requires proper training, verified competence, and written permission from the overseeing doctor. An authorization for intravenous treatment can be procured via duly licensed professionals, including registered nurses, medical practitioners, first aid personnel, public health nurses, or midwives. The assessment of their proficiency is conducted periodically within the confines of the workplace. (Rautava-Nurmi et al., 2020, 162.)

#### 2.1 Indications for peripheral vein cannulation

Indications for peripheral vein cannulation are maintenance of normal fluid and electrolyte balance when the patient cannot take fluids orally or enteral hydration is not appropriate, e.g. surgery patient, administering drugs when other routes of drug administration are not appropriate, such as pain medication, also administration of blood products, replacement of severe fluid loss in an acute situation, such as bleeding, shock, burns, vomiting, or dehydration due to diarrhea and securing the vascular connection in the acute phase of the disease. (Iivanainen & Syväoja 2016, 443.)

The peripheral vein cannula itself is a plastic tube that is inserted into the vein with the help of a needle; a plastic hollow tube remains in the vein and the needle part is removed (Terveyskylä 2020). As shown in Table 1. The peripheral vein cannula comes in different sizes and the diameter of the cannula is given in gauge units (G). The size of the cannula is selected according to the purpose of use. The size of the cannula affects the flow with which fluids and medicines can be administered. When the G unit increases, the cannula diameter decreases, and vice versa. (Saano & Taam-Ukkonen, 2021, 170.)

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COLOR	SIZE	FLOW RATE	PURPOSE OF USE
PURPLE	26	13-20 ml/min	For newborns and children
YELLOW	24	20-36 ml/min	For newborns, children, and the elderly (fragile veins)
BLUE	22	36-60 ml/min	For fragile and small veins
PINK	20	60-80 ml/min	For adults, medication infusions and hydration
GREY	17	90-180 ml/min	For adults, in need of urgently large volumes of fluids and blood products i.e. trauma patients
ORANGE	14	180- 240 ml/min	For adults, in need of urgent and massive hydration

Table 1. Cannula size and purposes (Saano & Taam-Ukkonen, 2021, 170)

Selecting the correct cannula size is essential. The nurse chooses the size of the cannula according to the purpose and the patient who it will be used for e.g. babies and small children usually use the smallest cannula size, i.e. purple which is the smallest size and blue cannula for patient with fragile and thin veins. If the intended use is for adult patients who urgently need a large amount of hydration, the size of the cannula is orange and the largest size. The size of the cannula is constantly evaluated, because a too big cannula can damage the patient's veins or block the blood flow in the vein. (Saano & Taam-Ukkonen, 2021, 170).

A safety cannula is a medical device designed to prevent needlestick injuries in healthcare settings. To prevent needlestick injuries, various safety cannulas have been developed. In the safety cannula, the needle blade is protected when the needle is pulled out. (Saano & Taam-Ukkonen, 2021, 169.) It is widely used in Finland because needlestick injuries are a big risk in connection with peripheral vein cannulation. In picture 1. two different sizes of cannulas with different safety mechanisms are shown.

Lisää tekstiä napsauttamalla tätä.



Picture 1. From left safety cannula orange before and after the use and blue cannula before and after the use (@ Hafso Ali)

## 2.2 Asepsis, complications, and safety of peripheral vein cannulation

Intravenous drug treatment presents various challenges, with a significant concern being the high risk of infections. Inflammation can originate at the insertion site and progress along the cannula, potentially affecting the entire body. Given the substantial infection risk associated with cannulation, the procedure warrants an approach akin to a minor surgical operation. Signs of local inflammation encompass pain, redness, swelling, tenderness, venous hardening, and localized increased skin temperature. Mechanical irritation of the vein arises from the presence of the foreign cannula and the size of the cannula, can induce a reactive response that intensifies with cannula duration within the vein. Chemical irritation results from the interaction of infusion fluids and added medications, while microbial contamination arises from non-aseptic procedures. (Iivanainen & Syväoja, 2016, 444)

Most treatment-related infections are caused by bacteria. Usually, these infections originate from bacteria that the patient already had when they arrive at the hospital. Bacteria can also spread through healthcare staff's insufficient hand hygiene. (Terveysportti, 2022.). Essential measures to prevent infections include maintaining proper hand hygiene and practicing aseptic techniques during the procedure and handling of the cannula. It's important to minimize unnecessary handling

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of the peripheral vein cannula and keep the number of injection ports to a minimum. Prompt removal of the cannula once it's no longer needed is recommended. (THL, 2021.)

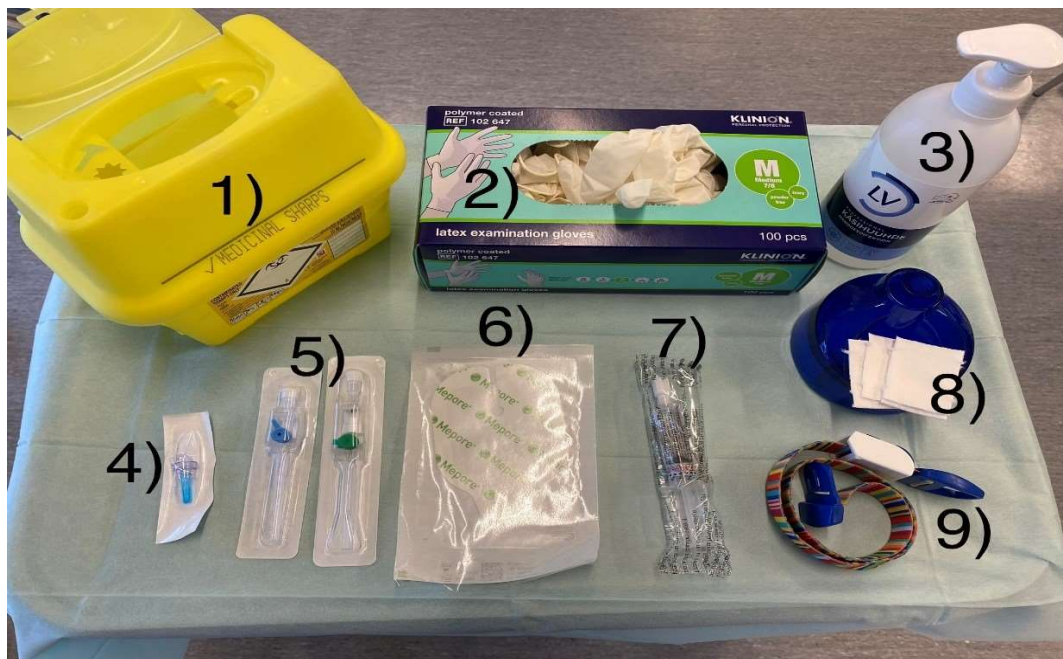
The primary purposes of the protective film on the cannula are to shield the puncture site, secure the cannula in place, and prevent microbial contamination. Maintaining a dry puncture site and dressing is crucial. During dressing changes, the skin surrounding the puncture site should be disinfected using >70% alcohol or 2% chlorhexidine-alcohol solution, allowing it to dry before applying a new protective film. Unless the protective film becomes soiled or there are signs of infection at the cannula's base, it is advisable to change the protective film every 5-7 days. (THL, 2021.)

### 2.3 Peripheral vein cannulation steps

Peripheral vein cannulation is undertaken based on various indications. These indications vary depending on the situation. As said earlier, examples include the essential maintenance of normal fluid and salt balance in situations where oral fluid intake is impractical or enteral hydration is contraindicated, as observed in surgical patients. Furthermore, peripheral vein cannulation proves crucial for drug administration when alternative routes are unsuitable, particularly in the case of medications such as pain relievers. (Iivanainen & Syväoja 2016, 443, Evison, Carrington, & Keijzers 2022, *BMJ Open*). Licensed medical professionals make an informed decision regarding the initiation of peripheral vein cannulation, carefully evaluating the patient's condition and tailoring the approach to address specific medical needs (NHS, 2023, 4-5,16). Communicating these indications to patients is important, serving as a crucial first step in the process. This transparent communication not only informs patients about the necessity of the intervention but also fosters understanding and cooperation. (Kourkouta, & Papathanasiou 2014.)

After this, the next step is collecting equipment before the cannulation to avoid mid-procedure retrieval challenges that jeopardize aseptic conditions and patient safety. Supplies needed for peripheral vein cannulation: cannula, connector tubing, alcohol, with an alcohol content of at least 70%, factory clean gloves and edge waste container, sterile cannula dressing, tourniquet and ready to use 5 ml NaCl 0.9% a syringe that can be used to test the function of the cannula and sometimes numbing cream is used as local anesthesia. Next, the nurse introduces her/himself to the patient, makes sure of the patient's identity, and informs them about the insertion of a peripheral venous cannula. (Saano & Taam-Ukkonen, 2021, 176-177.)

Lisää tekstiä napsauttamalla tätä.



Picture 2. 1) Sharps disposal container 2) Factory clean gloves 3) Hand sanitizer 4) Connector tubing, 5) Blue and green Cannula 6) Sterile cannula dressing 7) Ready to use 5 ml NaCl 0.9% a syringe 8) 70% alcohol content 9) Tourniquet. (@ Hafso Ali)

The preferred punctation site for the peripheral vein cannula is on the back of the non-dominant hand. Finding a suitable punctation site can be challenging in different target groups, such as children, obese patients, and people with darker skin complexes. The correct puncture site is found on the patient's limb by palpating with the fingertips. Often appropriate, the site can be found on the back of the hand or in the veins of the forearm. As a puncture site, veins of the upper rather than the lower limb are preferred, because thrombus, i.e., the risk of venous occlusion is greater in the lower limbs. (Rautava-Nurmi et al., 2020, 444-447). The skin of the injection site is disinfected with at least 70 percent alcohol and the skin is allowed to dry before injecting. Avoid touching the disinfected area once the disinfectant has dried completely. At this point, the nurse disinfects their hands and puts on factory-clean protective gloves. (Saano & Taam-Ukkonen, 2021, 177.)

The peripheral vein cannula is removed from the protective packaging, the wings of the cannula are straightened, and the plastic cover of the venous cannula is removed. The needle stays untouched to keep it sterile. A three-finger pinch is taken from the cannula. The patient's skin is tightened near the injection site to prevent the vein from escaping while puncturing, being careful not to touch the disinfected area. The needle opening of the cannula should be facing up, and it is good to tell the patient what is to come from the injection. The cannula is inserted into the vein at an angle of about 30 degrees. The needle is advanced in the vein until in the chamber at the end of

the needle blood is detected. The cannula is straightened and advanced about two millimeters. The needle is withdrawn at the same time as the remaining plastic part of the cannula is left in the vein. The needle should never be pushed back to the cannula. Pressure is applied to the vein and the tourniquet is released. The vein is gently pressed from the tip of the cannula to prevent the blood from escaping. When pressing the vein, the needle is completely removed from inside the cannula and the needle is transferred to the sharp bin. Next, the function of the cannula is checked by putting ready-to-use 5 ml NaCl 0.9% fluid into the cannula. After the nurse has checked that the cannula is functioning, a disinfecting cap is placed on the cannula, or it is connected directly to the infusion. The next step is to put the dressing on top of the cannula to secure its placement. (Saano & Taam-Ukkonen, 2021,177.)

It's important to minimize unnecessary handling of the peripheral cannula and keep the number of injection ports to a minimum. Prompt removal of the cannula once it's no longer needed is recommended. When the cannula is removed, the patient is instructed to apply pressure to the injection site for a moment, allowing the bleeding to stop. Then a bandage is applied, and the patient is asked to observe the injection site for leakage. (THL, 2021)

## 2.4 Patient Safety

Patient safety spans a range of critical elements, assuring the safety of treatment procedures, secure medication management, and proper medical device use. In every healthcare setting, a strong reporting system should be in place, carefully monitoring and addressing any adverse events during treatment. Simultaneously, these organizations are required to establish a comprehensive patient safety strategy. (World Health Organization 2023, Sosiaali ja terveystieteiden ministeriö 2022). This strategy involves identifying responsible individuals and outlining how the administrative leadership of the facility will proactively meet the necessary conditions and resources for delivering exceptional healthcare services while upholding patient safety standards, as outlined by the EU Healthcare Directive of 2022.

Furthermore, patient safety is a complex interplay where treatment safety, involving careful care methods and technical nursing expertise, harmonizes with medication administration security. This extends naturally to aspects like physical safety and proper medical equipment functionality. Notably, another crucial aspect involves non-technical competence, which encapsulates a holistic patient-centered approach. (THL 2011,7.) In this context, communicating pertinent treatment-related information to patients takes on paramount significance, nurturing a stronger sense of security and reassurance for the patient (Leino-Kilpi 2009, 176-177). This approach hinges on evidence-based, impactful treatment that's accessible and equitably delivered. This commitment to

quality care is further woven into the fabric of cost-effectiveness. From a different perspective, another facet of patient safety highlights the idea that patients should receive necessary medical interventions with minimal risk. (THL 2011, 7.)

In the specific context of peripheral vein cannulation, patient safety principles are to ensure proper hand hygiene, select an appropriate vein, use aseptic technique, and monitor for complications during peripheral vein cannula insertion to prioritize patient safety (Franklin, Deelchand, Cooke, Holmes, & Vincent 2012.) This includes ensuring safe treatment practices, adept nursing techniques, secure medication administration, and proper equipment use. (THL 2021) Effective communication of treatment-related information holds paramount importance, fostering a heightened sense of assurance for patients during the peripheral vein cannulation process. (Vaismoradi, Tella, Logan, Khakurel & Vizcaya 2020) Patient safety in peripheral vein cannulation involves thoroughly understanding how to secure treatment procedures while putting the well-being of the patient first. This, with detailed reporting and good safety plans, is key for safe and efficient peripheral vein cannulation practices. (Faris, Abdulkareem, Ismael & Qader 2023.)

## 2.5 Video as an educational method

Utilizing videos as a study aid proves to be at least as effective as traditional face-to-face teaching when it comes to facilitating learning (Kuokkonen 2019). Individuals acquire knowledge and information through diverse channels, often optimizing their learning process by engaging in methods that align with their innate preferences and tendencies. This method typically produces the most optimal learning results. (Laine, Salervo, Sivén & Välimäki & Ruishalme 2014). Videos used for educational purposes improve understanding and memory by leveraging the influence of both audio and visual components on the viewer's cognitive, logical, and emotional reactions (Kuokkonen 2019). The instructional video is a beneficial tool for cannulation training along with other educational materials. Saving and replaying the video whenever needed is crucial for effective learning.

## 3 Purpose and aim of the thesis

The purpose of this thesis is to support degree nursing students learning the process of peripheral vein cannulation, through educational video. The aim is to create an educational video in English, for degree nursing students following Finnish healthcare regulations in peripheral vein cannulation.

## 4 Functional thesis

A functional thesis is one of the many kinds of theses. It focuses on work and daily life to create and develop something such as an activity. Included are the theoretical and practical parts of the functional thesis. In the theoretical section, the research concerns or questions are defined, and a body of knowledge is created. The theoretical section also includes the reporting of the results of the functional part's analysis. (SeAmk: Toiminnallinen opinnäytetyö 2019). A handbook or a video are a few examples of the functional component.

An educational video containing both visual and auditory components increase the likelihood that the viewer will remember the subject and be able to repeat what was shown. Studies have shown that the brain processes visual information more quickly and thoroughly than text. (Raiyn 2016, 115).

### 4.1 Information search for functional thesis

In the process of information retrieval, the primary criteria revolved around source reliability, recency within a five-year span, and contemporary relevance. The search aimed to acquire evidence-based data, treatment recommendations, and pertinent news updates. This entailed referencing sources like the Health Library (Terveysportti) website. Furthermore, databases such as Medic and PubMed were employed to access studies and relevant information. Specific search terms included "cannula," "cannulation," "peripheral vein," "infections," "educational video," "peripheral intravenous cannula," "intravenous cannulation," "infections," and "complications." The exploration extended to encompass literature and resources, including those from THL. While the search was initially conducted in Finnish, it was also expanded to encompass English-language databases, ensuring a comprehensive scope of investigation.

### 4.2 Implementation of the functional thesis

The authors of this thesis selected the topic in September 2022 due to the identified scarcity of English teaching videos following Finnish guidelines. The decision to create a quality educational video tailored for Laurea UAS stemmed from the authors status as English-language students at the institution. Previous theses on peripheral vein cannulation provided insights for the work, which influenced the initial framework development. The process began by presenting the thesis plan in a seminar. The supervisors reviewed the plan and added comments to it. The authors corrected the plan and sent the finished version to the supervisors, who then either approved the plan or indicated that the work needed more correction. Once the plan was approved, the authors moved on to the next stage and started filming the educational video.

The written component of the thesis journey started with a focused approach to defining authors' goals and objectives. Research was conducted to gather information on peripheral vein cannulation and instructional videos. Discussions during meetings guided the content selection and the creation of a table of contents with headings. Ongoing discussions during the meetings played a crucial role in shaping the content and constructing a comprehensive table of contents with relevant headings. To effectively distribute the theoretical part among the group members, each is assigned a specific section to work on.

## 5 The production process of the educational video

### 5.1 Manuscript

When planning the educational video manuscript, it's good to begin with the educational objectives specific to the intended audience. These objectives encompass areas like knowledge, skills, or attitudes. During the production of the educational video, it's important to ensure an engaging and motivating presentation. For training and educational content, avoiding extremes of simplicity or complexity is advised, as excessively intricate tutorial videos can deter viewers. The optimal duration should be moderately short, usually ranging from two to six minutes. (Kuokkonen 2019).

### 5.2 Design phase

The goal was to produce an evidence-based educational video. The theoretical base work was done to highlight the parts of the peripheral vein cannulation that are important, such as the importance of good hand hygiene while being in skin contact with the patient and how to work aseptically throughout the process. The educational video provides clear, step-by-step instructions which will make understanding easier for the students' audio-visually. Planning for this bachelor thesis started May 2023. The authors met up and discussed what kind of video was needed and how to get the best evidence-based information into a visual video.

The script was reviewed verbally before transcription, and each step will be meticulously executed to ensure a clear and easily comprehensible outcome. Commencing the production of the educational video, the authors examine each step to comprehensively address fundamental aspects and the equipment utilized in the insertion of a peripheral vein cannula. The manuscript for the educational video is found in Appendix 1.

### 5.3 Production phase

The production process can be categorized into three main phases: pre-production, production, and post-production. During pre-production, tasks such as script development and the creation of shooting plans take place. The production phase encompasses preparations, directing, filming, potential audio recordings, and lighting arrangements. In the post-production phase, activities such as supplementary audio recording, editing, post-processing, potential motion graphics creation, final product assessment, and delivery to the client are conducted. (Assemble Magazine 2022.)

The educational video was filmed at Laurea UAS premises, and Laurea also provided the necessary needed peripheral vein cannulation equipment. The authors agreed with each other to go ask outside help for filming and editing the video. The authors have consulted Laurea's UAS media producer and agreed with them about the production of the video. The authors have shared the roles of producing the educational video among themselves. The division of production goes in such a way that one of the authors acts as the patient of the procedure, the second does the peripheral vein cannulation, and the third author's voice is used for the educational videos' audio. The cannulation of the educational video took place under the supervision of the teacher. The educational video is filmed under the supervision of the senior lecturer. The actual production process started when the authors got an approved research permit from Laurea UAS. After obtaining the research permit in mid-January 2024, filming for the educational video on peripheral vein cannulation began immediately. The senior lecturer joined the process. Pre-production started with the authors meeting among themselves to gather the necessary equipment and review the script. This collaborative session allowed for corrections and discussions about the upcoming filming, including how roles would be assigned and divided.

The authors enlisted the help of Laurea University's media producer for filming and editing. Prior to filming, the producer and authors thoroughly assessed and arranged the workstation's angles, space, background, and lighting to ensure optimal clarity. Rehearsals, including test scenes, were conducted to perfect the video.

The educational video was structured into three distinct scenes. The first scene captured the preparation of the equipment table, followed by the second scene of the nurse disinfecting hands and putting factory-clean gloves. The final scene was the insertion of the peripheral vein cannula. This last scene, due to the complexities of finding the right vein, required multiple takes. Together with the supervising lecturer, a decision was made to change the patient, with the author playing the role of the narrator taking on the patient's role. Post-filming, focus shifted to editing and voice recording. The script underwent multiple readings before recording, ensuring clarity, appropriate

spacing, and quality. Test recordings were conducted to synchronize the voice with the video speed seamlessly. The media producer presented the authors with the raw scenes, allowing for a comprehensive review. This step enabled the authors to make informed decisions on narration and text additions.

The entire production process, including breaks, took about seven hours. The aim was a 5-minute video, but the final product was 3 minutes and 28 seconds. The media producer delivered the edited video the next day. Collaborative feedback led to the submission of the final version to senior lectures for evaluation. Upon submission, the educational video was reviewed by supervising teachers, who watched it together and provided feedback. While the supervisors praised the overall quality and clarity of the video, most of the comments focused on the last scene about the insertion of the peripheral vein cannula. Additionally, there were suggestions for refining the wording of equipment used in the procedure. Acknowledging the importance of addressing these comments, the authors arranged a meeting with the media producer to discuss necessary corrections. Despite the challenge of securing a supervising lecturer on short notice, one was successfully arranged.

At the end of January 2024, filming resumed. Prior to filming, the authors met for an hour to finalize details and make script corrections. The authors strategized on ensuring a seamless process. Upon meeting with the supervising teacher and media producer, the authors gathered the necessary equipment, and filming started. The authors primarily focused on the scenes requiring reshooting, particularly the scene involving the insertion of the peripheral vein cannula and the preceding steps leading up to it. Upon completing filming, the authors, along with the media producer, proceeded to the recording studio to record any script changes.

The following day, the media producer provided raw materials with time stamps, facilitating easier correction, and editing. The authors thoroughly watched the video multiple times, identifying editing corrections that needed to be made. The producer made the necessary edits and sent the finished video once more, this time without any further corrections required. With the video refined, the authors submitted it to the supervising teachers. Upon review, the teachers accepted the video and agreed that it met the required standards.

## 6 Assessment of educational video and data protection

In functional thesis, there is a clear deviation from conventional research thesis, as there are no standardized templates provided for guidance within universities of applied sciences (Airaksinen &

Vilkka, 2003, 154, 161). Upon completion, the educational underwent an assessment in a thesis seminar attended by both thesis supervisors and students. As part of the comprehensive evaluation process, the authors developed a survey to gather feedback on the educational video. The survey questions are intricately crafted to align with the thesis objectives, ensuring that the collected feedback is directly related to the purpose and aims of the study, as underscored by the tutor's feedback.

The principal objectives of the thesis revolve around assessing the effectiveness of the educational video in meeting its intended purpose. Specifically, the aim is to evaluate its impact on the understanding and retention of crucial nursing concepts among third-year students (Brame 2016). The surveys are conducted via an e-form, which can be found on Laurea intranet (E-lomake). The survey questions are meticulously designed to address clarity, relevance, and overall educational efficacy, directly tying the feedback to these objectives (Yaddanapudi & Yaddanapudi 2019).

Based on the privacy and data protection concerns, the survey design incorporates principles outlined in the General Data Protection Regulation (GDPR), with explicit attention given to ensuring participants consent, anonymity, and overall privacy. The authors adhere to ethical guidelines provided by TENK and Arene, further safeguarding the rights and well-being of the participants. Prior to taking part in the survey, participants will receive a cover letter for the questionnaire along with a link to access it. The cover letter should include a brief description that conveys essential information on the topic clearly outlining the handling of participant responses to ensure both confidentiality and anonymity. (Kaiser 2010.) In this letter also a clear explanation of the objectives is presented. Informed consent is fundamental to ethics, ensuring that participants comprehensively understand the purpose and potential implications (Yip, Han, & Sng 2016). By completing the E-form and submitting the answers, participants are providing informed consent. The survey distribution process is structured to uphold the principles of anonymity. The tutor teacher, serving as an intermediary, selects the target group for the survey. This ensures participant anonymity and adds an extra layer of ethical oversight, entrusting the tutor with safeguarding the participants privacy. The goal was to get around 10-15 participants. Participation in the survey was entirely voluntary, highlighting the author's commitment to ethical research practices. By incorporating GDPR principles, the participants are assured that their data will be handled with the utmost care, stored securely, and used exclusively for research purposes.

Transparency in data handling processes is maintained to instill confidence in the participants regarding the ethical conduct of the study. The survey results were utilized solely for the assessment of the video, and strict confidentiality was maintained. All the data was securely stored with password protection and is deleted upon the completion of the thesis.

Questions will be the following.

1. The flow and progression of the educational video are easy to follow?
2. The presented information in the educational video is easy to understand?
3. An aseptic technique was utilized in the educational video?
4. The educational video comprehensively covers the topic?
5. The educational video has relevance and utility for educational purposes?

#### 7 The feedback of the educational video

On March 4<sup>th</sup>, 2024, the survey was sent by the tutor teacher to 25 third-year students, but only 3 students responded. On March 18<sup>th</sup>, the survey was sent again, this time to 80 students consisting of second- and third-years nursing students. Seven students responded to this second round of surveys. A total of 10 individuals responded in the survey, with responses collected over approximately one month. Two of the respondents disagreed regarding the fourth question, which asked whether the video comprehensively covers the topic (refer to Table 4). Additionally, the educational video was presented by the authors at a thesis seminar attended by 12 students and 2 lecturers. Both the lecturers and students provided verbal feedback on the seminar, with unanimous agreement that the video was clear and straightforward. No constructive criticism was given. The educational video was also assessed by Laurea UAS working life partner representative. The working life partner gave the authors positive feedback stating that the video was very clear, and they liked that it was simple enough to demonstrate the technical procedure of cannulation. The representative also asked if they could use the video for their upcoming class. The feedback was given via email.

Two respondents disagreed on whether the video comprehensively covered the topic, only one of them provided an explanation for their disagreement and gave a correction proposal. After the correction proposal was received from one of the participants regarding how to choose a correct cannula size (see Table 4.). The authors took the suggestion and added the information about choosing the right cannula size to the theoretical part of the thesis.

Lisää tekstiä napsauttamalla tätä.

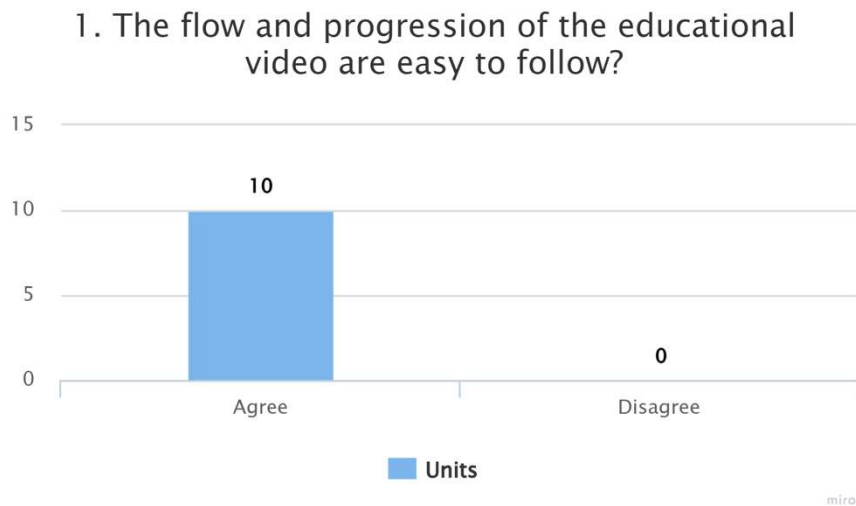


Table 1: Flow and the progression of the video are easy to follow.

In the first question, all the respondents agreed that the videos flow and progression was easy to follow

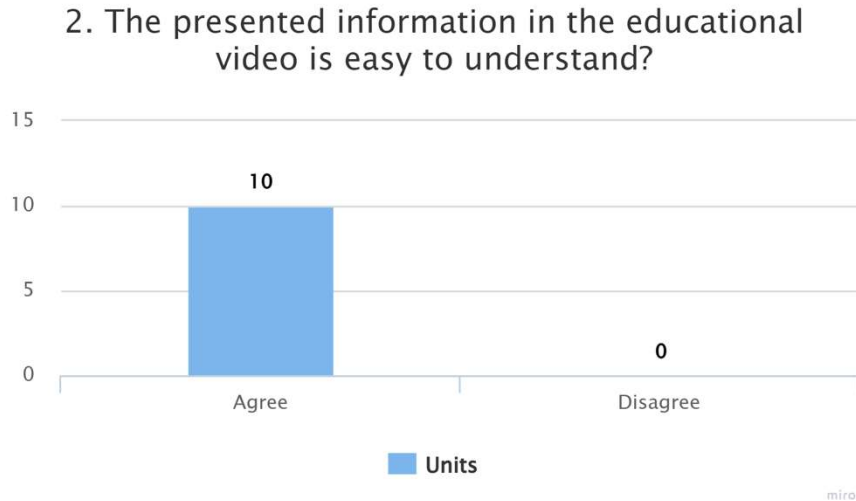


Table 2: Information in the video is easy to follow.

In the second question, all the respondents agreed that the information in the video is easy to understand (Table 2).

Lisää tekstiä napsauttamalla tätä.

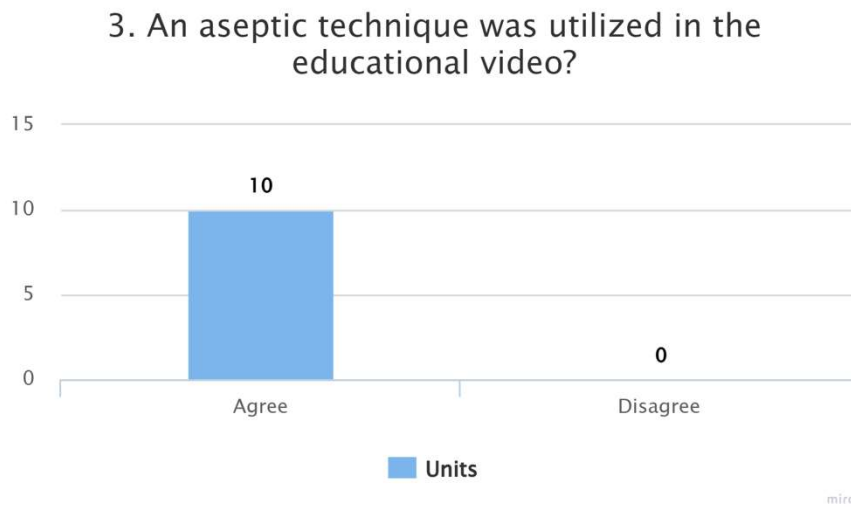


Table 3: Aseptic technique is used in the video. In the third question, all the respondents agreed that aseptic techniques are used in the video (Table 3).

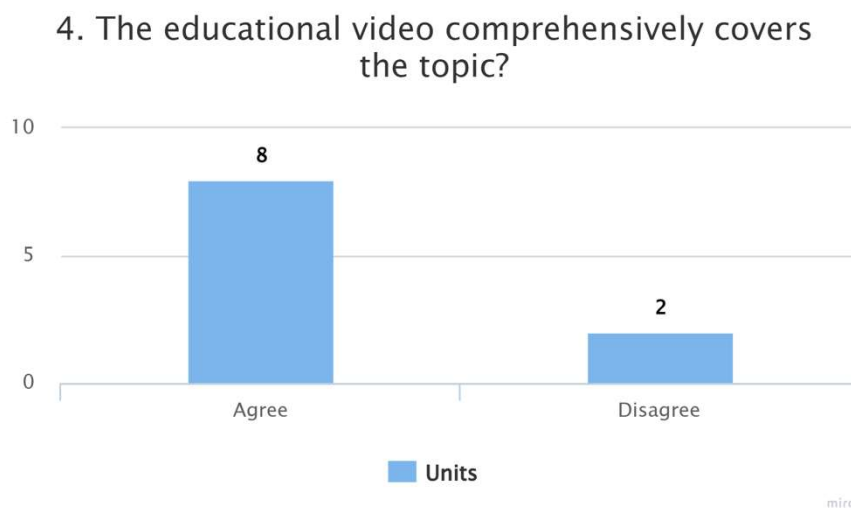


Table 4: Educational video comprehensively covered the topic. In the fourth question, two respondents disagreed on whether the video comprehensively covers the topic (Table 4). One of the respondents provided a comment suggesting that they would have liked to see in the video how to choose the right cannula size.

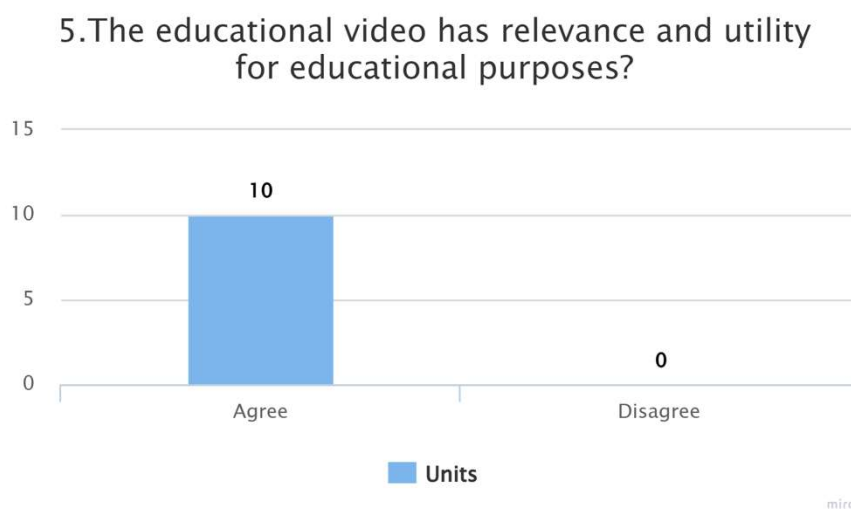


Table 5: Educational video is relevant and can be used for educational purposes.

In the fifth question, all the respondents agreed that the video was relevant and can be used for educational purposes (Table 5).

## 8 Ethics

Research ethics is the application of principles in research activities. This includes planning and conducting research in a way that shows respect, honesty, general care, and accuracy in research work, recording and presenting results, and evaluating research and its results. Adhering to ethical considerations in research is critical for ensuring the prevention of any potential harm that may arise from the research or its findings, both to the subjects under study and the individuals participating. This commitment to ethical standards not only upholds the integrity of the research process but also underscores the responsibility to prioritize the well-being and safety of all individuals associated with the study. Therefore, scrupulously adhering to ethical guidelines enhances the overall credibility and reliability of research outcomes, cultivating a culture of respect and protection within the scientific community. (TENK 2019.)

The authors appropriately acknowledge and respect the work of their peers by referencing their publications and recognizing the value of their contributions in their own research and publications (HTK 2023). Authors carry the responsibility for addressing ethical concerns that may arise during their research. By consistently following strict ethical guidelines and instructions, authors ensure that they are well-prepared to handle any ethical challenges that might arise in the future. (TENK 2019.) During the thesis research, a diverse range of sources was utilized, including evidence-based nursing

knowledge and regulations established by the Ministry of Social Affairs and Health, in addition to guidelines provided by the Institute of Health and Welfare. This approach was adopted to ensure the applicability of the thesis findings within the context of Finland.

Once the research plan was approved the authors applied for the research permit from Laurea UAS and filmed an educational video on its premises. After the educational video was produced, the plan was to collect feedback from nursing students. Feedback is collected anonymously and confidentially using Laurea UAS's own e-form. This e-form allows the authors to prepare feedback survey. The privacy of the participants in the survey is protected in such a way that the link to the e-form is only shared with the teacher, and the data will only be processed by the authors.

## 9 Reliability and validity

The reliability and validity of the thesis have been reinforced through a comprehensive understanding of the topic and a thorough review of pertinent literature (Jansen 2023). As nursing students, the authors practice peripheral vein cannulation both at work and during practical training. In the process of the thesis, a commitment to evidence-based scientific methods was upheld, and due acknowledgment and referencing of prior research and contributions by others were consistently maintained. The content was created with meticulous care and without any form of plagiarism, with substantial efforts dedicated to generating original material pertaining to the sensitive subject.

The plan is to produce an educational video that is usable and high-quality. The manuscript for the educational video was prepared by adhering to the latest guidelines to ensure its relevance and practicality, with a focus on preventing the dissemination of inaccurate information in an educational setting, to ensure the reliability and validity of the final product. The reliability of the thesis also depends on the cooperation with the supervisors and adherence to mutually agreed-upon agreements, which the authors have aimed to fulfill. (Arene 2018.)

The thesis, along with the educational video, was presented at a seminar attended by both nursing students and lecturers. The authors received positive feedback verbally from the attendees. After the seminar, the authors sent the final version of the video to the working-life partner via email. The educational video's credibility is strengthened by its theoretical foundation.

## 10 Conclusion

In the creation of an educational video focusing on inserting a peripheral vein cannula, the authors quickly identified a significant gap in the availability of comprehensive educational materials that adhered to Finnish guidelines. This realization presented the authors with a distinctive opportunity to develop an educational resource that directly addressed the gap in knowledge.

Throughout the execution of this thesis, the authors' commitment was evident despite the challenges posed by work commitments, mandatory lessons, placements, and the overall complexity of managing differing schedules. The experience of effectively juggling these responsibilities not only refined the authors' time management skills but also contributed significantly to the overall professional development.

The collaborative project undertaken by the authors alongside their working life partner played a crucial role in achieving significant milestones, benefiting both individuals involved. By combining personal insights and experiences gathered from clinical placements and professional environments, the authors succeeded in producing an educational video tailored to meet the needs of both current and future nursing students.

Furthermore, this project acted as a driving force for the professional growth of the authors, offering invaluable opportunities to broaden the authors knowledge and skills in both nursing practice and multimedia production.

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ChatGPT has been used to edit the language of this text.

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Appendix 1: Manuscript for the video

<p><b><u>Scene 1- Introduction</u></b></p>	<p>On the screen, a slide with Laurea's logo and the name and authors of the thesis.</p> <p>Peripheral vein cannulation. This video was made as a functional thesis for the University of Applied Sciences of Laurea, for it to be used as teaching material. This video is intended for nursing students and graduated nurses to support learning. It explains the correct cannulation technique and cannulation sites. This text is in slide</p> <ul style="list-style-type: none"> <li>• After the slide, the next picture is when the nurse walks into the procedure room.</li> </ul>
<p><b><u>Scene 2- Let's talk about peripheral vein cannulation in general.</u></b></p> <p><i>Narration</i></p>	<p><i>“A peripheral venous cannula is placed for intravenous fluid therapy, drug therapy, nutritional solution, blood products and to secure vascular access in situations requiring urgent treatment”</i></p> <p><i>“Before starting the procedure, the patient's identity must be confirmed. Identity is confirmed by asking the patient ID or asking them their social security number. After that you inform the patient what you they are receiving the cannula and how the procedure will go.</i></p>
<p><b><u>Scene 3- Picture of the finished cannulation instrument table about 1 min.</u></b></p>	<p><i>“Before starting the cannulation, it is important to gather the necessary equipment to have everything within reach. Retrieving instruments</i></p>

Lisää tekstiä napsauttamalla tätä.

<p><b>Narration</b></p>	<p><i>during cannulation endangers the aseptics of the procedure and patient safety”</i></p> <p><i>“ Necessary tools for peripheral cannulation are: cannula, disinfectant, gauzes, factory clean gloves, sharps disposar container, semi-permeable protective film, and a ready-to-use 5ml NaCl 0.9% flushing syringe, which can be used to ensure the functionality of the cannula. “</i></p>
<p><b><u>Scene 4- Initiating the procedure</u></b></p> <p><b>Narration</b></p>	<p><i>“The patient's arm is placed in the right position, a pillow can be used for support, then the stasis is placed on the patient's arm and the search for the vein begins. After finding the vein to be cannulated, the nurse tightens the stasis on the arm to prevent the blood flow and make the vein more visible”</i></p> <p><i>“Before starting to cannulate, the nurse disinfects the hands carefully, after which he/she puts on the gloves. “</i></p> <p><i>“Next, the nurse cleans the injection site with an alcohol soaked cleaning pad with one long stroke, after which the injection site must no longer be touched. The protective cap is removed of the cannula and take a good three-finger grip on the cannula. The skin area is slightly stretched so that the vein stays better in place when entering. When piercing the skin, inject at angle of about 30 degrees”</i></p>

Lisää tekstiä napsauttamalla tätä.

<p><b><u>Scene 5- Close-up of the injection site</u></b></p> <p><b>Narration</b></p>	<p><i>“When the needle tip is in the vein, blood flows into the chamber. The needle is pushed a few more millimeters into the vein. Stasis is removed. The needle inside the cannula is withdrawn away from the vein, while simultaneously pushing the plastic cannula into the vein”</i></p> <p><i>“When the needle has been withdrawn from the cannula, blood flow from the cannula is prevented by pressing the vein in front of the cannula with fingers. The needle is immediately placed in the sharps disposal container”</i></p> <p><i>“The function of the cannula can be tested by injecting one to two milliliters of physiological NaCl solution into the cannula. After this, a sterile cap is attached to the hub of the cannula. The cannula is in the vein if it draws well and does not cause pain or fluid accumulation on the skin. The cannula is partially secured with a transparent adhesive tape, allowing for monitoring of the puncture area”</i></p>
<p><b>Disclaimer</b></p>	<p><b>The video was recorded without sound and narration was added later on so that the audio of the video remains clear.</b></p>

## Appendix 2: Invitation Letter

Dear nursing students,

We are English speaking nursing students from Laurea University of Applied Sciences. Currently, we are working on our thesis project on the topic "Inserting Peripheral Vein Cannula." Our aim is to create an instructional video to support the learning of nursing students studying in English. This project is conducted in collaboration with Laurea University of Applied Sciences, under the guidance of Riikka Mulder and Kati Saarinen. We would greatly appreciate your participation by responding to the attached questionnaire. Your responses will be treated confidentially, and your anonymity will be maintained. The collected data will be used solely for the purpose of our thesis and will be discarded upon its completion. We estimate that the time required to complete the survey is approximately 10 minutes of your valuable time.

Thank you in advance for your participation. Best regards, Hafsa Ali, Fardawsa Hashi, and Nasra Ahmed Mohamed

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### Appendix 3: Questionnaire

The flow and progression of the educational video are easy to follow?	Agree	Disagree
The presented information in the educational video is easy to understand?	Agree	Disagree
An aseptic technique was utilized in the educational video?	Agree	Disagree
The educational video comprehensively covers the topic?	Agree	Disagree
The educational video has relevance and utility for educational purposes.	Agree	Disagree

If you disagree with one of the questions, please write a idea for improvement here.	
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Lisää tekstiä napsauttamalla tätä.

Appendix: Link to the educational video: [https://video.laurea.fi/media/t/0\\_qg4vask5](https://video.laurea.fi/media/t/0_qg4vask5)