

# Virtual Reality tailored to the needs of post-ICU patients: a safety and immersiveness study in healthy volunteers.

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**Supplementary Materials 1.** Film script of the intensive care unit-specific virtual reality intervention.

**Scene 1.** Introduction and tour around the ICU guided by a voice-over.

Introduction by an ICU physician and a nurse.

*Setting: The ICU physician and nurse are placed in front of the ICU.*

**ICU physician:** Hello, welcome to this virtual environment. You can look around you by turning your head to your left or your right. My name is '**name physician**', one of the physicians in this ICU.

**ICU nurse:** Hello, I am '**name nurse**', one of the nurses in this ICU.

**ICU physician:** Together, we will join you during this virtual reality experience.

**ICU nurse:** Therefore, we will first lay you down on an ICU bed, and then bring you to your ICU room.

*Setting: The patient will be virtually installed on an ICU bed during a fade in-fade out.*

*Setting: The ICU physician and ICU nurse will bring the patient to one of the ICU rooms while walking over the intensive care department.*

**Voice-over:** Intensive care means intensive and special care for critically ill patients, where the most important vital functions, such as the respiratory rate, oxygen saturation and heart rate, can be monitored and supported, if needed. Therefore, this department is different from other departments. If you look around, you'll see the intensive care department. The intensive care department consists of several one-patient ICU rooms and a post for nurses located in the middle of the department. In an ICU room, circumstances and materials are available to offer critically ill patients the optimal treatment. Moreover, the chances of hospital acquired infections and medication failures are minimal, and a quiet environment is provided. At the nurse post, nurses are present throughout the day, as are monitors. As such, nurses can monitor you 24 hours per day. Nurses can also monitor patients physically through the windows of the room, which allows nurses to be able to continuously keep an eye on you.

*Setting: The patient arrives at the ICU room, and the ICU physician and ICU nurse place the patient on the bed in the ICU room.*

**ICU physician:** We are now entering an ICU room. Here, you'll receive an explanation about intensive care treatment. We will first explain the devices in the room, which are placed next to you. We will now leave the room and will come back after the explanation.

*Setting: The ICU physician and ICU nurse will leave the room.*

**Scene 2.** Explanation of all devices and noises in an ICU room.

**Voice-over:** There are several devices next to you, such as a monitor, medication pumps and a mechanical ventilator; look around you. To adequately monitor you, we want to know immediately when something is changing. For instance when your blood pressure is low, or when you're out of medication. Each device has its own functions and alarm noise to warn ICU nurses and physicians. As a result, you often hear alarm noises in your ICU room. Besides using monitors, you are monitored also in other manners. We will now explain the functions of each device to you.

*Setting: The surveillance monitor is outlined.*

**Voice-over:** When you look to your left, you'll see the surveillance monitor.

*Setting: A white arrow appears that points from the surveillance monitor to an explanation window in front of the patient, where the surveillance monitor is animated.*

**Voice-over:** When you look forward again, we will explain the function of the surveillance monitor. The surveillance monitor monitors heart rate, blood pressure, respiratory rate, and oxygen saturation. If, for instance, your blood pressure is too low, the following alarm signal is produced to warn the ICU nurse.  
<ALARM SIGNAL SURVEILLANCE MONITOR>

*Setting: The explanation window disappears. The medication pumps are outlined.*

**Voice-over:** If you look to your right, you'll see the medication pumps.

*Setting: A white arrow appears that points from the medication pumps to an explanation window in front of the patient, where the medication pumps are animated.*

**Voice-over:** These pumps are used to give medication. When you hear the following sound,  
<ALARM SIGNAL MEDICATION PUMPS>  
the nurse is warned that your medication is almost empty.

**Scene 3.** Explanation about mechanical ventilation, intubation, and tracheal tube suction.

*Setting: The explanation window disappears. The mechanical ventilator is outlined.*

**Voice-over:** If you look to your left, you'll see the mechanical ventilator.

**Voice-over:** When you look in front of you, we will give you a further explanation about the mechanical ventilator. The mechanical ventilator supports your breathing. If you heard the following sound,  
<ALARM SIGNAL MECHANICAL VENTILATOR>  
the nurse was warned.

*Setting: The explanation about the mechanical ventilator disappears, and an animation appears in the explanation window explaining intubation and mechanical ventilation.*

**Voice-over:** Because you were critically ill, we decided to support your breathing. This was done to maintain the appropriate amount of oxygen in your body. To support your breathing, we inserted a tracheal tube. This tube is placed through your mouth into your trachea. To make sure this procedure is carried out optimally and because this procedure is often uncomfortable, you were sedated during the insertion of the tube. At the end of the tube, there is a small air balloon, which is filled with air. This balloon prevents the leakage of oxygen and the contents of the stomach from entering the lungs. Due to the placement of the tube between the vocal cords, patients cannot talk when they are intubated. When the lungs have sufficiently recovered, the tracheal tube can be removed. The tracheal tube is frequently cleaned by suctioning the tube. The nurse will slide a suctioning tube in the tube. Hereby, mucus will be removed, and infections will be prevented. Sometimes, it will be enough to do this once, but this has to be repeated often.

**Scene 4.** Explanation about central/peripheral lines, intravenous drips and the gastric tube,

*Setting: The explanation window disappears, and the ICU physician and nurse enter the room.*

**ICU physician:** The different devices, the mechanical ventilator and the alarm signals have just been explained to you. Now, you will receive an explanation concerning the drips, infusions and gastric tube.

*Setting: The ICU physician and nurse leave the room..*

*Setting: The explanation window appears, and the function of a peripheral drip is explained using an animation.*

**Voice-over:** This is an 'ordinary' IV drip, also called a peripheral IV drip. This is usually inserted into a vessel in the forearm, but sometimes, it is placed in the foot. The nurse can administer medication or fluid through this drip. Because these peripheral vessels are thin, not every medication can be administered through the veins.

*Setting: Explanation of a central line is explained using an animation.*

**Voice-over:** Here, you see a central line. This is a thick IV drip that is inserted into a large blood vessel, often in the neck or groin. The insertion of such a line will be performed in a sterile manner; therefore, a blue cloth is stretched over your head. Working in a sterile field minimises the risk of infection. The main reason to insert a central line is to administer medications that cannot be administered through ordinary IV drips. Nutrition can also be directly administered to the blood stream through a central line.

*Setting: Explanation of an arterial line is explained using an animation.*

**Voice-over:** This is an arterial line. This is an IV drip that is placed directly into an artery, so blood pressure can continuously be monitored. It is also used to take blood samples. Without such a line, blood samples may have to be taken too often.

*Setting: Explanation about a gastric tube is given using an animation.*

**Voice-over:** A gastric tube is a tube that is placed through the nose or mouth through the oesophagus into the stomach. The tube is usually to administer tube feedings. It can also be used to administer medications.

**Scene 5.** Explanation about the treatment team and ICU workflow.

*Setting: The explanation window disappears, and an ICU physician, nurse and resident enter the ICU room.*

- ICU physician:** My fellow ICU physicians and I, the intensivists, are specialised in the treatment of critically ill patients. Every morning, afternoon and evening, there is a meeting with the treatment team taking care of you to discuss how you are doing. This will take place in your room.
- Resident** Hello, my name is '**name resident**', and I am the resident, a doctor in training to become a medical specialist. My fellow residents and I are responsible for the daily medical care, in which we are always supervised by the intensivists.
- ICU nurse:** My fellow ICU nurses and I will look after you, monitor you continuously and are trained to operate the devices for your treatment. You will be taken care of by the same nurse every shift.

## **Scene 6.** Sepsis explanation.

*Setting: The treatment team leaves the room. An explanation window appears to give information about sepsis..*

**Voice-over:** You were treated in the ICU due to a sepsis. We will now explain to you what a sepsis is, and how it is treated. Sepsis is a life-threatening inflammatory syndrome, as a reaction of the body to an infection. An infection is caused by a microorganism, most often a bacteria or a virus, which enters the body, and multiplies there. Sometimes the blood circulation of body tissues is disturbed by a sepsis. Then we speak of a septic shock. This can, in its turn, cause acidification, which limits the functioning of organs. This is called multi-organ failure. The treatment of sepsis consists of administering antibiotics or other medication to decrease the microorganism. To ensure that your tissues and organs will stay well circulated, we additionally administer fluids and strong medication through the bloodstream. This often happens through a thick IV drip; the central line. The treatment of a sepsis, and especially a septic shock, is best done in an intensive care unit.

*Setting: The explanation window disappears, the window fades to white, and the patients are told that the VR glasses can be removed.*