

Erasmus Plus Strategic Partnerships

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Healthcare Curriculum implementing Virtual Reality Reusable e-Resources

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**Healthcare Curriculum implementing Virtual
Reality reusable e-resources**



Introduction

Aim of project: CoViRR aims at co-creating virtual, augmented and mixed reality reusable e-resources aimed towards medical education. More specifically, the projects targets clinical skills' training, based on current curricula. It aims at incorporating open education via digital technologies, employed to develop low-cost, reusable e-resources for European Medical and Nursing schools. CoViRR is built around the concept of participatory design, thus engaging stakeholders (students, healthcare workforce staff, lecturers, clinicians, etc.), targeting at assisting students to increase their clinical skills through immersive and flexible learning.

Aim of this deliverable: This deliverable is linked with the first objective of the project: "To identify the potential role of virtual reality e-resources into the current healthcare curricula". It aims to identify, find consensus and ensure the quality of the virtual reality themes and scenarios that could be implemented in healthcare curricula and provide an innovative new healthcare curriculum. The aim of this particular deliverable is to increase understanding and awareness of use of digital immersive resources into healthcare curricula.

This document is structured in four sections:

1. Introduction, that describes the scope and aims of this document.
2. Outline of learning outcomes from partner healthcare institutions, that describes the main Learning Outcomes (LOs) from all medical institutions of the CoViRR consortium.
3. LO Expert Evaluation, that presents the methods and results of the consensus finding process for the integrated clinical skills curriculum Learning Outcomes.
4. Healthcare curriculum plan implementing virtual reality reusable e-resources, that outlines the most prevalent learning outcomes in the form of a tentative curriculum plan.

Outline of learning outcomes from partner healthcare institutions.

In order to identify the learning outcomes of the curricula of clinical skills, modules of all three institutes (AUTH, RISE and UoN) where studied. We present the results in the following tables (Table 1 – Table 3) .

Learning Objectives AUTH:

Table 1

CLINICAL SKILLS	LEARNING OUTCOMES
Communication in Medical History	<ol style="list-style-type: none">Identify the optimal questions, as well as, their proper order in order to get all the information needed for obtaining a well-structured medical history recordDistinguish and evaluate the information received from the patient in useful and non-useful

	<p>iii. Communicate successfully, in terms of comprehension, with the patient for achieving a complete and correct medical history recording</p>
Patient-centred listening in consultation	<p>i. Communicate with plain and understandable language with patients in order to provide consultation</p> <p>ii. Distinguish themselves from the patients and act with a professional yet sympathetic attitude</p> <p>iii. Transfer the information with honesty and without consolation.</p>
Infection control	<p>i. Know the basic standards regarding hand sanitation and hygiene in order to protect themselves as well as potential patients from catching and spreading infections</p> <p>ii. Comprehend and repeat the process of hand sterilization before applying gloves upon entering a sterile space</p> <p>iii. Understand the regulations towards the prevention of bloodstream infections, transmit this knowledge to third parties and apply the regulations upon demand</p> <p>iv. Perform waste disposal safely in specially designed configurations.</p>
Vital signs measurement	<p>i. Effectively use a thermometer in order to obtain accurate temperature readings from patients</p> <p>ii. Check for pulse in key body-parts and count the beats per minute of the heart</p> <p>iii. Measure the respiratory ability of a patient with the use of a stethoscope placed in appropriate places on the chest and on the back</p> <p>iv. Measure the blood pressure of a patient and identify hypertension or hypotension.</p> <p>v. Use an oximeter in order to identify oxygen saturation</p>
Injection techniques	<p>i. Perform Intravenous injections in terms of finding and preserving the veins</p> <p>ii. Perform Intramuscular injections in terms of finding the optimal space and placing appropriately the injector</p>

	<ul style="list-style-type: none"> iii. Perform Subcutaneous injections without damaging the tissue
Basic Life Support and use of automatic external defibrillator (BLS-AED)	<ul style="list-style-type: none"> i. Understand and perform the BLS algorithm ii. Address prominent situations like drowning and pnigma iii. Properly use the defibrillator without causing damage to themselves or the patient
Health Education and Promotion	<ul style="list-style-type: none"> i. Understand and identify vulnerable populations and successfully inform them regarding hazards for their health ii. Explain with simple, understandable terms health policies to children and special groups iii. Perform various screening tests regarding health assessment and evaluate their results
Levels of prevention, Vaccines for Healthcare Workers - "Flu" Vaccine	<ul style="list-style-type: none"> i. Understand, apply and communicate rules applying to health workers regarding their personal health ii. Protect themselves during clinical examinations and surgeries from potential threats to their health iii. Estimate the need for self-vaccination towards seasonal flues and inform other practitioners about the importance of it.
Communication with people with disabilities	<ul style="list-style-type: none"> i. Address people with disabilities with the appropriate empathy, but without crossing lines which may jeopardize their professionalism ii. Understand the place of disabled people in modern society, the challenges they face and offer targeted consultation
Introduction to clinical examination	<ul style="list-style-type: none"> i. Apply general hygiene rules to their everyday practice in order to protect themselves and their patients from health hazards ii. Comprehend and follow the pipeline towards a complete and successful clinical examination without omitting any steps iii. Perform a targeted clinical examination with speed and precision

	without wasting their as well as their patients' time
Intimate examination	<ul style="list-style-type: none"> i. Perform a digital rectal examination discretely and without causing discomfort to the patient ii. Properly explain the cause of the examination to the patient, informing them about any discomfort they may feel and consulting them along the way of the examination
Venipuncture	<ul style="list-style-type: none"> i. Perform intravenous fluid administration without damaging the veins ii. Collect blood samples without hurting the patients or damaging the veins
Male and female bladder catheterization	<ul style="list-style-type: none"> i. Identify the differences between the male and female urinary system and understand the specifications of each gender ii. Perform a bladder catheterization quickly and correct without causing pain to the patient iii. Comprehend and apply the basic hygiene rules when performing a bladder catheterization in order to avoid infections
Wound dressing and suturing	<ul style="list-style-type: none"> i. Perform wound sterilization and bandaging in order to avoid infections ii. Perform stitches to a wound without hurting the patient, damaging the area as little as possible in order to avoid future scars iii. Perform post-traumatic monitoring of the wound, evaluate its course and take any necessary actions towards a quick healing
Airway management	<ul style="list-style-type: none"> i. Understand and perform all the ventilation and air release techniques ii. Evaluate the situation and if needed successfully perform a tracheotomy iii. Inform the patients about the dangers of a tracheotomy, its pros and cons and guide them towards a safe decision

Electrocardiogram technique	<ul style="list-style-type: none"> i. Successfully place the electrodes in the correct places on the human body in order to achieve a high-quality, artifact-free electrocardiogram ii. Operate the electrocardiogram machine
X ray reading	<ul style="list-style-type: none"> i. Evaluate an x ray scan and identify potential structures on the ribs ii. Successfully identify irregularities in the heart size and shape, or any pneumonic abnormalities through an x ray iii. Inform the patients with accuracy and comprehension regarding any irregularities found on an x ray iv. Estimate the need for further examination when the results of an x ray are inconclusive
Electrocardiogram reading	<ul style="list-style-type: none"> i. Evaluate any given electrocardiogram and identify abnormalities regarding it ii. Identify certain heart syndromes based on the electrocardiogram

Learning Objectives RISE

Table 2

CLINICAL SKILLS	LEARNING OUTCOMES
Nasogastric tube insertion	<ul style="list-style-type: none"> I. Recognise and use anatomical landmarks (nostrils, tragus, xiphoid) II. Insert nasogastric tube in a safe way
Choking	<ul style="list-style-type: none"> I. Recognise and use anatomical landmarks (xiphoid) II. Became familiar with the Heimlich maneuver
Ankle-Brachial Index (ABI):	<ul style="list-style-type: none"> I. Recognise and use anatomical landmarks (upper and lower limbs arteries) II. Learn about the use of triplex/doppler III. Measure the arterial pressure in upper and lower limbs

	IV. Discuss the results and advice the patient properly
Otoscopy / Ophthalmoscopy	I. Recognise and use anatomical landmarks (optic disc, macula, tympanic membrane, cone of light) II. Learn and become familiar about the use of specific instruments such as ophthalmoscope, & otoscope. III. Evaluate the clinical findings
Clinical examination of pregnant and non-pregnant woman	I. Experiment with mannequins II. Familiarize with delivery (Leopold's maneuvers) III. Learn the fundamentals of pap-test IV. Evaluate the pathology of internal genitalia
Arterial puncture / Umbilical catheterisation / Intraosseous puncture / Central venous catheter	I. Recognise and use anatomical landmarks (basilic, cephalic vein, radial, femoral arteries, tibia, umbilical arteries and vein) II. Understand the difference between vein and arterial puncture III. Learn about different venous catheters IV. Understand the concept of asepsis V. Learn about and use surgical / non-surgical gloves
Abscess drainage / dermal lesions excision	I. Recognise several dermal lesions II. Learn about and use specific surgical instruments III. Understand the philosophy of lesions excision

Learning Objectives UoN

Table 3

CLINICAL SKILLS	LEARNING OUTCOMES
Basic emergency care	<ul style="list-style-type: none"> Resuscitation, recovery Position and First Aid
Communication for care	<ul style="list-style-type: none"> To understand the importance of communication on nursing To introduce some models of communication

	<ul style="list-style-type: none"> • To emphasise the importance of the effective communication on achieving and maintaining registration with NMC
Essential personal care	<ul style="list-style-type: none"> • To use evidence based, best practice approaches for meeting needs for care and support with comfort and maintenance of dignity accurately assessing the person's capacity for independence and self-care and initiating appropriate interventions, observe assess • To optimise skin and hygiene status and assess needs for and provide appropriate assistance with washing, bathing, shaving and dressing • To assess the needs for and provide appropriate oral, dental eye and nail care and decide when an onward referral is needed.
Infection prevention and control	<ul style="list-style-type: none"> • To Observe, assess and respond rapidly to potential infection risks using best practice guidelines • To Use standard precautions and protocols • To Use appropriate personal protection equipment • To Implement isolation procedures • To Use evidence-based hand hygiene techniques • To safely use and dispose of waste, laundry and sharps • To understand Constipation and effective bowel care
Nutrition and hydration	<ul style="list-style-type: none"> • To describe the principles of balanced nutrition, hydration, malnutrition and individual's in their care • To recognise the risk factors significant to individuals and the importance of these in nutritional assessments • To demonstrate carefully how to measure height/weight/BMI and linked clinical nutritional assessments (MUST/PYMS) applied to case studies



	<ul style="list-style-type: none"> • To practice feeding another individual and recognise appropriate assistance aids that maybe needed • To demonstrate how to record fluid input and output for their applied case studies and how to respond to respective conditions
Record keeping	<ul style="list-style-type: none"> • To recap principles of record keeping • To write a summary of care using a narrative style of writing • To consider frameworks for narrative record keeping • To identify the strengths and weaknesses of narrative record keeping
Medicines management	<ul style="list-style-type: none"> • To Describe the standards for the safe administration of medication including controlled drugs • To Develop an understanding of the documentation required when storing, ordering and administering controlled drugs • To Explore how the BNF can provide guidance on the safe administration of medication and how drug errors can be minimised • To Demonstrate an awareness of administering medication via different routes: topical, eye, ear, rectal, vagina, sublingual, inhaled, nasal, buccal, nasogastrically, via PEG etc.
Mental Health First Aid	<ul style="list-style-type: none"> • To develop understanding of some of the issues that can impact on and relate to mental health. • To better understand how to spot some indicators of mental health issues. • To promote early intervention for mental health concerns.
Vital signs	<ul style="list-style-type: none"> • Explain the underlying physiology related to Temperature, Pulse and Blood Pressure and Respiratory Rate • To ensure that students will become familiar and competent with the equipment involved in taking and recording a respiratory rate, pulse, blood pressure and temperature.

Introduction to play	<ul style="list-style-type: none"> To consider the need and impact of play within healthcare settings and the role of nurses in ensuring that all receive appropriate opportunity to play.
Sleep and rest	<ul style="list-style-type: none"> To understand the physiology of sleep and rest To understand the challenges that can impact on sleep and rest patterns To discuss nursing actions to reduce fatigue and minimise insomnia.
Wound care	<ul style="list-style-type: none"> To Examine the structure of skin To Explore the functions of skin To Clarify how pressure ulcers develop To Explain the categories of pressure ulcers To Review associated risk factors through accurate risk assessment To Explore key preventative strategies To Explain different types of acute and chronic wounds To Explore the importance of a holistic assessment To Determine the factors likely to delay healing To Discuss the management of simple wounds To Explore the significance of accurate record keeping
Elimination and continence	<ul style="list-style-type: none"> Basic introduction to elimination and maintaining continence, continence products and stomas understand normal elimination of waste products outline the different types of incontinence, assessments, treatments and management solutions available understand the needs of someone with incontinence and the impact the condition can have on them Support the individual with incontinence to manage their condition and support and maintain their dignity and privacy.

A to E assessment	<ul style="list-style-type: none"> • To have knowledge of the A-E assessment process and rational of its use. • To be able to understand the implications of a person's age and development in undertaking an accurate assessment. • To demonstrate how to conduct a systematic A-E assessment • To be able to demonstrate the ability to correctly interpret vital signs and the early warning score and suggest appropriate actions. • To demonstrate the ability to use tools such as NEWS/PEWS when assessing and communicating about your patient.
Medicine management	<ul style="list-style-type: none"> • Demonstrate an understanding of the safe administration of medication • Understand how to use a drug chart and give accurate doses of medication • Accurately document drug administration including controlled drugs • Be comfortable using the BNF for basic drugs information
Harm free care	<ul style="list-style-type: none"> • Identify the four common harms and discuss the importance of reducing these • Demonstrate evidence based risk assessment tools to determine the need for support and manage the risk of falls, pressure ulcer development, VTE incidence and UTI development. • Practice interventions to gain an insight to the individuals perspective through simulation of the 4 common harms
Interprofessional Learning	<ul style="list-style-type: none"> • to review the concepts of inter-professional working in terms of an educational opportunity
Communication for care	<ul style="list-style-type: none"> • To identify the range of sensory impairments that may exist in communication



	<ul style="list-style-type: none">• To identify the need for and manage a range of alternative communication techniques.• To recognise the need for, and facilitate access to interpreter services and translated material• To identify the need for and manage a range of alternative communication techniques
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LO Expert Evaluation.

Aim

After extracting the learning objectives from the corresponding curricula, they were prioritized according to their importance, based on experts in the field of medicine (clinical experts, technical experts). Nine of them were selected as the most important ones to be implemented in VR, AR and MR tools. Furthermore, the experts were asked to associate each LO to the ideal tool of implementation.

Methods

An aggregation of the LOs of the previous tables removing duplicates and LOs that would require heavy manual interaction was conducted. Given the non-mature state of haptic feedback devices in VR and their limited availability an inclusion of such LOs would involve a) high development risks and b) a very limited transferability and repurposing capacity.

For the aggregated LO list, a google questionnaire was formed, prompting experts to rate the clinical skills according to their opinion regarding the importance of their implementation in VR/AR/MR. In that a Likert Scale was used with (1) being the lowest score and (5) being the highest score. Clinical skills were rated according to responses from the experts. A score was calculated using the formula: $\text{Score} = \text{Sum}(\text{Likert Scale Response} * \text{Participants that selected this response})$. The second section of the questionnaire asked the participant to rate in order of appropriateness 3 immersive modalities (360° interactive videos, Mixed Reality and Virtual Reality) for each LO.

Questionnaire link: <https://docs.google.com/forms/d/e/1FAIpQLSd1KUtPFvZkKCF-nUtQvq9cCr7tD-1KpAgmD4l-lHDLAf5x9w/viewform>

Pool of experts

A total of 11 participants (6 men, 4 women, 1 non-defined) from all partner institutions were selected. They were aged 31-52 years old (average 39, std 8.76). The group consisted of 5 technical experts and 6 clinicians.

Results



The results of this process are presented Table 3. After the evaluation process, the 9 prevalent LOs were green-lit due to their respective scores with an additional 33% of them (3) as tentative for implementation scenarios.

Table 4

Surgical wound stitching	52	<p>i. Perform wound sterilization and bandaging in order to avoid infections</p> <p>ii. Perform stitches to a wound without hurting the patient, damaging the area as little as possible in order to avoid future scars</p> <p>iii. Perform post-traumatic monitoring of the wound, evaluate its course and take any necessary actions towards a quick healing</p>	<ul style="list-style-type: none"> • 54.5% 360° interactive video • 36.4% Mixed Reality • 9.1% Virtual Reality 	YES
X-ray reading	51	<p>i. Evaluate an x ray scan and identify potential structures on the ribs</p> <p>ii. Successfully identify irregularities in the heart size and shape, or any pneumonic abnormalities through an x ray</p> <p>iii. Inform the patients with accuracy and comprehension regarding any irregularities found on an x ray</p> <p>iv. Estimate the need for further examination when the results of an x ray are inconclusive</p>	<ul style="list-style-type: none"> • 100% Mixed Reality 	YES

ECG reading	51	<p>i. Evaluate any given electrocardiogram and identify abnormalities regarding it</p> <p>ii. Identify certain heart syndromes based on the electrocardiogram</p>	<ul style="list-style-type: none"> • 72.7% Mixed Reality • 18.2% Virtual Reality • 9.1% 360° interactive video 	YES
ECG acquisition (electrodes placement)	50	Successfully place the electrodes in the correct places on the human body in order to achieve a high-quality, artefact-free electrocardiogram	<ul style="list-style-type: none"> • 81.8% Mixed Reality • 9.1% Virtual Reality • 9.1% 360° interactive video 	YES
Surgical excision of a skin lesion	48	<p>I. Recognise several dermal lesions</p> <p>II. Learn about and use specific surgical instruments</p> <p>III. Understand the philosophy of lesions excision</p>	<ul style="list-style-type: none"> • 36.4% 360° interactive video • 36.4% Mixed Reality • 27.3% Virtual reality 	YES
Models of communication in nursing	45	<ul style="list-style-type: none"> • To understand the importance of communication on nursing • To introduce some models of communication • To emphasise the importance of the effective communication on achieving and maintaining registration with NMC 	<ul style="list-style-type: none"> • 54.5% 360° interactive video • 36.4% Virtual Reality • 9.1% Mixed Reality 	YES
Intraosseous puncture	44	<p>I. Recognise and use anatomical landmarks (basilic, cephalic vein, radial, femoral arteries, tibia, umbilical arteries and vein)</p> <p>II. Understand the difference between vein and arterial puncture</p>	<ul style="list-style-type: none"> • 54.5% 360° interactive video • 36.4% Mixed Reality • 9.1% Virtual Reality 	YES



Wound care	43	<ul style="list-style-type: none"> • To Examine the structure of skin • To Explore the functions of skin • To Clarify how pressure ulcers develop • To Explain the categories of pressure ulcers • To Review associated risk factors through accurate risk assessment • To Explore key preventative strategies 	<ul style="list-style-type: none"> • 54.5% Virtual Reality • 36.4% Mixed Reality • 9.1% 360° interactive video 	YES
Need of essential self-care	40	<ul style="list-style-type: none"> • To use evidence based, best practice approaches for meeting needs for care and support with comfort and maintenance of dignity accurately assessing the person's capacity for independence and self-care and initiating appropriate interventions, observe assess • To optimise skin and hygiene status and assess needs for and provide appropriate assistance with washing, bathing, shaving and dressing • To assess the needs for and provide appropriate oral, dental eye and nail care and decide when an onward referral is needed. 	<ul style="list-style-type: none"> • 72.7% 360° interactive video • 18.2% Virtual reality • 9.1% Mixed Reality 	YES
Mental health awareness	40	<ul style="list-style-type: none"> • To develop understanding of some of the issues that can impact on and relate to mental health. 	<ul style="list-style-type: none"> • 54.5% 360° interactive video • 27.3% Mixed reality • 18.2% Virtual Reality 	TENTATIVE



		<ul style="list-style-type: none"> To better understand how to spot some indicators of mental health issues. To promote early intervention for mental health concerns. 		
A-E assessment	40	<ul style="list-style-type: none"> To have knowledge of the A-E assessment process and rational of its use. To be able to understand the implications of a person's age and development in undertaking an accurate assessment. To demonstrate how to conduct a systematic A-E assessment To be able to demonstrate the ability to correctly interpret vital signs and the early warning score and suggest appropriate actions. To demonstrate the ability to use tools such as NEWS/PEWS when assessing and communicating about your patient. 	<ul style="list-style-type: none"> 54.5% 360° interactive video 27.3% Mixed Reality 18.2% Virtual reality 	TENTATIVE
Techniques of alternative communication	40	<ul style="list-style-type: none"> To identify the range of sensory impairments that may exist in communication To identify the need for and manage a range of alternative communication techniques. To recognise the need for, and facilitate access to interpreter 	<ul style="list-style-type: none"> 54.5% 360° interactive video 27.3% Virtual Reality 18.2% Mixed Reality 	TENTATIVE



		<p>services and translated material</p> <ul style="list-style-type: none"> To identify the need for and manage a range of alternative communication techniques 		
Continence care	36	<ul style="list-style-type: none"> outline the different types of incontinence, assessments, treatments and management solutions available understand the needs of someone with incontinence and the impact the condition can have on them Support the individual with incontinence to manage their condition and support and maintain their dignity and privacy. 	<ul style="list-style-type: none"> 63.6% Virtual Reality 18.2% 360° interactive video 18.2% Mixed reality 	NO
Harm free care	35	<ul style="list-style-type: none"> Identify the four common harms and discuss the importance of reducing these Demonstrate evidence based risk assessment tools to determine the need for support and manage the risk of falls, pressure ulcer development, VTE incidence and UTI development. Practice interventions to gain an insight to the individuals perspective through simulation of the 4 common harms 	<ul style="list-style-type: none"> 45.5% Virtual Reality 27.3% Mixed Reality 27.3% 360° interactive video 	NO



Healthcare curriculum plan implementing virtual reality reusable e-resources.

After the evaluation process, the following LOs were selected due to their respective scores.

Table 5

Surgical wound stitching	<p>i. Perform wound sterilization and bandaging in order to avoid infections</p> <p>ii. Perform stitches to a wound without hurting the patient, damaging the area as little as possible in order to avoid future scars</p> <p>iii. Perform post-traumatic monitoring of the wound, evaluate its course and take any necessary actions towards a quick healing</p>	<ul style="list-style-type: none"> • 54.5% 360° interactive video • 36.4% Mixed Reality • 9.1% Virtual Reality
X-ray reading	<p>i. Evaluate an x ray scan and identify potential structures on the ribs</p> <p>ii. Successfully identify irregularities in the heart size and shape, or any pneumonic abnormalities through an x ray</p> <p>iii. Inform the patients with accuracy and comprehension regarding any irregularities found on an x ray</p> <p>iv. Estimate the need for further examination when the results of an x ray are inconclusive</p>	<ul style="list-style-type: none"> • 100% Mixed Reality
ECG reading	<p>i. Evaluate any given electrocardiogram and identify abnormalities regarding it</p> <p>ii. Identify certain heart syndromes based on the electrocardiogram</p>	<ul style="list-style-type: none"> • 72.7% Mixed Reality • 18.2% Virtual Reality • 9.1% 360° interactive video
ECG acquisition (electrodes placement)	<p>Successfully place the electrodes in the correct places on the human body in order to achieve a high-quality, artefact-free electrocardiogram</p>	<ul style="list-style-type: none"> • 81.8% Mixed Reality • 9.1% Virtual Reality • 9.1% 360° interactive video

<p>Surgical excision of a skin lesion</p>	<p>I. Recognise several dermal lesions II. Learn about and use specific surgical instruments III. Understand the philosophy of lesions excision</p>	<ul style="list-style-type: none"> • 36.4% 360° interactive video • 36.4% Mixed Reality • 27.3% Virtual reality
<p>Models of communication in nursing</p>	<ul style="list-style-type: none"> • To understand the importance of communication on nursing • To introduce some models of communication • To emphasise the importance of the effective communication on achieving and maintaining registration with NMC 	<ul style="list-style-type: none"> • 54.5% 360° interactive video • 36.4% Virtual Reality • 9.1% Mixed Reality
<p>Intraosseous puncture</p>	<p>I. Recognise and use anatomical landmarks (basilic, cephalic vein, radial, femoral arteries, tibia, umbilical arteries and vein) II. Understand the difference between vein and arterial puncture</p>	<ul style="list-style-type: none"> • 54.5% 360° interactive video • 36.4% Mixed Reality • 9.1% Virtual Reality
<p>Wound care</p>	<ul style="list-style-type: none"> • To Examine the structure of skin • To Explore the functions of skin • To Clarify how pressure ulcers develop • To Explain the categories of pressure ulcers • To Review associated risk factors through accurate risk assessment • To Explore key preventative strategies 	<ul style="list-style-type: none"> • 54.5% Virtual Reality • 36.4% Mixed Reality • 9.1% 360° interactive video
<p>Need of essential self-care</p>	<ul style="list-style-type: none"> • To use evidence based, best practice approaches for meeting needs for care and support with comfort and maintenance of dignity accurately assessing the person's capacity for independence and self-care and initiating appropriate interventions, observe assess • To optimise skin and hygiene status and assess needs for 	<ul style="list-style-type: none"> • 72.7% 360° interactive video • 18.2% Virtual reality • 9.1% Mixed Reality



	<p>and provide appropriate assistance with washing, bathing, shaving and dressing</p> <ul style="list-style-type: none"> To assess the needs for and provide appropriate oral, dental eye and nail care and decide when an onward referral is needed. 	
Mental health awareness	<ul style="list-style-type: none"> To develop understanding of some of the issues that can impact on and relate to mental health. To better understand how to spot some indicators of mental health issues. To promote early intervention for mental health concerns. 	<ul style="list-style-type: none"> 54.5% 360° interactive video 27.3% Mixed reality 18.2% Virtual Reality
A-E assessment	<ul style="list-style-type: none"> To have knowledge of the A-E assessment process and rationale of its use. To be able to understand the implications of a person's age and development in undertaking an accurate assessment. To demonstrate how to conduct a systematic A-E assessment To be able to demonstrate the ability to correctly interpret vital signs and the early warning score and suggest appropriate actions. To demonstrate the ability to use tools such as NEWS/PEWS when assessing and communicating about your patient. 	<ul style="list-style-type: none"> 54.5% 360° interactive video 27.3% Mixed Reality 18.2% Virtual reality
Techniques of alternative communication	<ul style="list-style-type: none"> To identify the range of sensory impairments that may exist in communication To identify the need for and manage a range of alternative communication techniques. To recognise the need for, and facilitate access to interpreter services and translated material 	<ul style="list-style-type: none"> 54.5% 360° interactive video 27.3% Virtual Reality 18.2% Mixed Reality



	<ul style="list-style-type: none">• To identify the need for and manage a range of alternative communication techniques	
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Based on them an integrative curriculum for them previous results, a common clinical skills curriculum was devised and is presented below.

Aim

Completion of the 12 modules through VR/AR/MR will enable the participants to acquire useful knowledge in clinical skills necessary for their future careers. They will offer them an interactive, multimodal experience which will assist them in experiencing real-life scenarios through their training.

The modules will equip participants with skills gained through practice that otherwise they would acquire much later in their life. Furthermore, this experience will inspire the adoption of such methodologies in other health institutes.

Learning Objectives

The learning outcomes extracted from the selected clinical skills presented above can be further broken down in Learning objectives as follows:

Knowledge and understanding Skills

- Recognise several dermal lesions
- To understand the importance of communication on nursing
- To develop understanding of some of the issues that can impact on and relate to mental health.
- To be able to understand the implications of a person's age and development in undertaking an accurate assessment.
- Successfully identify irregularities in the heart size and shape, or any pneumonic abnormalities through an x ray
- Evaluate any given electrocardiogram and identify the most common abnormalities regarding it
- Recognise and use anatomical landmarks (basilic, cephalic vein, radial, femoral arteries, tibia, umbilical arteries and vein)
- Evaluate an x ray scan and identify potential structures on the ribs
- Understand the philosophy of lesions excision
- To introduce some models of communication
- To Review associated risk factors through accurate risk assessment
- To Explore key preventative strategies
- To better understand how to spot some indicators of mental health issues.
- To promote early intervention for mental health concerns.
- To have knowledge of the A-E assessment process and rational of its use.
- To Explain the categories of pressure ulcers



- To Clarify how pressure ulcers develop
- To Explore the functions of skin
- Understand the difference between vein and arterial puncture

Skills

Professional / practical skills

- Perform wound sterilization and bandaging in order to avoid infections
- Perform stitches to a wound without hurting the patient, damaging the area as little as possible in order to avoid future scars
- Estimate the need for further examination when the results of an x ray are inconclusive
- Identify certain heart syndromes based on the electrocardiogram
- Successfully place the electrodes in the correct places on the human body in order to achieve a high-quality, artefact-free electrocardiogram
- To Examine the structure of skin
- To optimise skin and hygiene status and assess needs for and provide appropriate assistance with washing, bathing, shaving and dressing
- To assess the needs for and provide appropriate oral, dental eye and nail care and decide when an onward referral is needed.
- To conduct a systematic A-E assessment
- To correctly interpret vital signs and the early warning score and suggest appropriate actions.
- To use tools such as NEWS/PEWS when assessing and communicating about your patient Perform post-traumatic monitoring of the wound, evaluate its course and take any necessary actions towards a quick healing.
- Inform the patients with accuracy and comprehension regarding any irregularities found on an x ray

Transferable / key skills

- Learn about and use specific surgical instruments
- Emphasize the importance of the effective communication on achieving and maintaining registration with NMC
- Use evidence based, best practice approaches for meeting needs for care and support with comfort and maintenance of dignity accurately assessing the person's capacity for independence and self-care and initiating appropriate interventions, observe assess
- Identify the need for and manage a range of alternative communication techniques.
- Recognise the need for, and facilitate access to interpreter services and translated material
- Identify the need for and manage a range of alternative communication techniques
- To identify the range of sensory impairments that may exist in communication