SimX

Realistic Medical VR Training

SimX is a VR (Virtual Reality) training environment in which trainees can perform realistic lifelike medical examinations and treatments. The trainees can communicate with the virtual patient(s), listen with a stethoscope and measure blood pressure. Trainees can select from more than 300 examinations or treatments. Patients will respond as if they were real human patients. Vital signs will change in response to elapsed time or executed interventions. The state of the patient is visible through vital signs as well as visual parameters (e.g. skin color) and patient behavior like agitation or awareness.
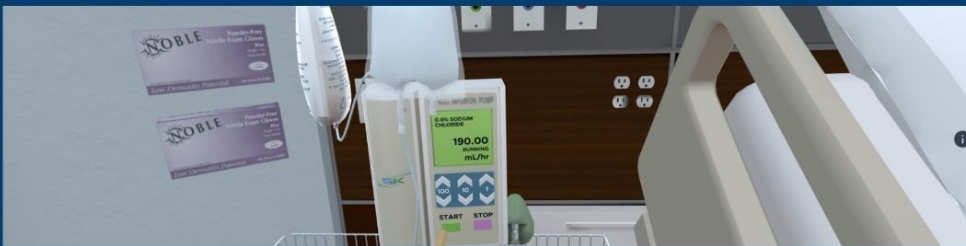
One or more trainees can access SimX using a wireless Oculus Quest2 headset

The instructor/moderator controls the scenario from a WIndows PC

Instructor (s) and students can all work in the same scenario via internet

Scenarios

SimX allows scenarios to be created which are customized to your own language and protocols. VR Support Center Europe is investing in pre-hospital training scenarios in multiple languages. We are looking for "Care Pioneers" who are willing to co-finance further development of scenarios.

The developers

SimX Inc. was founded in 2013 in San Francisco by physicians in cooperation with simulation-experts. SimX is currently being used by the US Air Force and renowned medical institutions. SimX is working with VR simulations experts around the world to make it accessible worldwide.

SimX in Europe

VR Support Center Europe is SimX's prime distributor in Europe and is available to support the use of SimX and creation of new scenarios in multiple languages.

For more information please visit:

www.vrsupportcenter.net and

www.simxar.com

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Single trainee or team-work

In SimX, one or more trainees can jointly perform necessary treatments and examinations on one or more patients. The trainees can align and synchronize their examinations and interventions. The instructor can view the trainee's actions and influence the scenario flow. The instructor can view the scenario from bird's eye view or from the point of view of every trainee. The views can be shared with any on site or remote viewers to allow for peer review or (remote) instructor feedback. From the moderator screen, the instructor has a variety of verbal responses of the virtual patient (s) and or the 'Non-Playing-Characters', which can also be tasked to undertake interventions in the scenario.

Medical examinations and interventions

SimX includes more than 300 medical examination procedures and interventions. These range from Basic to Intermediate and or Advanced Life Support. Unique to SimX is the highly realistic representation of the performed examinations and interventions:

Tactile	The VR controllers provide a tactile representation of a pulse: the student feels the speed/ frequency and strength of the pulse.
Auditive	Auscultation of lungs, heart and abdomen return realistic audible sounds (healthy and pathological).
Exams	Direct results when oxygen, blood pressure or for example heart (ECG) is monitored or a (Fast) Echo is performed.
Lab	Student can order lab, x-rays and other different examinations. Students can also read back the results of prior lab tests.
Visual	Visible bleeding, anatomic abnormalities, skin color, wounds, agitation, pain, awareness level, reaction of the pupils etc.

Examples:

- (Non) invasive monitoring and measurement of the vital signs (for example Swan-Ganz)
- Perform patient based testing: Neurological examination like the FAST test, AVPU, GCS
- Perform basic airway maneuvers like the chin-lift/jaw thrust, stopping of catastrophic bleeding using trauma bandages and or a tourniquet
- Order X-ray examinations, labs, ECG etc
- Perform Basic/Advanced airway management: SGA/ETT/ Coniotomie/Cricothyreotomie
- Implementation of (for example) A (C) LS guidelines and or regional/state-based protocols
- Recognition of drugs- and or alcohol related patient behaviors
- Invasive and non-invasive oxygen delivery therapy and ventilation: NRM/BVM/breathingapparatus etc
- Administer medication in different ways
- IM/SC/IV/IO/Nasal/Buccal/Oral etc
- Trauma interventions: wound management, (catastrophic) bleeding control (TQ//Chest Seal/Trauma bandages etc
- Perform a Trauma log-roll, an in-spine immobilization/ give the patient a SLAM sling etc.

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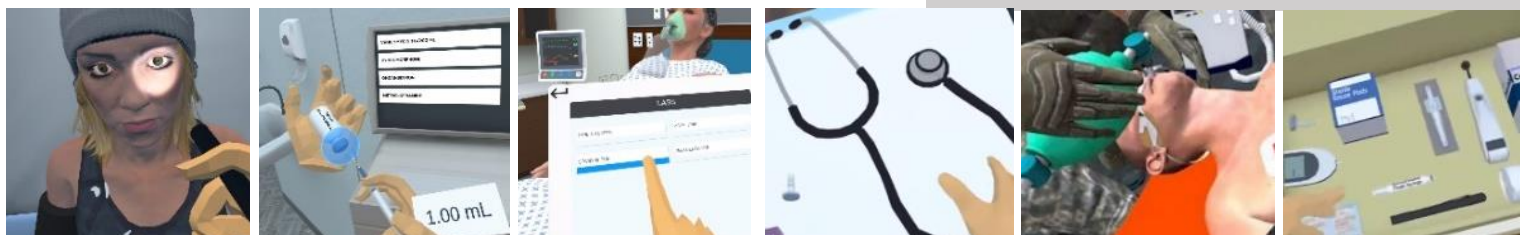
Learning objectives

SimX supports a large variety of learning objectives including both hard as well as soft skills. SimX support training from basic life support to higher level training including nursing education and Advanced (Trauma) Life Support (A(T)LS). SimX training can be implemented in initial education and training as well as skills maintenance and refresher training. SimX also allows employers to give their future employees a realistic impression of their future work whilst at the same time being able to observe a candidate's behavior in a high-pressure care situation.

Hard skills	Understanding pathophysiology, interpretation of vital signs, administering medication, performing medical interventions and interpretation of an ECG, Fast echo of lab results.

Soft skills	- Communication: train Crew Resource Management principles in stress induced environments within the safety of a virtual world. The possibility of observation by the instructor(s) and fellow students is a powerful learning aid. - TIME management: the student must prioritize and take in account the time-sensitivity of the patient's health. - Delegation of interventions and tasks, recognizing and initiating higher TIER medical assistance. - Empathy: interactive, realistic communication with (virtual) patients, family members and other non-playing-characters. These people all have realistic emotions, pain and frustration which will provide the trainees a strong feeling of immersion in the situation. - Leadership: in the safe VR learning environment, trainees can safely practice leadership in stress induced cases. - Team Role: SimX has full multiplayer integration, providing an excellent objective overview of each team member as part of a team, in a equal, lower and or medical TIER.
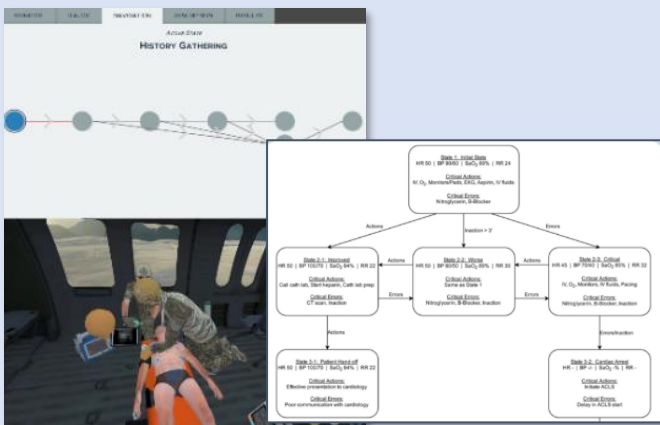
Patient models

The simulation of the patients in SimX is highly advanced. Vital signs will change during time and as result of interventions done (or missed). The trainee(s) can observe the patient's wellbeing by observing visible physical changes (for example skin color), changes in mental state and or changes in vital signs (if the appropriate monitoring is applied).

The instructor can alter the patient state during the scenario within the boundaries of the validated scenario as set by the scenario author(s).

Feedback and reporting

After the training, the instructor has access to a variety of feedback options. The available reports will give an oversight of the made decisions and chosen interventions of the student. Furthermore, scores can be calculated based on the (non) performed -Critical Actions- adding up to an overall score of the trainees performance.

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