

# ADAM

HUMAN PATIENT SIMULATOR



**ADAM-X** is a high-fidelity patient simulator: the highest standard of realism in form and function. It is designed to take training to another level: in for instance anesthesia, nursing, intensive care, emergency (services) and combat-related medical training. It can be used wireless and tetherless, in the hospital, on-the-go and in an outside setting. The scenarios and stand-alone procedure practices are immersive and easy-to-use.

Through its realism in looks and feels, vital signs, interactivity, procedural and scenario training, the Adam-X can and will be treated as an actual patient. Providing doctors and nurses, all (para-)medical staff, access to a true learning experience.



ADAM-X\*

- ▶ **Vital signs:**
  - spontaneous breathing;
  - heartbeat;
  - secretion;
  - bloodloss;
  - pupil reflex etc.
- ▶ **Sounds throughout the body:**
  - breathing sounds;
  - heart sounds;
  - peristaltic sounds;
  - Korotkoff sounds;
- ▶ **Injection sites for application of medicine:**
  - Intraosseous infusion;
  - Intravenous injection;
- ▶ **Realistic intubation**
- ▶ **Lifelike musculoskeletal system**
- ▶ **Accurate mobility in the spine, neck, waist and joints**
- ▶ **Highly realistic in appearance and in tactile sensations, fully enveloped skin**
- ▶ **Replaceable skin modules for procedures such as: intubation, IO-infusion and intravenous injection**
- ▶ **Replaceable models of wounded hands and feet for modular training**
- ▶ **A wide range of possible patient conditions, stand-alone and within complex scenarios**

**The most realistic human patient simulator**



## Features

The **airway** (mouth, pharynx, larynx, esophagus and trachea) is modeled on actual CT scans, ensuring a realistic anatomy. Because of this, ventilation of the lungs will automatically lead to the corresponding sounds of breathing and chest excursions.

The **musculoskeletal system** corresponds fully to that of a human and also includes:

- ▶ bones in the fingers
- ▶ palpation of the ribs
- ▶ palpation of blades
- ▶ palpation of pelvic bones
- ▶ mobility of the patella

### Precise motion detailing:

- ▶ Blinking of the eyelids occurs automatically, depending on the physiological status of the patient
- ▶ Pupils automatically respond to light, reflecting the physiological status of the patient
- ▶ Body trembling, such as convulsions or spasms
- ▶ Realistic mobility in all major joints
- ▶ Aschner reflex

The **breathing system** includes right and left lungs with independent ventilation for both lungs. During spontaneous breathing, ADAM-X breathes with an automatically controlled respiratory volume and respiratory rate, which helps to control eucapnia and normal oxygen saturation.

The **pulse** depends on ADAM-X physiological state and is activated by pressing on the appropriate points, which there are 12 of: bilaterally on the carotid, radial, femoral, tibial arteries and dorsal arteries. The effective compression of the chest leads to the imitation of circulation and cardiac output with a central and peripheral blood pressure, as determined by the pulse.

**Secretion** of the liquids includes sweat (diaphoresis), tears, saliva, ear secretions, urine and blood. The secretion settings can be predetermined in the software to specifically simulate conditions or to serve as a marker for them.

**Compressions** are detected on depth, rate and effectivity. Effective compression lead to a simulation of cardiopulmonary bypass, cardiac output, a heart rate, and oxygen saturation during exhalation. The parameters are shown on the bedside monitor. Ineffective compressions lead to irregularities of cardiopulmonary bypass and a dropping of patient vital signs.



## Additional features

**Intraosseous infusion and intravenous injection** can be performed with actual needles and are met with life-like resistance of Adam's skin and bone tissues, fluids are secreted where the skin is pierced. Skin modules can be replaced in the pierced area instead of the whole arm/leg; this significantly lowers the cost and effort of repeating the procedure.

The realistically modelled **breathing system** gives sensitive feedback to any mistakes during **mechanical ventilation** and the **intubation** process. For example, if the ventilation tube is inserted incorrectly, only one of the lungs will be ventilated and only one side of the chest will rise.

It is possible to change the size of the glottis and set **tongue swelling** in order to make intubation more complex.

The extensive **medicine library** contains a vast amount of different medications and drugs for the implementation in any possible scenario. The administration of medicine is performed by using pre-set imitation syringes, held close to the **intravenous injection** located on the patient arm, or via the bed-side monitor. The dosage will be identified automatically.

A **bedside monitor**, which is used to monitor and display the following parameters of the patient:

- ▶ heart rate (HR);
- ▶ Systolic and diastolic blood pressure;
- ▶ SpO2 (saturation);
- ▶ etCO2 (capnometer, CO2 at the end of exhalation);
- ▶ respiratory rate (RR);
- ▶ blood and body temperature;

## Software

The **Instructor**-software starts the predetermined scenarios and allows the monitoring of the exercise progress. It records the sequence of actions performed by the students, and all successes or mistakes are logged. After completion of the exercise it is possible to view and discuss the full exercise within a **debriefing** setting.

The **Scenario Designer**-software allows you to create scenarios by mixing the various clinical situations, with the creation of a checklist of actions and later save the script in order to use it in the future.

The **ECG Designer**-software allows you to create your own ECG-graphics, which can later be used in scenarios, either by drawing them from scratch or choosing the ECGs from the library.