For medical trainees and students to acquire essential medical skills and knowledge, exposure to live patients in realistic environments is necessary. However, this exposure to live patients is only possible when optimal treatment and patient safety can be assured. The need for both exposure to patients and said patients’ well-being form a challenge in medical education; a challenge which can be addressed by using simulation based medical training. Not only does simulation based training lead to enhanced experience and improved confidence, it also prepares healthcare professionals for real interventions by simulating these interventions and their circumstances and environments as realistically as possible, as well as by making unlimited repetition of procedures and interventions possible. Skills can be developed and refined, while simultaneously preparing extensively for exposure to live patients. Medical training with simulation based courses allows healthcare professionals to acquire necessary skills and knowledge in a safe and efficient environment. Technical skills can be learned as well as measured and assessed, making it a valuable step to becoming a certified healthcare practitioner. Simulation based training provides an ethical, safe and effective platform for training surgical interventions, whilst protecting patients from unnecessary risks.

About MEDICAL-X

MEDICAL-X is a company specialized in the design, development, manufacturing, marketing and distribution of simulation products for medical teaching and training. MEDICAL-X is an innovative scientific company providing simulated training solutions in various medical specialties. Training exercises of MEDICAL-X’s simulators are developed with cutting edge technology combined with the professional input of expert physicians. The simulators fulfill the demand of healthcare professionals to be able to train clinical skills cost-effectively as well as time-effectively, in medical schools, universities, hospitals and skills centers outside the operating room and without risks to human patients.

Simulation training

For medical trainees and students to acquire essential medical skills and knowledge, exposure to live patients in realistic environments is necessary. However, this exposure to live patients is only possible when optimal treatment and patient safety can be assured. The need for both exposure to patients and said patients’ well-being form a challenge in medical education; a challenge which can be addressed by using simulation based medical training. Not only does simulation based training lead to enhanced experience and improved confidence, it also prepares healthcare professionals for real interventions by simulating these interventions and their circumstances and environments as realistically as possible, as well as by making unlimited repetition of procedures and interventions possible. Skills can be developed and refined, while simultaneously preparing extensively for exposure to live patients. Medical training with simulation based courses allows healthcare professionals to acquire necessary skills and knowledge in a safe and efficient environment. Technical skills can be learned as well as measured and assessed, making it a valuable step to becoming a certified healthcare practitioner. Simulation based training provides an ethical, safe and effective platform for training surgical interventions, whilst protecting patients from unnecessary risks.

Individual / Team training

When training to become a certified healthcare professional, not only knowledge and technical skills, but also confidence, attitude and self-assessment are of the utmost importance. Repetitive individual training enhances these important elements, allowing the healthcare trainee to perform repetitive rule- and knowledge based behavioral training. Simulation based training has also shown to improve self-assessment by offering an enhanced statistical evaluation of performances. However, solely training individually is not enough. Patient care has grown to be more complex and extensive than ever. Not only procedural skills and medical knowledge are required from healthcare professionals, but also leadership skills and the ability to communicate effectively with their team and with patients are of growing importance. The training of each individual member of a medical team needs to be brought together: every person has a role to play, and team members need to learn to be aware of their role as an individual in a team. Team training can be performed during simulation training: simulation training has not only proven to be an efficient way of achieving technical proficiency, but also to be a valuable asset in the development of communication skills, leadership abilities and team work.

Types of training

- Individual training
- Team training
- Technical skills
- Communication skills
- Leadership skills
- Team work
- Professionalism
- Clinical Judgment

Development by MEDICAL-X

MEDICAL-X is an innovative scientific company providing simulated training solutions in various medical specialties. Training exercises of MEDICAL-X’s simulators are developed with cutting edge technology combined with the professional input of expert physicians. The simulators fulfill the demand of healthcare professionals to be able to train clinical skills cost-effectively as well as time-effectively, in medical schools, universities, hospitals and skills centers outside the operating room and without risks to human patients. MEDICAL-X is constantly developing new simulators, modules and exercises to support the increasing demand of simulated solutions for medical training.
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NENASim HPS Xtreme

The NENA-product line is composed of the ALS, the BLS Task Trainer, the HPS, the Neonatal and the Preemie. This brochure is on the Human Patient Simulator Xtreme, the HPS Xtreme.

NENASim Human Patient Simulator Xtreme
The NENASim-HPS Xtreme is an advanced wireless scenario-based simulator. It simulates a baby from 0 to 6 months old. To be used for a full range of medical skills, procedures and team training. With the NENASim-HPS Xtreme - which includes our training software, the patient monitor and the baby simulator - predefined and customizable scenarios can be played out by medical teams.

Design philosophy: realism in form and function
Realism is key in our design philosophy. Simulator training gives medical teams the experience, competence and confidence they desire. Realism adds to the quality and effectivity of training. Our NENASim is developed through extensive feedback programs to produce an engaging baby patient experience for medical professionals. Form and function come together in a realistic, interactive simulator, ready to be used in training for all levels of care.

Simulator training
We can provide additional training modules for the medical departments and skills centers, both in-house and in training locations around the world.

Software included: Tutor, Scenario Editor, Patient Monitor, ECG and Sound Editor.
The NENASim HPS Xtreme is fully interactive and empowered by Windows to give the user full control:
- The patient monitor, which accurately replicates the graphs and values as shown on the tutor software, making any adjustments by the tutor directly visible.
- Tutor software for tracking, commenting and evaluating the full scenario.
- Possible to add three cameras.
- Scenario-editor for creating and editing your own scenarios. All parameters, responses and sequences can be adjusted within an easy-to-use program
  An ECG editor and sound editor. To add your own ECGs and sounds to scenarios we provide user-friendly editors.

BENEFITS AT A GLANCE
- Perfect for training medical professionals, especially NICU-departments.
- Realistic skeleton, recognizable landmarks, accurate movement degrees, with a durable soft skin.
- Movement of limbs, head, eyelids, heart beats and breathing movements.
- Measurable effectivity and results of CPR.
- Pulse detectable in various places; axillary and femoral.
- Intubation through the anatomically realistic airway, Stethoscope simulator: detects location and emits suitable isolated sounds.
- Various parameters output on the patient monitor: ECGs, SpO2, CO2, ABP, CVP, PAP, PCWP, NIBP and TOF.
- Full scenario training: ready-made and user-friendly customizing, with strong feedback and review components. Ideal for individual skills-training and team training.
- A wide variety of vocal sounds: laughing, crying, hiccups, coughing, grunting and breathing.
- Full simulation of breathing patterns with different rates, depths and complications.
- Colorization of the skin in the cheek, chin and extremities, to simulate conditions like cyanosis, jaundice, paleness and redness.
- Wireless and tetherless control: able to be used everywhere.
The most realistic baby simulator with durable and life-like silicon skin

**NENASim HPS Xtreme FEATURES**

**Realistic anatomy**
The NENASim is designed to most accurately resemble a baby. Being wireless and tetherless the baby can be used within and outside medical departments, even on the move. The durable skin is soft to the touch, easy to clean, and completely envelopes the simulator. The inner parts are designed for realism: the human skeleton is recognizable. Landmark features like the ribs, sternum, fontanelles, collar bones, arm and leg bones, can be found and be used for medical procedures. The fontanelles can be set to different states. All joint types have accurate movement degrees.

The NENASim has realistic eyes, head and limb movement. It is capable of a variety of breathing patterns, with different rates, depth and complications. Sounds include the different breathing patterns, pulse, bowel, and vocal sounds like coughing, laughing and crying. It is possible to add own sounds.

Through the use of the stethoscope simulator many different sounds within the body can be traced, like heart, breathing, bowel and bruit sounds. These too can be added on.

**Cardiovascular system**
The cardiovascular system of the NENASim simulates blood circulation. Vital signs, like blood pressure, pulse rate and respiratory rate are visible on the patient monitor and directly from the patient simulator. The NENASim has palpable axillary, femoral, fontanel and umbilical cord pulses, which are synchronized with the patient monitor. When applying CPR, the software shows feedback on the depth and frequency. The CPR compressions generate corresponding pulses, blood pressure waveforms, sounds and ECG.

**Realistic airway management**
One of the most important aspects of pediatric care, which requires full understanding and expertise of the staff, is airway management. The NENASim has a realistic airway, with a tongue, vocal chords, trachea and esophagus, attached to two lungs. The NENASim allows training with endotracheal, nasotracheal and orotracheal intubation as well as mask ventilation and laryngeal mask insertion. Head tilt and chin lift can be trained, as well as performing the jaw-thrust maneuver. Pneumothorax can be performed, as well as chest tube insertion.

**Interactivity and responsiveness**
All different parameters, motor functions, sounds and colorization, like cyanosis, jaundice, paleness and redness, can be set. The NENASim responds automatically and dynamically to actions taken by the user. They follow the conditions of the medical scenarios and can be individually selected by the user. The scenarios and individual settings can be set up wireless through easy-to-use software.

The colorization of the NENASim reacts upon the level of light in the room. The dilation of the pupils also respond to light. It has a foot reflex build in.

**Product training, service and guarantee**
The NENASim is a complex product, we understand the need for a strong service component. Medical-X provides application training and guarantees the product for 1 year. Additional service packages can be provided for.
Positioning NENASim HPS

NENASim complements realistic multidisciplinary team or individual baby patient simulation training. NENASim is a neonatal simulator with an unprecedented level of realism, and offers an ideal training solution with different scenarios for a wide range of healthcare professionals, including patient care, emergency medical intervention training and resuscitation training. NENASim has a durable, life-like silicon skin and is easy to clean and disinfect.

Features NENASim HPS

- NENASim HPS has all the advantages of NENASim ALS+
- Suitable for a wide range of healthcare professionals
- Available in different models and ages
- Wireless and tetherless control
- Ideal for BLS, ALS and CPR training
- Realistic eyes, head and limb movements
- Palpable axillary, femoral, fontanel and umbilical cord pulses
- Simulate various breathing patterns with different rates, depths and complications
- Intubation through realistic airway
- Vocal sounds: laughing, crying, hiccups, coughing and breathing
- User-friendly scenarios setup functions
- Automatic scenario training and real time adjustable scenario training
- Comes with wireless stethoscope simulator
- Heart, breathing, bowel and bruit sounds with stethoscope simulator
- Features tutor software and patient monitor
- Various parameters output on the patient monitor: ECGs, SpO2, CO2, ABP, CVP, PAP, PCWP, NIBP and TOF
- Built-in AV (audio/video) recording solution
- Features scenario editor, sound editor and ECG editor
- Features debriefing software

Other NENASim models

NENASim Care*
NENASim Care has a realistic look and feel, and is ideal for training basic nursing skills.

NENASim BLS*
NENASim BLS is ideal for training basic life support and CPR. NENASim BLS features unilateral and bilateral chest rise, and has a realistic airway system with airbag support.

NENASim ALS*
NENASim ALS has all the advantages of NENASim Care and NENASim BLS, and is ideal for advanced life support training. NENASim ALS also features software with visual feedback.

NENASim ALS+*
NENASim ALS+ has all the advantages of NENASim ALS, and is ideal for advanced life support training. NENASim ALS+ also features controllable breathing movement and eyelids movement.
Realistic Anatomy
NENASim has a life-like appearance. It can move its eyes, eyelids and head and it also simulates various breathing patterns with different rates, depths and complications. NENASim’s movements are wirelessly controlled with the NENASim software. The simulator has vocal sounds to enhance the training realism, including laughing, crying, hiccups, coughing and breathing.

Cardiovascular System
The trainee can observe blood circulation vital signs like blood pressure, pulse rate and respiratory rate on the patient monitor. Blood pressure can be measured. NENASim has palpable axillary, femoral, fontanel and umbilical cord pulses, which are synchronized with the patient monitor. When applying CPR the software shows feedback on the depth and frequency, and CPR compressions generate corresponding pulses, blood pressure waveforms and ECG.

Tutor Software and Patient Monitor
The NENASim software features tutor software and a patient monitor, on which different parameters are shown. The patient monitor replicates the graphs and values shown on the tutor software, allowing the tutor to adjust shown parameters. The tutor can control the running scenario real-time.

Airway Management
Pediatric airway management remains a difficult task that many healthcare professionals have to face. NENASim has a very realistic airway with tongue, vocal cords, trachea and esophagus, and during intubation the resistance of the airway is life-like. NENASim allows training with endotracheal, nasotracheal and orotracheal intubation as well as mask ventilation and mouth to mouth.

Evaluation Log
During the training, the tutor can add comments in the evaluation log for (later) evaluation. Regular or important comments can be reported by typing the comments in the text box; important comments will appear red, with an exclamation mark. Some actions taken by students wait for approval or comments before appearing in the log, making the evaluation log a valuable tool in a complete and useful assessment of the student’s performance.

Stethoscope Simulator
The NENASim stethoscope works wirelessly with the NENASim, and provides clear heart, breathing, bowel and bruit sounds.

Scenario Editor
There is a possibility to create your own scenarios with the scenario editor. Each state of the NENASim has different parameters. All parameters can be adjusted, and it is possible to introduce state dependent as well as state independent parameters. The scenario editor allows for endless custom training scenarios that can be performed with the NENASim.

Sound Editor
There is a possibility to add your own sounds to the NENASim software. The sound editor allows for custom sounds to be uploaded and added to scenarios and states of the NENASim.

ECG Editor
There is a possibility to create your own ECG with the NENASim software. The simple ECG editor can be used to create a custom ECG.

Built-in AV recording solution: connect up to three cameras
NENASim-Preemie ALS

The NENASim baby simulators are available in various sizes and degrees of fidelity. This brochure is on our preterm baby, the Preemie, ALS edition.

NENASim Preemie
The NENASim Preemie is a realistic interactive simulator, to be used for neonatal intensive care training. The Preemie allows for a variety of medical procedures, preparing medical staff and everyone involved on the great responsibility of care for a preterm baby. The main assets of the Preemie are its realistic airway, life-like feel and looks and task-training functionalities.

Design philosophy: realism in form and function
Realism is key in our design philosophy. Simulator training gives medical teams the experience, competence and confidence they desire. Realism adds to the quality and effectiveness of training. Our NENASim product line is developed through extensive feedback programs to produce an engaging baby patient experience for medical professionals. Form and function come together in a realistic, interactive simulator, ready to be used in training for all levels of care.

Simulator training
We can provide additional training modules for the medical departments and skills centers, both in-house and in training locations around the world.

The Preemie enables medical teams to work together in caring for a premature baby. By giving the trainees different roles within predefined scenarios, medical skills and teamwork are tested and improved.

Size and weight of the NENA-Preemie:
Weight: 730 grams
Length: 320 mm
Head size: 240 mm
Belly size: 210 mm
Femur length: 48 mm

Product training, service and guarantee
The NENASim is a complex product, we understand the need for a strong service component. Medical-X provides application training and guarantees the product for 1 year. Additional service packages can be provided for.
NENASim-Preemie ALS FEATURES

Lifelike looks and feel
The fragile stature of preterm babies is accurately experienced through the realistic looks and feel of the simulator. Being fully enveloped in skin, having eyes with eyelids, proportioned as a premature, the NENA-Preemie feels alive. This is a great asset for the preparation of staff and family, which can require close skin-to-skin contact as a potential care technique. The skin is soft to the touch, easy to clean and durable.

Realistic airway system
The airway is realistic, with a tongue, vocal cords, trachea and esophagus. The Preemie can be endotracheal and nasally intubated. The baby can be ventilated manually. Ventilation generates a rise in the chest. Improper intubation and ventilation leads to a rise of the belly. The resistance of either lungs can be adjusted manually.

IV access points
There are multiple IV access points to train with. On the scalp two wet IVs can be placed on the superficial temporal veins. Fluids are then drained.

CPR training
The NENA-Preemie can be used to practice CPR, using the two-thumb technique.

Stomach
The NENA-Preemie has a stomach. It can be accessed through orogastric intubation.

Umbilical cord vascular access
The umbilical cord is attached to a drainage tube, allowing for the training of umbilical cord catheterization through the umbilical vein and the use of actual fluids within the medical treatment. The umbilical cord is replaceable after repeated use.

The most realistic premature baby simulator with durable and life-like silicon skin
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.

- **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**
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 the 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
- Tracking of the angles of the head tilt
- Tracking of the excision of the lower jaw
- Aschner reflex

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.

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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.

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, popliteal, femoral, brachial, 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 effectiveness. 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. Furthermore, it is possible to break the front teeth if intubation is performed incorrectly. These can be replaced.

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.
Models

LAP-X BOX is an innovative and powerful box trainer, ideal for training and maintaining certain skills, as well as for warming up before a real medical intervention. LAP-X BOX is available in two different models to accommodate different budgets, requirements and projects. Both models feature an ergonomic design and have an easy, intuitive and user-friendly user interface. Both models are portable, compact and easy to set up, and can be used with any desktop or laptop computer. LAP-X BOX comes in a light weight, portable and strong carrying case, making transport and installation even easier.

- **LAP-X BOX**
  LAP-X BOX has the ability to measure time, and to record and store the performances of the trainees in the local database (when there is no internet) or on the server (when there is internet). Because the data is stored, the instructor can review trainee performances and scores at a later time. The trainees can review their own training progress and change the information in their account. Trainees can also create their own online portfolio; this allows for worldwide online competitions with trainees from different areas and hospitals.

- **LAP-X BOX PRO**
  LAP-X BOX PRO not only measures time, but also the movement of each instrument: it measures and records the left path length and the right path length of the instruments. Trainee’s acquired performance scores can be assessed not only by the teacher but also automatically: the scores will be compared with the nominal scores set by the administrator. LAP-X BOX PRO can be upgraded to become a hybrid system, which means the system can be used as a virtual reality simulator and as a box trainer, with the benefit of all movements being measured.

Benefits at a glance

- Innovative box system at low cost
- Portable, compact and easy to set up
- Intuitive and self-explanatory system
- Database to register different users
- Trainee’s performance can be recorded for later assessment
- Record and store the performances of the trainees in the local database or on the server
- Trainees can create their own online portfolio
- Administration tool to monitor the training progress of trainees
- Change or add training modules and exercises
- Reduce learning curve, operational procedure time and instruction time
Positioning LAP-X VR

LAP-X VR is an innovative virtual reality simulator for cost-effective motor skills training in a safe environment for different surgical specialties. LAP-X provides a validated package of various curricula of increasing difficulty to attain proficiency skill levels in all surgical specialties, including gynecology, urology, pediatric surgery, general surgery, and gastrointestinal surgery. LAP-X VR offers you an excellent training aid to standardize, structure, and complement hands-on skills training in surgical residency programs. LAP-X VR helps to reduce the learning curve, to reduce operational procedure time and also to decrease instruction time. With the possibility of metrics measurement and performance recording as well as online remote assessment, LAP-X VR helps you to perfectly organize, manage and standardize training. LAP-X VR provides an ideal training solution to help surgical educators save time, effort and money while achieving the best training result.

Functionality

LAP-X VR features exercise videos, which the trainee can watch before performing the exercise. After the exercise has been completed, the trainee will receive an automatic assessment by the software. The trainee can then submit the scores and video recording to the instructor for later assessment. The instructor can log in locally or online to review the trainee’s scores and video recording, and is given the possibility to assess the performance and give comments or feedback. LAP-X VR includes e-learning content, exam questions and the ability to create a personal portfolio. LAP-X VR also includes administration tools for educators that are easily incorporated in each hospital’s training program, enabling the possibility of standardized training. The standardization of this training can be done in a hospital, but also in a cluster of hospitals or in a certain region.

Benefits at a glance

- Innovative virtual reality system at low cost
- Portable, compact and easy to set up
- Intuitive and self-explanatory system
- Database to register different users
- Trainees’ performance can be recorded for later assessment
- Real surgical instruments are used, narrowing the gap between training and real surgery
- Administration tool to monitor the training progress of trainees
- Change or add training modules and exercises
- Reduce learning curve, operational procedure time and instruction time
- Ideal for mandatory laparoscopic skills training
- Instant feedback with measurements
Positioning LAP-X HYBRID

LAP-X HYBRID is an innovative and powerful laparoscopic simulator for all minimally invasive surgery specialties, including but not limited to general surgery, gynecology, urology, gastro-intestinal surgery and pediatric surgery. LAP-X HYBRID offers the best of both worlds by combining virtual reality exercises and traditional box trainer exercises in one simulator, with the possibility of metrics measurement and performance recording as well as online remote assessment to perfectly organize, manage and standardize the training. LAP-X HYBRID provides an ideal training solution to help surgical educators save time, effort and money while achieving the best training result.

Functionality

The instructor can create a new curriculum by performing and recording new custom exercises. Nominal scores can be set, and the curriculum can be standardized. The trainee can watch the existing or newly created recordings before performing an exercise. After the exercise has been completed, the trainee will receive an automatic assessment by the software, based on nominal scores set by the instructor. The trainee can then submit the scores and video recording to the instructor for later assessment. The instructor can log in locally or online to review the trainee’s scores and video recording, and is given the possibility to assess the performance and give comments or feedback.

Tools

LAP-X HYBRID includes e-learning content, exam questions and the ability to create a personal portfolio. LAP-X HYBRID also includes administration tools for educators that are easily incorporated in each hospital’s training program, enabling the possibility of standardized training.

Benefits at a glance

- Affordably priced
- Scientifically proven
- Portable, compact and easy to set up
- Ideal for mandatory laparoscopic skills training
- Administration tool for training management
- Combination of virtual reality and box trainer
- Reduce learning curve, operational procedure time and instruction time
- Compatible with all box trainer exercises
- Possibility to use animal organs
- Unlimited user registration
- Record instruction videos and set nominal scores
- Instant feedback with measurement: duration, path lengths, mistakes
- Online remote assessment by instructors
Virtual reality modules for LAP-X VR and LAP-X HYBRID

**Basic skills**
This module is designed to practice basic endoscope controlling skills in a non-anatomical environment.

**Clipping of the renal vein**
Complete nephrectomy
Intended to train a laparoscopic complete nephrectomy. This exercise allows clipping and cutting the renal vein, renal artery, and ureter.

**Removal of the appendix**
Laparoscopic appendectomy
This module is designed to train a laparoscopic appendectomy. Trainees can choose among different instruments, such as an EndoLoop, scissors, and/or EndoGIA.

**Removal of the gall bladder**
Laparoscopic cholecystectomy
Project and train a laparoscopic cholecystectomy intervention.

**Solving kidney complications**
Preview kidney complication
Focuses on solving kidney complications up until performing a complete nephrectomy.

**Practice navigation and anatomy**
Anatomy navigation
Made to test trainees’ knowledge of the anatomical structures in the pelvic area, while simultaneously training controlling the endoscope.

**System specifications**
- Two controllers of 1.6 kg each
- Controller Dimensions: 22x15x32cm (WxDxH) each
- HD camera, led light, foot pedals
- Exercise platform 35x30x5cm (WxDxH)

**Computer requirements**
- Processor intel i7, 3.4GHz
- Operating system windows 7 or 8
- Memory >8 GB
- Video Card Nvidia® GeForce® GTX 650 or better
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Version 188

* Actual products may differ from shown hardware and software images