



SIMENDOTM
certifying skills

Laparoscopy training essentials product information

Simendo camera

Simendo laparoscopy

Simendo all-in-one

About Simendo

Simendo BV is located in the dynamic city centre of Rotterdam, which is famous for the amount of skyscrapers and Dutch multi-nationals such as the ING, Unilever and Shell.

Our goal is to achieve a worldwide certification standard for the handling of minimal invasive skills, and to build a training solution with which students can be certified in their own time, possibly at home, but without direct supervision by a teacher. To this end we have developed scientifically validated training programs that allow students to practice in a safe, virtual environment.

If we succeed in getting laparoscopic surgeons certified throughout the world, more lives will be saved. Therefore we will keep on investing to reach our goal driven by our credo; if you invest in life, life will invest in you.

Strategy

Simulators that do not have a structured training curriculum have a high risk of ending up as a dust catcher. To overcome this problem we have developed an intuitive score tracking system that helps you implement the Simendo training in your educational program within the blink of an eye. Once you start using our simulators it will soon lead to an essential need for your educational program.

Without a certification system for students, you will not get the full benefit of your trainer. Our training programs certify your students automatically upon successful completion of our various curricula. All that is required to implement the Simendo into your education program, is to mandate one or more of these curricula.

We have developed our trainers such that students can train in their own time, according to their own schedule, or whenever they feel like it. There is no need for classroom sessions or supervisors to be physically present when students are training, freeing up teachers and supervisors for more important tasks. Ease of use of the software makes sure students can find their way around the trainer intuitively.

Our innovative score tracking system allows you to group hospitals to set up a regional certification program. Setting the system to use time limited certificates ensures that students across the region keep training to keep their skills on par.

We take over the difficult part of getting your students up to a high level of instrument handling for safer surgery. We challenge them with a variety of exercises, starting from easy up to a highly advanced level. With our trainers you can mandate training without a physical supervisor and at the same time make it fun, challenging and contemporary. We have over ten thousand training sessions every year and look forward to helping you certify your students as well. Please feel free to contact us for more information.

Products

Simendo Pro3 camera



This training program certifies the camera skills for a zero and thirty degree camera. The trainee will learn to handle the zero degree camera by moving around and aiming at different locations around the liver. The 30 degrees angled endoscope movements are trained by finding objects hidden in boxes and by tracing lines around the liver.

Simendo Pro3 laparoscopy



The Simendo laparoscopy is designed for residents/surgeons that perform laparoscopic procedures in the fields of surgery, gynaecology and urology. This simulator focuses on skills training.

Products

Simendo all-in-one

Camera + laparoscopy + team training



With the all-in-one team trainer you can certify camera and laparoscopic skills. Using the team training software you will be able to train together with your colleague, one holding the instruments while the other holds the camera.

Simendo all-in-one click

Camera + laparoscopy + team training

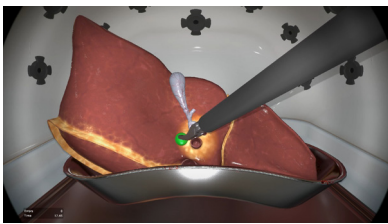


If you are already using the Simendo laparoscopy trainer you can easily expand your collection with the Simendo camera trainer and vice versa. You will receive a special base plate on which you can click all three instruments in the right position. This way you can also start with team training.

Simendo camera

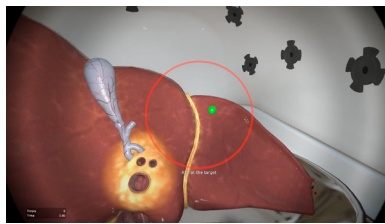
Navigation curriculum

The navigation curriculum focuses on the fundamental skills in a static environment and teaches the trainee to convert movements from a 3D environment to a 2D screen, getting used to the difficulty of the instruments having only four degrees of freedom and working in a spherical coordinate system.



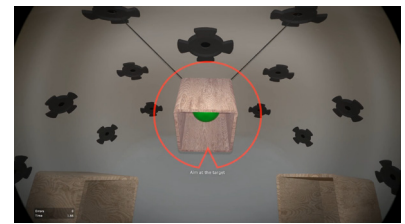
Touch

There is a significant difference between camera and instrument handling and both need a different training approach. This exercise lets the trainee control a laparoscopic instrument to feel and experience the difference between instrument and camera handling.



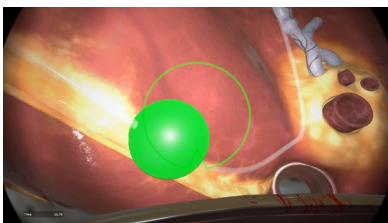
Aim

This the same exercise as the previous exercise with the laparoscopic instrument but now with a zero degree camera. The goal of this exercise is to learn to control a zero degree camera and experience the difference between camera and instrument handling.



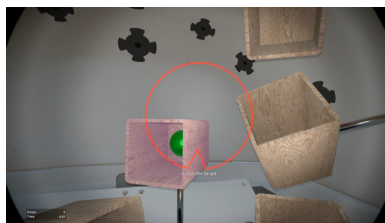
4 Boxes

A very effective exercise to learn and understand the basics for handling a 30 degrees camera. The boxes are placed in North-South-East-West position and inside the boxes are hidden objects. The objects can only be found by using a 30 degrees camera and steering the angled scope in all positions. In the meanwhile the trainee has to keep the horizon straight.



Trace

Follow a sphere that moves over the path in all directions along the liver and gallbladder using a 30 degrees camera. This exercise trains to follow a moving object at all angles along the liver. The trainee will learn to steer the angled camera while moving through the area at the same time and keeping the horizon straight.



6 Boxes

Based on the four boxes exercise but now the amount of boxes has been increased and they are placed in random positions. The trainee will learn to steer the 30 degrees camera to the targets that are positioned at random spots.



Which scope?

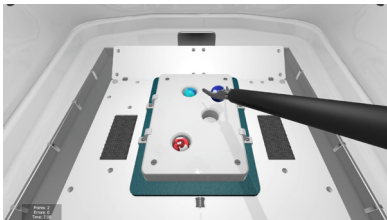
In this exercise the trainee has to find out and tell what kind of camera it is by moving it towards the spheres. It can be a zero degree or 30 degrees camera. The trainee will learn how to quickly detect what kind of camera it is (angled or non-angled) by moving it through the area.

Simendo laparoscopy

Novice curriculum

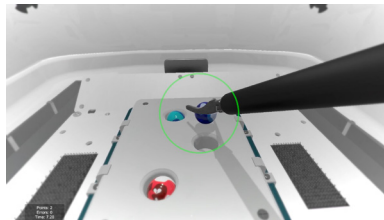
The novice curriculum is designed for trainees with none or little laparoscopic experience. The trainee will step-by-step obtain the first basic laparoscopic skills. In this curriculum the trainee will work in a friendly training environment that fully focusses on instrument handling.

This curriculum has been introduced in 2008 and is proven to be highly effective by extensive research as well as in the operating theatre.



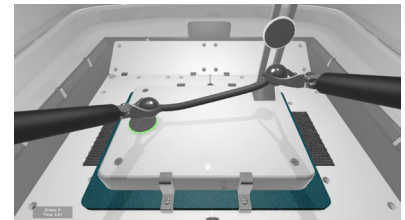
Pick up & drop

This exercise will teach the trainee the first motorial skills for handling a laparoscopic instrument. The amount of distracting factors is minimised so the trainee can fully concentrate on controlling the instrument.



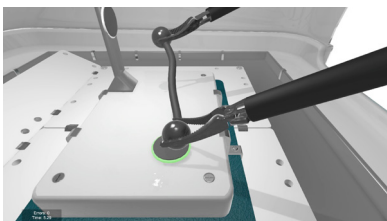
Pick up & navigate

A follow up of the first exercise where the trainee has to learn to control the camera as well. The trainee will come to understand the difference between camera and instrument steering and will learn to follow the instrument with the camera.



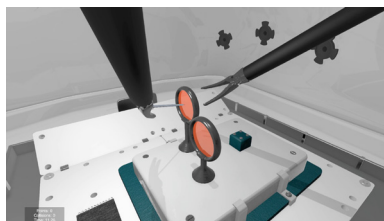
Stretch

This is the first exercise where the trainee will learn to work bimanually (with two instruments at the same time).



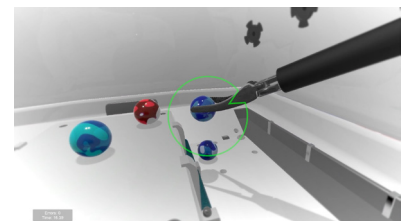
Stretch with misorientation

In this exercise the camera position has been changed perpendicular to the instruments. The trainee will experience the importance of the camera position and will come to a better understanding as to why a triangular position of instruments and camera is the safest way to position the instruments and camera.



Ring & needle

This exercise trains to position and grab an object from one instrument to another and move it in a straight line through both rings. Navigating the needle through the rings in a straight line by rotating and retracting the instrument at the same time is a difficult technique that needs extra attention. Therefore this exercise is considered as the most difficult exercise of the novice curriculum.

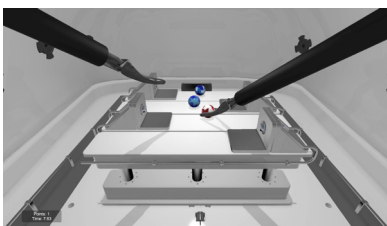


30 Degree scope

The trainee will experience the difficulties and advantages of a 30 degrees endoscope and will learn the principles needed to control it. The trainee has to rotate the angled camera to create a good working space with an optimal view. Once positioned correctly the trainee has to keep the camera in steady position while using the laparoscopic instrument to place the marbles.

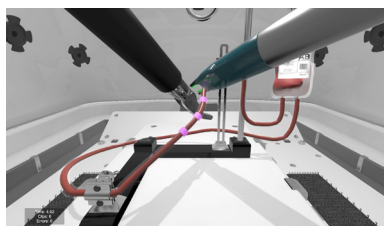
Intermediate curriculum

This curriculum is a follow up of the novice curriculum. It is designed for starting laparoscopic surgeons and for those who finished the novice curriculum. The trainee will obtain the most important skills to perform a laparoscopic operation. All exercises are simulating skills that are commonly performed during an operation. After finishing this exercise the trainee is ready to assist a general laparoscopic operation under supervision of an expert, or train on a cadaver or pig.



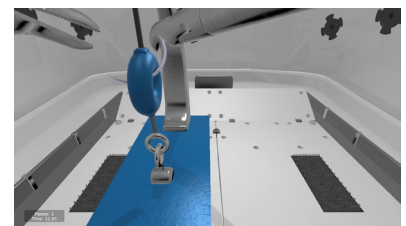
Slide & drop

This exercise simulates the instrument movements for preparing tissue to create a proper working space. It focusses on left and right handed instrument handling. The trainee has to work horizontally and has to avoid unnecessary movements. Only small vertical movement of the beams are allowed during the exercise and the trainee is forced to work cooperate with the left and right instrument.



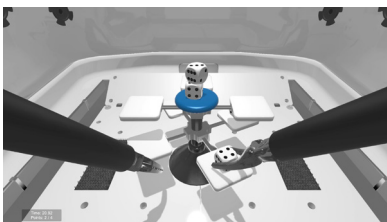
Clip a vessel

The trainee will learn to safely clip a vessel on four different locations. The vessel is in a common position for surgical and gynecologic operations. Both sides of the clip must be visible before clipping to make sure the vessel is fully closed. In total four clips have to be placed at four different positions.



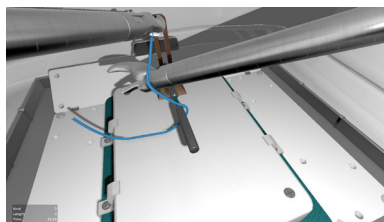
Ring & needle

Learns the basic principles for stitching with a curved needle. The trainee will learn how to manipulate, position and rotate a curved needle. The trainee will also learn how to rotate the wrist needed for stitching with to avoid collateral damage.



Carousel

Here the trainee is forced to work at a very precise level with the left and right instruments together. The objects are highly sensitive and even small movements or leaning dice can cause the tower of dice to fall. If the trainee is able to finish this exercise he/she has obtained a high level of instrument control.



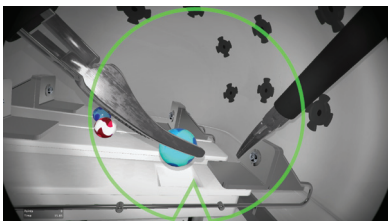
Single knot

Teaches the basic principles for tying a knot. The exercise represents a single knot. During the ring and needle exercise the trainee has learned how to position the curved needle. The next step is to close a knot. The safest way to do this is by not holding the needle, as this is a sharp and solid object that can cause collateral damage. The trainee has to pull the thread horizontally (only minimal upward beam movement is allowed) to prevent tissue damage when closing the knot.

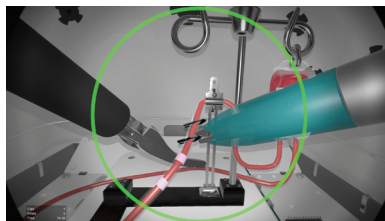
Simendo team training

The team trainer allows you to train with two persons at the same time, one holding the camera while the other is controlling the instruments. This training is excellent for teaching the camera operator how to work with, and follow the commands of the surgeon during the real operation.

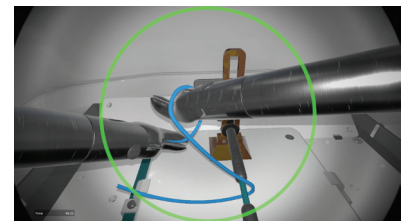
The exercises are based on the scientifically validated novice and intermediate curricula of the Simendo laparoscopy software. The tasks alternate between a zero degree and 30 degrees angled camera.



Slide & drop (team training)



Clip a vessel (team training)



Single knot (team training)

Publications

If you decide to mandate the training it is essential that there is a scientifically proven foundation. Therefore Simendo BV maintains a close relationship with various academic centres and universities. This close relationship does not only lead to new products, but also new publications and validation articles on which the certificate scores are based. A small selection of articles on these subjects includes:

Simendo camera

Graafland, M., Bok, K., Schreuder, H.W., & Schijven, M.P. (2013) A Multicenter Prospective Cohort Study on Camera Navigation Training for Key User Groups in Minimally Invasive Surgery. *Surgical Innovation*, 21(3), 312-319.

Simendo laparoscopy

Barnes J., Burns J., Nesbitt C., Hawkins H., Horgan A. (2015) Home virtual reality simulation training: the effect on trainee ability and confidence with laparoscopic surgery. *Journal of Surgical Simulation*, 2, 53-59.

Verdaasdonk, E.G., Dankelman, J., Lange, J.F., & Stassen, L.P. (2008) Transfer validity of laparoscopic knot-tying training on a VR simulator to a realistic environment: A randomized controlled trial. *Surgical Endoscopy*, 22(7), 1636-1642.

Article available at: <http://www.ncbi.nlm.nih.gov/pubmed/18027030>

Schreuder, H.W., van Hove, D., Janse, J.A., Verheijen, R.H., Stassen, L.P., & Dankelman, J. (2011). An 'Intermediate Curriculum' for Advanced Laparoscopic Skills Training using Virtual Reality Simulation.

Article available at: <http://www.ncbi.nlm.nih.gov/pubmed/21783431>

More references to articles and publications are available on our website at <http://www.simendo.eu/publications/>

Contact

Feel free to contact us if you would like purchase information about the Simendo laparoscopy trainer or one of our other products.

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