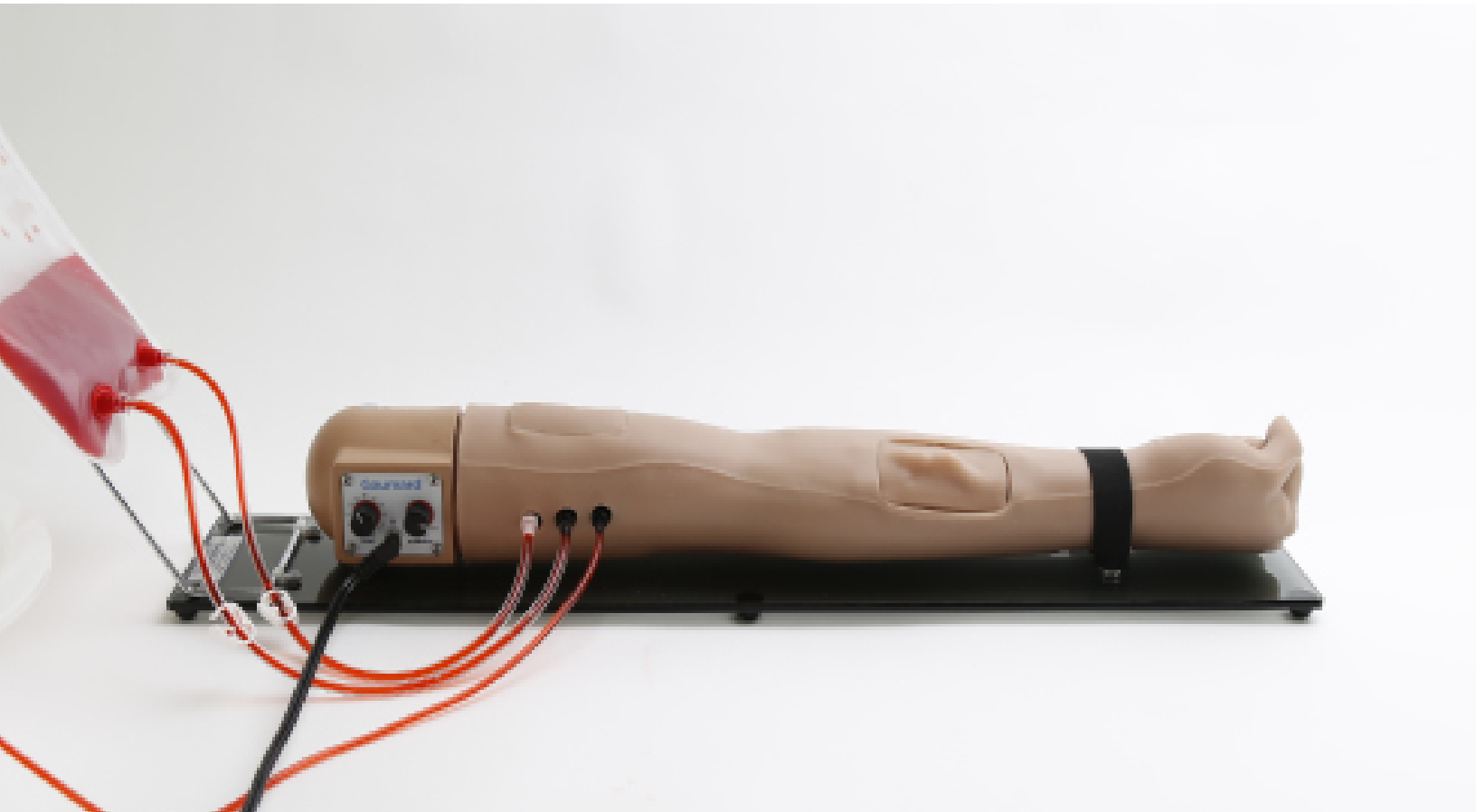


SMASH Advanced Patient Training Arm

S402.100



Gaumard[®]
Simulators for Health Care Education

Arterial and Venous Patient Training Arm is an interactive educational system developed to assist a certified instructor. It is not a substitute for a comprehensive understanding of the subject matter and not intended for clinical decision making.

User Guide 19.1.1

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Care and Cautions

Overall Warnings

Damage caused by misuse may void the manufacturer's warranty. Failure to comply with the following guidelines may result in injury or damage to the equipment. Additional warnings are found throughout the document.

- We recommend flushing veins with 70:30 solution of clean water to isopropyl alcohol (IPA) at least once per month to prolong the life of the vasculature.

The simulator is “splash-proof” but not water-proof. Do not submerge or allow water to enter the interior of the simulator.

GENERAL

- This simulator is constructed of material that approximates skin texture. Therefore, in handling the model, use the same gentle techniques as you would in working with a patient.
- Do not wrap this or any other Gaumard product in newsprint.
- Indelible marks made with ballpoint pens, ink or marker cannot be removed.
- Do not use alcohol, acetone, Betadine® or any other antiseptic which contains iodine in this or any Gaumard® simulator. These products could damage or stain the skin of the simulator.
- Use of needles sizes 22 gauge and smaller will extend the lifetime of the resealing skin and tubing.

STORAGE

- Improper storage may damage the simulator. Keep it stored in the box and/or bag provided.
- Store the simulator in a cool, dry place. extended storage should be between 32 - 85 degrees F (0-29 Celsius). Other temperatures will cause the simulator to soften and slowly warp.
- Do not stack or store heavy materials on top of the box and/or bag.
- It is acceptable to operate the simulator at an ambient temperature of 95 degrees Fahrenheit (35 Celsius) for a short period of time.

CLEANING

- Clean the skin of the simulator after every training session. The skin should be cleaned with a cloth, dampened with diluted liquid dish washing soap.
- Always purge with clean distilled water and then drain the vein reservoirs at the end of the simulation session. Doing so will retard the formation of mold and prevent clogging of the system.

Getting Started

Overview

The S402 Arterial and Venous Patient Training Arm, is an advanced training tool useful to illustrate the following procedures:

- Medication infusion
- Phlebotomy and venipuncture
- Subcutaneous, intramuscular, and IV bolus injections.
- Incisions and suture placement exercises at the bicep sites.
- Surgical interventions, such as the placement of an AV graft or AV fistula.
- Hemodialysis through the utilization of the fistula insert installed in the forearm.

APPEARANCE

- Medium skin tone is the standard simulator color; light or dark skin is available at no extra cost.

SIMULATOR

- Full-size adult arm with replaceable veins and skin cover.
- Adjustable pulse rate and intensity
- Interchangeable Incision and Suture inserts.
- Interchangeable Arterial & Venous (A&V) Inserts and Fistula inserts to simulate healthy artery and vein and a healed arteriovenous fistula, respectively.
- Veins, skin and inserts self heal from repeated sticks.

OTHER

- One year limited warranty

Contents

Item	Quantity	Description
1	1	S402.100 SMASH Advanced Patient Training Arm
2	1	Squeeze Bulb with 2 Ft Line
3	1	Smoked Lucite® Base with Metal Stand for Blood Bag.
4	1	Dispensing Bag
5	1	Vein Filling Kit

6	1	Stopper
7	2	Incision and Suture Insert
8	2	Arterial and Venous Insert
9	2	Fistula Insert
10	4	Clamp
11	1	Synthetic Blood Concentrate
12	1	Replacement Vein Set
13	1	Talcum Powder
14	1	Funnel
15	2	Hex L-Key 5mm
16	1	Power supply with cord 110 or 220 VAC (Country)
17	1	Instruction Manual
18	1	Carrying Bag



Terminology

FACILITATOR - the person conducting the simulation; an instructor or lab staff member.

PROVIDER - a person participating in the simulation as a healthcare provider.

Equipment Set Up

SIMULATOR SET UP

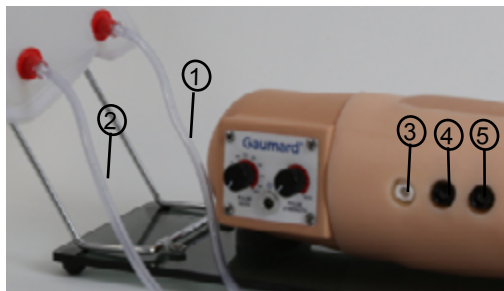
To set up the Arterial and Venous Patient Training Arm follow the instructions below:

1. Gather the following items:
 - Training arm installed in the Lucite® base with metal stand
 - Dispensing bag
 - Arterial and venous in-flow tube (white connector)
 - Arterial recirculation tube (black connector)
2. Rotate the metal stand into position as shown below.
3. Place the blood dispensing bag on the metal stand as shown below
4. Connect the arterial and venous in-flow tube and the arterial recirculation tube to the outlet ports in lower section of the dispensing bag.

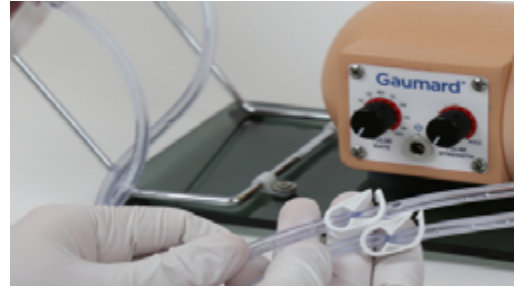


Port and tubing classification:

- ① Arterial and venous (A&V) in-flow tube (white connector)
- ② Arterial recirculation tube (black connector)
- ③ Arterial and venous (A&V) in-flow port (white)
- ④ Arterial recirculation port (black)
- ⑤ Drainage port (black)



5. Close both clamps on the A&V in-flow tube and arterial recirculation tube.



6. Fill the blood dispensing bag with simulated blood or water by placing the provided funnel into the upper port and dispensing the fluid.

Use water initially and once you are familiar with the simulator, use the simulated blood.

In a separate container, mix a solution of Gaumard simulated blood colorant and water following the mixing instructions on the bottle.

WARNING

Use only Gaumard's provided simulated blood. Any other simulated blood brand may contain sugar or other additives that may cause blockages and interrupt the bleeding system.



7. Connect the stopper to upper port on the dispensing bag.

8. Place the end of both tubes in a container and open the clamps.

9. When you start to see the blood flow out of tubes, proceed to close the clamps.



The training arm is completely assembled, proceed to the “Priming The System” Section to fill the system.

PRIMING THE SYSTEM

1. Locate the IV filling kit:
 - One syringe with filling tube
 - Two drainage tubes with clamps
2. Connect the two drainage tubes to the arterial recirculation port and the drainage port respectively.



3. Open the clamps on both drainage tubes and place the ends inside a container to drain the fluids.
4. Fill the syringe with filling tube with the water or simulated blood.
5. After filling the syringe with the desired fluid, attach it to the A&V in-flow port and slowly fill the system.

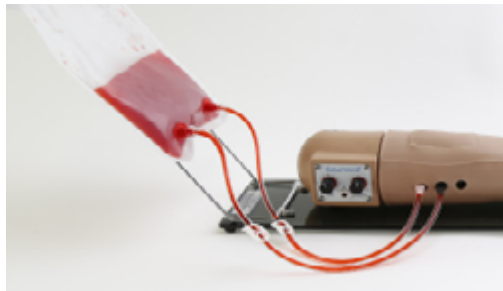


6. Repeat the previous step several times until no more air bubbles are released from the

drainage tubes.



7. When satisfied, close the clamps on both the drainage tubes.
8. Disconnect the syringe with filling tube from the A&V in-flow port and connect the A&V in-flow tube from the bag.
9. Disconnect the drainage tube from the arterial recirculation port and connect the arterial recirculation tube from the bag.



10. Leave the drainage tube connected to the drainage port with the clamp open.
11. Ensure all tubes are securely connected to the dispensing bag as well as to the ports on the training arm.
12. Ensure that the connections on both sides of the chosen A&V or Fistula insert are secure.



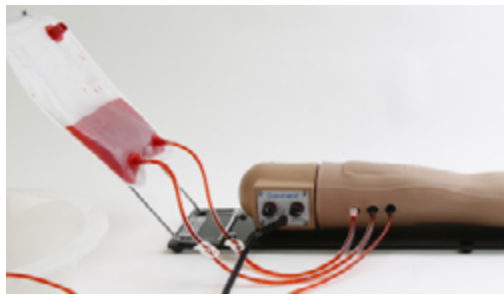
13. Turn the pulse rate and strength controls counter-clockwise, so they are set to their minimum values.



14. Connect the power supply to the power port located on the shoulder control panel.

15. Open the clamps on the A&V in-flow tube and arterial recirculation tube.

16. Let the blood flow towards the arm.



17. Set the pulse rate control to 80 beats per minute and pulse strength control to maximum value.



As the fluid is circulated, air bubbles entrapped will be flushed from the arterial recirculation tube to the dispensing bag.

If there is no fluid circulation or the pulse is not working, please check the tubes to ensure that there are no kinks and both clamps are open.

If everything is correctly setup and still there is no circulation, then repeat the priming procedure.

The system is considered primed and ready to use when the veins are free of air bubbles.

Working with the Simulator

ARTERIAL AND VENOUS EXERCISES

The training arm simulates the following arteries and veins:

- Cephalic vein (Antecubital vein)
- Median cubital vein
- Basilic vein
- Radial vein
- Ulnar vein
- Radial artery and Brachial artery

An internal pump located in the shoulder allows for variable pulse rate and intensity without the need for external pumps.

The skin and veins are designed to show a minute leakage when an eccentric puncture is performed. A “perfect” stick will show little or no leakage.

The A&V insert can, therefore, also be used for surgical interventions, such as the placement of an AV graft or the creation of an AV fistula.

Standard IV exercises can be performed in all vessels, including the arterial ones.

The radial and brachial artery can be converted to the veins by turning the pump controls to their minimum value and disconnecting the power supply.

INSTRUCTIONS FOR USE

If the system hasn't been primed refer to the “Priming the System” section above.

Notice that these instructions are applicable for the both, the SMASH arm S402.100 and S263.100 SMASH arm with attachable shoulder.

1. Place the simulator on a level surface.

2. Apply the desired pressure to the veins via the squeeze bulb. Increasing the pressure allows for stronger flashback.



3. Proceed with the arterial and venous exercises.



4. Disconnect the wrist band before to feel and adjust the pulses.



5. Adjust the radial and brachial pulse rate and intensity using the controls in the shoulder panel.



6. When the training session is completed, proceed to drain the system.

You can perform an average of 200 needle sticks with a 22 gauge needle by utilizing the entire surface area of the injectable sites.

Note that the use of needles larger than 22 gauge will reduce the skin/vein life.

WARNING

Use only Gaumard's provided simulated blood. Any other simulated blood brand may contain sugar or other additives that may cause blockages and interrupt the bleeding system.

DRAINING THE SYSTEM

WARNING

At the end of every simulation session, you must purge the IV system with clean water. If the training arm is not going to be used for a week or more, purge the system with a solution of isopropyl alcohol in distilled water. Failure to do so may permanently damage the system.

INSTRUCTIONS FOR USE

1. Close all clamps.
2. Disconnect the A&V in-flow tube and the arterial recirculation tube.
3. Connect the second drainage tube to the arterial recirculation port.



4. Open both clamps on the drainages tubes.
5. Fill the syringe with filling tube with distilled water and connect it to the A&V in-flow port on the arm.
6. Slowly inject fluid into the system.

We recommend flushing veins with 70:30 solution of clean water to isopropyl alcohol (IPA) at least once per month to prolong the life of the vasculature.

7. Disconnect the syringe with filling tube.
8. Repeat steps 6-7 with air until all fluid has been drained from the arm.
9. Close all the clamps and disconnect all ports.

INTRAMUSCULAR AND SUBCUTANEOUS EXERCISES

The training arm includes an incision and suture insert in the upper arm to perform intramuscular injections, incisions and suturing exercises.

Both the Incision and Suture Insert and the A&V insert are multilayer, consisting of the skin, subcutaneous tissue, and muscle, so they provide a platform to train incision and suturing.



Interchange the inserts according to the training procedure.

There are also two subcutaneous injection sides located in the volar forearm and lateral upper arm.

REPLACING THE INCISION AND SUTURE INSERT



1. Lift up one side of the insert and carefully remove it.
2. Hold the replacement Incision and Suture insert over the new vacant slot.
3. Orient the S on the Incision and Suture insert to face towards the shoulder.
4. Place the insert and massage the sides to smooth the transition between insert and skin.

INJECTIONS IN THE DORSUM OF THE HAND

Three veins are supplied in the dorsum of the hand for additional intravenous exercises.



The simulator is shipped with the antecubital area of the arm presented, and the palm hand shown palm up. In order to access the veins in the dorsum of the hand, please follow the instructions below:

1. Disconnect one of the snaps securing the wrist band.
2. Looking from the fist towards the shoulder, hold the shoulder with one hand and gently rotate the arm clockwise until the dorsum is exposed.
3. Secure the arm by reconnecting the snap from step 1.
4. In order to return to the palm up position, repeat the first 3 steps, but rotating the arm counter-clockwise instead of clockwise.

HEMODIALYSIS EXERCISES

The fistula insert represents a healed fistula that allows hemodialysis exercises.

The Arterial and Venous Insert can be used for training of the placement of arteriovenous (AV) grafts or creation of an AV fistula



To install the Fistula insert, refer to the "Replacing the Arterial and Venous Insert and Fistula Insert" below.

REPLACING THE ARTERIAL AND VENOUS INSERT AND FISTULA INSERT



1. Please refer to the "Draining The System" section to remove all fluids from the arm.
2. On the proximal end of the insert, gently lift up the skin.

WARNING

Avoid using nails or sharp objects to lift the skin or separate the male and female connectors

3. Pull the insert's male quick-connectors backwards to separate them from the arm's female quick-connectors.

4. Repeat steps 2 and 3 for the insert's distal side.



5. Completely remove the insert.



6. Gather the insert you wish to use as replacement.
7. Orient the wider end of the replacement insert with the proximal side.
8. Align and position the edges of the skin to smooth the transition between skin and insert.
9. Direct the male connectors of the wider end of the insert into the proximal female connectors on the arm.



10. Repeat steps 7 and 8 for the insert's distal side.
11. Ensure that all connections are secure.

Appendix

Replacements

SKIN REPLACEMENT

To replace the skin of training arm follow the instructions below:

1. Drain any fluids from prior training exercises; refer to the “Draining The System” section to empty the system.
2. Close all clamps.
3. Disconnect the tubes from all three ports located on the arm.
4. Remove the dispensing bag from the metal stand.



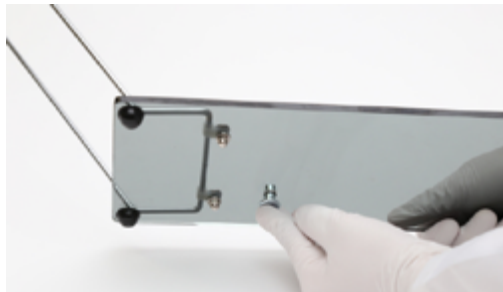
5. Disconnect wrist band with the snaps holding the training arm in place.
6. Use the Allen key provided to remove the upper bolt from the shoulder.



7. Gently lift the arm and release it completely from the base.



8. Keep the shoulder base pad and the nut in position as shown below.



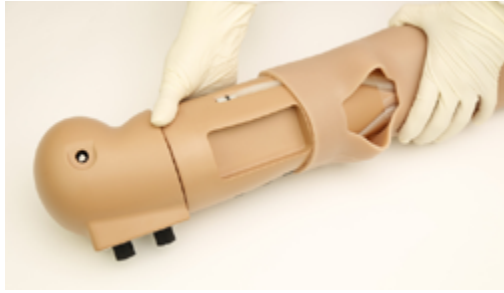
9. Remove the arterial and venous or fistula insert



10. Remove the incision and suture insert.



11. Gently remove skin starting from the shoulder.



WARNING

Do not use sharp objects or fingernails as they will puncture or tear the skin



12. If at this point you wish to perform the IV replacement, refer to the “IV Replacement” section below.

13. To install the new skin apply talcum powder inside the skin to aid with the process.



14. Place the new skin over the hand and pull it all the way up.



15. Line up skin with the holes for the inserts.



16. Once the skin is in place, check for any areas that may have bunched up and massage them down.



17. Proceed to install the arm onto the Lucite® base using the steps 4-9 in reverse order.

When reinstalling the bolt described in the step 6, ensure the shoulder hole is clear to avoid pinching any tubing inside.

VEIN REPLACEMENT

To replace the veins used in the arm, follow the instructions listed below:

1. Gather the following items:

- Replacement vein set
- Talcum powder
- Clear tape

2. Refer to the “Skin Replacement” section above to remove the skin prior to start this section.

3. Remove the tape holding the veins in place.



4. To replace the veins gently pull to separate them from the white elbow connectors as shown below.



5. Disconnect the veins to be replaced from the arm.



6. Remove the black rings from the veins.
7. Locate the replacement vein set.



8. Measure and cut the new veins to be installed.

9. Place the black rings on either end of the replacement veins.

10. Position the replacement veins within their designated channel on the arm, as shown below.



11. Slide the replacement vein tubing ends onto their respective tubing connector, and secure them in place by sliding the black ring over the connector barb.

12. If replacing the vein tubes that connect to the A&V and Fistula inserts, secure the female connector in the respective end of the tube.



13. Follow the same instructions to replace the veins from the dorsum of the hand.



14. Use new tape to hold the veins in position as there were originally.



15. Refer to steps 12-15 from the “Skin Replacement” section to place the skin back into position.



16. Proceed to the “Priming the System” section as replacing the vein will introduce air into the system and it will need to be re-primed.

Consumables and Replacements

SELECTED PARTS LIST

Contact Gaumard Scientific for a complete list of consumables and replacement parts and their prices.

Item ID	Description
S402.100.911.L/M/D	Arterial and Venous Insert
S402.100.912.L/M/D	Fistula Insert
S402.100.913.L/M/D	Incision and Suture Insert
1308044(5/6/7)A	Arm Skin
S402.100.810	Replacement Vein Set
S402.100.985	Vein Filling Kit
S402.100.812	Synthetic Blood Concentrate
S402.100.948	Talcum Powder
S402.100.968	Power Supply with Cord
S402.100.906	Shoulder Base Pad
S402.100.811	Dispensing Bag

Warranty

EXCLUSIVE ONE-YEAR LIMITED WARRANTY

Gaumard warrants that if the accompanying Gaumard product proves to be defective in material or workmanship within one year from the date on which the product is shipped from Gaumard to the customer, Gaumard will, at Gaumard's option, repair or replace the Gaumard product.

This limited warranty covers all defects in material and workmanship in the Gaumard product, except:

Damage resulting from accident, misuse, abuse, neglect, or unintended use of the Gaumard product;

Damage resulting from failure to properly maintain the Gaumard product in accordance with Gaumard product instructions, including failure to properly clean the Gaumard product; and

Damage resulting from a repair or attempted repair of the Gaumard product by anyone other than Gaumard or a Gaumard representative.

This one-year limited warranty is the sole and exclusive warranty provided by Gaumard for the accompanying Gaumard product, and Gaumard hereby explicitly disclaims the implied warranties of merchantability, satisfactory quality, and fitness for a particular purpose. Except for the limited obligations specifically set forth in this one-year limited warranty, Gaumard will not be liable for any direct, indirect, special, incidental, or consequential damages, whether based on contract, tort, or any other legal theory regardless of whether Gaumard has been advised of the possibilities of such damages. Some jurisdictions do not allow disclaimers of implied warranties or the exclusion or limitation of consequential damages, so the above disclaimers and exclusions may not apply and the first purchaser may have other legal rights.

This limited warranty applies only to the first purchaser of the product and is not transferable. Any subsequent purchasers or users of the product acquire the product "as is" and this limited warranty does not apply.

This limited warranty applies only to the products manufactured and produced by Gaumard. This limited warranty does not apply to any products provided along with the Gaumard product that are manufactured by third parties. For example, third-party products such as computers (desktop, laptop, tablet, or handheld) and monitors (standard or touch-screen) are not covered by this limited warranty. Gaumard does not provide any warranty, express or implied, with respect to any third-party products. Defects in third-party products are covered exclusively by the warranty, if any, provided by the third-party.

Any waiver or amendment of this warranty must be in writing and signed by an officer of Gaumard.

In the event of a perceived defect in material or workmanship of the Gaumard product, the first purchaser must:

Contact Gaumard and request authorization to return the Gaumard product. Do **NOT** return the Gaumard product to Gaumard without prior authorization.

Upon receiving authorization from Gaumard, send the Gaumard product along with copies of (1) the original bill of sale or receipt and (2) this limited warranty document to Gaumard at 14700 SW 136 Street, Miami, FL, 33196-5691 USA.

If the necessary repairs to the Gaumard product are covered by this limited warranty, then the first purchaser will pay only the incidental expenses associated with the repair, including any shipping, handling, and related costs for sending the product to Gaumard and for sending the product back to the first purchaser. However, if the repairs are not covered by this limited warranty, then the first purchaser will be liable for all repair costs in addition to costs of shipping and handling.

Extended Warranty In addition to the standard one year of coverage, the following support plans are available: Two-Year Extension (covers second and third years)

Call for pricing (USA only)



Gaumard®
Simulators for Health Care Education

Contact Us

E-mail Technical Support: support@gaumard.com

Before contacting Tech Support you must:

1. Have the simulator's Serial Number
2. Be next to the simulator if troubleshooting is needed.

E-mail Sales and Customer Service: sales@gaumard.com

Phone: Toll-free in the USA: (800) 882-6655

Worldwide: 01 (305) 971-3790

Fax: (305) 667-6085

Post: Gaumard Scientific

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USA

Office hours: Monday-Friday, 8:30am - 4:30pm EST (GMT-5, -4 Summer Time)

General Information

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