

EVAC-U-SPLINT[®]

APPLICATION GUIDELINES



Applies To Model Numbers:

EV 3000

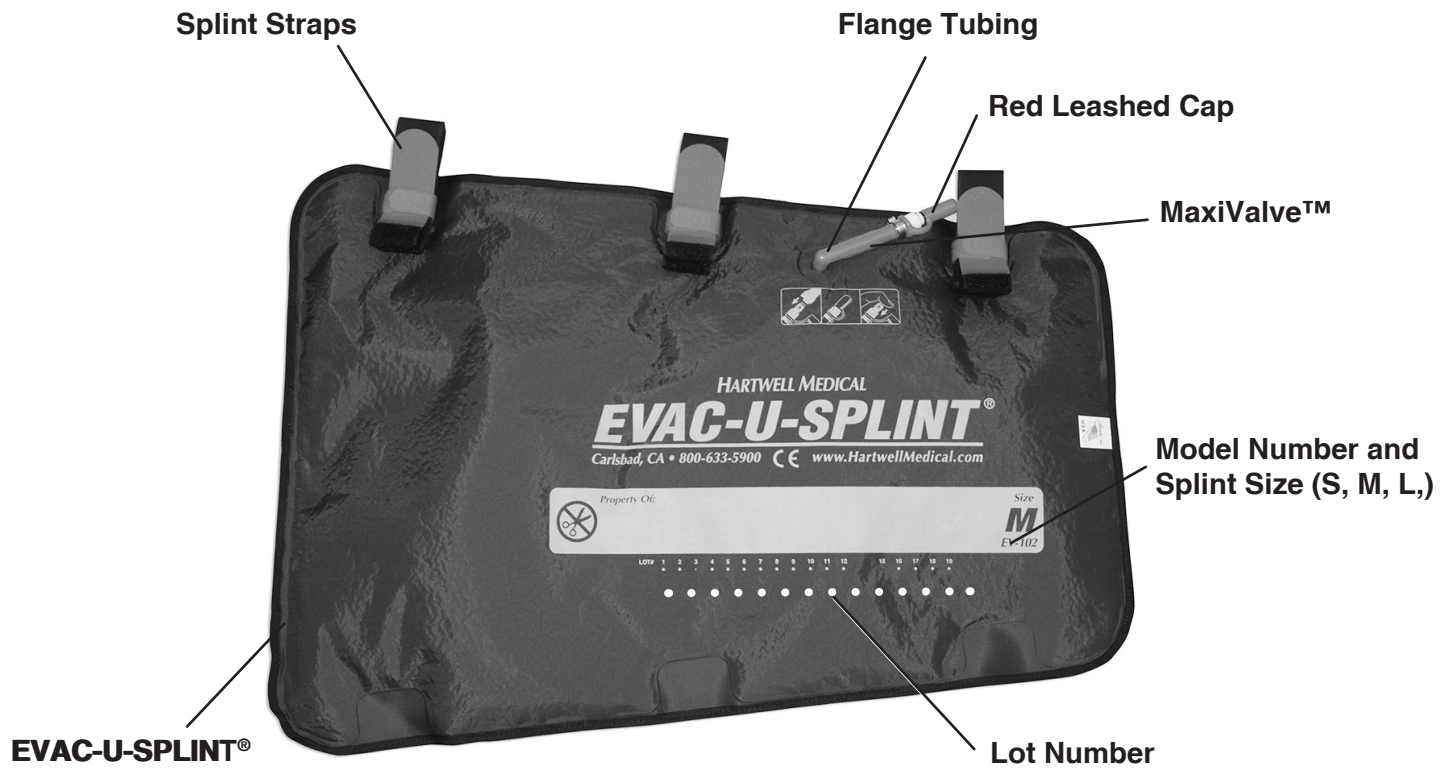
EV 3000SR



EVAC-U-SPLINT®

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PRODUCT TERMINOLOGY



SPECIFICATIONS

Dimensions:	Large Splint		Medium Splint		Small Splint	
Length:	40.0"	(101.6 cm)	27.5"	(69.9 cm)	19.5"	(49.5 cm)
Width:	30.0"	(76.2 cm)	20.0"	(50.8 cm)	13.0"	(33.0 cm)
Thickness:	1.0"	(2.5 cm)	1.0"	(2.5 cm)	1.0"	(2.5 cm)
Weight:	2.2 lbs.	(1.0 kg)	1.0 lb.	(0.5 kg)	0.5 lb.	(0.2 kg)

In Carry Case: 25.0" L x 12.0" W x 12.0" D (64 cm L x 31 cm W x 31 cm D)

Operating Temp: -30° F to 150° F (-34° C to 66° C)

Compact Pump: 11.0" L x 2.5" Dia. Aluminum Cylinder with 4" handle (28 cm L x 6.4 cm Dia.)
2.0 lbs. (0.9 kg)

*Our company philosophy is one of constant improvement in design and craftsmanship.
Therefore, specifications are subject to change without notice.*

EVAC-U-SPLINT® is a registered trademark of Hartwell Medical
MaxiValve™ is a trademark of Hartwell Medical



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INTRODUCTION

The EVAC-U-SPLINT® has been designed to aid in stabilization of an injured or ill person with a minimum amount of movement to the injured area or extremity. Unlike a rigid board splint or a metal ladder splint, the EVAC-U-SPLINT uses vacuum technology to conform to the exact shape and contours of the patient's anatomy, providing improved immobilization without circumferential pressure.

Specific application and operation techniques may vary from user to user. Hartwell Medical does not recommend that this product be used for any purpose other than what it is designed for as outlined in these guidelines for use. Any other use or application of the EVAC-U-SPLINT becomes the sole and complete responsibility of the product user.

Physical Abilities of User

All users of the EVAC-U-SPLINT should be familiar with its operation and should possess the following basic physical abilities:

- be able to grasp firmly with both hands
- sufficient strength in their back, arms and legs to support and lift their respective amount of patient weight being handled
- good balance
- good vision and reflexes
- muscular coordination

CAUTION: *At all times, a sufficient number of properly trained healthcare providers should be available to move the patient once they have been immobilized with an EVAC-U-SPLINT. Use caution at all times when handling and maneuvering an injured patient.*

AUTHORIZATION

A Word of Caution

These application guidelines are intended solely as a guide to the appropriate procedures to be employed when using the EVAC-U-SPLINT.

It is the responsibility of the user of this professional medical device to obtain competent emergency medical training and instruction. The application guidelines furnished here are for use by properly trained and authorized emergency medical personnel who operate under proper medical control or under the medical supervision of a licensed Physician Medical Director.

The application guidelines are not intended as a statement of the standard of care required in any particular situation, since circumstances and patient's physical condition can vary widely from one emergency to another.

Further, it is not intended that these application guidelines shall in any way advise emergency medical personnel concerning their legal authority to

perform such activities or procedures outlined herein. Determinations are local, and should be made only with the authority of their local emergency medical service, and the aid of legal counsel.

Hartwell Medical firmly advocates the following:

- Use the application guidelines set forth, when approved by your local emergency medical service authority.
- Supervised emergency medical training is required in the proper use of the EVAC-U-SPLINT prior to field use.
- Proper application of the EVAC-U-SPLINT requires a minimum of two trained emergency medical personnel.
- Continuing medical education on a regular basis with "hands-on" experience is recommended.



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OPERATING INSTRUCTIONS

It is recommended by the Centers for Disease Control that emergency medical personnel wear eye and face protection, in addition to protective gloves, whenever there is a possibility of coming into contact with patient blood or any body fluids.

Positioning

Always make sure that the basic ABC's of airway, breathing and circulation are intact prior to any splinting activities.

Expose the injured area.

Observe skin color and symmetry.

Determine if there has been a loss of mobility and/or sensation.

Palpate distal pulse and check for prompt capillary refill. *Photo 1.*

Apply constant, "long axis" (in-line) gentle manual traction on severely deformed, long bone fractures.

Return extremity to its normal anatomical position with an assistant supporting the extremity under the suspected fracture site.

CAUTION: Do not return the extremity to its anatomical position when **contraindicated**. If the patient complains of **increased pain** or if there is **resistance** during manipulation movement, then STOP and immobilize the extremity as best possible in the position found. Joints or distal limb fractures with no neurovascular deficits should be immobilized in the position found.

Maintain manual support of the injured area while coordinating additional assistance during the EVAC-U-SPLINT® immobilization process. *Photo 2.*

ALWAYS FOLLOW YOUR LOCAL MEDICAL PROTOCOLS APPROVED BY YOUR MEDICAL DIRECTOR.



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Preparation

Your healthcare partner or a qualified assistant should:

- Apply appropriate dressings to all wounds in and around the suspected fracture site.
- Open the EVAC-U-SPLINT carry case and select a splint that will immobilize the joints above and below the fracture site. Shoulder and hip injuries will require additional immobilization methods to accomplish this goal.
- Remove the red leashed cap from the MaxiValve™ and push in on the red end of the valve to equalize the air pressure in the splint.
- Lay the splint out on the ground or on a flat surface, valve side down, and manually distribute the beads evenly throughout the splint. *Photo 3.*



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- The EVAC-U-SPLINT® should be soft enough to easily and comfortably conform to the injured area, yet firm enough to keep the beads in place if positioned vertically. This adjustment method can easily be made by simply removing or allowing air to enter the splint.

TIP: When working on a dislocated shoulder, evacuate enough air from the splint to make it resemble modeling clay, then conform the splint to your partner who is mimicking the patient's injury. Then, simply transfer the "shaped splint" to the patient. (See special applications on page 8.)

Application

Maintain support of the injured area and elevate (if indicated) the injured extremity just enough to apply the splint. *Photo 4.*

Your assistant should:

- Have the splint positioned for proper application and assist with supporting the injured area if necessary.
- Slide or place the splint under the injured area, positioning the splint so that at least one strap is above the suspected fracture site and at least one strap is below the suspected fracture site.

DO NOT SECURE THE SPLINT STRAPS AT THIS TIME.

- Cradle the injured extremity with the splint and gently manipulate beads into voids to provide the best conforming mold possible. The splint should conform easily. If not, simply adjust by allowing air to enter the splint. Splint edges should not overlap. *Photo 5.*

TIP: Leave an open space approximately 1" whenever possible along the length of the splint. This provides proper immobilization, yet allows for visual inspection along the full length of the injured extremity.

- If the splint is too wide, fold the strapless edge back on itself and smooth out the edge to form a narrower splint.
- Hold the splint in place "hands-on-stable" by grasping both top leading edges above and below the fracture site. *Photo 6.*

Once the splint is properly applied, release your support of the extremity, letting the splint cradle the suspected fracture site, assisted by your partner's "hands-on-stable" support, which maintains the injured limb in a desired and comfortable position.





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Evacuation

- While holding the flange tubing on the splint, **connect the MaxiValve™ coupling** on the pump hose to the MaxiValve on the EVAC-U-SPLINT®. You should hear a “click” when the connection has been made. If the red leashed cap has not been removed from the MaxiValve, remove the cap prior to connecting the pump hose. *Photo 7.*
- **Evacuate the air** from the splint by using the manual pump until the splint is firm. You will feel resistance on the pump handle when the splint has been sufficiently evacuated. *Photo 8.*
- **Remove the pump hose** from the MaxiValve by depressing the metal tab on the pump hose coupling. The evacuated splint has now formed a rigid supportive “cast” around the injured area. *Photo 9.* Place the red leashed cap back on the MaxiValve.
- **Place the splint straps**, with slight tension, around the splint. Secure the straps in place. **NOTE:** The EVAC-U-SPLINT is available with “hook and loop” or side release buckle straps. The “hook and loop” straps are shown here.

The suspected fracture site is now splint-stable.

Adjustments can now be made, if necessary, to add stability or to make slight positional changes for patient comfort. These adjustments can be accomplished by simply removing or allowing air to enter the splint.

During aeromedical transport the splint may soften with significant altitude changes due to the decrease/increase in air pressure. Adjust as necessary. The change in rigidity will not be nearly as noticeable as with anti-shock garmets because there is very little air inside the EVAC-U-SPLINT once it has been evacuated.

After evacuating the splint, re-evaluate skin color, recheck mobility and sensation, palpate distal pulse and time capillary refill. *Photo 10.*

Finish treatment of the patient with the appropriate EMS equipment and supplies based on the patient’s needs and the location of injury.



ALWAYS FOLLOW YOUR LOCAL MEDICAL PROTOCOLS APPROVED BY YOUR MEDICAL DIRECTOR.



Valve and Pump Operation

To Evacuate Air: (Manual Pump)

- Manually remove the red leashed cap from the Maxi-Valve™. *Photo 11.*

- While holding the flexible flange tubing just below the MaxiValve, attach the vacuum pump hose to the MaxiValve. You should hear a “click” when the connection has been made. *Photo 12.*

- Evacuate the air from the splint.
- Remove the pump hose from the MaxiValve by depressing the metal tab on the pump hose connector. Place the red leashed cap back on the MaxiValve.

To Evacuate Air: (Electric Suction)

- Manually remove the red leashed cap from the MaxiValve.

- Connect the MaxiValve Portable Suction Adapter (PSA) to the end of your portable suction tubing. *Photo 13.*

- While holding the flexible flange tubing just below the MaxiValve, attach the vacuum pump hose with adapter to the MaxiValve. You should hear a “click” when the connection has been made.

- Evacuate the air from the splint.
- Remove the pump hose with adapter from the MaxiValve by depressing the metal tab on the Portable Suction Adapter (PSA). Place the red leashed cap back on the MaxiValve.

To Release Vacuum:

- Manually remove the red leashed cap from the MaxiValve.

- While holding the MaxiValve, depress the red plastic center section, which will allow air to enter the splint. *Photo 14.*

- Place the red leashed cap back on the MaxiValve for storage.





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Special Applications

The EVAC-U-SPLINT® is a versatile product that can be used in many ways for immobilizing and support of a variety of suspected injuries. The EVAC-U-SPLINT is only limited by the creativity of the users. Some of the unique applications of the EVAC-U-SPLINT are noted below.

Dislocated Shoulder

The EVAC-U-SPLINT can be especially helpful when caring for a patient with a dislocated shoulder. Frequently, these patients are in extreme pain and are holding their injured arm in a position that causes them the least amount of discomfort.

- Evacuate a small amount of air out of the splint to make it like modeling clay.
- Have your partner pose in the same position as the patient and then mold the splint around your partner's arm.

NOTE: You can do this same type of pre-forming by using your own lower leg and foot. *Photo 15.*

- Transfer the splint to the patient and complete the molding of the splint around the patient's injured area.
- Evacuate the splint with the pump and secure the straps. It may be necessary to use a backboard strap around the torso of the patient. *Photo 16.*

Long Legs

Two EVAC-U-SPLINTS, can be "nested" together to form a longer splint for those rare occasions when a longer splint is needed *Photo 17.*

- Place the smaller of the two splints inside the larger one.
- While your partner provides support to the injured leg area, slide this new combination splint under the fracture site and position the splint where it is needed to provide sufficient support.
- Evacuate the smaller of the two splints first, then evacuate the larger one.

This application is especially useful when trying to completely immobilize the entire leg and foot of a very tall person.

Infant Immobilization

The medium or large size EVAC-U-SPLINT can be effectively used as a full-body immobilizer for infants and toddlers (0-2 years old). The appropriate size splint should be selected based on the suspected injuries. The EVAC-U-SPLINT will also act as a thermal insulator, helping to reduce temperature loss. *Photo 18.*

If the child is too big for these splints, then the EVAC-U-SPLINT Pediatric Mattress should be used.





STORAGE

The EVAC-U-SPLINT® set comes in a duffel bag style carry case that easily fits in most vehicle compartments or under a squad bench. The splints and the manual pump should always be stored in their carry case to reduce the potential for getting them soiled or damaged. They should NOT be stored in compartments exposed to extreme heat or cold and should NEVER be placed next to a muffler or exhaust system. *Photo 19.*

MAINTENANCE

To properly maintain your EVAC-U-SPLINT, establish a preventative maintenance program that meets the needs of your particular service area. Daily inspection should include looking for anything that would affect the integrity of performance of the EVAC-U-SPLINT, i.e. tears, broken parts, loose hose clamps, inoperable valves, etc. If damage is found or if maintenance is required, take the EVAC-U-SPLINT out of service until such time that it can be properly repaired or replaced.

The materials used in the construction of the EVAC-U-SPLINT do not require any special maintenance. Keep all surfaces clean, dry and free of tears and your EVAC-U-SPLINT should provide you with many years of reliable service.

The manual vacuum pump is virtually maintenance-free. Perform general exterior cleaning as needed. Once a year, check the O-ring seal. If the “O” ring needs lubrication, use a water proof, aluminum complex formula grease. NOTE: a 1” spread spanner wrench will be needed to remove the top cap of the pump to inspect the O-ring. *Photo 20.*

CLEANING

Clean and disinfect the EVAC-U-SPLINT according to your medical director’s guidelines. The EVAC-U-SPLINT and the splint straps should be cleaned using soap and water, a mild detergent, or a commercial cleaner/disinfectant. When the splint has been exposed to blood or body fluids, it should be cleaned using cold water and then allowed to soak in a detergent solution for 24 hours and then thoroughly rinsed and dried. **ALWAYS** keep the red leashed cap on the MaxiValve™ when soaking the EVAC-U-SPLINT. *Photo 21.*

Sodium hypochlorite (bleach) solutions may be used, but avoid prolonged exposure of the fabric to high concentrations of bleach because discoloration is possible. A 1% bleach solution can be used on the EVAC-U-SPLINT, but it should be thoroughly rinsed off with lukewarm or cold water and then allowed to dry. Make sure the splint and splint straps are completely dry before placing them back into their storage/carry case.

NOTE: The EVAC-U-SPLINT can be machine washed using a **washing machine without an agitator**. Make sure the MaxiValve is protected with the red leashed cap prior to placing the splint into the washing machine.



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REPAIR PROCEDURES

VINYL PATCH MATERIAL AND ADHESIVE

These instructions are intended for **minor repairs** of small holes or tears in the fabric material of the extremity splints. **Large rips or tears may require the product to be replaced.** Contact your authorized Hartwell Medical Distributor or call us directly if you have questions about the repair of your EVAC-U-SPLINT® product.

For holes or tears less than 3/4" (1.9 cm) in size:

- Locate the hole or tear in the material and mark it with a piece of masking tape for easy identification.
- Clean the surface to be repaired thoroughly using isopropyl (rubbing) alcohol. Make sure the area is dry and free of fingerprints before applying adhesive.

If the hole is less than 1/8" (0.3 cm) in size:

- Apply a small amount of vinyl glue to the damaged area, thoroughly covering the area.
- Vacuum a small amount of air out of the splint to pull some of the glue into the damaged area.
- Release the vacuum to let air back into the splint.
- Allow the glue to dry thoroughly for 24 hours at room temperature.

If the hole or tear is larger than 1/8" (0.3 cm), but less than 3/4" (1.9 cm) in size:

- Make a patch from the material supplied that is at least 3/4" larger than the tear on all sides. Example: for a 3/4" tear make a patch that measures 1.5" x 2.25". Make sure to round the corners of the patch so they do not peel.
- Using your finger (wear rubber gloves), apply the glue to the splint and to one side of the patch. Use a thin even coating. Don't apply a heavy layer because it will take longer to dry and will be squeezed out around the edges of the patch.
- Allow the glue to become tacky, then place the patch over the damaged area. Press the patch and the splint material firmly together. Make sure the entire edge of the patch is glued securely to the splint.
- Allow the glue to dry thoroughly for 24 hours at room temperature.

For holes or tears larger than 3/4" (1.9 cm) in size.

Contact your local authorized Hartwell Medical Distributor.

Temporary field repairs may be accomplished using a small piece of nonporous adhesive tape or duct tape over the damaged area. If you have any questions about these repair procedures, please contact us directly.

PEEL AND STICK PATCHES

If you have a need to patch your EVAC-U-SPLINT® mattress or splint product you may find Peel and Stick Patches for Vacuum Splints patches easy to use and quick to apply. Read ALL directions before applying a patch.

For best results wash and dry your hands before applying the patch. Apply to a clean, dry surface. Surface temperature of the materials to be repaired should be 50° F or warmer. The splint should be soft, not evacuated. Move the beads inside of the vacuum splint or mattress away from the area to be patched, creating as flat an area of fabric as possible. These patches are designed for and will provide the best results for use on small holes or cuts that are 1/4" or LESS in length.

STEP 1. CLEAN & DRY: Clean the surface to be repaired with an alcohol prep pad or a 50/50 mixture of rubbing (isopropyl) alcohol and water. Before proceeding, make sure the surface is completely dry.

STEP 2. PEEL: Carefully peel back half of the paper liner, touching just the edges or corners of the patch.

STEP 3. STICK: Position and anchor the exposed portion of the patch. Position the patch so the small hole or tear will be in the center area of the patch. Slowly peel back the rest of the liner while carefully applying the patch over the small hole – take care to avoid air bubbles. Smooth out the patch working from the center of the patch to the outside edges of the patch. Rub all edges to seal the patch and then rub the entire patch aggressively. Let the splint or mattress sit, undisturbed and not evacuated for one hour. Repair is now complete.

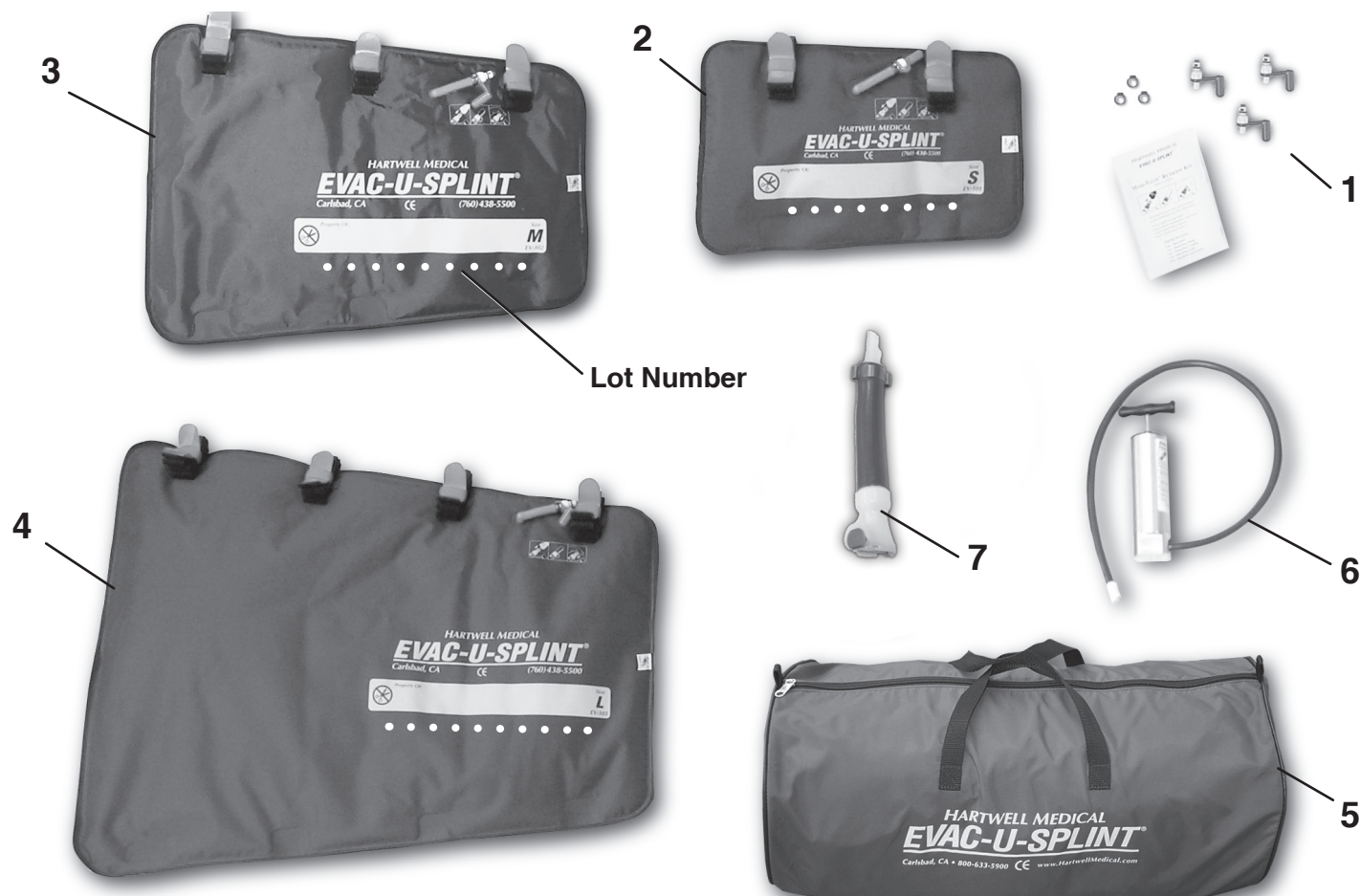
ALWAYS TEST THE PRODUCT BEFORE PLACING IT BACK IN SERVICE. Do not place repaired products into a washer or dryer. For best results, store patch material at room temperature.

Note: Temporary field repairs can be made using a small piece of nonporous adhesive tape or duct tape placed over the damaged area. If you have any questions about these repair procedures please contact us directly at 760-438-5500 or customerservice@hartwellmedical.com.

Additional repair kits can be ordered online at
www.HartwellMedical.com



PARTS DIAGRAM



PARTS LIST

Ref#	Replacement Part Number	Description	Quantity
1	EV 15P	MaxiValve™ Replacement Kit (3 MaxiValves, 3 Leashed Caps and 3 Hose Clamps)	1
2	EV 101	EVAC-U-SPLINT® Small Extremity Splint	1
3	EV 102	EVAC-U-SPLINT Medium Extremity Splint	1
4	EV 103	EVAC-U-SPLINT Large Extremity Splint	1
5	EV 14	EVAC-U-SPLINT Carry/Storage Case	1
6	EV 12C	EVAC-U-SPLINT Compact Pump - Aluminum	1
7	EV 15PSA	MaxiValve Portable Suction Adapter	1

For more information on additional parts, please contact our Customer Service Department at 760-438-5500.



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CUSTOMER SERVICE

The lot number is located on the front of the splint underneath the “Property of” area. Record this number with other important information, such as date of purchase and Distributor name in the space provided. Retain this manual for reference and include it with any change in ownership of this product.

Should you need to contact us, please always provide the model number and lot number of your product. If you become aware of any serious incident related to the use of the device, you should report the incident to Hartwell Medical and to your medical device regulatory authority.

Should you have any questions about your EVAC-U-SPLINT, our customer service personnel will be happy to help you. Our customer service department can be reached by calling:

(760) 438-5500, Monday - Friday, 7:30 am - 4:30 pm PST.

Product: EVAC-U-SPLINT Extremity Set

Model Number: _____

Lot #: _____

Date Purchased: _____

Purchased from: _____

Date Product Inspected

And Approved for Use: _____

In-Service Training

Completion Date: _____

LIMITED WARRANTY

All EVAC-U-SPLINT products manufactured by Hartwell Medical are warranted for two years from the date of purchase, or the date of receipt, if proof of delivery is provided. The EVAC-U-SPLINT MaxiValve™ is guaranteed for the life of the product.

All disposable and soft goods are warranted for 90 days from the date of purchase, or the date of receipt if proof of delivery is provided.

Any product claimed to be defective due to materials or workmanship within the specified time period will be inspected by an authorized representative of Hartwell Medical. Obligation shall be limited to replacement or repair of components found to be defective.

Should a possible defect be found after the product is placed in-service, contact your Hartwell Medical Distributor directly. **DO NOT return the product without prior authorization.**

RETURN POLICY

No product claimed to be deficient will be accepted without prior approval of Hartwell Medical. Product accepted for investigation will be cleaned (if necessary), inspected, tested and then evaluated for repair or replacement. Returned products will be evaluated by age of product, condition of product and expected length of time to repair the product. If deemed repairable, the customer will be provided with an estimate prior to beginning any repairs. All repaired items carry a 90-day warranty.

DOCUMENTATION OF TRAINING

Everyone who will be using or operating the EVAC-U-SPLINT® should be required to actively participate in the initial training and all subsequent refresher training sessions. This will ensure a clear understanding of the function and capabilities of the EVAC-U-SPLINT. You should utilize the training process that has been approved by your organization and is in accordance with your medical director’s guidelines. Important items to document should be the training date, names of attendees, the instructor’s name and title, and the training location.

MAINTENANCE LOG

Routine inspection and maintenance is required to keep the EVAC-U-SPLINT® ready for immediate use. If, at any time, the EVAC-U-SPLINT is suspected of not functioning properly it should be taken out of service until such time that it can be thoroughly inspected and properly repaired or replaced. As part of your preventative maintenance program, you should maintain a written log of any maintenance performed on the EVAC-U-SPLINT.

HARTWELL MEDICAL



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