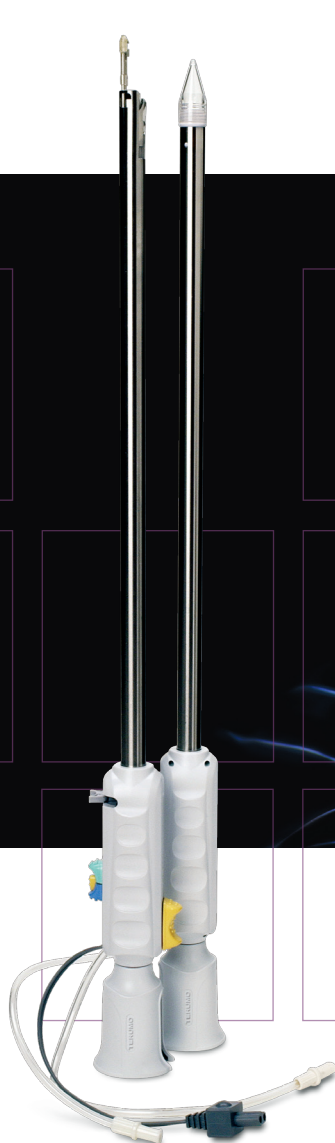
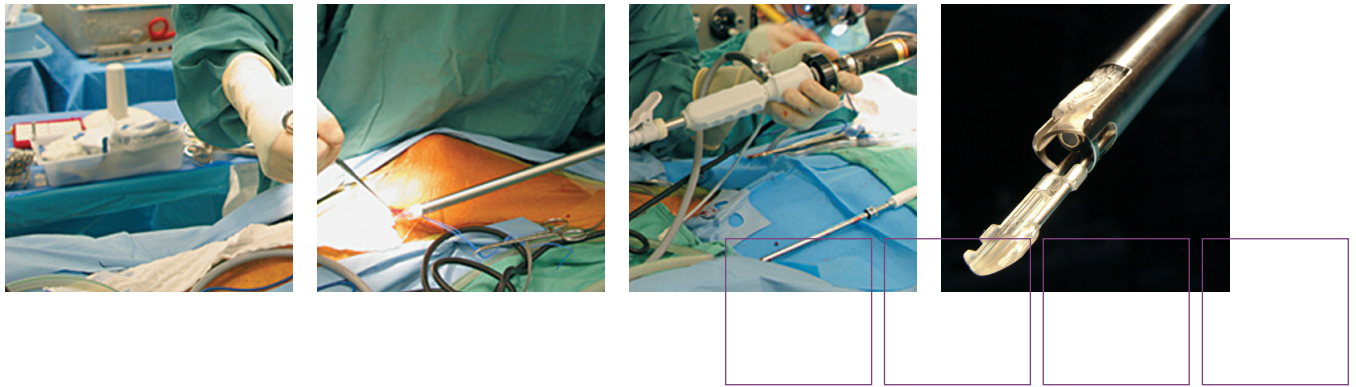


VirtuoSaph[™] ENDOSCOPIC VEIN HARVESTING SYSTEM

Unique Technology Worth a Closer Look





Get a Closer Look

Terumo's Centers of Excellence bring together clinicians interested in evaluating Terumo's endoscopic vein harvesting products and experienced clinicians already successfully using them. The Centers facilitate the learning of techniques and procedures that can improve patient outcomes.

Based in highly reputable medical institutions, Terumo's Centers of Excellence in Endoscopic Vein Harvesting have been established to promote collaboration and the establishment of best practices. The centers provide opportunities for clinicians evaluating the VirtuoSaph System to discuss the system and procedure with experienced surgical clinicians, observe cases, and practice the procedure on simulators.

Comprehensive training is available including advanced techniques and access to a clinical support team with more than 100 years of experience harvesting vein.

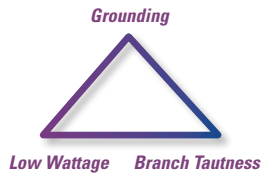
Continuing Support

Terumo supports its products and the clinicians who use them with a commitment to service before, during and after the evaluation.

Unique Technology Worth a Closer Look

The VirtuoSaph™ Endoscopic Vein Harvesting System is designed to elevate standards for patient safety, conduit quality, and ergonomics. When developing the VirtuoSaph System, Terumo spent significant resources to understand the needs and wants of clinicians worldwide. The resulting design uses unique technology within an open system to ensure the effectiveness of the procedure and provide the optimal conduit.

What makes the technology unique?



A harvester rod with V-keeper, V-lock and V-cutter

The V-cutter provides an optimal conduit through the “cutting triad” – grounding, low wattage, and branch tautness.

- Targeted, low energy during cauterizing and cutting of branches
- Quick ease and control of branch tautness



“Open” system distal insufflation with non-occlusive trocar

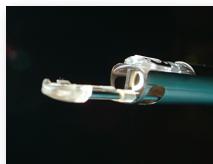
Several studies support the use of open systems and a non-occlusive trocar.¹⁻⁵

- May lower the risk of CO₂ embolism
- May lower risk of intraluminal clot



A dissector rod with an atraumatic conical tip, centering rings, and CO₂ delivered at the tip

Centering rings allow the clinician to monitor the location of the dissector one tip relative to the vein during dissection.



Unique wiper to clean the endoscope lens

- One wiper activation immediately improves visibility
- Allows cleaning in the tunnel without the need for additional fluid



Figure 1
Endoscopic view of the centering rings within dissector tip.

Better Patient Outcomes

The VirtuoSaph EVH System provides an endoscopic approach to saphenous vein harvesting. One small leg incision minimizes scarring, morbidity and infection associated with traditional longitudinal incisions.

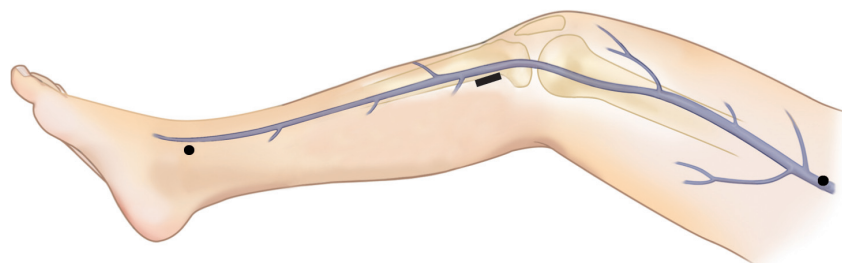


Figure 2
This smaller incision and two small stab wounds improve patient comfort and post-operative recovery.

Endoscope

The **Terumo® Endoscope** is a 5.5 mm endoscope designed exclusively for the VirtuoSaph EVH System utilizing Olympus technology. Olympus is recognized worldwide for its expertise in optics technology. This vital component provides superior resolution and image quality.

Trocar

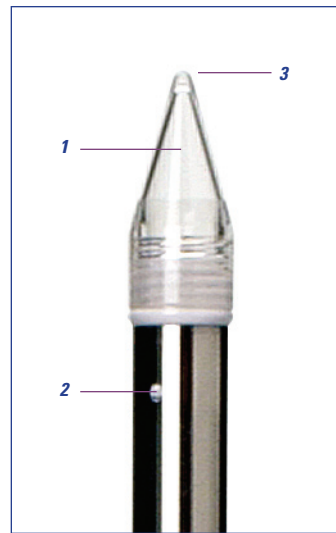
This device is a simple clip-on **trocar**. The dissector or harvester rod accesses the saphenous vein by entering the non-occluding trocar through the port. The body of the trocar is inserted into the leg incision and stays in place with the clip securely placed on the skin allowing fast conversion between the procedural steps. It places little or no pressure on the vein at the incision site. Research has shown that clot formation can result if stagnant blood that is not anti-coagulated is allowed to remain within a collapsed saphenous vein.¹

Simple one-click mechanism to secure the endoscope in the dissector or harvester rod.

Universal eyepiece to accommodate a variety of camera heads.

Light Guide Cable Port

Insufflation Tubing



1 The atraumatic conical tip of the dissector rod offers consistent and uniform dissection.

2 CO₂ delivered at the tip consistently provides space in the tunnel for increased visibility.

Use of open CO₂ insufflation can lead to dramatic reductions in retained clots.

Research has shown the frequent presence of intra-luminal clots in vessels harvested endoscopically using a "closed" EVH system.¹⁻³ Two studies noted CO₂ embolisms are noted about 4% to 17% of the time when using "closed" systems.⁴⁻⁵

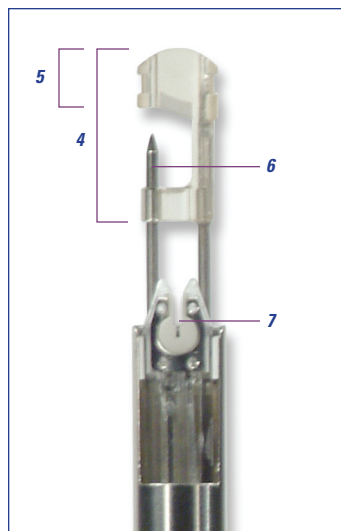
Continuous monitoring is suggested to provide early detection and help prevent development of significant CO₂ embolisms.⁵

3 Centering rings allow monitoring of the dissector cone tip during dissection.

Dissector Rod

To dissect the
and surround.





- 4 The **V-keeper** holds down the saphenous vein to minimize potential damage to the vein during cauterization. It is designed to set up the proper branch tautness and work in concert with the V-cutter for optimal sealing and cutting.
- 5 The **bilateral notches** anchor the branch to provide optimal tension during transaction.
- 6 The **V-lock mechanism** secures the saphenous vein in place during harvesting and transaction of the branches. It ensures that all the branches are cauterized and cut prior to removing the harvester rod from the leg.
- 7 The **V-cutter** is a simple cut-and-coagulate mechanism employing targeted low energy. It provides both functions in one easy step.

The safety design of the harvester rod maintains a controlled distance between the V-keeper and the V-cutter to provide consistent branch lengths and help ensure that sealing and cutting take place near the tunnel wall and not near the conduit. The V-cutter automatically responds to changes in tissue resistance as the branch is first sealed then cut.

Wiper Switch

V-Keeper Button

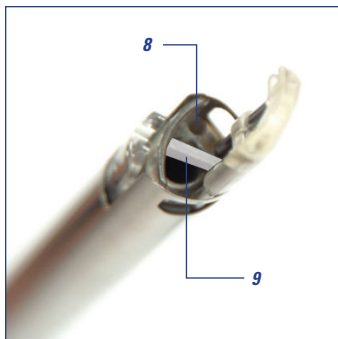
V-Lock Button

Insufflation Tubing

Bipolar Cord

Harvester Rod

To coagulate and cut the branches of the saphenous vein in one easy step.



- 8 **CO₂ delivered at the tip** consistently provides space in the tunnel for increased visibility. Use of open CO₂ insufflation can lead to dramatic reductions in retained clots. Research has shown the frequent presence of intra-luminal clots in vessels harvested endoscopically using a "closed" EVH system.¹⁻³ Two studies noted CO₂ embolisms about 4% to 17% of the time when using "closed" systems.⁴⁻⁵ Continuous monitoring is suggested to provide early detection and help prevent development of significant CO₂ embolisms.⁵
- 9 The **unique wiper** located on the harvester rod clears and cleans the endoscope lens of fat or blood to improve procedural visibility with one wipe, without adding fluid in the cavity. The ergonomic placement of the wiper switch on the handle allows easy activation.



The clinician uses the buttons on the harvester handle to manipulate the endoscopic tools, while viewing the procedure on a nearby monitor. The **ergonomic design of the handle** allows one-handed manipulation of the device.



Endoscopic Tower

In the United States, Terumo provides all the hardware components necessary to perform endoscopic vein harvesting. The imaging components for the **endoscopic tower** include the Olympus VISERA™ camera processor unit (CPU), VISERA light source, monitor, and a cart.

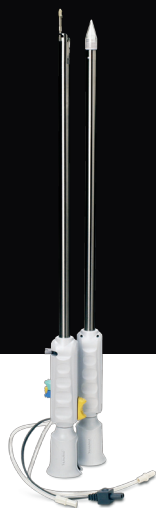
OLYMPUS

VISERA

Generator

The UES-40 **generator** from Olympus, combined with the VirtuoSaph System, provides the latest in electrosurgical technology and performance. The UES-40 generator delivers the flexibility needed to delicately adjust coagulation and cutting settings to meet clinicians' procedural needs.





Unique Technology Worth a Closer Look

Ordering Information	Product Code	Units/Case
Disposable Products		
VirtuoSaph Endoscopic Vein Harvesting System, sterile, (includes dissector, harvester and trocar)	MCVS550	5
Trocar, sterile (for spare)	MCTRC550S	10
Endoscope Product		
5.5 mm Endoscope	MCENDO550	1
Generator Products		
Bipolar cord	MCBICORD1	1
Generator*	UES-40	1

*Manufactured by Olympus Corporation, Tokyo, Japan. Available in the United States only.

For more information on tower components and generator compatibility, please contact your local Terumo sales representative or call Customer Service at (888) 758-8000.

www.terumo-cvs.com/virtuosaph

FOOTNOTES

- 1 Brown et al. Strategies to reduce intraluminal clot formation in endoscopically harvested saphenous veins. *J Thorac Cardiovasc Surg* 2007;134:1259-1265.
- 2 Burris et al. Incidence of residual clot strands in saphenous vein grafts after endoscopic harvest. *Innovations: Technology & Techniques in Cardiothorac & Vasc Surg* 2006;1(6):323-327.
- 3 Burris et al. Catheter-based infrared light scanner as a tool to assess conduit quality in coronary artery bypass surgery. *J Thorac Cardiovasc Surg* 2007;133:419-42.
- 4 Chiu et al. Reduction of carbon dioxide embolism for endoscopic saphenous vein harvesting. *Ann Thorac Surg* 2006;81:1697-1699.
- 5 Lin et al. Carbon dioxide embolism during endoscopic saphenous vein harvesting in coronary artery bypass surgery. *J Thorac Cardiovasc Surg* 2003;126:2011-2015.



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