Easier minimally invasive technology to deliver the optimal vessel for CABG.
Endoscopic vein harvesting (EVH) is a minimally invasive procedure undertaken through keyhole surgery. EVH is the standard of care for patients who require saphenous vein grafts for coronary and lower limb revascularizations.¹

With the Terumo VirtuoSaph Plus EVH System, the saphenous vein in the thigh and/or lower leg is harvested to be used as grafts for coronary artery bypass surgery (CABG). The saphenous vein remains an essential and most commonly utilized conduit for CABG procedures because it can be tailored to various lengths to fit anywhere across the heart.

Benefits with the VirtuoSaph Plus EVH System:

For Patients:
+ Reduces wound healing complications²
+ Less post-operative pain³
+ Shorter stay in the hospital⁴
+ Improved patient satisfaction (better cosmetic outcome)

For Clinicians:
+ Excellent graft quality⁵
+ Minimal thermal spread⁶
+ Cost-effective⁷
+ Easy to use

Simple Step by Step EVH Procedure.

**+ Step 1**

**Dissection**
- Make a 2.5 cm incision below the knee and locate the saphenous vein. Insert the TROCAR (if used) in the direction of dissection.
- Dissect the thigh and/or calf through a two pass dissection (first posterior, then anterior of the saphenous vein).

**+ Step 2**

**Switch instrument**
- Remove the Dissector and insert trocar (if not already inserted).
- Advance Harvester slowly through the trocar to the distal end from the incision site.

**+ Step 3**

**Catch Vein**
- Advance V-keeper to the middle position.
- Open V-lock mechanism and capture the main saphenous vein by closing the V-lock.

**+ Step 4**

**Coagulate/Cut**
- Move back towards the incision site and advance V-cutter to the side branch while applying slight tension on it.
- Coagulate and cut all the side branches via electro cautery.

**Spot Cautery Function**
- If bleeding occurs, spot cautery can be applied to control hemostasis.

**Wiper Function**
- If fat/blood on the endoscope lens impairs visibility, use the unique wiper function to clear and clean it without adding fluid.

**+ Step 5**

**Harvest**
- After all branches are coagulated and cut, return to the distal end to perform a stab wound.
- Ligate the saphenous vein.
- Release the main saphenous vein from the V-keeper and remove the harvester and trocar.
- Gently pull the vein through the knee incision.

For complete procedure instructions, please refer to the VirtuoSaph Plus Instruction Manual.
**Trocar**

Clip-on trocar aids in facilitating the insertion and stability of the dissector and harvester.

**Dissector**

To dissect the saphenous vein and surrounding branches.

1. The **atraumatic conical tip**.
2. **CO₂, delivered at the tip**, consistently provides space in the tunnel for increased visibility.
3. **40 cm working length** of the dissector rod allows dissection of longer vessel lengths.
4. The **PTFE V-glide surface** and flexibility of the dissector rod minimize drag and resistance.
5. The **ergonomic handle** reduces potential for hand strain.
6. **Centering rings** in the dissector cone tip aid in visualization and minimize risk of branch avulsions and vessel perforations.

**Harvester**

One-handed instrument that coagulates and cuts the branches of the saphenous vein.

7. The **V-keeper** safely encapsulates the vein securing it during the procedure. It ensures that all branches are coagulated and cut prior to removing the harvester rod from the leg.
8. The **V-cutter integrates** coagulation and cutting of the side branches in one step employing targeted low energy. A controlled distance between the V-keeper and V-cutter is maintained providing optimal branch lengths and ensuring that sealing and cutting take place away from the vessel to be used as a graft.
9. The V-cutter can also deliver **spot cautery** for added hemostasis control; this can be activated by the **V-cautery switch** (10).
10. First-of-its-kind **integrated bipolar cord** not requiring extra connections for smart and quick preparation.
11. **CO₂, delivered at the tip** consistently provides space in the tunnel for increased visibility.
12. The **unique wiper** makes the cleaning of the endoscope lens possible without interruption of the procedure and without adding fluid in the cavity.
13. The **ergonomic design of the handles** allows one-handed manipulation of the device.
What are the advantages with the VirtuoSaph+ Plus?

**Controls hemostasis**
- The integrated coagulation-cut function of the V-cutter (V=Vein) allows for superior sealing and cutting capabilities.
- Its one-of-a-kind spot cautery mechanism allows for precise control of when and where to apply spot cautery.

**Limits thermal spread**
- The fixed distance between the V-cutter and V-keeper delivers simultaneous sealing and cutting of branches, as well as an optimal length of the side branches.
- Delivers low targeted energy away from the main vessel at the tunnel wall.

**Reduces risk of CO₂ embolism and intraluminal thrombus**
- VirtuoSaph Plus is an “Open” EVH system with distal insufflation and a non-occlusive trocar minimizing the amount of CO₂ needed for tunnel maintenance.
- Minimizes contact and pressure on the vein at the incision site.

**Provides space in the tunnel for increased visibility**
- Consistently delivers CO₂ at the tip, where it counts.

**Allows for atraumatic dissecting and harvesting**
- Atraumatic conical dissector tip with centering rings allows the clinician to monitor the location of the dissector cone tip relative to the vein for consistent and uniform dissection.
- PTFE V-Glide surface of dissector rod minimizes drag and resistance and improves ease of dissection.
- The V-keeper gently encapsulates the vein minimizing potential damage during cauterization.

**Is easy to use**
- Unique integrated bipolar cord allows for an easy and quick set up.
- Unique wiper that immediately improves visibility in one activation.

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What are the advantages with the VirtuoSaph Plus?

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