

# Surgical Pearls for the EVA Platform



Improved fluidics and illumination are features of this vitrectomy system.

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The Enhancing Visual Acuity (EVA) vitrectomy system (Dutch Ophthalmic) can be used for vitreoretinal surgery, cataract surgery, and combined anterior-posterior segment surgery. The system has gained widespread use due to its safety and efficiency and its lower price point compared with other similar systems.

The EVA incorporates an innovative fluidics system and a twin duty cycle cutter, and it works with a variety of peripheral accessories. This article describes three posterior segment surgical pearls relating to the EVA system.

## PEARL No. 1: FLUIDICS

The EVA system's most distinctive feature is its VacuFlow Valve Timing Intelligence (VTi) vacuum control system. In traditional venturi pump systems, a flow of air is used to create a vacuum. The surgeon controls the vacuum, and the flow depends on several factors, including the amount of vacuum, the gauge of instrumentation, and the viscosity of fluid or tissue. In a peristaltic system, a rotary wheel compresses the tubing system to displace fluid. The surgeon controls the flow, and vacuum can also be controlled independently.

The EVA system's VTi system pump can be used in vacuum or in flow mode. Core vitrectomy is typically performed in vacuum mode, as it allows quick and efficient removal of core vitreous. When the surgeon is

working closer to the retina, however, it is advantageous to switch to flow mode. In vacuum mode, the vacuum rate is constant but flow fluctuates depending on the viscosity of the fluid. When working closer to the retina, this may cause inadvertent contact by the cutter, resulting in iatrogenic breaks. Transient hypotony may also occur.

When flow mode is activated, the flow at the tip of the cutter (or other instrument) is kept constant with the assistance of VTi, often resulting in safer and more effective shaving, especially over detached retina or during a posterior membrane peel.

Furthermore, the surgeon can toggle among customized preset flows using the footpedal, based on the mobility of the retina or the desired proximity of the cutter to the retinal surface. A common setting for peripheral vitrectomy, for example, is to use flow mode with a low-vacuum *shave* setting.

## PEARL No. 2: ILLUMINATION

The EVA system also incorporates LEDStar Illumination LED technology. These LED bulbs are known for their long life, minimizing the frequency of bulb changes. The technology includes updated LED light fibers that provide better visualization in 27-gauge surgery. The color of the light can be varied from white to yellow or amber. Some surgeons like to use the yellow or amber light while working under air or during long cases.

The EVA's light pipe incorporates a directional light, minimizing glare and allowing the surgeon to efficiently visualize the vitreous and retina. Of note, it may take a couple of surgeries for the user to get accustomed to directing this light pipe posteriorly when it is introduced through the trocar.

Light pipes in all gauges also come with a clear cap that can be fitted over the light pipe so that it can be used as an illuminated scleral depressor. This

## AT A GLANCE

- ▶ The EVA system's VTi system pump can be used in vacuum or in flow mode, depending on the surgical scenario.
- ▶ The LED illumination system offers improved visualization with 27-gauge instrumentation.
- ▶ A high-flow infusion system can provide high infusion pressure in small-gauge surgeries.

**LIGHT PIPES IN ALL GAUGES ALSO COME WITH A CLEAR CAP THAT CAN BE FITTED OVER THE LIGHT PIPE SO THAT IT CAN BE USED AS AN ILLUMINATED SCLERAL DEPRESSOR. THIS FEATURE IS BEST USED ON LIGHTLY PIGMENTED EYES AND MAY NOT PROVIDE SUFFICIENT TRANSSCLERAL ILLUMINATION IN SOME CASES.**

feature is best used on lightly pigmented eyes and may not provide sufficient transscleral illumination in some cases.

### **PEARL No. 3: CANNULAS AND INFUSION**

The trocars and cannulas of the EVA system have both pluses and minuses. The trocars are fitted with transparent, removable, silicone valved cannulas that provide a watertight seal. The funnel-shaped metal trocar makes insertion of rigid instruments easy. However, care must be taken when choosing soft tip instruments, as some soft silicone soft tips will adhere to the silicone valves, impeding their entry into the cannulas. This is a common problem across platforms with silicone valves. Some widely used soft tip cannulas may be difficult to introduce into the EVA's trocar-cannulas. Stabilizing the cannula with forceps can often solve this difficulty. In our experience, the soft tip cannula manufactured by Vortex Surgical, with its slightly shorter and more rigid silicone tip, is significantly easier to introduce into the EVA trocar-cannula than other soft tip cannulas. Vortex also offers 23- and 25-gauge retractable soft tip cannulas, which basically eliminate this issue.

The removable valved cannula also allows the EVA system to be used with an alternative high-flow infusion system, which is optional in 23- and 25-gauge systems and is used in all 27-gauge systems. For use of this system, the translucent valved cannula is

removed, and the infusion is changed from one that is fitted inside the trocar cannula to one that fits around the trocar. This allows full use of the entire lumen of the trocar for infusion, and therefore lower infusion pressures.

When the high-flow infusion system is used, the surgeon must be mindful to decrease the upper limit of the automatic infusion control in order to avoid excessively high infusion pressures in comparison with those of standard infusion systems.

Conversely, when standard infusion is used, the surgeon must be careful not to overpower the infusion with excessive vacuum, which can result in hypotony. Getting used to one's own individual infusion, flow, and vacuum settings is easy and intuitive on the EVA system, but each surgeon should work with his or her company representative to customize the machine's setup.

### **CONCLUSION**

The EVA system offers significant advantages over traditional systems, especially with regard to its innovative fluidics system. We recommend the use of flow mode when the cutter is coming into close contact with mobile retina or when preretinal membranes are being removed with the vitreous cutter. The EVA illumination system allows greater customization and broader use of 27-gauge instrumentation than other lighting systems. It is important for surgeons to familiarize themselves with the accessories most

compatible with the EVA trocars in order to maximize their surgical efficiency. ■

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