

Greater Surgical Control Means Greater Surgical Confidence

Advanced features like next-generation fluidics set the OS4 surgical platform apart from other vitrectomy machines.

BY CHRISTIAN PRÜENTE, MD



In retinal surgery, it is crucial for the surgeon to have the capability to make careful micromovements when operating on and dissecting the delicate tissue of the posterior segment. The right piece of equipment should feel like an extension of the surgeon's hands, and it goes without saying that it should be reliable, stable, and precise. Such technology, when used correctly, undoubtedly improves surgical control.

In my experience, greater surgical control means greater surgical confidence and greater surgical outcomes. One technology that I have come to depend heavily on is the OS4 surgical platform* (Oertli; Figure 1). I have used a variety of vitrectomy machines, but it is the OS4 that gives me the greatest control and is the most responsive and adaptable to my personal preferences. This is preferable over some of the other devices I have experience with, which sometimes required that I learn a certain way of performing surgery due to the machine's onboard settings or because of limited functionality.

With the OS4, during surgery I have the flexibility to perform safe surgery and make critical adjustments based on the patient's anatomy. Several built-in advanced features including next-generation fluidics make the OS4 responsive to the changes I need to make during every procedure. I have found that this machine is able to do exactly what I need it to do to achieve safe, efficient surgery for my patients. Because of the versatility of the OS4, I have been able to maintain my surgical preferences and also improve efficiency in the operating room.

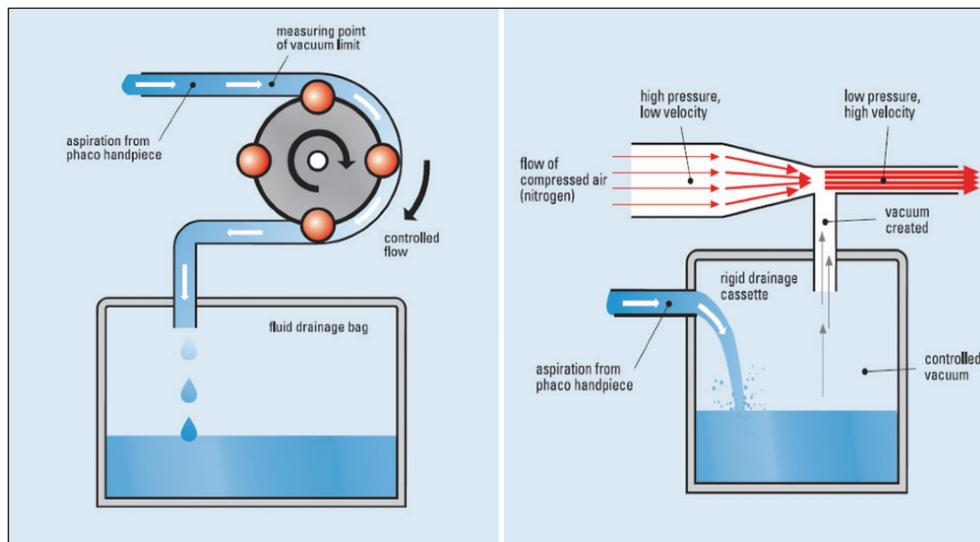


Figure 2. A peristaltic pump employs rollers to compress the tubing system to create flow while a preset vacuum level is engaged when the port is occluded. As the port becomes occluded, the rollers slow down, yielding decreased outflow (left). A Venturi system operates on a different principle, where the flow is generated by compressed air, the air nozzle is connected to a closed drainage bag, and vacuum is constantly on (right).



Figure 1. The OS4 platform.

TABLE 1. KEY DIFFERENCES IN PUMP MODES ON THE OS4 SURGICAL PLATFORM

	Peristaltic	Venturi	SPEEPMoDe
Basic function	<ul style="list-style-type: none"> • Flow control 	<ul style="list-style-type: none"> • Vacuum control 	<ul style="list-style-type: none"> • Vacuum and flow control
Practical possibilities	<ul style="list-style-type: none"> • Vacuum by occlusion • Low flow and high vacuum possible 	<ul style="list-style-type: none"> • Quickly available vacuum without occlusion • No flow control • Low flow and high vacuum not possible 	<ul style="list-style-type: none"> • Vacuum by occlusion • Fast vacuum control under occlusion • Controlled flow and vacuum
Practical applications	<ul style="list-style-type: none"> • Good for delicate work • Little rests difficult to grasp • Low traction • Release of particles means loss of occlusion 	<ul style="list-style-type: none"> • High efficiency for fast core removal • Traction • Turbulance 	<ul style="list-style-type: none"> • High efficiency and still safe • Low traction • Precision in delicate work • Little rests can be grasped well • Controlled manipulation and release of particles without loss of occlusion

HDC: THE NEXT GENERATION IN FLUIDICS

In my opinion, the most important element of the OS4 is its High Definition Dynamic Direct Control (HDC) fluidics control. The HDC feature monitors and controls all onboard functions and intuitively adjusts the parameters throughout the entire procedure. Because HDC has an easy-to-use interface, the time it takes to reprogram and recalibrate between operating room sessions is minimized.

What is unique about the OS4’s fluidics control compared with other vitrectomy machines is that it can quickly switch between three different pump modes: peristaltic, Venturi, and SPEEPMoDe (for a comparison of pump modes, see Table 1). This last mode, which combines the best features of the peristaltic and Venturi pumps, offers controlled flow and vacuum. SPEEPMoDe can better maintain the holding force of the vacuum, enable the highest degree of efficacy, and assure safety and control of the flow. I have found that this setting is ideal for several maneuvers, including controlled lifting of epinucleus; aspiration of cortex, especially in the presence of weak zonules; creation of a posterior vitreous detachment; and detachment of posterior hyloid. It is also helpful when working precisely and with control in the periphery, with or without detached retina.

Alternatively, the peristaltic pump, which creates a relative vacuum when the aspiration port is occluded, is exceptional at the start of surgery, during the core vitrectomy; in the periphery,

where tractional forces are more consequential; and when dissecting near fragile vitreomacular adhesions. In peristaltic pump mode, the surgeon can control flow rate with the footpedal; however, he or she cannot adjust vacuum (Figure 2).

The Venturi pump is best used for fast and highly efficient core removal and for creating traction and turbulence (Figure 2). It provides the surgeon with vacuum control, and the fluid is controlled by preset parameters depending on the vacuum power, size of the aspiration port, and the condition of the material being aspirated.

CONCLUSION

The OS4 provides a high level of precision and control in retinal surgery. There are many aspects of the OS4 that I appreciate, among them being the machine’s responsiveness to the adjustments I make with the footpedal. The ability I have to switch between peristaltic, Venturi, and SPEEPMoDe pumps has provided me with greater surgical control and greater surgical confidence. In the end, this translates to greater surgical outcomes for my patients. ■

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