

# Disposable Instruments are Cost Effective and as Good as Reusable

## Pro: The Hidden Cost of Reusable Instruments Make Them Financially Unsustainable

By Ryan Tarantola, MD; Magdalena Shuler, MD, PhD; Shalesh Kaushal, MD, PhD; and Sunil Gupta, MD



Advances in vitreoretinal surgery, including the advent of small gauge instrumentation, has led to more efficient surgery and a general trend of retinal surgery being performed in ambulatory surgery centers. In the era of 20-gauge vitrectomy surgery, reusable vitreoretinal instrumentation was preferred.

Compared with instruments used during small-gauge surgery, the repair and maintenance of these larger instruments was cost efficient. Now, as the adoption of minimally-invasive vitreoretinal surgery becomes widespread, several factors, including the reliability, fragility, sterility, competitive cost, and wide array of options of small gauge instrumentation, have led many surgeons to prefer disposable vitreoretinal instruments.

### RELIABILITY

The first generation of disposable microinstruments and 25-gauge vitreoretinal surgery was introduced more than a decade ago. These first-generation instruments were quite flexible and suffered from limited quality and consistency in their grasping platform and cutting ability. The initial disposable 25-gauge instruments were less reliable compared with reusable 20-gauge instruments, and the limited options for instrumentation type restricted the kinds of cases that could be performed using them.

*(Continued on page 69)*

## Con: Reusable Equipment is a Necessity to Ensure Patients Have Access to Surgery

By Manish Nagpal, MS, DO, FRCS(UK)



Vitrectomy requires the use of specialized machines and instrumentation to perform delicate maneuvers under the operating microscope. A variety of equipment is available to the vitreoretinal surgeon, with multiple models of vitrectomy machines made by several manufacturers. Some machines employ reusable tubing and other components, while for some devices these components are supplied in disposable packs.

Vitrectomy packs may include disposable laser probes, soft tip cannulas, forceps, scissors, injectors for heavy liquids, and other instruments. These are all meant to be thrown out after a single surgery, and are labeled as such.

### ANOTHER OPTION

I use disposable instruments in my surgery practice in India. However, I must admit that I love disposable instruments perhaps too much. That is to say, I love them so much, I do not want to discard them after a single use. I like to get more than 1 use out of my disposables.

In a country such as India, where most patients are self-paying, there is a limit to the amount one can charge for a surgical encounter. Most of us, therefore, reuse some disposable components related to these procedures to make them economically viable for our patients. Although these instruments are labeled for single use, they are of high quality, and they stand up to limited reuse with no problem.

### COST

Cost is an issue when a surgeon or surgical center administrator is deciding on the choice of purchasing

*(Continued on page 70)*

(*Tarantola et al continued from page 68*)

Vitreotomy surgery has since been revolutionized by 23-gauge, 25-gauge, and, most recently, 27-gauge surgery. The issues of instrument flexibility and reliability have been largely solved with newer microsurgical instruments. By changing the shaft design and incorporating titanium into their construction, manufacturers have made small-gauge instruments more rigid. Thus, the current generation of disposable small-gauge instruments is consistently reliable.

Although the microsurgical instruments produced by various manufacturers differ, their overall quality is excellent, and the range of available instruments has vastly expanded, ensuring a multitude of options to address each surgical challenge. A surgeon can feel assured that when a new disposable instrument is opened it will perform consistently and as designed. Such reliability is important for the surgeon. The gradual degradation of reusable forceps or scissors can affect the precision of membrane removal or cutting, for example, and ultimately lead to surgical delays and possibly complications that may impact outcomes.

### FRAGILITY

During the era of 20-gauge vitrectomy, reusable instruments, although considered small and fragile by most surgical technicians, were the mainstay of vitreoretinal surgery. Reusable instruments degraded over time and required frequent servicing and replacement. The longevity of these instruments depended on their overall use and how well they were cared for by ophthalmic surgical technicians.

Instruments used during smaller-gauge surgery are even more difficult to maintain. Even an experienced ophthalmic surgical technician may inadvertently damage these delicate instruments. The smallest alteration in the grasping platform or scissor blades will affect function, increase operative time, and influence results. Extensive training is needed to instruct staff on how to properly care for these smaller instruments. Upkeep is difficult, and, therefore, the need for more frequent servicing and replacement has an even greater impact.

Disposable small-gauge instruments obviate these fragility issues. An ophthalmic technician can easily be taught to protect the instruments at all times. As an added benefit, this allows more rapid room turnover and preparation for the next surgery.

### STERILITY

Sterility is a concern with any reusable instrument. The chance for insufficient cleaning during the sterilization process between cases raises questions about sterility and cleanliness. Small fragments of tissue can be difficult to identify and even more difficult to free from the

---

**“Cleaning reusable instruments is time-consuming, difficult, and causes delays in surgical turnover times.”**

---

grasping platform or cutting blades. The manipulation of neural tissue may confer a risk of prion infectious agents causing instrument contamination. Cleaning reusable instruments is time-consuming, difficult, and causes delays in surgical turnover times. With disposable instruments, the surgeon can be certain that the instrument is sterile every time.

### COST

There are multiple factors to consider in a cost-benefit analysis comparing disposable and reusable instruments for small-gauge vitreoretinal surgery. Disposable instruments offer predictable costs. Furthermore, volume purchasing is possible to negotiate a lower unit cost. The true cost of reusable instruments is much more difficult to quantify and predict.

For example, in our experience, the average reusable instrument costs about \$2000 to \$3500. Of course, surgeons must have more than 1 of each instrument, significantly increasing the initial expenditure on new instrumentation. Depending on the number of cases performed and wear and tear, reusable instruments in our surgical center typically require 3 or 4 repairs a year. Each repair costs on average \$800 to \$1000 dollars. We replace instruments usually once per year, keeping at least 1 working instrument of each type available at all times.

The intangible costs of reusable instruments are more difficult to quantify. An instrument that malfunctions during a case can cause stress on the OR staff and surgeon. Time required to properly clean and sterilize reusable microsurgical instruments is prolonged and can significantly delay room turnover. Intraoperative time can also be prolonged while an instrument is replaced. Over the course of a busy OR day, the cumulative effect of delays related to reusable instruments can equal the time it would take to perform another surgical procedure. These time issues are especially important in the setting of an ambulatory surgery center.

When costs are weighed between reusable and disposable instruments for small gauge surgery, we feel that disposable instruments provide predictable cost and efficiency, and that is beneficial for our staff, doctors, and patients.

## WIDE INVENTORY OF OPTIONS

When we used reusable instruments in our surgical center, the cost of each instrument affected our ability to have on hand a wide assortment of instrument options. Many times, when less frequently used instruments were needed, they were in disrepair, oxidized, or possibly even rusted depending on the length of time since their previous use.

There are now a wide variety of disposable small-gauge instrument options, including forceps, scissors, picks, laser probes, contact lenses, diamond-dusted sweepers, back-flush instruments, and light fibers. Multiple companies offer excellent disposable products. Because each surgeon varies in his or her surgical techniques and preferences, we suggest that retina surgeons contact each company directly to obtain samples to evaluate these products. And, because most disposable items are sold in packages of 4 or 6, surgeons have the flexibility of changing their choice of forceps or scissors from 1 manufacturer to another. If multiple surgeons operate in the same center, each can have his or her own set of preferred instruments.

## CONCLUSION

Choosing between reusable and disposable vitreoretinal instruments requires weighing many different factors including reliability, fragility, sterility, cost, and number of instruments needed on hand. In the era of small-gauge vitrectomy surgery, reusable instruments are difficult to care for and prone to damage. Costs of reusable instruments can prohibit having a wide array of options available. We believe that disposable instruments provide excellent reliability and sterility, are more cost efficient when determining both the tangible and intangible costs, and allow a much wider assortment of options. ■

*Sunil Gupta, MD, is the founder of Retina Specialty Institute in Pensacola, Florida. He did not indicate a financial relationship with the products or companies mentioned herein. Dr. Gupta may be reached at [sgupta@retinaspecialty.com](mailto:sgupta@retinaspecialty.com).*

*Shalesh Kaushal, MD, PhD, practices at Retina Specialty Institute practicing in The Villages, Florida. Dr. Kaushal may be reached at [skaushal@retinaspecialty.com](mailto:skaushal@retinaspecialty.com).*

*Magdalena Shuler, MD, PhD, is a partner at Retina Specialty Institute practicing in Panama City, Florida. She has no financial relationship with the products or companies mentioned herein. Dr. Shuler may be reached at [mshuler@retinaspecialty.com](mailto:mshuler@retinaspecialty.com).*

*Ryan Tarantola, MD, practices at Retina Specialty Institute practicing in Pensacola, Fort Walton Beach, and Crestview, Florida. Dr. Tarantola may be reached at [rtarantola@retinaspecialty.com](mailto:rtarantola@retinaspecialty.com).*

*(Nagpal continued from page 68)*

reusable versus disposable surgical instruments. The cost for a vitrectomy in the United States is approximately \$3500 to \$4000 and in the United Kingdom is around £3500 (about US\$5300). In India, where I practice, the charge is considerably less, around \$1500 to \$2000. In any of these scenarios, the cost of a disposable surgery pack, at \$400 to \$500, adds considerably to the expense of the operation.

The key is to strike a balance: to limit reuse to a minimum so as not compromise efficiency and sterility while still being able to provide good eye care to patients who otherwise may not be able to afford the surgery. Only 10% to 15% of our patient population can pay the premium cost of vitrectomy: that is, enough for us to be able to reimburse the OR costs for disposable instruments to be discarded after a single surgery. The rest of our patients would not benefit from this practice at all, and, if untreated, would risk loss of vision in the course of time. Therefore, if we want to be able to provide surgical care to a majority of our patients using the finest and safest tools made by the industry, we may need to reuse some equipment with due discretion.

In my own practice, I limit reuse of disposable instruments to 2 or 3 times. This is a compromise from older times, when some surgeons might have reused supposedly disposable instruments until the cutter died or the light pipe became defunct. Rather than try to wring every last use from these high-quality disposable instruments, we judiciously reuse and then discard them.

I liken this practice to the off-label use of bevacizumab (Avastin, Genentech) injections for ophthalmic conditions such as age-related macular degeneration or diabetic macular edema. This is common practice, even in the United States. If cost were not an issue, would we not all always use the drug that is labeled and packaged for ophthalmic use?

If cost were not an issue, I do not think there would be any reason why one would ever reuse any disposable instrument. However, in a health care system in which patients are paying out of pocket for their care, we must do all we can to make surgery possible for the broadest range of patients. As we use the off-label drug to make treatment more affordable for our patients, we do the same by limited reuse of disposable instruments.

I look forward to a time when all of us can throw away every disposable instrument after a single use. Until then, I will continue to judiciously reuse them. ■

*Manish Nagpal, MS, DO, FRCS(UK), is senior consultant, Retina & Vitreous Services, at the Retina Foundation & Eye Research Centre in Gujarat, India. He is a member of the Retina Today Editorial Board. He is a consultant to Alcon, which produces surgical instruments. Dr. Nagpal may be reached at +91-79-22865537 or [drmanishnagpal@yahoo.com](mailto:drmanishnagpal@yahoo.com).*