

How Single-Use Laparoscopes Can Improve Workflow

A recently approved HD, fog-free, single-use laparoscope may improve hospital workflow during minimally invasive procedures.

October 17, 2022 - Last month, Xenacor, a medical device company, [launched](#) a new device called Saberscope. Saberscope is an HD, fog-free, single-use laparoscope developed to improve workflow and minimize challenges during [minimally invasive procedures](#). According to the Cleveland Clinic, laparoscopes can be used for multiple processes, including appendectomies, cholecystectomies, and tumor removals. The Cleveland Clinic also states that nearly 13 million laparoscopic procedures are done worldwide annually.

Although laparoscopies have revolutionized and significantly improved surgical outcomes for patients, there are some complications and limitations of the traditional device forms. According to the [United Kingdom National Health Service](#), 1–2% of patients undergoing laparoscopy experience minor complications. Additionally, approximately 1 out of every 1,000 patients experience severe complications such as organ damage, allergic reaction, blood clots, or arterial damage.

LifeScienceIntelligence sat down with Lane Brooks, PhD, CTO and lead engineer at Xenacor, and Tony Watson, COO of Xenacor, to discuss Saberscope and its clinical implications.

WHAT IS SABERSCOPE?

To start, Brooks gave *LifeScienceIntelligence* an overview of the Saberscope device. “The device is a five-millimeter diameter laparoscope. It uses a technology called chip-on-tip, which means the image sensor, the camera, and the light source are all in the tip of the laparoscope,” began Brooks.

He explained that traditional laparoscopes have a glass rod lens inside the scope used to produce an image. “A glass rod lens would go into the patient, and the lens would take the image and transfer it to the other end where you can attach a camera, and the camera then images a focal plane at the digital end of the scope,” he continued.

Conversely, “In Saberscope’s case, the camera, the light source, and everything are in the tip. The

device has wires running down the length of the laparoscope rather than optics. Everything’s digitized and captured in the tip,” noted Brooks. “The big advantage is that it can be disposable.”

Articulation

During the interview, Brooks showed *LifeScienceIntelligence* the device and modeled how it would be used in the body. He shared that the device is easy to navigate, and the handle allows for articulation in all directions.

“This articulation helps the provider search and see around corners and into tight spots that are challenging with the traditional scope because a traditional scope has a rigid glass rod lens,” explained Brooks. He noted that traditional laparoscopes are set at fixed angles with the hopes that these angles will provide the best visualization.

Despite traditional laparoscopes being used as a standard of care, they are not always successful in complex cases. “In complex cases, when a clinician is trying to see around organs, it can become quite challenging to get the visualization a surgeon needs through just a five-millimeter hole that they’ve put into the abdomen or into whichever area they’re doing their surgery,” he argued.

Watson added, “traditional laparoscopes have a zero degree—meaning a straight-on look—and a few different angles that the surgeon might switch between. Many of Xenacor’s customers and potential customers are telling us that one of the biggest frustrations of this old way of doing things is having all these different components; the more extra variables, the more risk for failure and issues.”

“Saberscope is simplifying the process by making it more complex,” said Watson. “The Saberscope gives providers everything they need in one device by adding the articulation.”

SUPPLY CHAIN IMPLICATIONS

[Supply chain issues](#) have become an increasing concern for providers and healthcare facilities.

Throughout the COVID-19 pandemic, healthcare professionals recognized the importance of addressing and preparing for supply chain issues.

In addition to reducing the risk of complications and failure, Watson states that this may improve supply chain issues. He asserted that “from a supply chain perspective, it’s one thing for manufacturers to control and then only one thing for the customer to stock, so they don’t have to buy a bunch of different things to achieve what they’re doing now.”

UNIQUE FEATURES OF SABERSCOPE

Brooks emphasized that Saberscope’s ability to address multiple issues in laparoscopy is essential. “There are other kinds of chip-on-a-tip scopes out there, not laparoscopes necessarily, but other scopes,” shared Brooks. However, this scope has some unique features. Brooks highlights features such as the single-use and its focusing abilities.

Autofocus

A critical feature of Saberscope is its autofocusing ability. When specifying the benefits of the focus, Brooks set the stage by outlining a common scenario. He says that often the surgeon puts in the scope after they’ve blown up the patient’s abdomen with gas. The scope is held from afar to prevent damage. For example, in gallbladder removal, the provider is trying to avoid cutting the bile duct.

“It’s not a serious issue. It happens frequently, but physicians try not to have it happen,” explained Brooks. “In a traditional scope that’s fixed focus, providers lose the ability to move in and out and keep their field of view in focus. This scope has the ability for the operator to both manually focus and to be auto-focused, which is the big feature of this particular revision of the product.”

Fog-Free and Visibility

Beyond the autofocus abilities of Saberscope, Brooks, Watson, and the rest of the team addressed an additional laparoscopic issue with this device. Fog is a significant issue during laparoscopic procedures. Brooks states that with this device, there is no fogging.

“In a traditional scope, physicians struggle. They’re putting the scope into the abdomen, it’s much warmer, the scope will fog up, and the visibility drops,” noted Brooks. According to him, there’s an industry being developed around anti-fogging techniques. “Our scope is inherently fog-free due to the presence of the chip on the tip. The tip stays warm enough that it won’t fog,” he continued.

Brooks added, “surgeons that use it are blown away that they can do a whole procedure without even worrying about the tip fogging up.”

In addition to the antifogging technology, the device improves visibility during procedures that use cautery devices. “Due to the low-intensity light source that Saberscope uses and the wavelengths of the lights, this scope sees through smoke much better,” asserted Brooks.

A Single-Use Device

During the discussion with *LifeScienceIntelligence*, Watson noted that many other laparoscopes are moving toward single use. However, he claimed that, unlike other laparoscopes, Saberscope has been able to do so without compromising the quality of the images.

SYSTEMIC BENEFITS OF SABERSCOPE

While the device addresses multiple providers’ concerns during the procedure, it also has more systemic benefits.

Workflow

When asked how Saberscope will improve workflow, Brooks and Watson shared a few things. First, Watson noted that the single-use nature of the tool would minimize the need to clean each device. “Not only that, but when healthcare teams set up for a procedure, they must warm these scopes to avoid fogging. That can be a 20-minute bath in warm saline, which is just part of the setup. The staff goes to the room earlier than they would need to just for that step,” explained Watson.

Resources

In addition to reducing prep and cleaning time, Watson shared that many hospitals only have so many versions of traditional scopes. “If a few scopes are bad, they open multiple trays. Then, providers might have a trauma case that should be laparoscopic and don’t have any clean equipment left. It can impact canceled or delayed procedures and patients waiting to be treated,” he said.

Watson believes that if the facility properly stocks Saberscope, there will be fewer instances in which minimally invasive procedures become invasive or are postponed.

Sustainability

Single-use devices are notorious for not being [sustainable](#). However, the press release launching Saberscope claimed that it would reduce waste. For

clarification, LifeScienceIntelligence asked Watson and Brooks how the device would reduce waste.

First, Watson notes that it reduces wasted time, but it also can minimize physical waste. "It's a small assembly of pieces. Additionally, a traditional setup requires someone to wear PPE, including a visor, a mask, a gown, and double gloves. Then they're wrapping each of these trays in two layers of fabric paper and use water and chemicals," he stated.

"When all of that is added up, it's filling a garbage bag every time you clean one setup. About 40 Saberscope units fit in a recycling bin that Xenocor offers at no charge. And we have a third-party partner that does all the processing of that. It goes in a biohazard-marked box and is shipped back via UPS at no charge to the customer. And then a facility in

Texas will break it down and convert it to energy or back to its base material," expanded Watson.

Costs

While the device's pricing is confidential and differs based on institutional needs, Watson says that the cost of Saberscope is "on par with the cost of reusable over their useful life."

LOOKING AHEAD

As Saberscope is implemented in hospital settings, healthcare professionals and institutions may consider integrating it into their workflow. As they do so, they may also monitor the impacts on workflow and its financial implications.