



SINGLE-USE
ENDOSCOPY

A Learning Center by Ambu USA

EXPLORING SINGLE-USE EFFICIENCY IN THE ICU

Why single-use bronchoscopes will remain the primary visualization tool in one New York City hospital's ICU post-pandemic.



Intensive care units in New York City became COVID-19 treatment centers at the height of the pandemic's first wave in the spring of 2020. Physicians had to adapt to a quickly changing healthcare landscape, especially when it came to aerosol-generating procedures.

Fear of catching the novel coronavirus kept very ill patients out of hospitals, or they were sent home if they were stable only to be readmitted when they were critically ill and in need of intubation. Traditional tower-based bronchoscopes were in short supply due to the onslaught of patients, and they needed the turnaround time necessary to sterilize them. Single-use bronchoscopes were recommended if physicians deemed the procedure necessary for airway management or disease diagnosis.

Dr. James M. Horowitz is no stranger to single-use endoscopy. Even prior to the pandemic, single-use bronchoscopes – specifically, the Ambu aScope™ 4 Broncho – were becoming a normal part of his clinical toolbox. They continue to be to this day.

“For the hospital day to day, it makes more and more sense to use single-use,” Horowitz said. “When I want to bronch, I can have it set up in 30 seconds.”

“For the hospital day to day, it makes more and more sense to use single-use.”



Dr. James M. Horowitz is medical director of NYU Langone Health Tisch Hospital Cardiac Care Unit. In this conversation with Single-Use Endoscopy, we explored how single-use bronchoscopes benefit healthcare workers and patients during both once-in-a-lifetime public health crises as well as routine ICU care.



SUE: Single-use bronchoscopes have come into the spotlight since the onset of COVID-19. Can you describe how your practice included single-use endoscopes even before the pandemic?

HOROWITZ: When you need to intubate someone, you need to have ready access to the supplies you need, along with backup supplies if that first technique fails. In fact, before I intubate someone, part of my checklist is to state out loud to the team what our first approach, or Plan A, will be followed by Plan B and C, etc. Then I make sure we have all that stuff at hand. This can take a while, and can be tricky because most places I've worked, the doctors have been in charge of stocking that sort of stash of backup supplies. And doctors are great at intubating, but they are bad at things like stocking shelves. That's not what they do. Stuff was always missing.

So, we got approval to create an Advanced Airway Cart that was standardized for every single ICU in the building and the ED. We also built plastic side cases for the cart that are custom sized to hold all three sizes of Ambu scopes, and now we also added the ENT scope. And then in the drawers themselves, we have a bronch kit that has everything you need – lidocaine, syringes, flushes, lube, atomizer, etc. – to

do the procedure. So, it's easier for me to bring that cart in and just set it up than it is for me to call [for a reusable scope]. I can literally roll this thing in and set everything up faster than I can call [respiratory therapy]. So, it's become very popular in my ICU.

Then, during the first wave of COVID back in March [2020], at first people weren't doing a lot of bronchs. We didn't want to expose people to aerosolized virus unless absolutely necessary. And then we kind of noted that the secretions the patients had were out of control, and people were clogging their tubes left and right. Then we started doing bronchs nonstop. By this time the ORs were closed so all the surgeons came in and offered to be our bronch team. So, we built even more carts with Ambu screens and stacks of scopes and they would just go ICU to ICU and do all of our bronchs. It was great teamwork.

I should add, no one on the bronch team got infected, even though we were all terrified of that. They were fine. And they had just standard N-95s that we re-used like everyone else in the country. And they did hundreds of bronchs.



SUE: Since last March, more and more societal guidelines are recommending single-use bronchoscopy for COVID-19 patients to help curb the spread of the virus. How were you thinking about infection prevention and single-use technology before the onset of COVID-19?

HOROWITZ: One of the reasons I was gravitating towards it was because I could see in the press, about once a year, there would be an article about some multidrug-resistant bacteria that was found in a reusable scope. You can just Google it.

You have to pre-clean them at the point of care so as soon as you're finished with the scope, whatever kind of scope it is – it could be a bronchoscope, it could be a

gastroscope – you have to pre-clean the thing with a sponge for the outside and a cleaning solution through the working channel. Otherwise pernicious stuff will get stuck on the outside or in the working channel of a scope. I routinely saw people over the years in multiple institutions not pre-clean the working channel. It wasn't in their workflow for some reason. It's just like washing dishes. Certain things you have to pre-clean before you put in the dishwasher or you're going to take it out and it's going to be still stuck there. It's the same kind of thing.

The other thing is they get micro perforations from recurrent use. And in those micro perforations, as I mentioned earlier, there could be multidrug-resistant bacteria. I'm surprised that it hasn't been bigger news than it's been, but at some point, that's going to be a big, big problem. Especially when you are talking about people with transplants, who are immunocompromised, which is more and more patients. That's problematic.

SUE: Aside from the infection control considerations, how else do single-use bronchoscopes benefit your patients?

HOROWITZ: It's good for the patients because it gets the scope to the patient faster as you don't have to deal with all of the onerous steps necessary with a traditional tower method, sending someone to find the cart, hope that a scope is clean, find all the adapters, etc. And this is especially important when emergencies come up. And while we're on the topic, trying to find the bronch cart is always a hassle. I can't count the number of times I've walked entire ICUs trying to find it. With single-use that's not nearly as much of a problem as it's a lot easier to convince your site to buy a couple extra Ambu screens than it is to buy an extra full bronch tower.



NEW BRONCHOSCOPY GUIDELINES EMERGE IN PANDEMIC

Since COVID-19 is primarily a respiratory illness spread through airborne droplets, healthcare workers are at an increased risk of direct exposure with aerosols from patients during intubation, bronchoscopy, one-lung ventilation and extubation. These risks led to multiple societies releasing safety guidelines for airway procedures during the pandemic.

The first of such statements came from the American Association for Bronchology and Interventional Pulmonology (AABIP), calling for physicians to not use bronchoscopy as a diagnostic or therapeutic tool in treating confirmed or suspected cases of COVID-19. If bronchoscopy was warranted, a disposable instrument should be used, according to the position statement published in March 2020.

“Because it is an aerosol-generating procedure that poses substantial risk to patients and staff, bronchoscopy should have an extremely limited role in diagnosis of COVID-19 and only be considered in intubated patients if upper respiratory samples are negative and other diagnosis is considered that would significantly change clinical management,” the statement read.

If disposable bronchoscopes are not available, AABIP said strict adherence to reprocessing guidelines is necessary for patient safety.

SUE: Collecting the bronchoalveolar lavage samples has always been a challenge for physicians. Do single-use products help?

HOROWITZ: When [Ambu] first told me about the BronchoSampler, I looked at it and I thought, “I don’t think I need this.” I already have traditional traps in my cart, and this would be an additional fee and additional thing to stock. I just didn’t get it.

Then during the first wave of COVID our hospital bought a massive amount of scopes and this time they bought BronchoSamplers as well. Once I started using them, I realized this is actually amazing because of two things. When you put a typical trap on a bronch to do a lavage, there’s several steps. One, you have to pull the suction tubing off of your scope. When you do that, I just imagine viral particles flying all over the room. Then, you attach your trap and do your lavage, and finally you have to pull your trap off and reapply the suction tubing to the scope. So, another potential superspreader event.

It seems a lot safer to have it all contained in the BronchoSampler. So, the first reason is possible improvement in safety for your team. The second issue goes back to design of the typical trap. The tubing is flexible so you can bend it, but it also has a lot of recoil so it can bounce back. And so if you’re not careful, half the time the trap will flip upside, and your sample gets sucked out of the trap into the suction canister on the wall. That’s the worst.

So, people have to tape it to the bronch and you have to have a second operator which is often another MD or the respiratory therapist just to hold the trap. With the BronchoSampler, I have a closed circuit so I’m not shedding virus everywhere and I don’t need any help loading and unloading it.

AN EXAMPLE OF A BAL/BW PROCEDURE WORKFLOW

Preparation outside ward/room	Preparation within ward/room	BAL/BW procedure in patient	Post procedure steps	Post processing and waste disposal
Collect accessories Collect scope Collect monitor/tower	Establish sterile work area Open sterile packs Prepare saline ad syringe(s) Attach suction equipment Prepare patient (oxygenate, anesthesia, respirator access)	Insert scope (topical anesthesia) General bronchial inspection (Wedging) Attach saline syringe(s) Perform suction (Change sample container and repeat if necessary) ↻	Post BAL/BW cleaning suction in bronchial tree	(Sample splitting) Sample labeling and documentation General cleaning Patient recovery



SUE: You said there were barriers to patient care with reusable bronchoscopes versus single-use. Can you elaborate?

HOROWITZ: There's a bunch of interesting questions about single-use versus reusable. Number one is the upfront cost of purchasing a traditional tower and setup.

Number two, now that I've got [a reusable scope], who's in charge of cleaning it? I have to figure out who's going to physically take it downstairs to central sterile, drop it off, and who's going to go pick it back up. And when do they go? And how do they know when to go? Do you trust central sterile to call or do you just keep calling them? How do you make sure your scopes don't get lost in the pool of scopes dedicated to a different departments like the OR.

And then you think, what does it cost to process the scopes in central sterile? What are the regulatory issues around that? Do they need to have specific certifications, etc.? All I know is that means you are spending a lot of money paying people to transport and clean these things, and someone is going to have to spend a lot of time creating all of these processes and training people.

Once I had the Ambu aScope Broncho I realized I could set up the whole scope and prep everything faster than I could call an RT to even get the scope, let alone if it was available, and find all of the adapters that you need for the [reusable]. When I want to bronch, I can do it in 30 seconds. It's totally changed my practice.

"When I want to bronch, I can do it in 30 seconds. It's totally changed my practice."



SUE: CAN YOU EXPLAIN MORE ABOUT THE COST CONSIDERATIONS YOU ALLUDED TO AS A BARRIER TO QUALITY PATIENT CARE?

HOROWITZ: Everything comes down to money. Let me put it this way: How many ICUs do you have in a hospital? Four, five, six, depending on the hospital. Do they each buy a bronch tower? Do they each have their own scopes?

They probably each want to silo and have their own scopes. But that ends up being \$150,000 a pop times five ICUs. And then, stuff is just not ready on demand when you need it. Otherwise, you share it. But then the problem is, well, I need the bronch, but what if the ICU is using it? With the Ambu scope, I don't have to reschedule my bronch around the other team's three bronchs. Which is again also critical for emergency cases. With the Ambu scope, I can do it whenever I want.

"With the Ambu scope, I don't have to reschedule my bronch around the other team's three bronchs. Which is again also critical for emergency cases. With the Ambu scope, I can do it whenever I want."

SUE: While you had already begun to implement single-use endoscopes into your ICU before last spring, single-use is not the norm for bronchoscopy across healthcare. What reservations might your peers have about disposable endoscopy technology?

HOROWITZ: I think the problem is that most physicians, whatever device they are trained on in their residency, they stick with.

INFECTION PREVENTION CHALLENGES IN BRONCHOSCOPY

More hospital-acquired infections are linked back to flexible endoscopes than any other medical device. These delicate instruments are difficult to clean and disinfect due to a number of factors, including complex reprocessing instructions, human error and the design of the scopes themselves.

Flexible endoscope reprocessing includes between 50 to 100 steps and can take up to two hours to complete. These steps must be followed carefully and sequentially and are prone to human error or delays.

In addition to manufacturer reprocessing guidelines for endoscopes, there are standard industry guidelines as well as infection control procedures that are also recommended for reprocessing these medical devices. In addition, reprocessing equipment – brushes, automated endoscope reprocessors and the like – come with their own set of operating, maintenance, and cleaning instructions.

