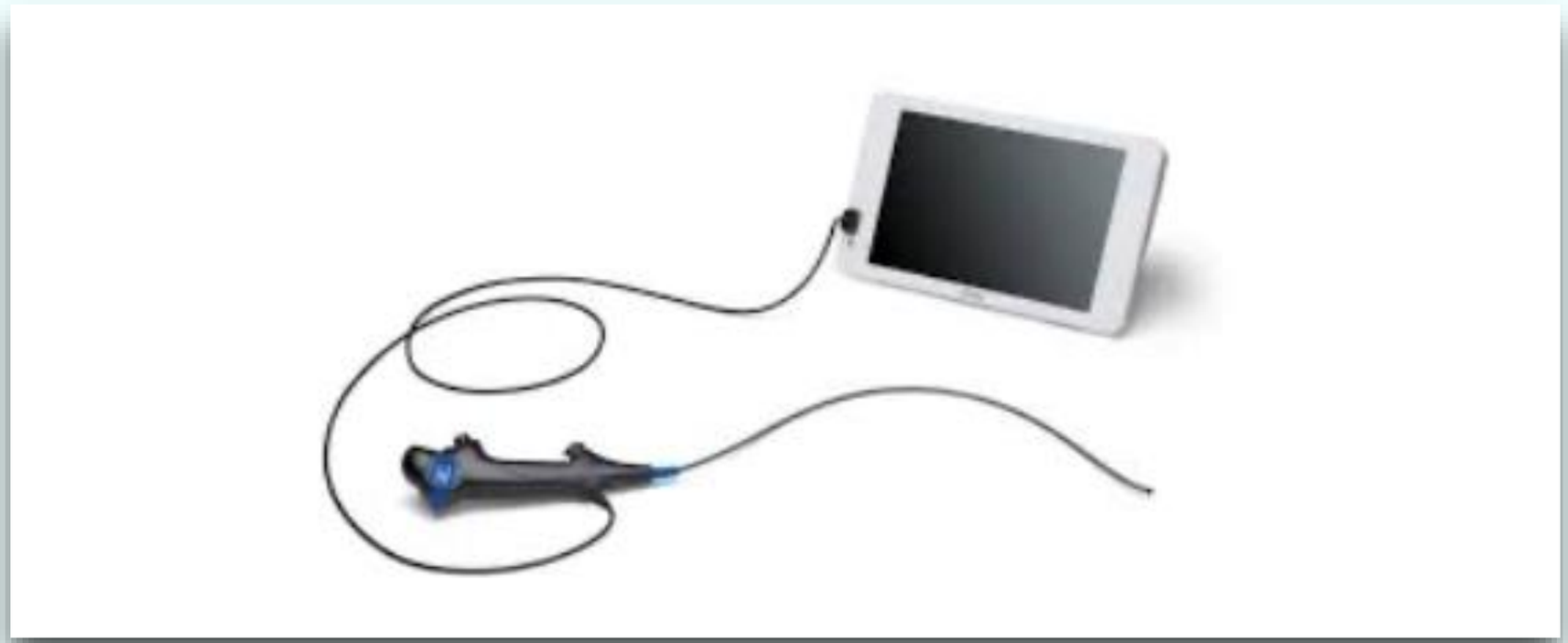
Πρώτη γνωριμία με το Single Use Flexible Bronchoscope

ΒΑΣΙΛΕΙΟΣ ΤΣΑΟΥΣΗΣ
MD, MSC, ΠΝΕΥΜΟΝΟΛΟΓΟΣ



- **Ενδείξεις**
  - Διαγνωστικά: BAL, επισκόπηση βρογχικού δέντρου, washing
  - Θεραπευτικά: θεραπευτική αναρρόφηση, διακοπή αιμορραγίας, αφαίρεση ξένου σώματος, υποβοηθητικά σε διασωλήνωση ασθενούς και επίσης υποβοηθητικά σε τραχειοστομία

• Πλεονεκτήματα SUB

Αποστείρωση: αν και με τα σύγχρονα πλυντήρια ενδοσκοπίων η αποστείρωση θεωρείται δεδομένη, ωστόσο υπάρχουν αναφορές μετάδοσης ιών και για το λόγο αυτό προτείνεται η χρήση SUB σε ασθενείς με SARS COV-2

1. Barron S., Kennedy M.P. Single-use Bronchoscopes: Applications in COVID-19
Pandemic. *J. Bronchol. Interv. Pulmonol.* 2021;28:e4. doi: 10.1097/LBR.0000000000000685. [PubMed] [CrossRef] [Google Scholar]
2. Wahidi M.M., Lamb C., Murgu S. American Association for Bronchology and Interventional Pulmonology (AABIP) statement on the use of bronchoscopy and respiratory specimen collection in patients with suspected or confirmed COVID-19 infection. *J. Bronchol. Interv. Pulmonol.* 2020;27:e52–e54. doi: 10.1097/LBR.0000000000000681. [PMC free article] [PubMed] [CrossRef] [Google Scholar]

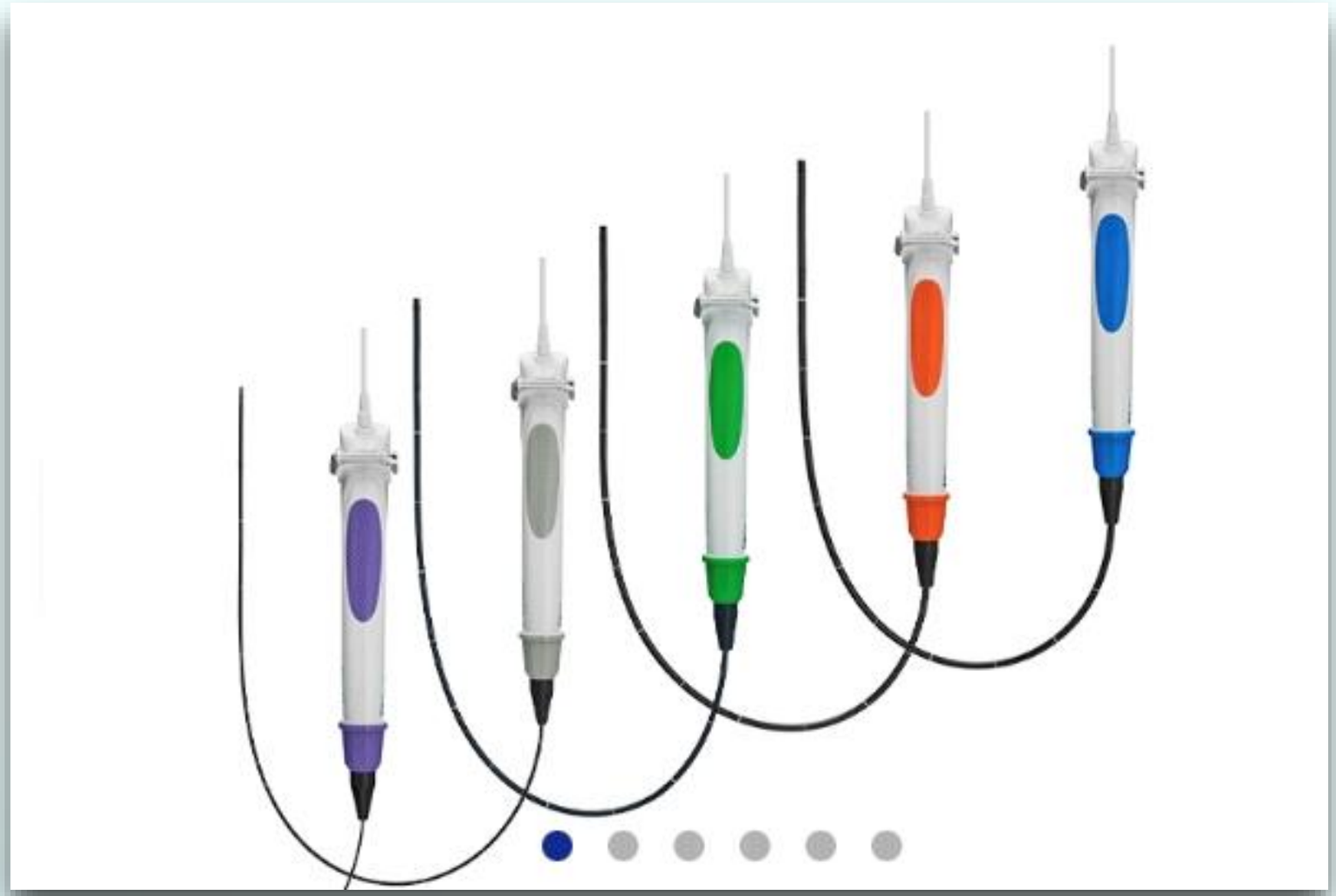
Ευκολία μεταφοράς: είναι σαφώς ευκολότερο στη μεταφορά και μπορεί να χρησιμοποιηθεί σε κοινό θάλαμο ή στην ΜΕΘ.
Ταχύτητα παρέμαβασης: Λόγω της φορητότητας του και του συνολικού του μεγέθους και βάρους καθώς και της ευκολίας αποθήκευσης του είναι ευκολότερα προσβάσιμο. Ο μέσος χρόνος χρήσης του σε οξύ περιστατικό στη ΜΕΘ είναι 10’ ενώ του επαναχρησιμοποιούμενου βρογχισκοπίου 66’ (μεταφορά από ενδοσκοπική μονάδα του βρογχοσκοπίου, μεταφορά του πύργου, συνδέσεις, ανεύρεση τραυματιοφορέα για τη μεταφορά)

Marshall D.C., Dagaonkar R.S., Yeow C., Peters A.T., Tan S.K., Tai D.Y., Keng Gohs S., Lim A.Y., Ho B.,
Lew S.J., et al. Experience with the Use of Single-Use Disposable Bronchoscope in the ICU in a Tertiary
Referral Center of Singapore. *J. Bronchol. Interv. Pulmonol.* 2017;24:136–143. doi: 10.1097/LBR.0000000000000335. [PubMed] [CrossRef] [Google Scholar] [Ref list]

- **Πλεονεκτήματα SUB**

Μικρότερο κόστος αγοράς: φτηνότερο καθώς είναι μιας χρήσης, δεν έχει κόστος πλυσίματος και αποθήκευσης.

Ευκολότερη εκπαιδευτική χρήση: Λόγω του μικρότερου κόστους είναι πιο εύκολη η αγορά του από ΜΕΘ και ευκολότερη η αντικατάσταση του σε περίπτωση βλάβης σε φάση εκπαίδευσης. Με τον τρόπο αυτό μπορούν να εκπαιδευτούν πιο εύκολα περισσότεροι ιατροί σε ΜΕΘ και πνευμονολόγοι.



Insertion Tube: 6.2 - 2.2 mm

Working Channel: 3.2 - 0.0 mm

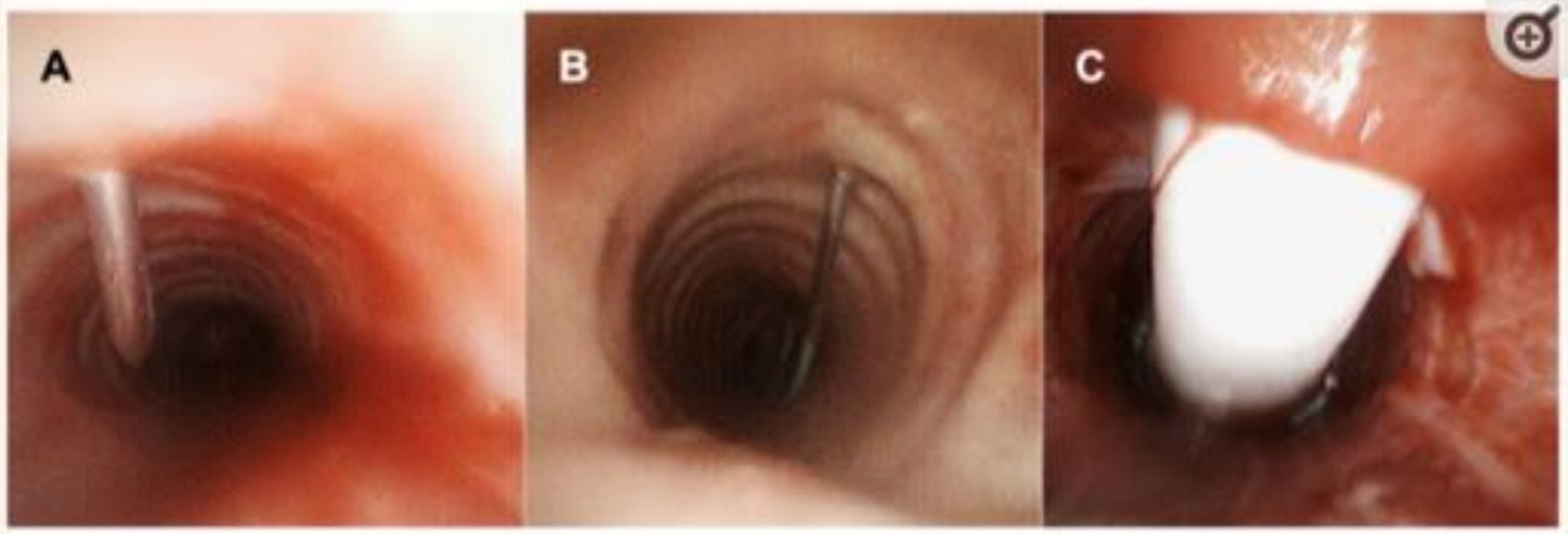


Figure 2

Using SUFB for Percutaneous Tracheostomy Tube Placement. This figure illustrates tracheostomy placement using the SUFB (EXALT Model B Single-Use Bronchoscope from Boston Scientific). Needle insertion (**A**), passing of the guidewire (**B**), and placement of the tracheostomy tube (**C**) are visualized.

Observational Study > Respir Res. 2020 Dec 2;21(1):320. doi: 10.1186/s12931-020-01576-w.

Bronchoscopist's perception of the quality of the single-use bronchoscope (Ambu aScope4™) in selected bronchoscopies: a multicenter study in 21 Spanish pulmonology services

Javier Flandes [1], Luis Fernando Giraldo-Cadavid [2 3], Javier Alfayate [1], Iker Fernández-Navamuel [1], Carlos Agusti [4], Carmen M Lucena [4], Antoni Rosell [5], Felipe Andreo [6], Carmen Centeno [6], Carmen Montero [7], Iria Vidal [7], Lucía García-Alfonso [7], Antonio Bango [8], Miguel Ariza [8], Rocío Gallego [9], Marta Orta [9], Salvador Bello [10], Elisa Mincholé [10], Alfons Torrego [11], Virginia Pajares [11], Héctor González [12], Aurelio Luis Wangüemert [13], Julio Pérez-Izquierdo [14], Carlos Disdier [15], Blanca de Vega Sanchez [15], Rosa Cordovilla [16], Juan Cascón [16], Antonio Cruz [16], J Javier García-López [17], Luis Puente [17], Paola Benedetti [17], Cristina L García-Gallo [18], Gema Díaz Nuevo [18], Silvia Aguado [18], Concepción Partida [19], Prudencio Díaz-Agero [19], Estefanía Luque Crespo [20], María Pavón [20], Francisco Páez [21], Enrique Cases [22], Raquel Martínez [22], Andrés Briones [22], Cleofe Fernández [23], Concepción Martín Serrano [23], Ana Maria Uribe-Hernández [24], Jose Robles [25]

Affiliations + expand

PMID: 33267892 PMCID: PMC7709094 DOI: 10.1186/s12931-020-01576-w

Conclusions: The aScope4™ scored well for ease of use, imaging, and aspiration. We found a learning curve with excellent scores from the 9th procedure. Bronchoscopists highlighted its portability, immediacy of use and the possibility of taking and storing images.

Outbreak of pulmonary Pseudomonas aeruginosa and Stenotrophomonas maltophilia infections related to contaminated bronchoscope suction valves, Lyon, France, 2014

Marine Guy [1], Philippe Vanhems, Cédric Dananché, Michel Perraud, Anne Regard, Monique Hulin, Olivier Dauwalder, Xavier Bertrand, Jullien Crozon-Clauzel, Bernard Floccard, Laurent Argaud, Pierre Cassier, Thomas Bénet

Affiliations + expand

PMID: 27458712 DOI: 10.2807/1560-7917.ES.2016.21.28.30286

Free article

This outbreak of pulmonary P. aeruginosa/S. maltophilia co-infections was caused by suction valve contamination of two bronchoscopes of the same manufacturer. Our findings underscore the need to test suction valves, in addition to bronchoscope channels, for routine detection of bacteria.

Journal of
Evaluation in Clinical Practice
International Journal of Public Health Policy and Health Services Research

ORIGINAL ARTICLE

Single-use flexible bronchoscopes compared with reusable bronchoscopes: Positive organizational impact but a costly solution

Constance Châteauvieux PharmD, Line Farah BPharm, Emmanuel Guérot MD, Delphine Wermert MD, PhD, Judith Pineau PharmD, Patrice Prognon PharmD, PhD ... See all authors

First published: 23 March 2018 | https://doi.org/10.1111/jep.12904 | Citations: 22

Conclusions

Organizational impact should be considered when assessing MDs. We show in this study that from an organizational viewpoint, there are many advantages to using single-use bronchoscopes. However, in economic impact, it is more cost-effective for our institution, with more than 1500 bronchoscopies performed annually, to use reusable devices.

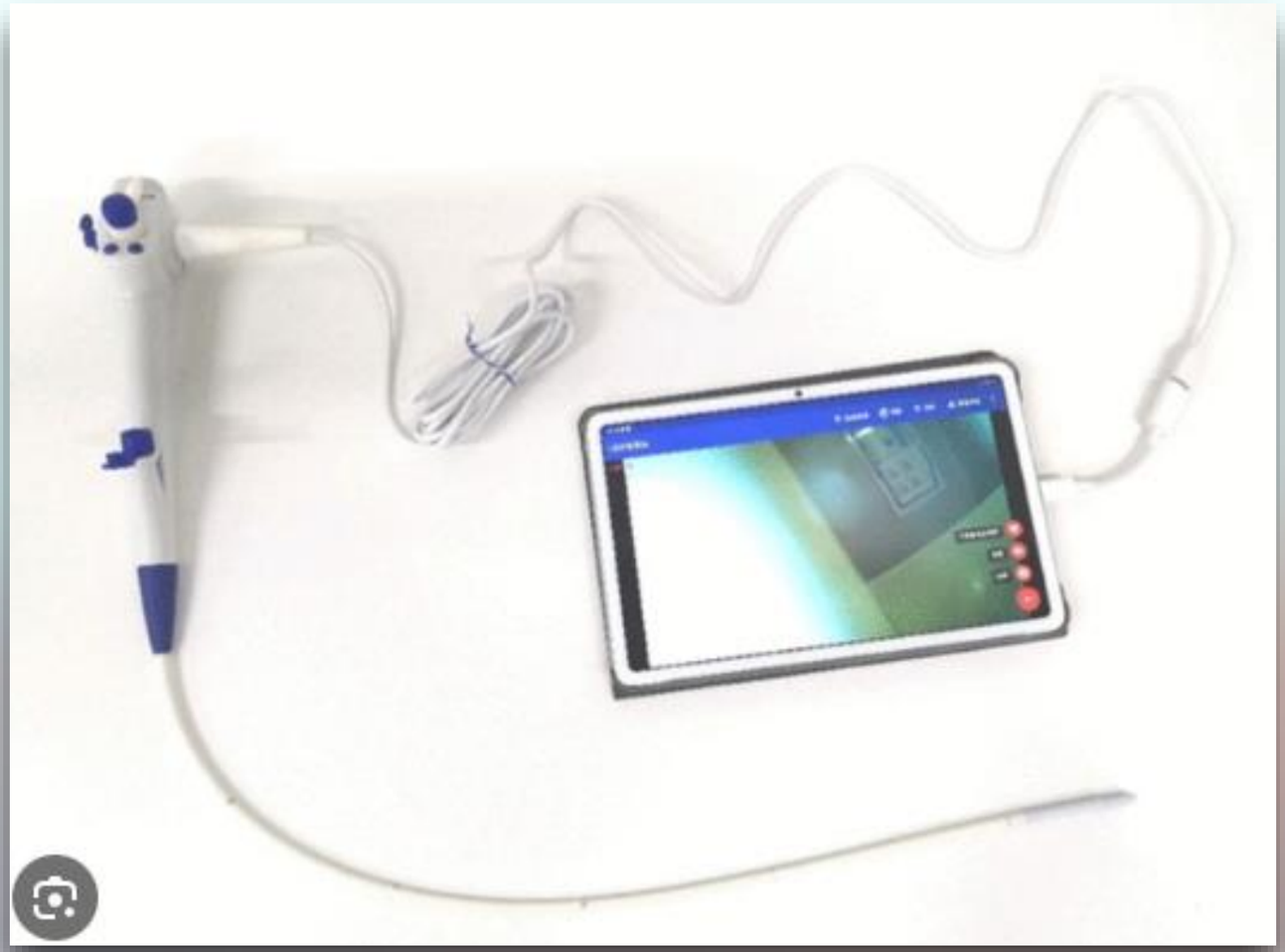
Review > Adv Ther. 2020 Nov;37(11):4538-4548. doi: 10.1007/s12325-020-01495-8.
Epub 2020 Sep 17.

Single-Use (Disposable) Flexible Bronchoscopes: The Future of Bronchoscopy?

Sarah P Barron [1], Marcus P Kennedy [2]

Affiliations + expand

PMID: 32944885 PMCID: PMC7497855 DOI: 10.1007/s12325-020-01495-8



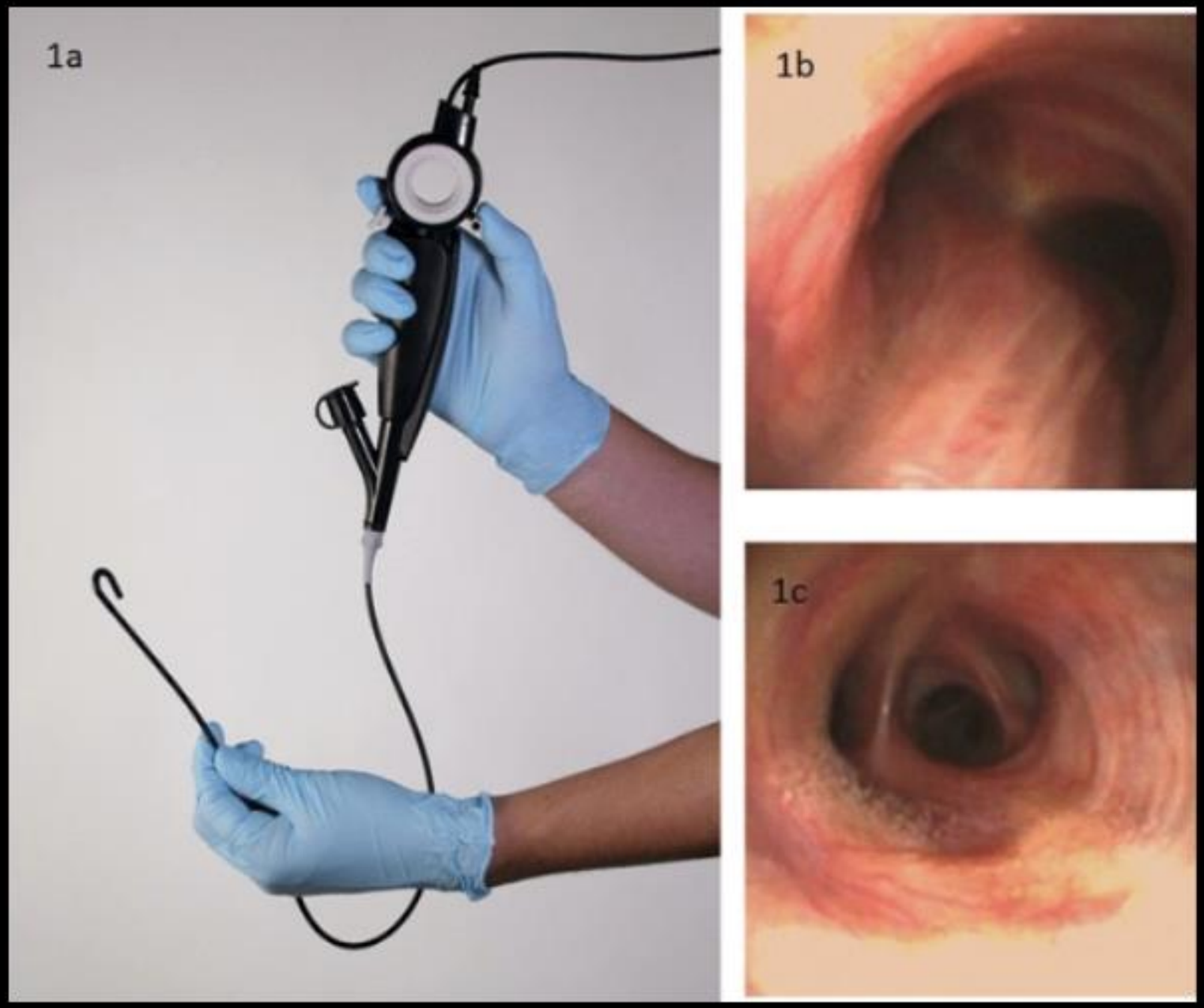


Fig. 1 Use of a single-use flexible bronchoscope to perform an airway inspection in a 64-year-old woman with chronic cough. **a** The SUFB used—Broncoflex®Agile[a]; Endobronchial images: **b** The carina. **c** The trifurcation of the right middle lobe (RML), right lower lobe (RLL) (RB$^{7-10}$) and the superior segment of the RLL (RB^{6}). [a]Reproduced with permission (Axess Vision)

Comparative Study on Environmental Impacts of Reusable and Single-Use Bronchoscopes

Birgitte Lilholt Sørensen, Henrik Grüttner

Published in ***American Journal of Environmental Protection*** **(Volume 7, Issue 4)**

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The analysis shows that the materials used for the cleaning operations of the reusable scopes are a key factor affecting the impact factors assessed; energy consumption, emission of CO2-equivalent and consumption of scarce resources. Initially, it is assumed that each reusable scope is cleaned using one set of personal protective equipment (PPE) per cleaning operation, but since cleaning practice may vary the consequence of cleaning more scopes with one set of PPE is also assessed. Using one set of protective wear per operation and the materials for cleaning and disinfection determine that reusable scopes have comparable or higher material and energy consumption as well as higher emissions of CO2-equivalents and values of resource consumption. Cleaning two or more reusable scopes per set of PPE makes the impacts fairly comparable.

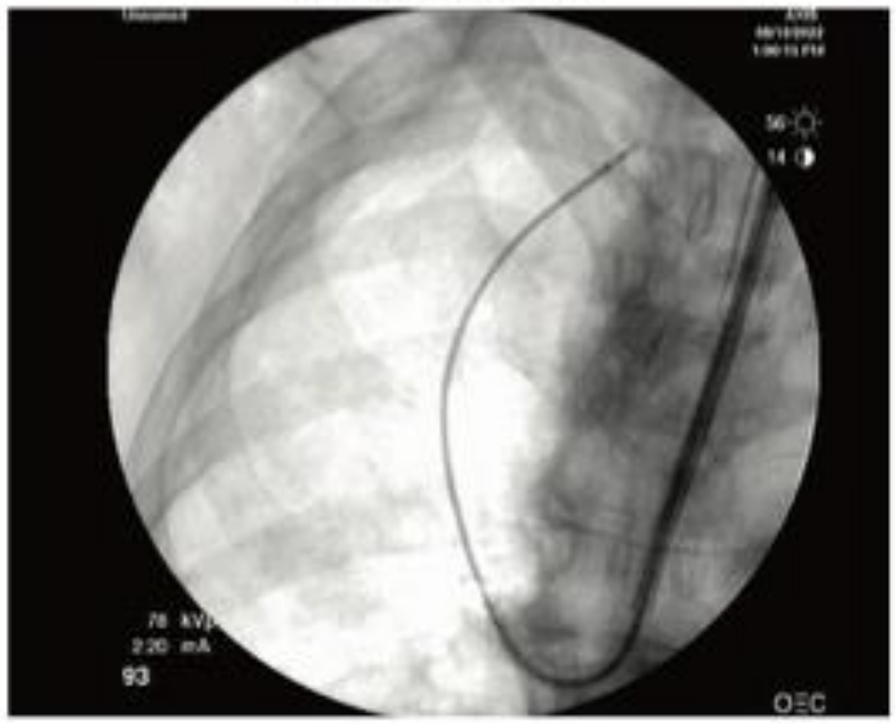
A Comparison of Single-Use Bronchoscopes and Reusable Bronchoscopes for Interventional Pulmonology Applications

J. Kurman[1], A. Wagh[2], B. Benn[1], S. Islam[3]
[1] Medical College of Wisconsin, Milwaukee, United States; [2] University of Chicago, Chicago, United States; [3] Medical College of Georgia, Augusta, United States

FLUOROSCOPY CADAVERIC IMAGES

Olympus BF-1TH190

Ambu aScope 5



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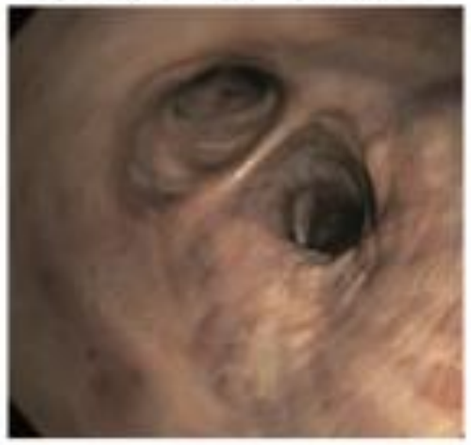
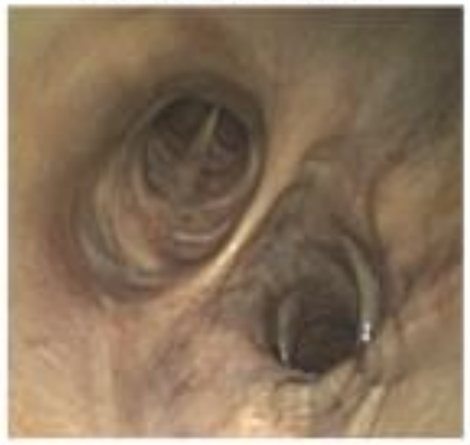
ENDOSCOPY CADAVERIC IMAGES (COLOR WAS NOT ADJUSTED)

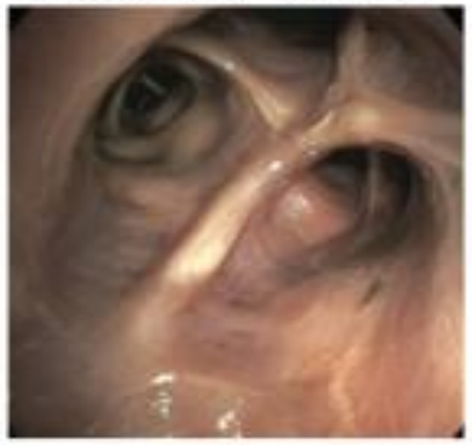
Olympus BF-1TH190



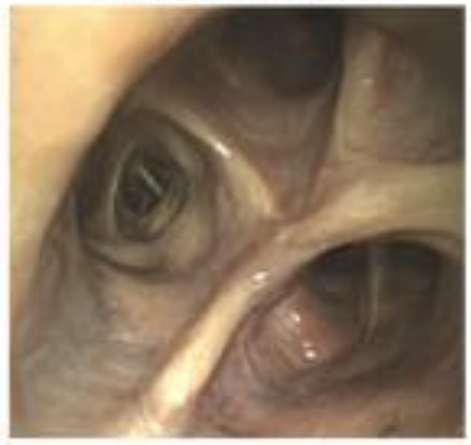
Ambu aScope 5



Olympus BF-1TH190



Ambu aScope 5



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Specification	Reusable	Single-Use Flexible Bronchoscopes			
	Olympus	Ambu	Olympus	Boston Scientific	Verathon
	BF-1TH190	aScope 5 Therapeutic	H-Steriscope Large	EXALT Model B Large	B-Flex Large
Working channel diameter (mm)	2.8	2.8	2.8	2.8	2.8
Flexion/Extension (Without tools)	180/130	195/195	210/210	180/180	140/135
Flexion/Extension (degrees) 2.8mm forceps	143/92	168/169	144/145	123/122	67/73
Flexion/Extension (degrees) 2.0mm forceps	156/117	193/193	181/177	162/162	90/101
Flexion/Extension (degrees) Pulmonx Zephyr Valve Catheter	161/114	195/184	181/176	151/153	86/94
Flexion/Extension (degrees) 2.3mm straight fire APC probe	156/118	195/189	185/180	165/165	94/89
Suction 60mL (seconds) – Water	4.10	5.35	5.55	3.05	4.41
Suction 60mL (seconds) – Viscous material	7.44	8.25	14.94	5.42	9.11
Optics – Depth of field (mm)	3-100	3-100	3-100	6-50	5-50
Optics – Field of view (degrees)	120	120	110	90	120

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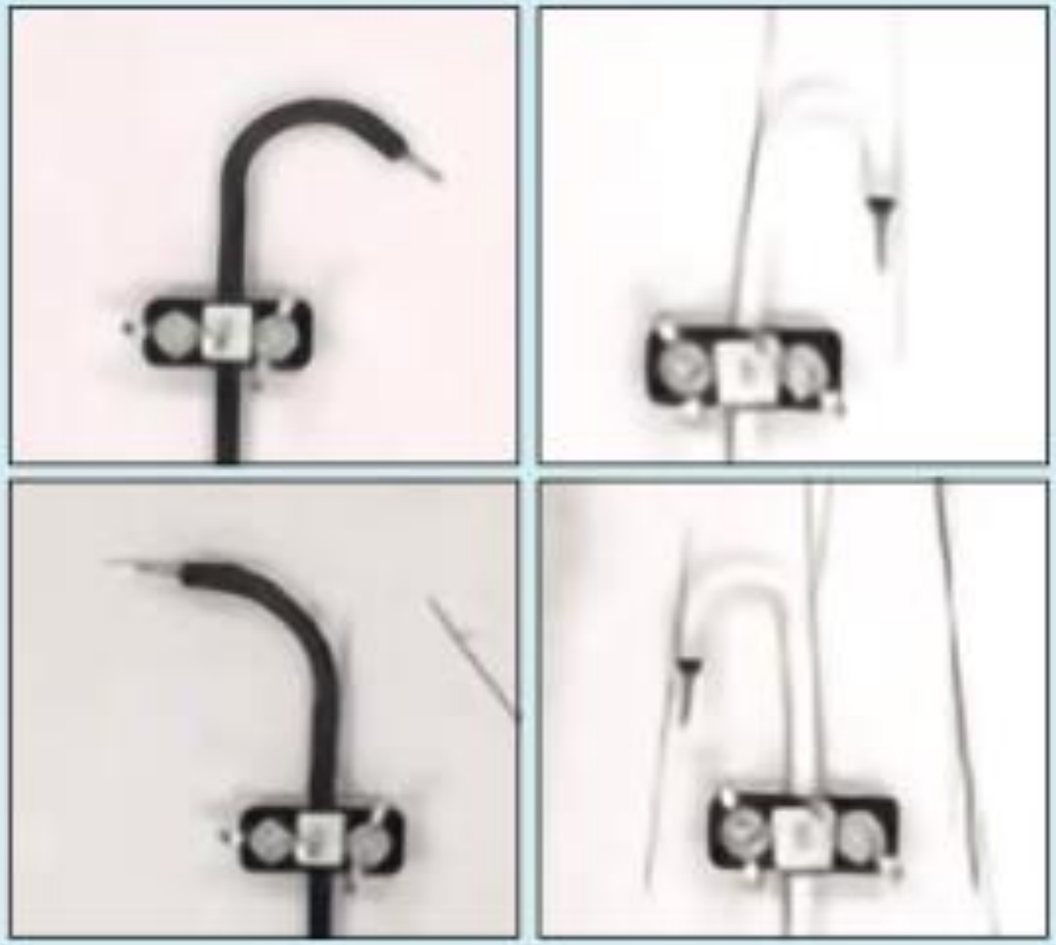
Large Capacity 2.8mm Forceps

Olympus BF-1TH190 Ambu aScope 5



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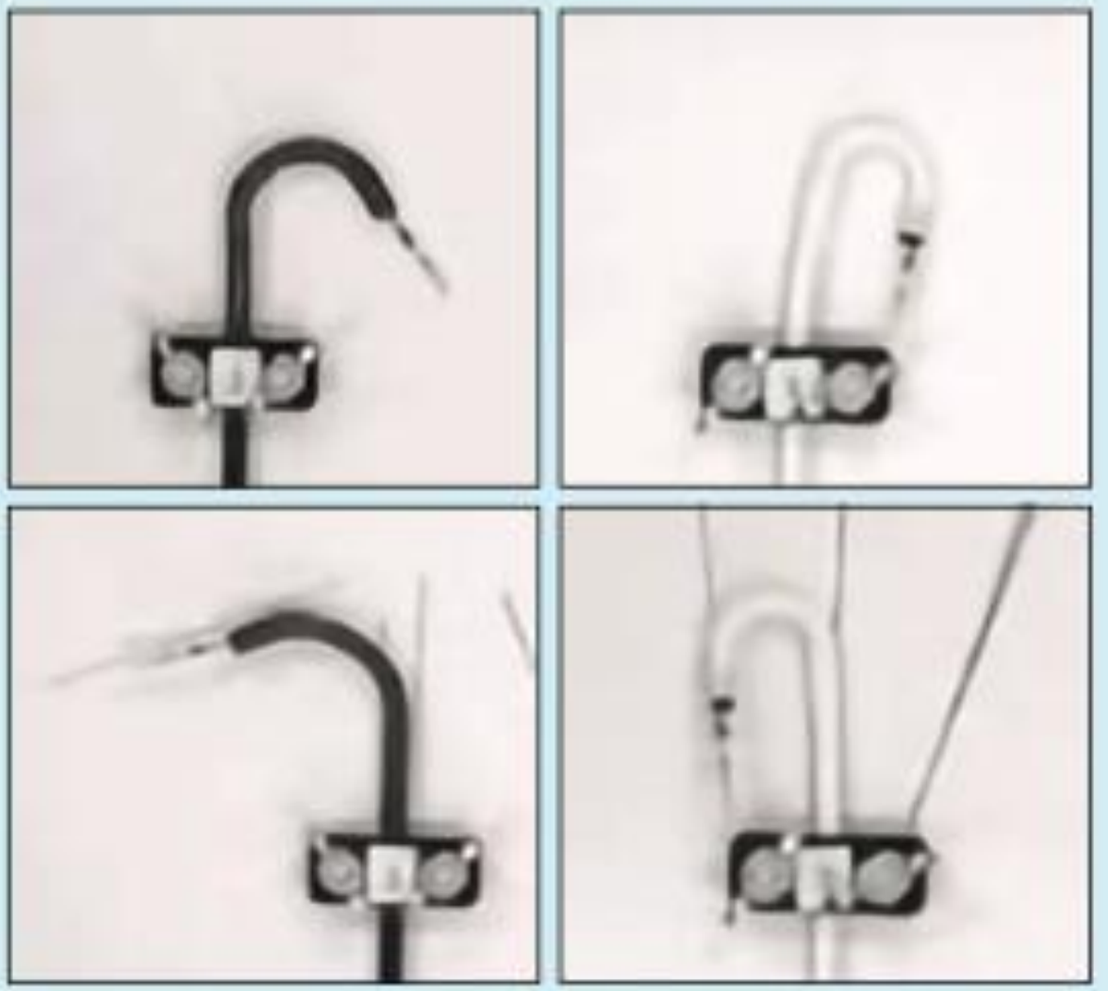
Pulmonx Zephyr 5.5 EDC Valve

Olympus BF-1TH190 Ambu aScope 5



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Conclusion: No SUFB or RFB was superior in every category evaluated. At least one SUFB was better than or equivalent to the RFB in each category. Among the SUFB, the Ambu aScope 5 was either superior or equivalent to the RFB in the most categories.

The latest generation of SUFB are a significant advancement over their predecessors. Many of their attributes are comparable to or even superior to RFB. SUFB may represent a viable alternative to RFB for interventional pulmonology procedures in the bronchoscopy suite, operating room, and intensive care unit.

FINALLY

CLINICAL PERFORMANCE

In more than 90% of 300 procedures performed with single-use flexible bronchoscopes, all the pulmonary segments could be reached, and all the planned techniques could be performed, for a general level of satisfaction with the device of 86% and a recommendation for its use in similar cases. Further, they found a learning curve with excellent scores from the ninth procedure.

Flandes et al. (2020)

CONTAMINATION AND INFECTIONS

Bronchoscopy-related pseudo-outbreaks occur despite standardized procedures for high-level disinfection. Of a total of 35 patients who had a bronchoscopy with a reusable flexible bronchoscope, 10 (28.6%) tested positive for Adenovirus infection. New technology that is high-quality disposable or able to undergo sterilization is needed.

Seidelman et al. (2021)

ORGANISATIONAL IMPACT

Organisational impact should be considered when assessing medical devices. This study shows that, from an organisational viewpoint, there are many advantages in using single-use flexible bronchoscopes, including working conditions and safety, patient pathways, logistics, and training requirements.

Châteauvieux et al. (2018)

CLINICAL PERFORMANCE

Single-use flexible bronchoscopy allows for parallel as opposed to linear use in the respiratory suite, which can decrease delays between procedures and increase the number of bronchoscopies that can be performed.

Barron and Kennedy (2020)

ENVIRONMENTAL IMPACT

Using one set of personal protective equipment per reprocessing, along with the materials for cleaning and disinfection, determines that reusable flexible bronchoscopes have comparable or higher material and energy consumption, as well as higher emissions of CO_2 equivalents.

Sørensen et al. (2018)