



KARIM

1.LF UK A VFN V PRAZE

Bronchoskopie pacientů s respirační insuficiencí

ČSARIM 2023

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FAKULTA
Univerzita Karlova



VŠEOBECNÁ FAKULTNÍ
NEMOCNICE V PRAZE



Bronchoskopie pacientů s respirační insuficiencí

- JAK? via ILAM / via OTI
- PROČ? **SNÍŽENÍ MORTALITY!!!** aspirace, VAP, HO BAL driven ATB
- **Součást COMPLETE CARE**
- **ČÍM? Single-use bronchoskopy**
- **Provedení FBSK za UPV**
- Toaleta / hadičky aneb aspirát, miniBAL, BAL
- **Nastavení UPV**
- www.bronchokurz.cz



ILMA - Ambu – Aura-i, iGEL



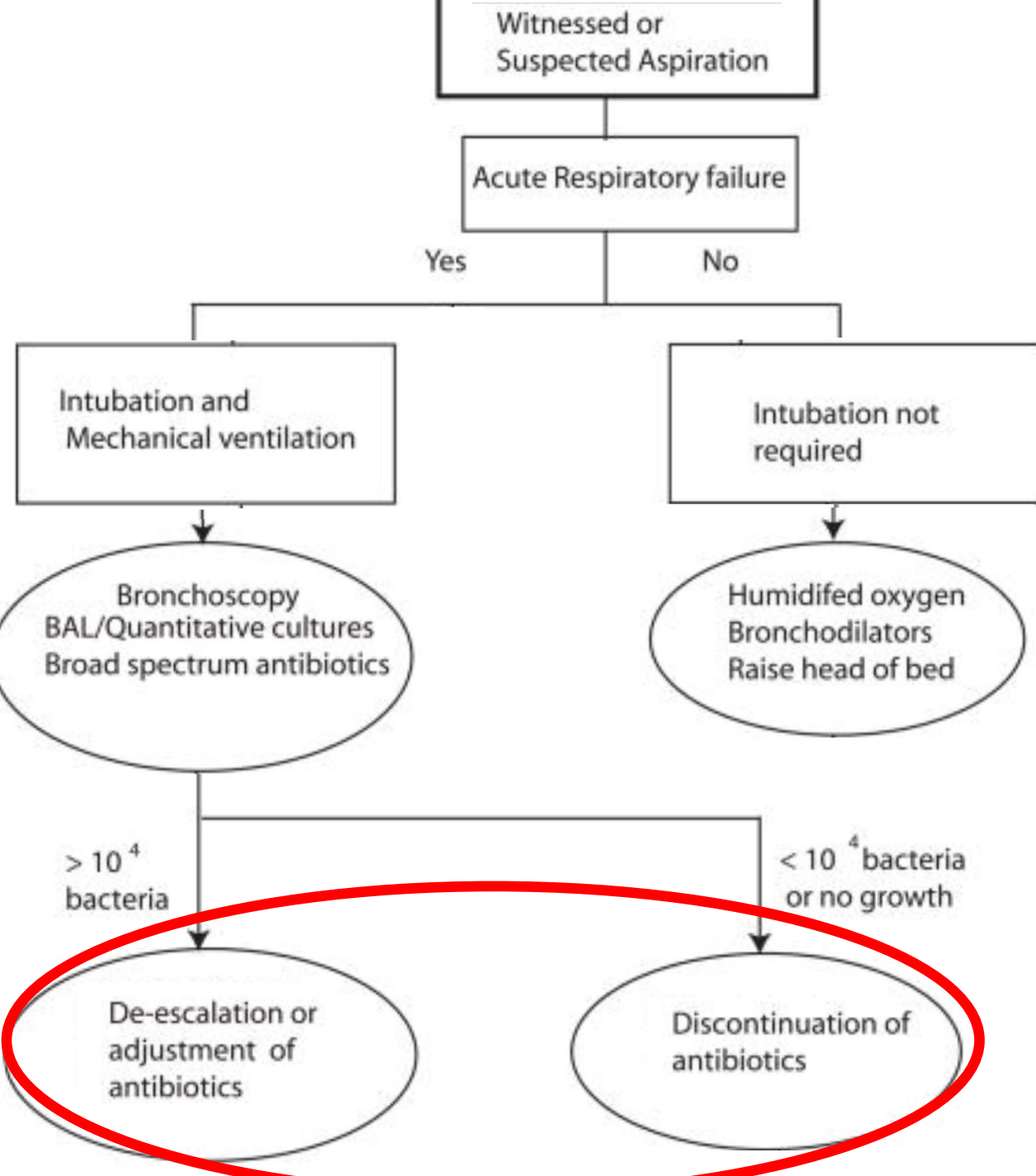


JOURNAL ARTICLE

Bronchoscopy in critical care

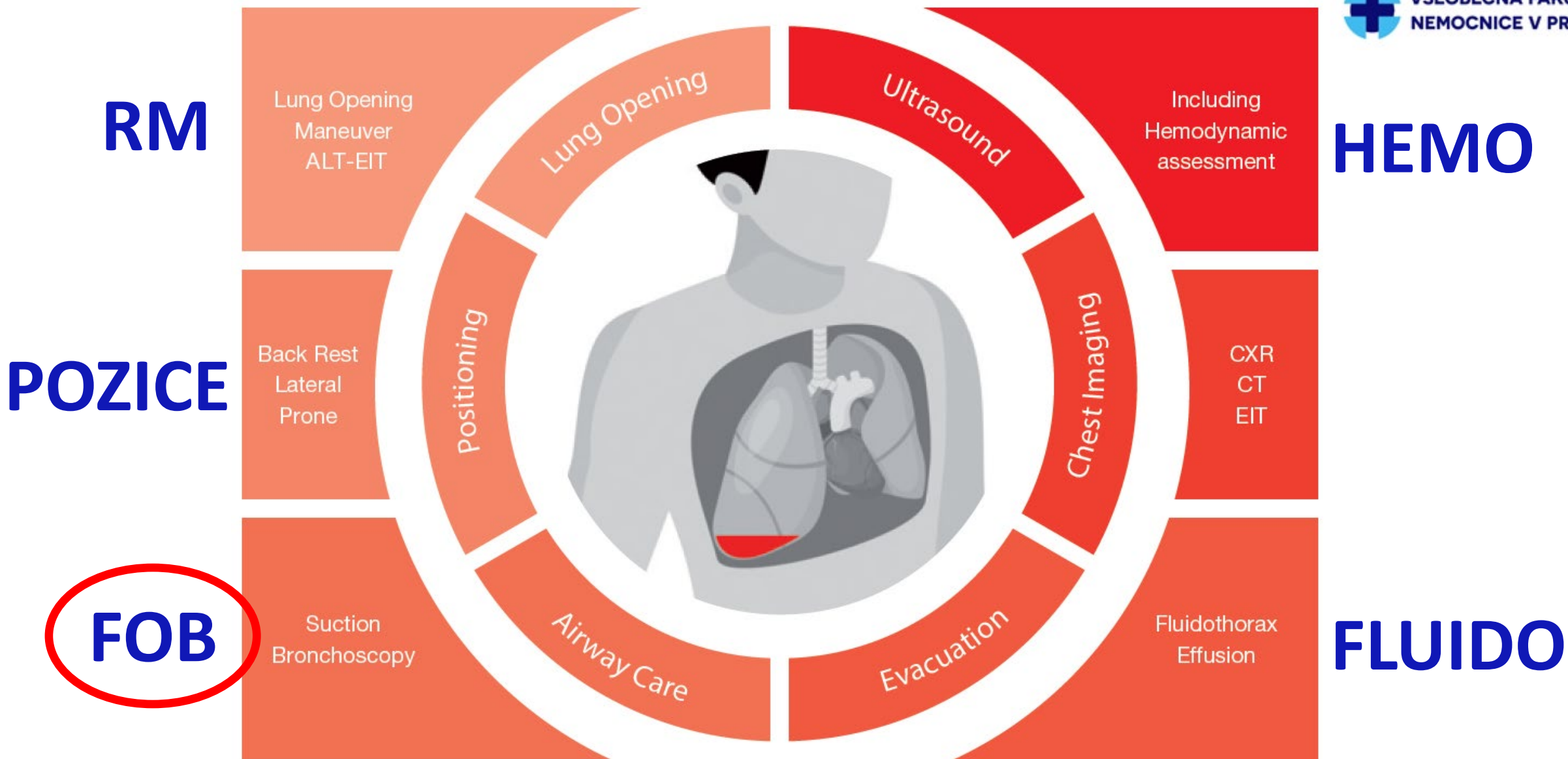


S Kabadayi, MBChB FRCA, M C Bellamy, MBBS MA FRCA FRCP |
BJA Education, Volume 17, Issue 2, February 2017, Pages 48–56



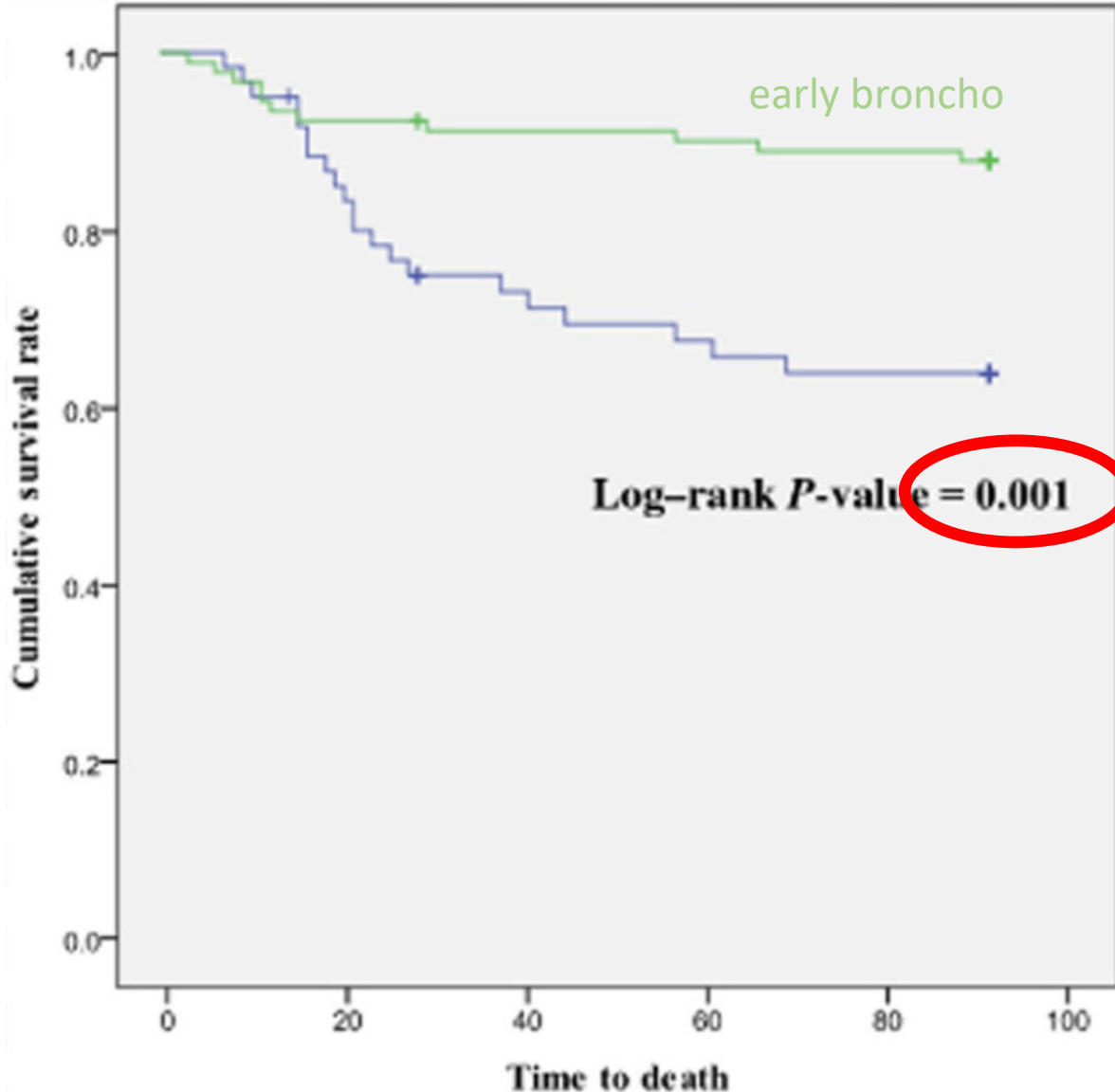
	Inspection	Sampling	Therapeutic
	X	X	X
	X	X	X
	X	X	X
rtion, BB insertion)	X		X
ima, tracheostomy	X		X
esophageal fistula)			
	X		X
	X		X
	X		X

COMPLETE care ... co musíme udělat?



Aspiration

Early bronchoscopy



Clinical impact of early bronchoscopy in mechanically ventilated patients with aspiration pneumonia

Hyun Woo Lee, Jinsoo Min, Jisoo Park, Yeon Joo Lee, Se Joong Kim, Jong Sun Park, Ho Il Yoon, Jae-Ho Lee, Choon-Taek Lee, Young-Jae Cho

Official Journal of the Asian Pacific Society of Respirology

Respirology

93) showed
ICU mortality 4.9% vs 24.6%
and 90-day mortality 11.8 vs 32.8%
regardless of the initial empirical antibiotics
were extubated earlier with a higher
of mechanical ventilation and had a

Aspiration

Early bronchoscopy



ORIGINAL ARTICLE

Use of Early Bronchoscopy in Mechanically Ventilated Patients with Aspiration Pneumonitis

Mohammed M Megahed¹, Ahmed M El-Menshaw², Ahmed M Ibrahim³

- (98) .. 76 adult subjects MV due to aspiration pneumonitis, half the subjects received **early bronchoscopy in the first 24** hours
- intervention group had a **significant reduction in the rate of development of pneumonia at 60.5 vs 81.6% $p = 0.043$**
- the intervention group has a **significantly better hypoxic index (HI), white blood count, clinical pulmonary infection score, lung injury score, and sepsis-related organ failure assessment (SOFA) score** compared to the control group

Aspiration

Ear



Outcome	Intervention (n = 38)		Control (n = 38)		Test of sig.	p-value
	No.	%	No.	%		
Development of pneumonia						
No	15	39.5	7	18.4	$\chi^2 = 4.094^*$	0.043*
Yes	23	60.5	31	81.6		
Days of MV						
Min.–Max.	1.0–23.0		1.0 – 25.0		$U = 543.50$	0.063
Mean \pm SD	7.39 \pm 5.67		10.13 \pm 6.92			
Median	5.0		8.0			
Outcome						
Discharge	28	73.7	20	52.6	$\chi^2 = 3.619$	0.057
Death	10	26.3	18	47.4		

scopy in Mechanically Ventilated
on Pneumonitis

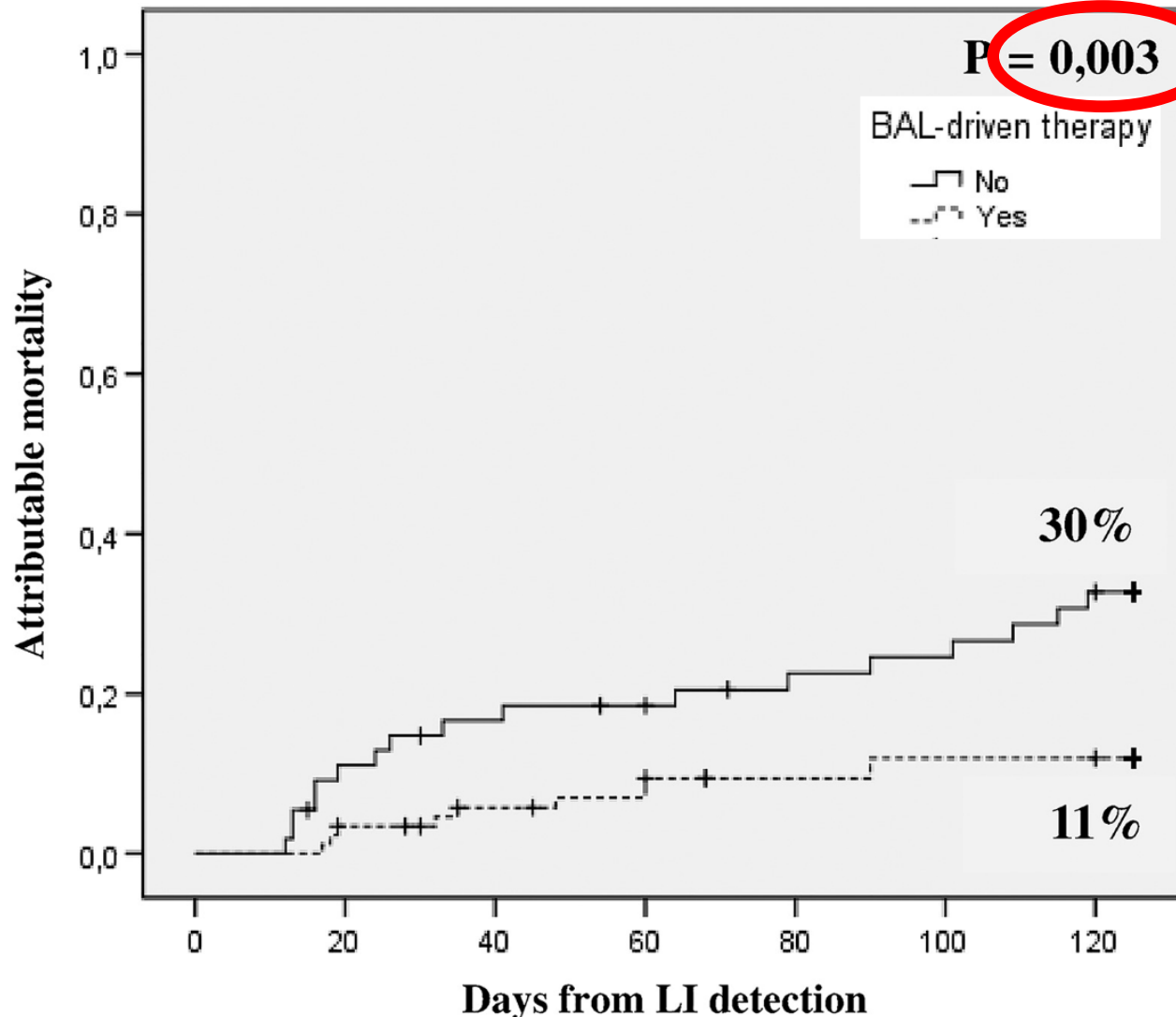
enshawy², Ahmed M Ibrahim³

BAL driven ATB

A bronchoalveolar lavage-driven antimicrobial treatment improves survival in hematologic malignancy patients with

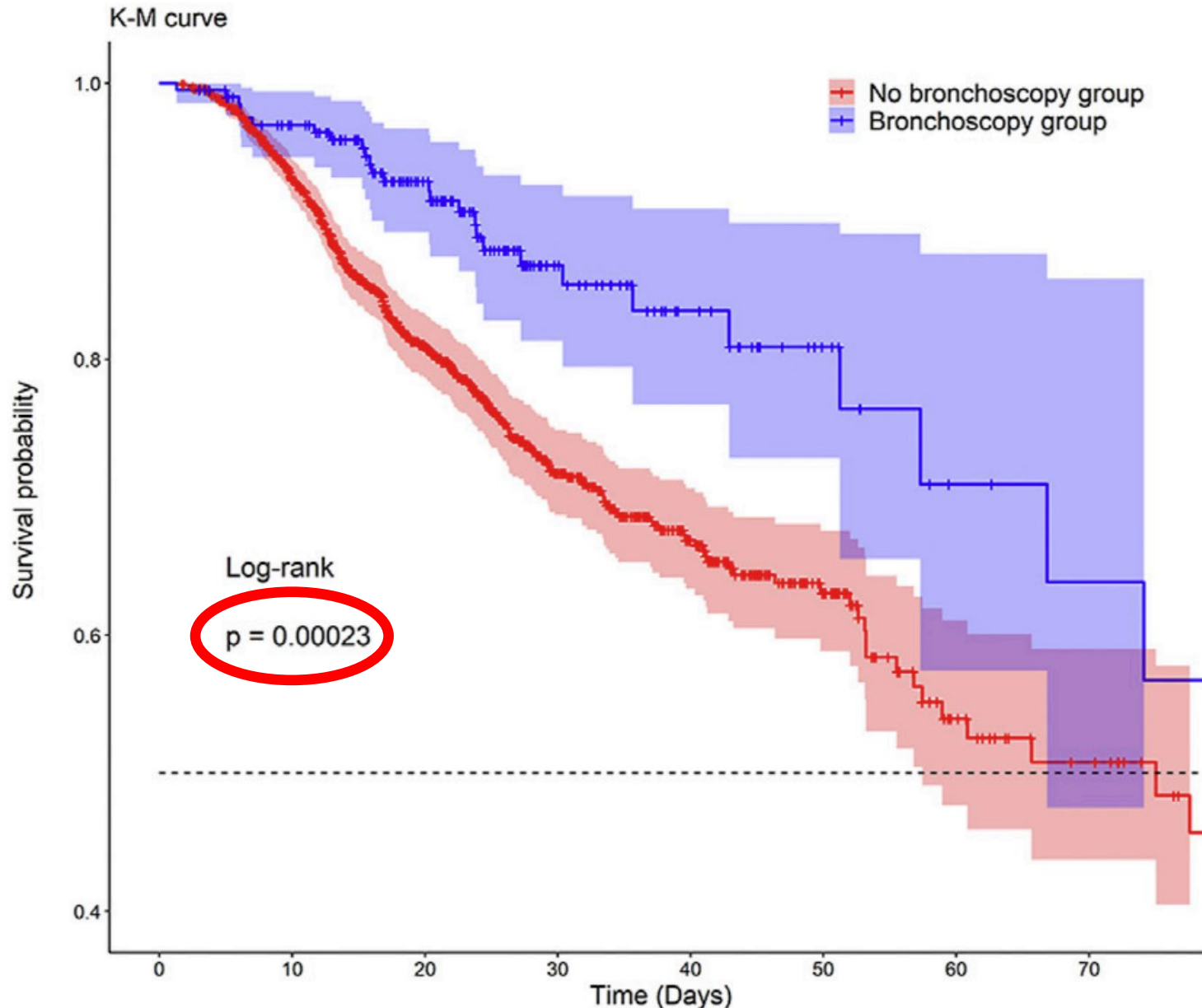
infiltrates: A prospective multicenter study of
 Group
 American Journal of
Hematology

Giara Cattaneo, Marianna Criscuolo, Mario Delia, Michelina Dargenio,
 Anna Maria Di Biase, SEIFEM Group



- BAL for LI among 3055 HM patients
- BAL was performed in 145 out of 434 patients who developed LI
- A putative **causal agent** was detected in 111 cases (76%),
- 89 cases (61%) the BAL results provided guidance to antimicrobial treatment
- 120-day attributable **mortality** (120d-AM) (**11% vs 30%; P = 0.003**)

VAP x bronchoscopy



The Association Between Bronchoscopy and the Prognoses of Patients With Ventilator-Associated Pneumonia in Intensive Care Units: A Retrospective Study Based on the MIMIC-IV Database

Frontiers in [Pharmacology](#)

Luming Zhang^{1,2†}, Shaojin Li^{3,†}, Shiqi Yuan^{4,†}, Xuehao Lu^{1,2}, Jieyao Li¹, Yu Liu¹, Tao Huang²

- MIMIC-IV approx. 250,000 patients hospitalized from 2008 to 2019 / MIT
- 1,560 patients with VAP: **1,355** in the **no-bronchoscopy** group and **205** in the **bronchoscopy** group
- When patients are undergoing IMV, bronchoscopy can not only help suck out the obstructions such as sputum and foreign bodies in the trachea, remove secretions, but also **repeatedly suction and wash the lungs, which is of great significance for reducing inflammation and improving lung ventilation**



Single-use bronchoskopy

Výhody:

- vždy připraven
- sterilní – **nemožnost přenosu infekce**
- jednoduché použití
- nevyžaduje proškolený personál

Nevýhody:

- horší manipulace? NE
- horší zobrazení? NE
- **Cena???**

Výrobce:

- **AMBU**
- **Boston Scientific**
- **TSC**

- **Vathin**
- **Verathon**
- **Karl Storz**
- **Olympus**
- **Pentax**



Single-use bronchoscopy

The Cost of Flexible Bronchoscopes: A Systematic Review and Meta-analysis

Annals of Intensive Care

RESEARCH

Cost analysis of single-use (Ambu[®] aScope[™]) and reusable bronchoscopes in the ICU

Perbet et al. *Ann. Intensive Care* (2017) 7:3

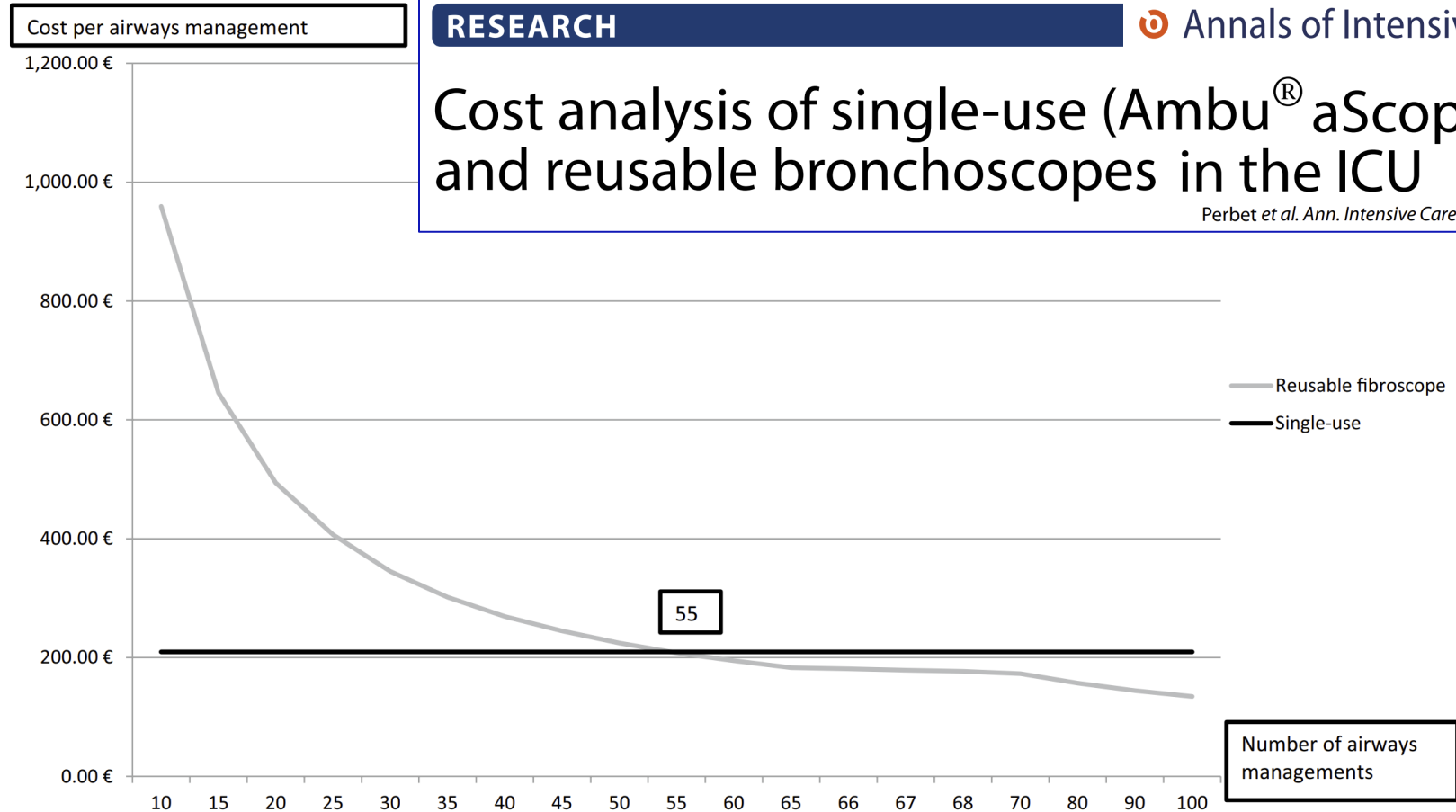
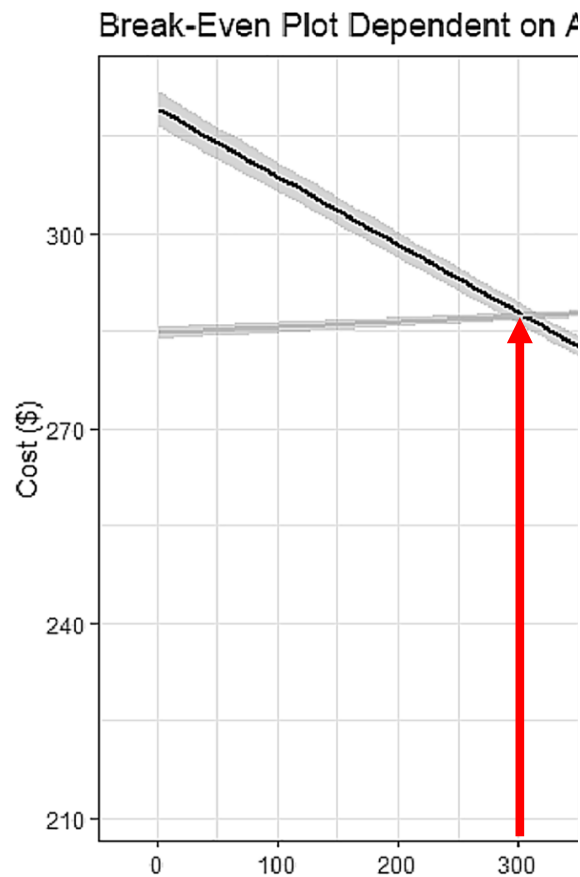
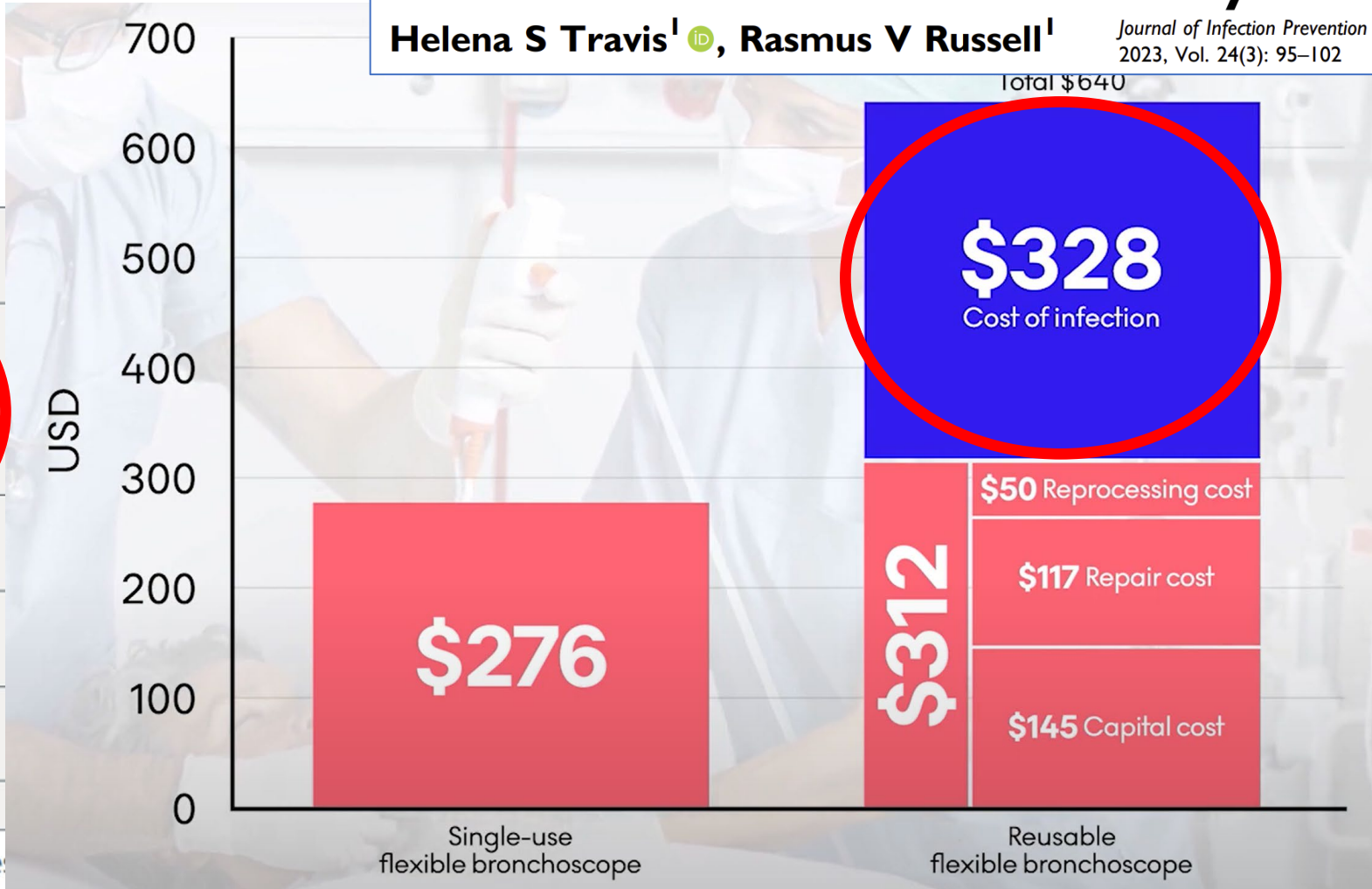
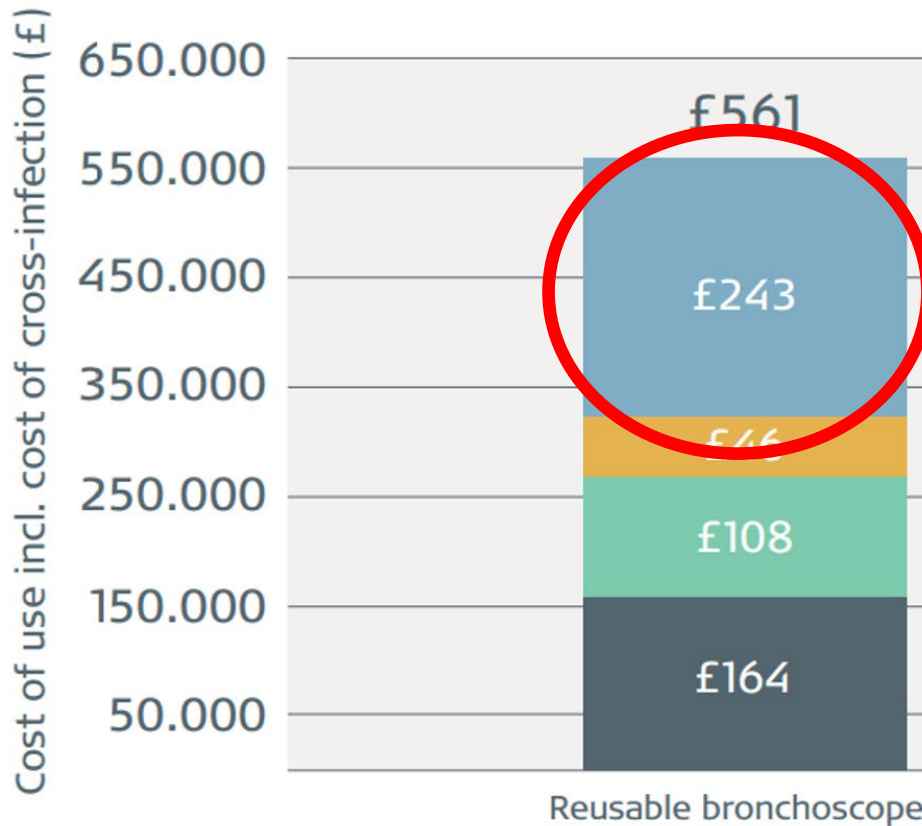


Fig. 1 Evolution of cost per airways management (EUR) when using one reusable scope per 50 airways managements per year comparing with single-use scopes



Single-use bronchoscopy

total RFB **cross-contamination rate**
was 8.69% ± 1.86



Cross-contamination rate of reusable flexible bronchoscopes: A systematic literature review and meta-analysis

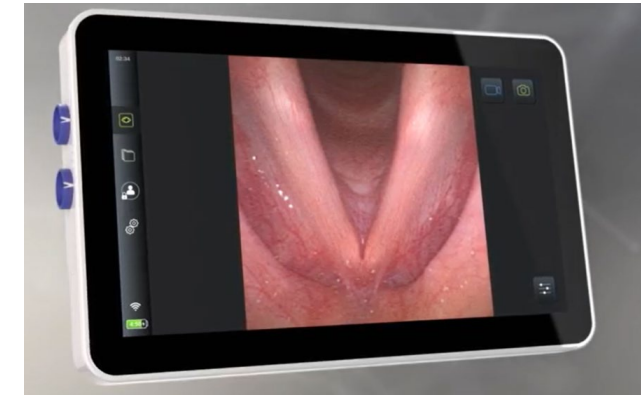
Helena S Travis¹, Rasmus V Russell¹

Journal of Infection Prevention
2023, Vol. 24(3): 95-102



Single-use bronchoskopy

- Výrobce:
- **AMBU**



- Ambu® aScope™ 5 Broncho HD 5.6/2.8
- Ambu® aScope™ 5 Broncho HD 5.0/2.2

aScope 4 Broncho
Slim 3.8/1.2
180°/180°

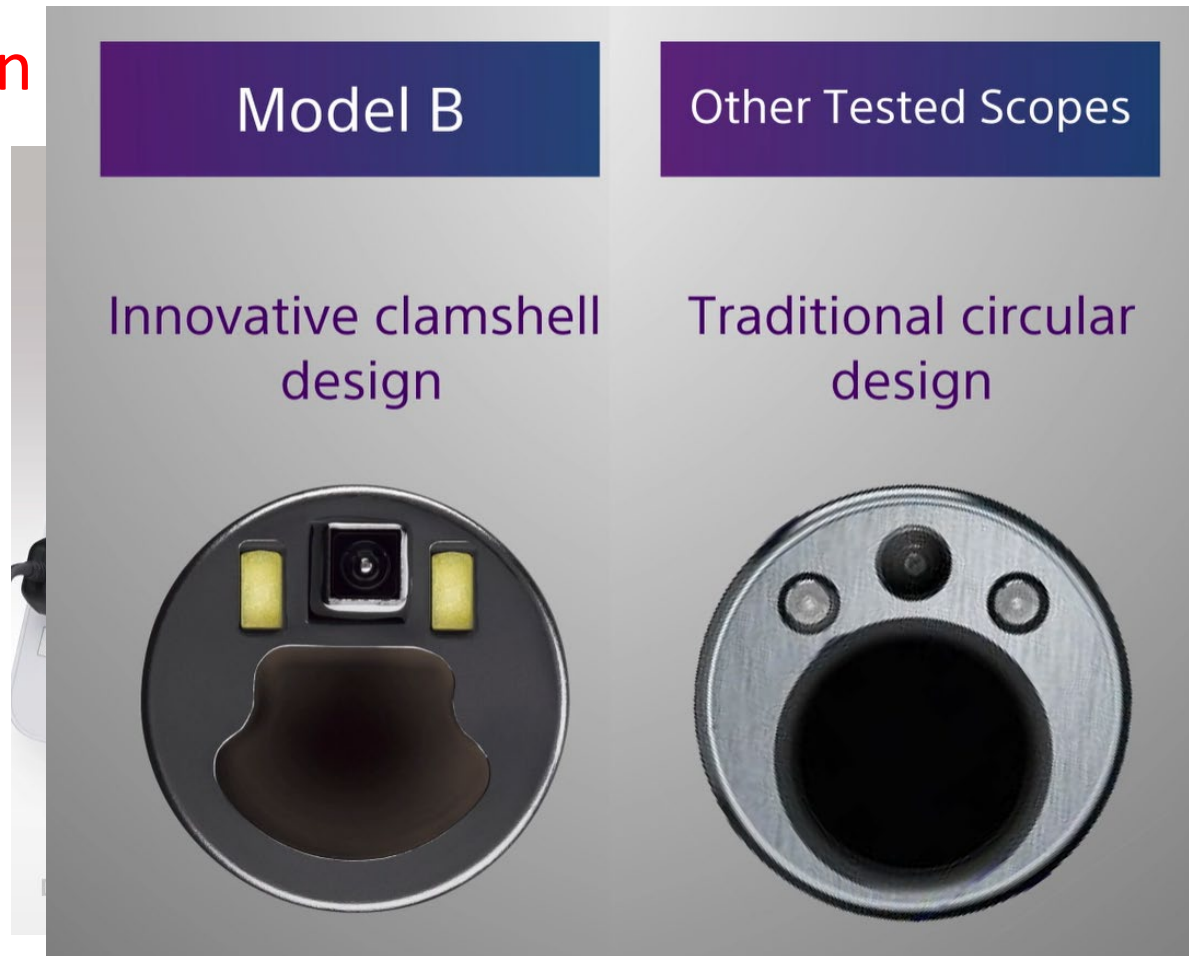
aScope 4 Broncho
Regular 5.0/2.2
180°/180°

aScope 4 Broncho
Large 5.8/2.8
180°/160°



Single-use bronchoscopy

- Výrobce:
- **Boston**





Single-use bronchoskopy



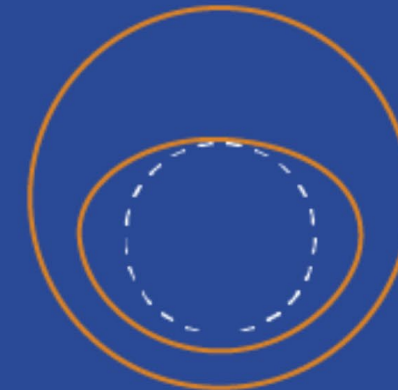
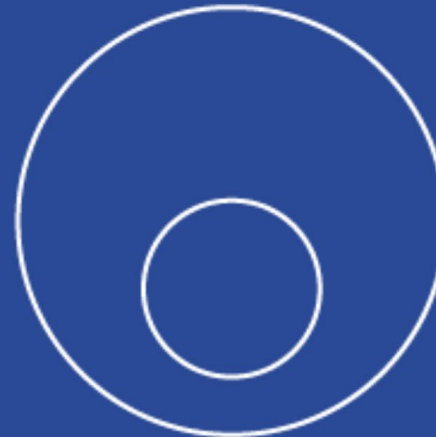
- Výrobce:

- TSC

BRONCOFLEX™

Standard single-use bronchoscopes

Broncoflex™
Vortex



Ø Distal tip (mm)	Ø 5,5
Ø Working channel (mm)	Ø 2,0
Suction area (mm²)	3,80

Ø 6,3
Ø 2,6
6,15

Ø 5,6
Ø 2,8
9,95



Single-use bronchoscopy

Single Use or Disposable Flexible Bronchoscopes: Bench Top and Preclinical Comparison of Currently Available Devices

Kevin Frederick Deasy, BSc, MB, MRCPI¹,

Journal of Intensive Care Medicine
2023, Vol. 38(6) 519-528

SUFB Specifications

Scope

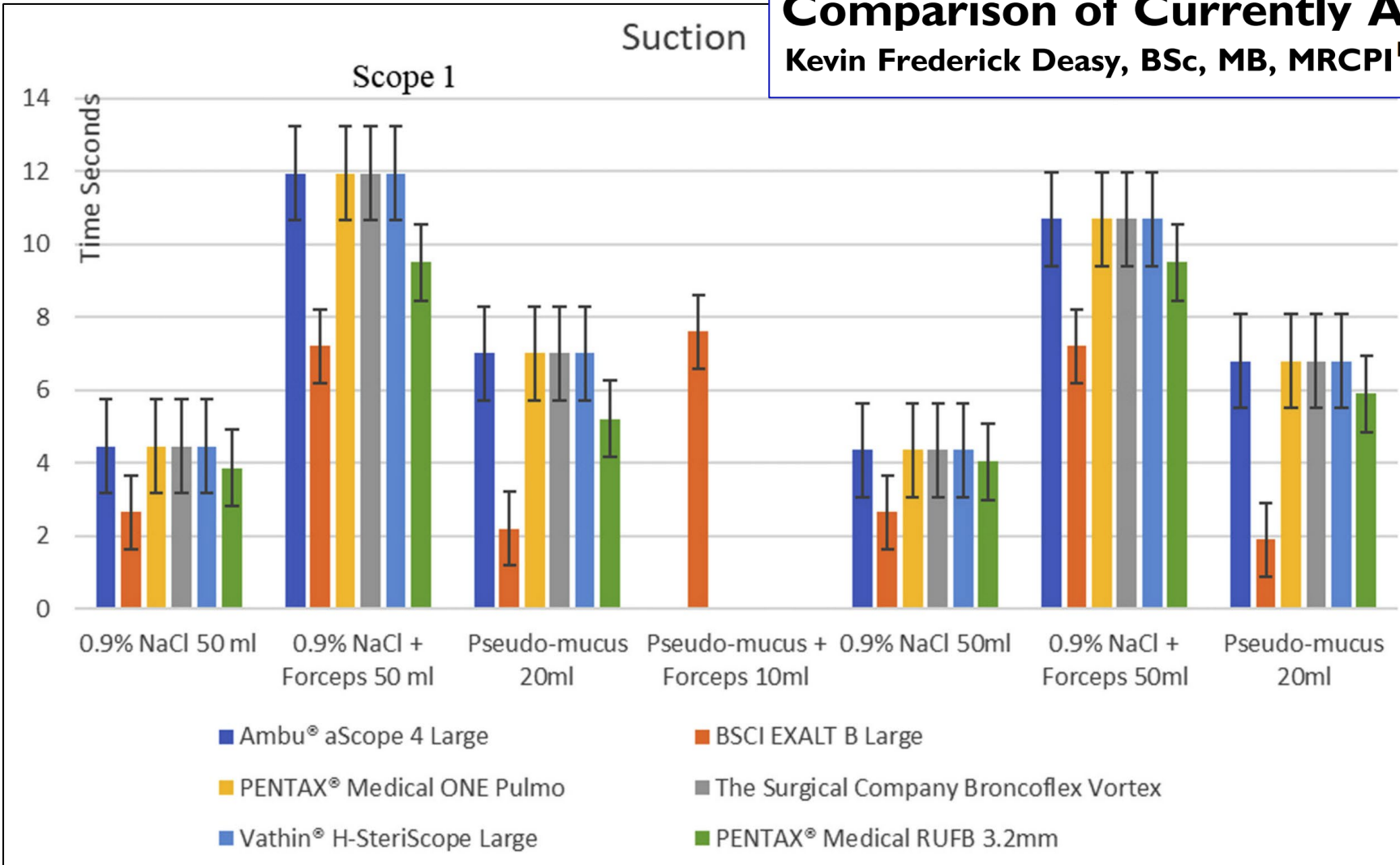
Art
La

Outer dimension (OD) (average (maximum)) (mm)

Inner dimension (ID) (average (minimum)) (mm)

Length

Weight (g)

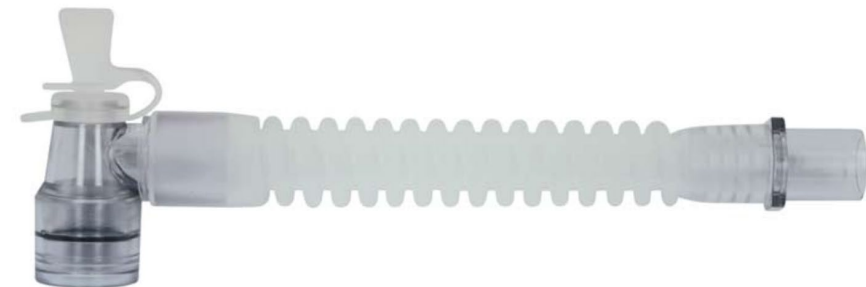
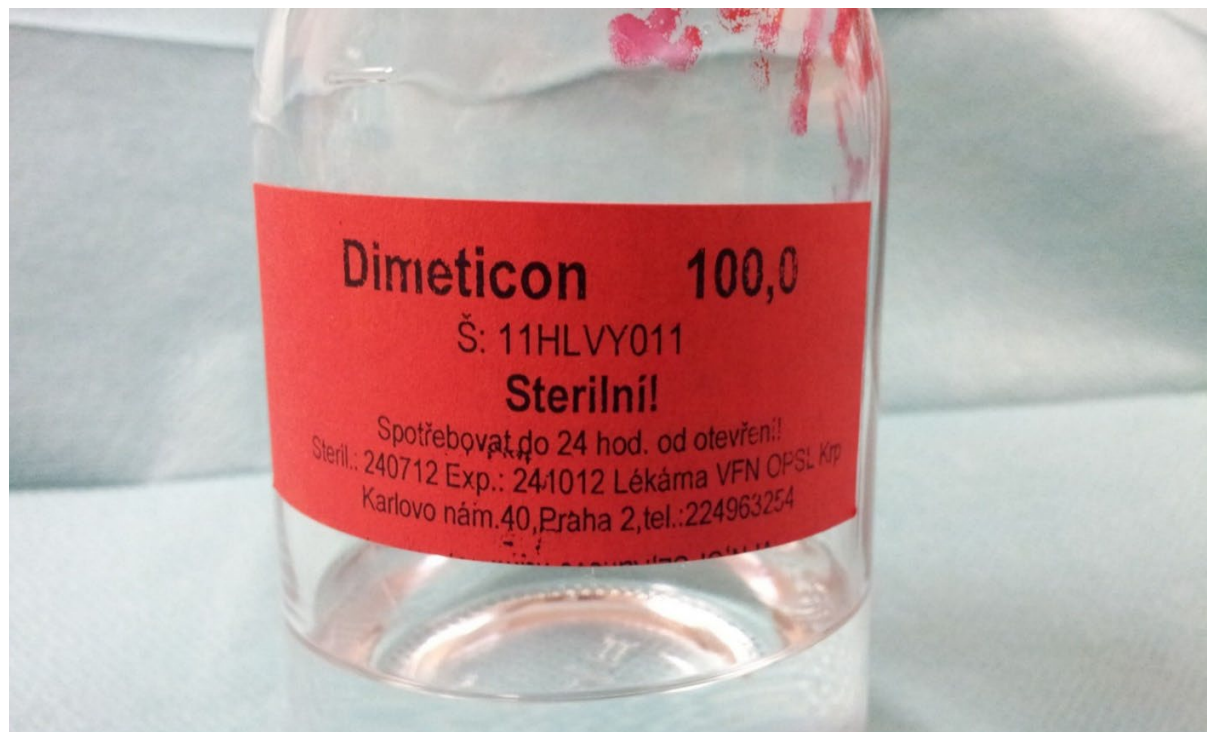


Jak na to? aneb praktické provedení

Kdo maže ten jede!



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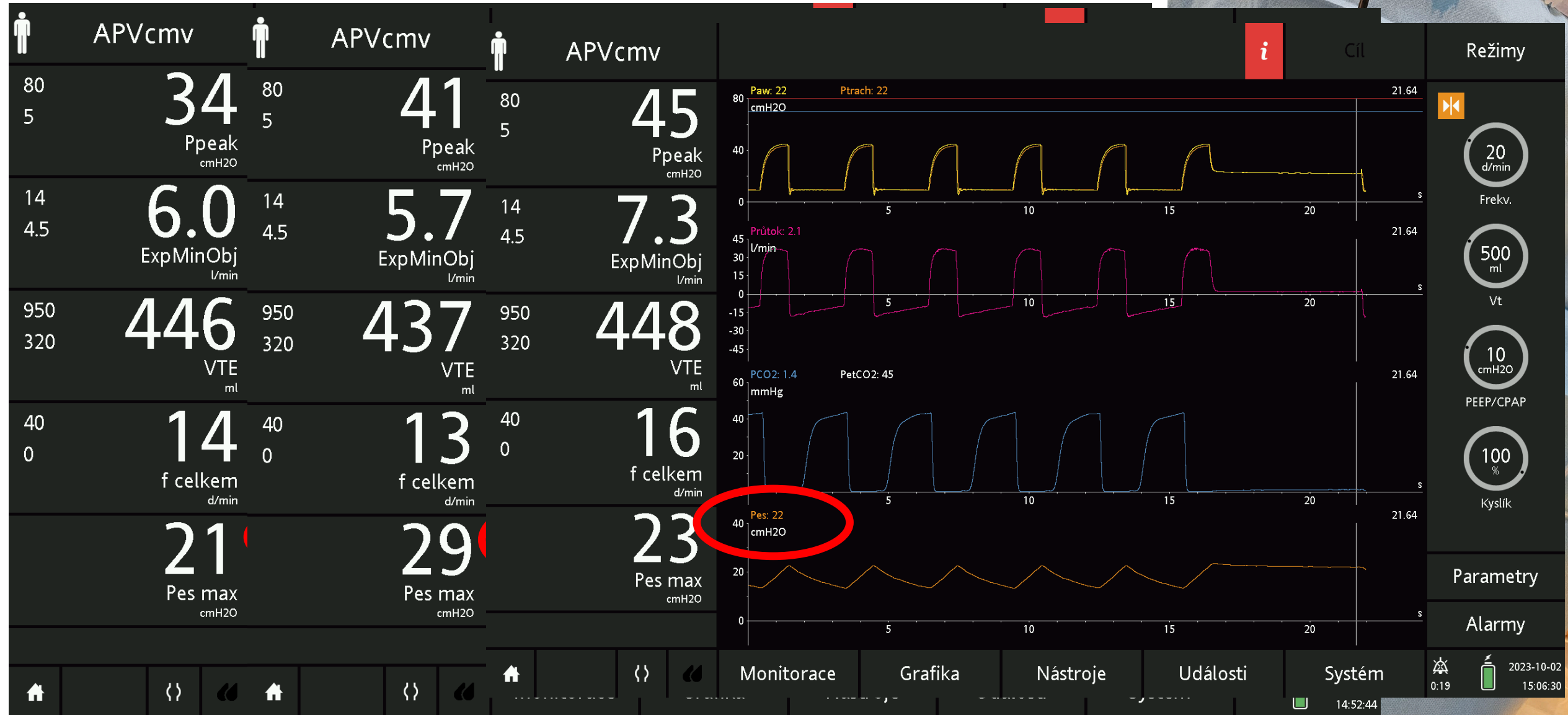
„Husí krk“ Obj.č. 65-65-130 č.šarže 1050477
Sterilizace v autoklávu
Výrobce: VBM MEDIZINTECHNIK GMBH –
dodavatel firma Cheiron
Cena: 273kč, opakovaná resterilizace (10-15x)

- polydimethylsiloxan, patří mezi silikonové oleje, liší se stupněm polymerace a tím i viskozitou.
- **dostupný Dimetikon 350 /f.Dr.Kulich/, Dimetikon 200 /f.Fagron/ 10g/ 246Kč**
při odběru 20ks / 10g / 66,40Kč
- nejsou sterilní, požadavek sterility se musí z vaší strany zdůraznit

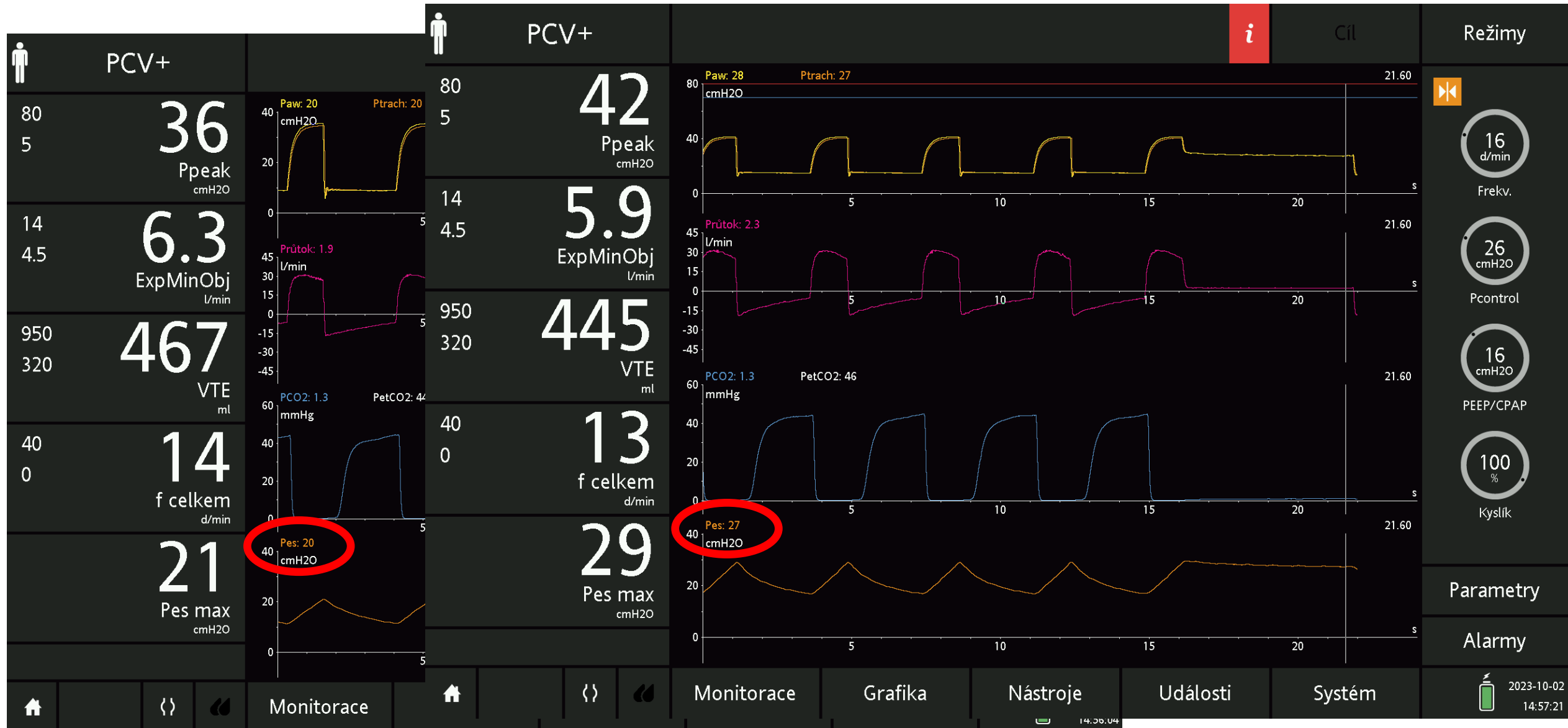
Provedení za kontinuální UPV



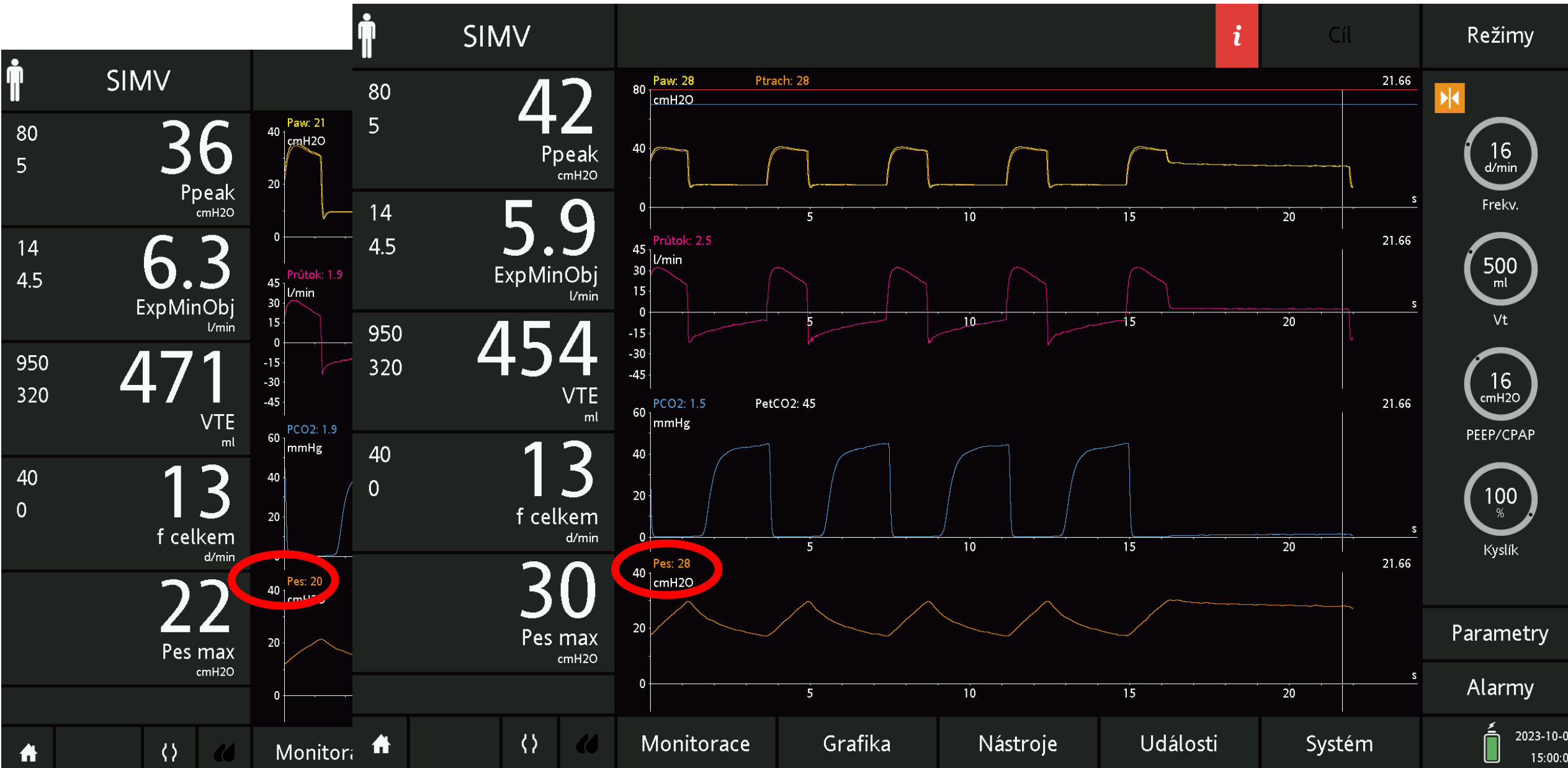
Nastavení UPV - APVcmv



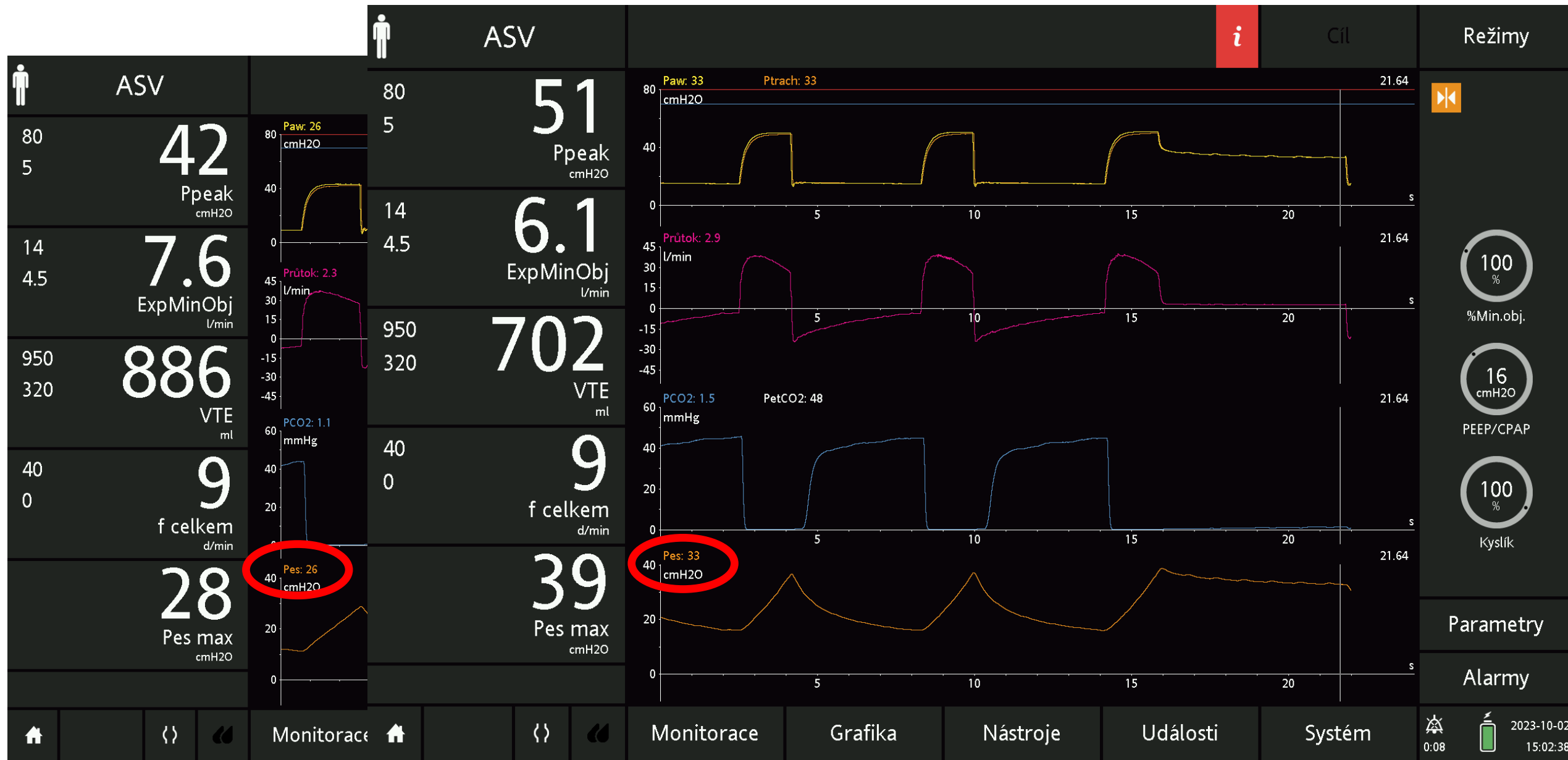
Nastavení UPV – PCV+



Nastavení UPV - SIMV



Nastavení UPV - ASV



Nastavení UPV



- VCV - objemové lepší než PCV – tlakové, lepší eliminace CO₂
- **ASV ventiluje jako obstrukční poruchu – NEVHODNÉ**
- propagace Ppeak nedosahuje hodnoty před obturací
- obturace TS nižší než ET kanyly
- PEEP ani Ppeak nejsou limitací



Bronchoskopie pacientů s respirační insuficiencí

- **FOB toaleta** = snížení nálože bakteriální infekce
/ redukce proinflamatorní nálože
- **COMPLETE CARE** = znovuzprůchodnění DC
- Odběr materiálu cílená ATB ... deescalace
- **SNÍŽENÍ MORTALITY !!!!**





www.bronchokurz.cz