

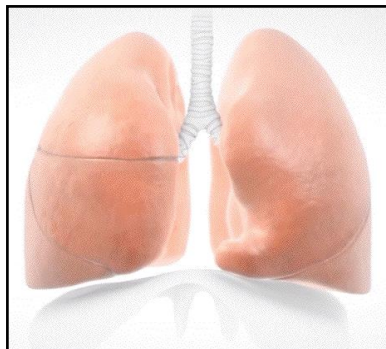
L'insuffisant respiratoire au bloc

Pr Hadrien Rozé
Anesthésie Réanimation Thoracique
SAR Sud, Hôpital Haut Leveque, CHU Bordeaux

Biarritz 26 juin 2022

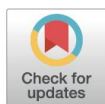


www.sim-va.com



Conflits d'intérêt

Je déclare avoir reçu des honoraires en tant que
consultant ou conférencier de la part de
Getinge / Medtronic / Air Liquide / Draeger / Fisher et
Paykel et Sanofi



Prise en charge anesthésique périopératoire du patient BPCO

Jean Selim^{1,2}, Bertrand Dureuil¹

Disponible sur internet le :
11 mai 2022

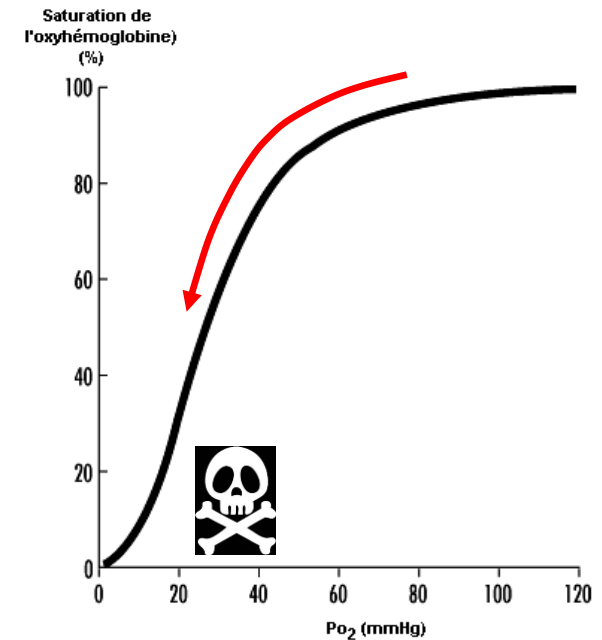
1. Rouen University Hospital, Department of Anaesthesiology and Critical Care, 76000 Rouen, France
2. Normandy University, UNIVROUEN, Inserm U1096, 76000 Rouen, France

4 mécanismes d'hypoxémie

- L'hypoventilation
- L'anomalie de diffusion
- Le shunt anatomique
- L'inégalité des rapports ventilation perfusion

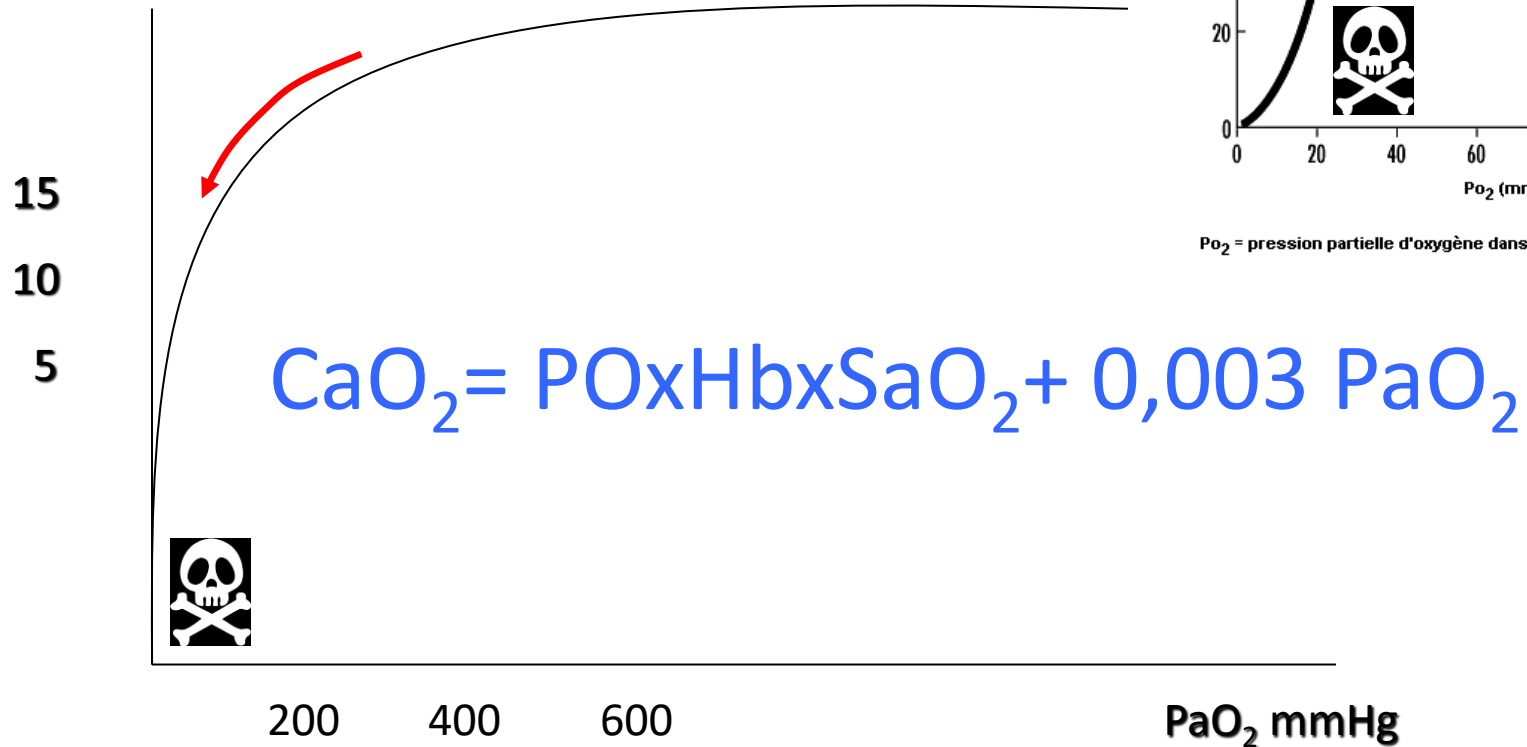


Objectifs oxygénation



Po₂ = pression partielle d'oxygène dans le sang artériel.

Contenu O₂ ml



Patient chronique

chirurgie programmée

- BPCO
- Fibrose
- Bronchite chronique
- DDB
- Asthme
- Obésité morbide

Patient aigue

chirurgie urgente

- SDRA
- Inhalation
- Covid-19 ...

Evaluation

- Symptômes respiratoires
- Test de marche 6 minutes
- GDS
- EFR
- Scintigraphie de ventilation/perfusion
- Scanner thoracique / RP

TDM6 matériel



uenight



- cardiofréquencemètre simple
- saturomètre
- application smartphone fonction podomètre
- matériel spécifique non indispensable :



bewell
connect

fc santé

Vintus Walk



i health PO3

Doit être métré, de préférence non encouragé. La première fois 2 tests doivent être fait à 30 min d'intervalle.



15 à 50 m

Test de marche de 6 mn

Equations prédictives de la distance

❖ Patients non encouragés (Equation d'Enright et Sherrill)

Homme : $7.57 \times \text{taille(cm)} - 5.02 \times \text{âge} - 1.76 \times \text{poids(kg)} - 309$

Femme : $2.11 \times \text{taille(cm)} - 5.78 \times \text{âge} - 2.29 \times \text{poids(kg)} + 667$

Il est admis que : **+ 40 m** est une amélioration significative

- 70 m est une détérioration significative

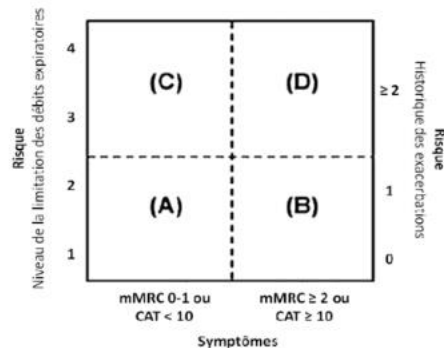
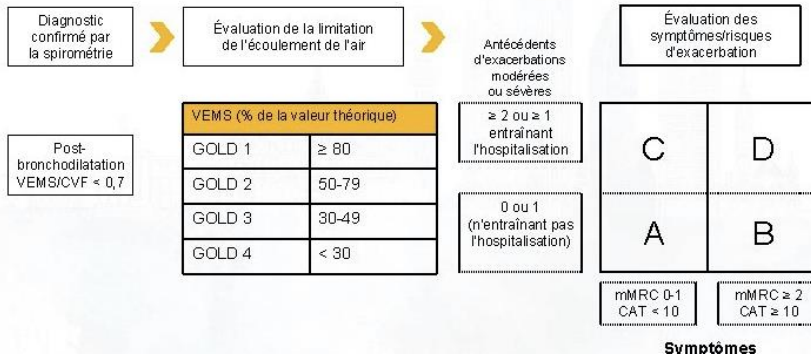
Distance m	Bonne mobilité	Limitation minimale	Limitation modérée	Limitation sévère
Femme 60-69 ans	+530	425-530	150-425	< 150
Femme 70-79 ans	+470	375-470	150-375	< 150
Homme 60-69 ans	+580	465-580	150-465	< 150
Homme 70-79 ans	+520	415-520	150-415	<150

Score et index

- BMI
- Obstruction
- Dyspnée
- Exercice

GOLD 2019 update

► Outil d'évaluation ABCD amélioré



Catégorie	Caractéristiques	Classification spirométrique	Exacerbation par année	Échelle de dyspnée mMRC	Questionnaire état de santé CAT
A	Risques faibles, symptômes faibles	Stade 1-2	≤ 1	0-1	< 10
B	Risques faibles, symptômes élevés	Stade 1-2	≤ 1	≥ 2	≥ 10
C	Risques élevées, symptômes faibles	Stade 3-4	≥ 2	0-1	< 10
D	Risques élevées, symptômes élevés	Stade 3-4	≥ 2	≥ 2	≥ 10

Index BODE

Score prédictif de mortalité à 52 mois en cas de BPCO.⁴

IMC (BMI) ≤ 21		I (0 si > 21)
% VEMS prédit	65% et plus 50-64% 36-49% 35% et moins	0 1 2 3
Distance en 6 minutes (en mètres)	350 et plus 250-349 150-249 149 et moins	0 1 2 3
Echelle de dyspnée MRC	Effort intense	0
Doit reprendre son souffle après	Marche rapide à plat	0
	Marche à son rythme à plat	1
	100 m à plat	2
	Habillage (reste à la maison)	3
Somme		—
% mortalité à 52 mois		—

VEMS: volume expiratoire maximal par seconde; MRC: Medical Research Council.

Accuracy of the Preoperative Assessment in Predicting Pulmonary Risk after Nonthoracic Surgery



Finlay A. McAlister, Nadia A. Khan, Sharon E. Straus, Miltiadis Papaioakim, Bruce W. Fisher, Sumit R. Majumdar, Ognjen Gajic, Malcolm Daniel, and George Tomlinson

TABLE 1. THE ASSOCIATION BETWEEN THE PREOPERATIVE HISTORY AND THE OCCURRENCE OF POSTOPERATIVE PULMONARY COMPLICATIONS

Variable	Number of Patients with a Particular Finding (<i>n</i> = 272)	Odds Ratio (95% Confidence Interval)	p Value
Age of 65 years or more	140	4.7 (1.6–14.4)	0.006
Male	108	1.03 (0.6–1.8)	0.91
Ever smoked (versus never smoked)	153	2.2 (0.8–5.8)	0.16
Current smoker (within 2 wk of operation)	52	0.7 (0.2–2.3)	0.69
Smoked 40 pack-years or more	42	5.7 (2.3–14.2)	0.0002
Recent (within 4 wk) upper respiratory tract infection	32	0.7 (0.2–3.3)	0.95
History of chronic obstructive airways disease	32	4.2 (1.6–11.3)	0.007
History of asthma	29	2 (0.6–6.4)	0.41
Daily productive cough	30	1.9 (0.6–6.1)	0.45
Exercise capacity of two blocks or less or one flight of stairs	41	3.0 (1.1–7.8)	0.05

Accuracy of the Preoperative Assessment in Predicting Pulmonary Risk after Nonthoracic Surgery

Finlay A. McAlister, Nadia A. Khan, Sharon E. Straus, Miltiadis Papaioakim, Bruce W. Fisher, Sumit R. Majumdar, Ognjen Gajic, Malcolm Daniel, and George Tomlinson

TABLE 2. THE ASSOCIATION BETWEEN THE PREOPERATIVE PHYSICAL EXAMINATION, OPERATIVE FACTORS, AND THE OCCURRENCE OF POSTOPERATIVE PULMONARY COMPLICATIONS

Variable	Number of Patients with a Particular Finding (<i>n</i> = 272)	Odds Ratio (95% Confidence Interval)	p Value
Preoperative physical examination			
Body mass index of 30 or more	101	4.1 (1.6–10.4)	0.004
Positive cough test	26	4.3 (1.5–12.3)	0.01
Positive wheeze test	31	3.4 (1.2–9.4)	0.04
Forced expiratory time of 9 sec or more	42	5.7 (2.3–14.2)	0.0002
Maximum laryngeal height of 4 cm or less	37	6.9 (2.7–17.4)	< 0.0001
Wheezing on standard auscultation	21	3.1 (0.9–10.0)	0.13
Operative factors			
Upper abdominal incision	24	1.0 (0.2–4.7)	0.73
General anesthesia	222	2.4 (0.5–10.5)	0.38
Duration of operation of 2.5 hours or more	75	2.9 (1.2–7.0)	0.03

Accuracy of the Preoperative Assessment in Predicting Pulmonary Risk after Nonthoracic Surgery

Finlay A. McAlister, Nadia A. Khan, Sharon E. Straus, Miltiadis Papaioakim, Bruce W. Fisher, Sumit R. Majumdar, Ognjen Gajic, Malcolm Daniel, and George Tomlinson

TABLE 3. THE ASSOCIATION BETWEEN PREOPERATIVE LABORATORY TESTS AND THE OCCURRENCE OF POSTOPERATIVE PULMONARY COMPLICATIONS

Variable	Number of Patients with a Particular Finding	Odds Ratio (95% Confidence Interval)	p Value
Had spirometry performed	145	0.84 (0.53–1.35)	0.78
FEV ₁ < 1 L/min*	10	7.9 (1.7–37.0)	0.02
FVC < 1.5 L/min*	8	11.1 (2.2–56.4)	0.005
Had arterial blood gases performed	66	0.7 (0.3–1.8)	0.61
Pco ₂ ≥ 45 mm Hg†	3	61.0 (3.8–986.4)	0.001
Po ₂ < 75 mm Hg†	14	13.4 (1.3–14.1)	0.008
Had chest radiography performed	124	1.1 (0.7–1.7)	0.83
Chest radiograph abnormal‡	21	1.7 (0.6–4.9)	0.40

ORIGINAL ARTICLE

Development and validation of a score to predict postoperative respiratory failure in a multicentre European cohort

A prospective, observational study

Jaume Canet, Sergi Sabaté, Valentín Mazo, Lluís Gallart, Marcelo Gama de Abreu, Javier Belda, Olivier Langeron, Andreas Hoeft, Paolo Pelosi, For the PERISCOPE group*

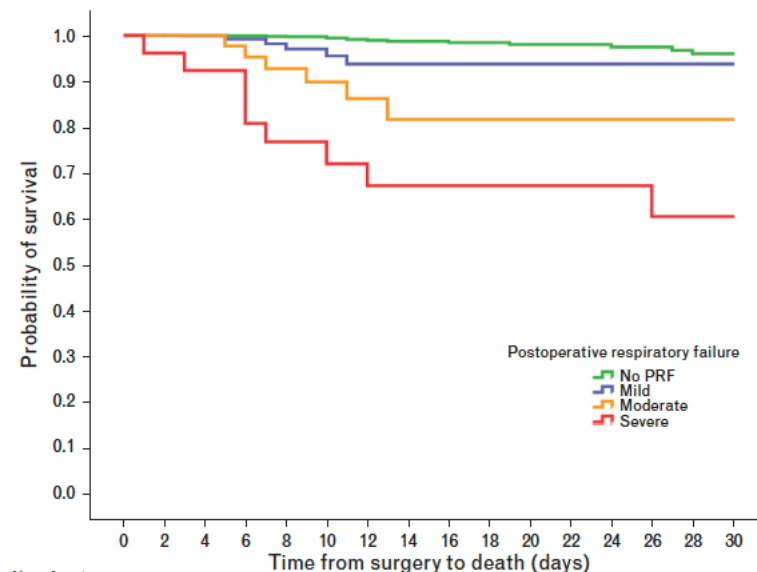


Table 3 Independent predictors of risk for postoperative respiratory failure as identified by logistic regression^a

	Bivariate analysis OR (95% CI) (n = 5384)	Multivariate analysis OR (95% CI) (n = 5256)	β Coefficients	Corrected β coefficients (95% CI) ^b	Risk score ^c
Patient health related factors					
Preoperative SpO ₂ (%)					
≥96	1	1			
91 to 95	3.4 (2.5 to 4.5)	2.0 (1.5 to 2.8)	0.704	0.696 (0.380 to 1.007)	7
≤90	7.4 (3.9 to 14.2)	2.7 (1.3 to 2.9)	0.982	0.982 (0.204 to 1.691)	10
Respiratory symptoms (at least 1)	4.3 (3.3 to 5.7)	2.7 (1.9 to 3.6)	0.984	0.983 (0.676 to 1.291)	10
History of congestive heart failure					
No	1	1			
NYHA I	2.2 (1.4 to 3.6)	1.3 (0.8 to 2.2)	0.270	0.273 (−0.281 to 0.775)	3
NYHA ≥II	5.9 (4.4 to 7.9)	2.2 (1.6 to 3.2)	0.806	0.802 (0.442 to 1.154)	8
History of chronic liver disease	2.6 (1.7 to 3.9)	2.1 (1.3 to 3.2)	0.729	0.730 (0.270 to 1.160)	7
Procedure related factors					
Emergency procedure	2.6 (1.9 to 3.6)	3.1 (2.2 to 4.5)	1.144	1.150 (0.777 to 1.511)	12
Surgical incision					
Peripheral	1	1			
Closed intrathoracic/closed upper abdominal	1.5 (1.0 to 2.3)	1.3 (0.9 to 2.1)	0.291	0.303 (−0.171 to 0.743)	3
Open upper abdominal	3.2 (2.2 to 4.6)	1.9 (1.3 to 2.9)	0.667	0.662 (0.247 to 1.062)	7
Intrathoracic open	8.4 (5.8 to 12.1)	3.3 (2.1 to 5.3)	1.195	1.187 (0.715 to 1.649)	12
Duration of surgery (h)					
≤ 2	1	1			
>2 to 3	2.0 (1.4 to 2.9)	1.6 (1.1 to 2.4)	0.453	0.456 (0.046 to 0.849)	5
>3	3.9 (2.9 to 5.4)	2.7 (1.8 to 3.9)	0.983	0.991 (0.601 to 1.372)	10

La réserve respiratoire



Évaluation préopératoire de la réserve fonctionnelle cardiaque en équivalents métaboliques (METs). Un score inférieur à 4 METs augmente significativement le risque périopératoire du patient

Aptitude physique (échelle de Dukes)	METs	VO ₂ estimée (mL/kg/min)	Activité physique réalisable sans symptôme	Risque chirurgical estimé
Excellente	> 10	> 35	Natation, tennis, basket...	Faible
Très bonne à bonne	7-10	25-35	Monter > 2 étages Marche rapide	
Modérée	4-7	14-25	Monter 2 étages Faire du ménage	
Faible	< 4	< 14	Marcher à domicile, toilette, habillage	Intermédiaire à élevé
Non évaluable	?	?	Aucune	

La coelioscopie

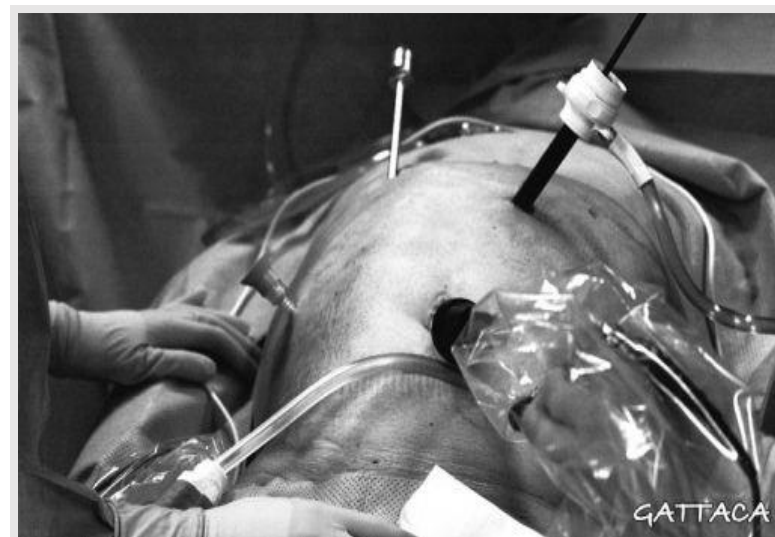
Function	Preoperative		24 h after operation ^c	
	Laparoscopic (n = 30)	Open (n = 28)	Laparoscopic (n = 30)	Open (n = 28)
FVC	3.58 ± 0.95 ^a	3.66 ± 0.85	2.93 ± 1.05 ¹	2.40 ± 0.66 ²
FEV ₁	3.12 ± 0.78	2.98 ± 0.66	2.33 ± 0.80 ³	1.49 ± 0.77 ⁴
FEF _{25-75%}	1.98 ± 0.93	1.81 ± 0.49	1.60 ± 0.73 ^b	1.45 ± 0.54
PEF	5.59 ± 1.97	5.99 ± 1.86	4.27 ± 1.66 ⁵	3.51 ± 1.35 ⁶
ERV	1.10 ± 0.48	1.09 ± 0.47	0.92 ± 0.43 ⁵	0.73 ± 0.34 ⁶
TLC	5.94 ± 1.00	5.94 ± 1.18	5.35 ± 1.03 ^b	5.30 ± 0.96
ITGV	3.42 ± 1.04	3.47 ± 0.94	3.25 ± 0.81 ^b	3.20 ± 0.89

Operation	n	Atelectasis 1 ^a	Atelectasis 2 ^b	Total ^c
Laparoscopic cholecystectomy	30	9	0	9 ¹
Open cholecystectomy	28	15	6	21 ²

^a Micro- or focal atelectasis

^b Segmental or lobar atelectasis

^c 1 vs 2, $p < 0.0002$



La coelioscopie

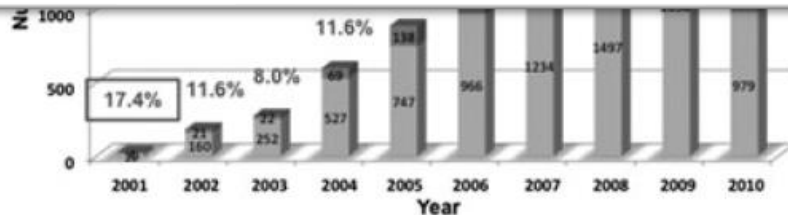
Thoracoscopic Lobectomy Has Increasing Benefit in Patients With Poor Pulmonary Function

A Society of Thoracic Surgeons Database Analysis

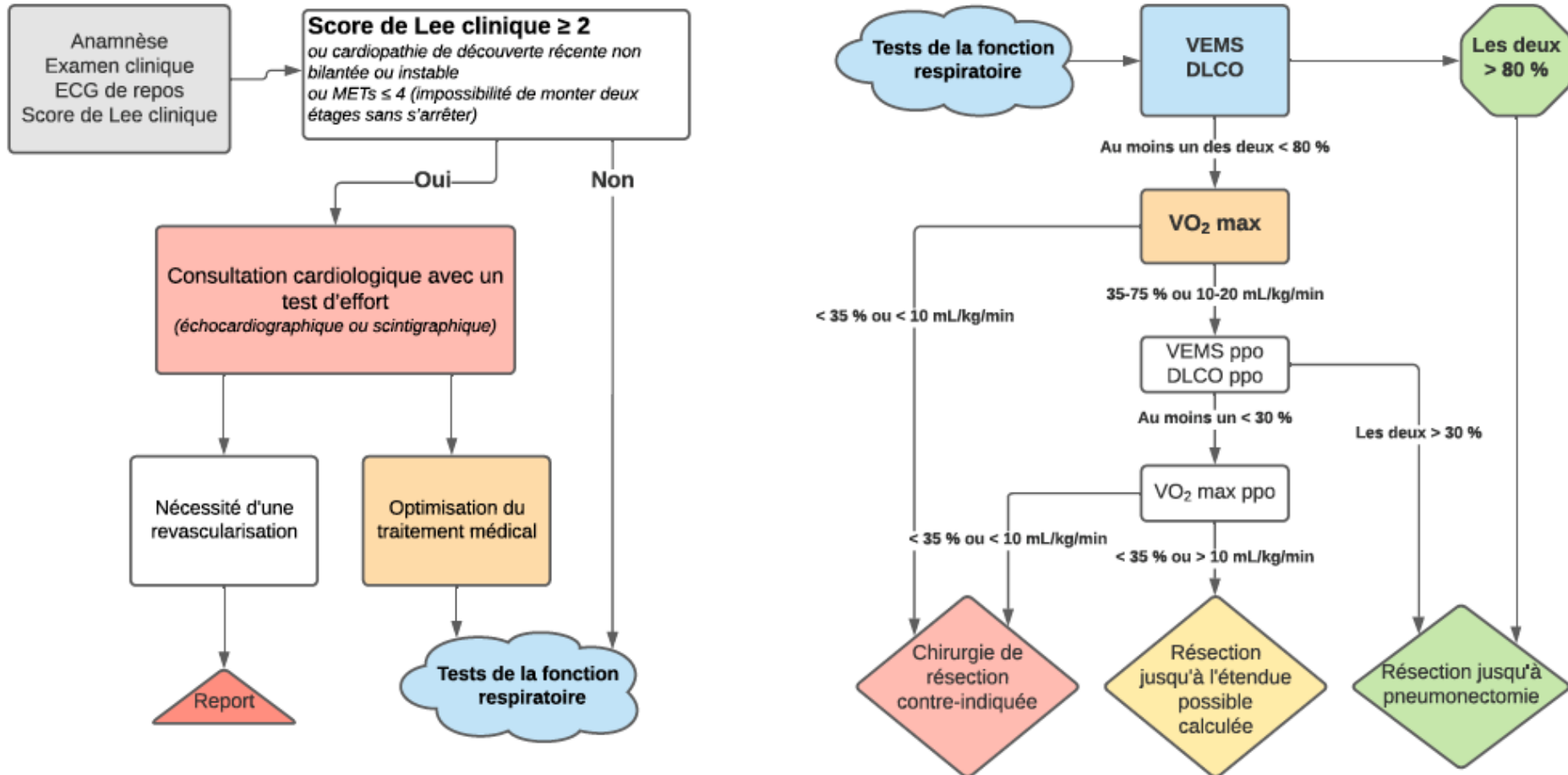
DuyKhanh P. Ceppa, MD, Andrzej S. Kosinski, PhD,† Mark F. Berry, MD,* Betty C. Tong, MD,* David H. Harpole, MD,* John D. Mitchell, MD,‡ Thomas A. D'Amico, MD,* and Mark W. Onaitis, MD**



Characteristic	Univariate			Multivariate (n = 11123)		
	OR	95% CI	P-value	OR	95% CI	P
Approach			<0.001			<0.001
Open	1.00			1.00		
VATS	0.699	(0.622, 0.785)		0.797	(0.702, 0.906)	



La chirurgie pulmonaire



Algorithme pour la gestion des risques cardiaque et respiratoire en chirurgie de résection pulmonaire.

Adapté de ERS/ESTS clinical guidelines on fitness for radical therapy in lung cancer patients Eur J Respir 2009 (trad. personnelle)

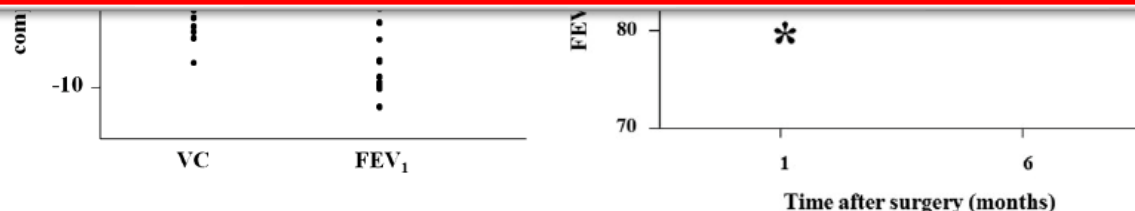
Préhabilitation Respiratoire

ORIGINAL ARTICLE

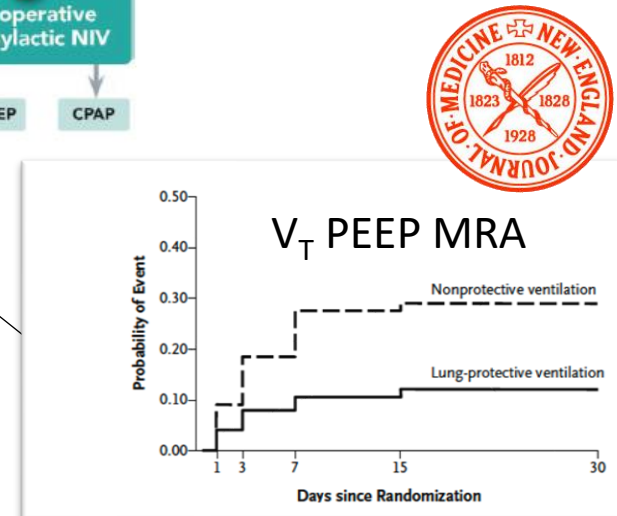
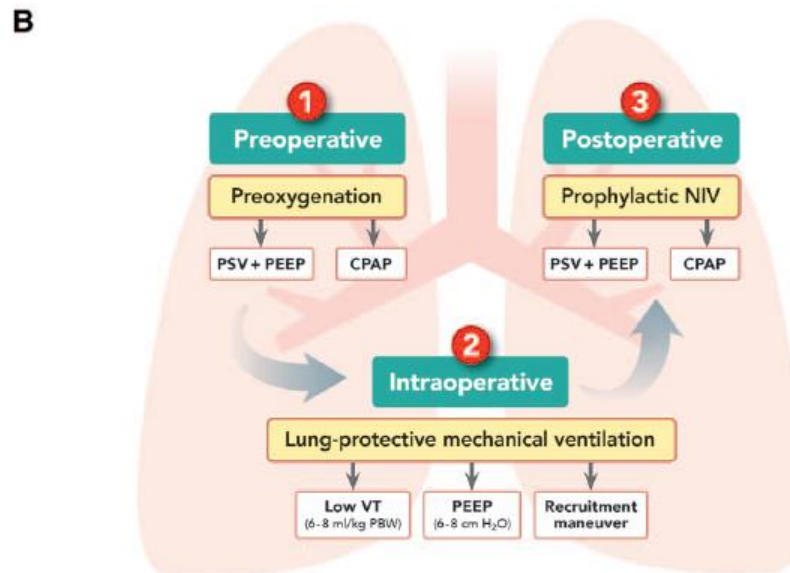
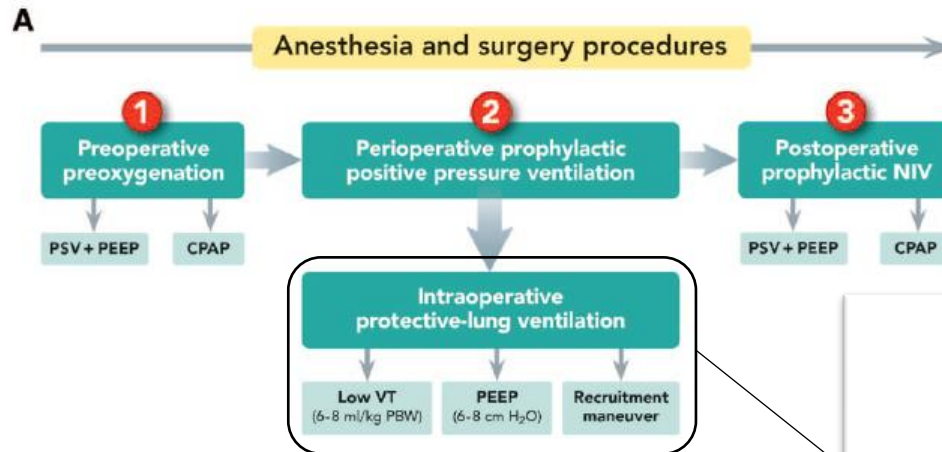
Impact of pulmonary rehabilitation on postoperative complications in patients with lung cancer and chronic obstructive pulmonary disease

Hajime Saito¹, Kazutoshi Hatakeyama², Hayato Konno¹, Toshiki Matsunaga², Yoichi Shimada³ & Yoshihiro Minamiya¹

Variable	Total COPD patients			After propensity score matching		
	OR	95% CI	P	OR	95% CI	P
Age (70 years $\leq$)	2.79	0.53–19.8	0.233	1.53	1.27–78.4	0.036*
Gender (Male)	3.35	0.09–67.1	0.462	1.70	0.45–2.23	0.096
Brinkman Index (400 $\leq$)	2.94	0.30–82.8	0.387	1.49	0.06–72.3	0.809
Tumor size (30 mm <)	2.74	0.68–13.1	0.160	2.25	0.18–32.9	0.519
Approach (open thoracotomy)	2.24	0.54–11.3	0.273	1.45	0.08–42.7	0.799
Predicted VC ($\leq$ 2000 mL)	10.16	0.88–276.1	0.064	1.49	0.08–11.4	0.205
Predicted FEV ₁ (<1500 mL)	31.30	2.34–974.9	0.007*	7.10	1.33–439.2	0.002*
Predicted %FEV ₁ ($\leq$ 60%)	9.67	1.24–92.9	0.030*	6.80	1.425–235.0	0.017*
Rehabilitation (–)	5.82	1.11–48.3	0.036*	6.42	1.69–589.1	0.021*



Ventilation péri opératoire

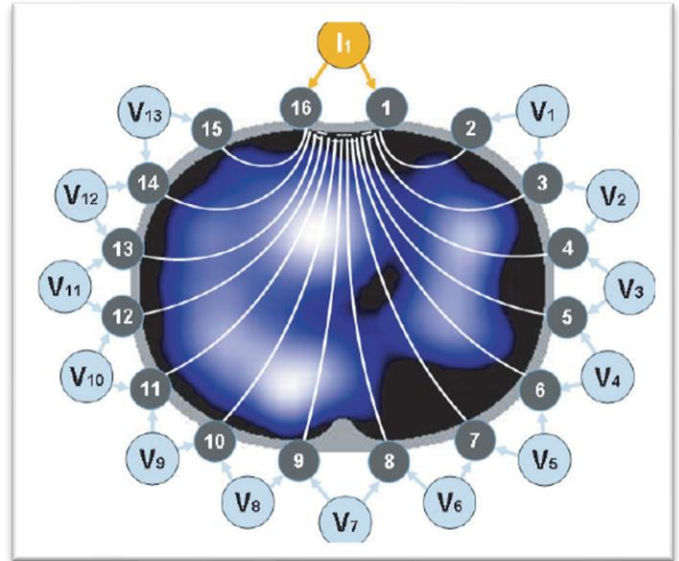
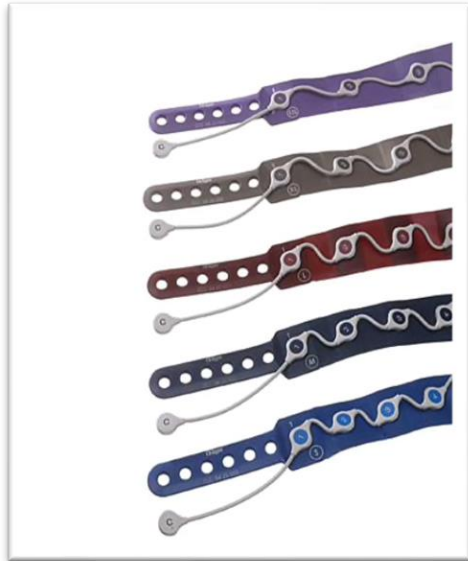


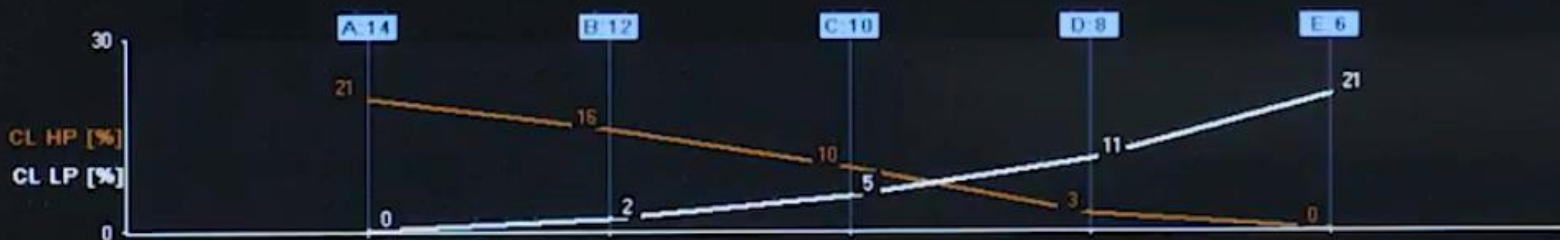
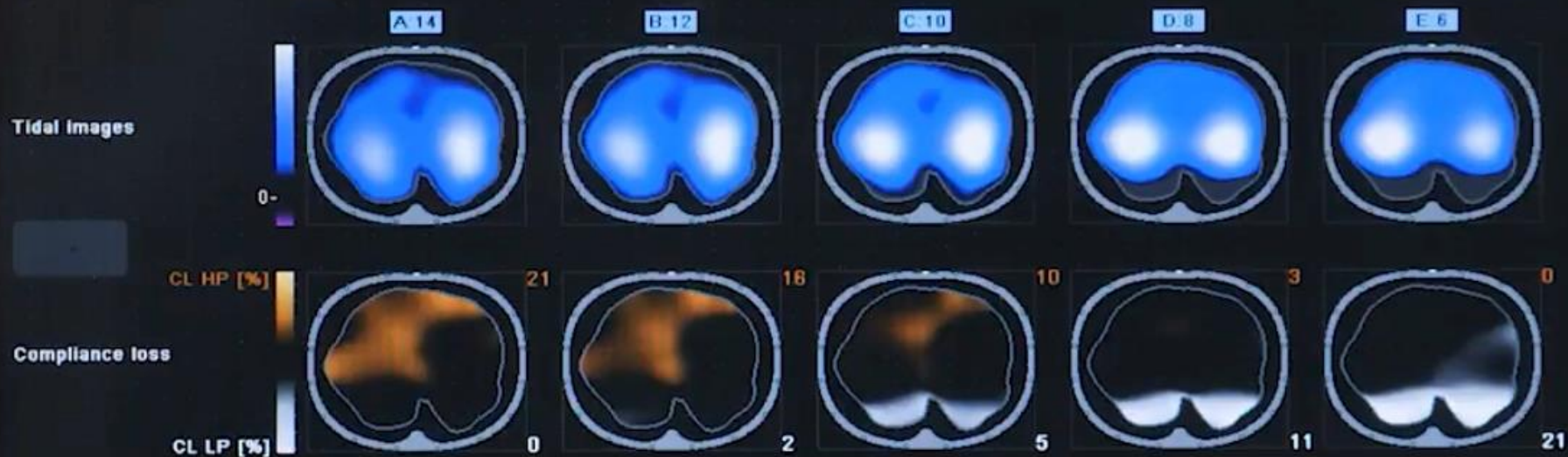
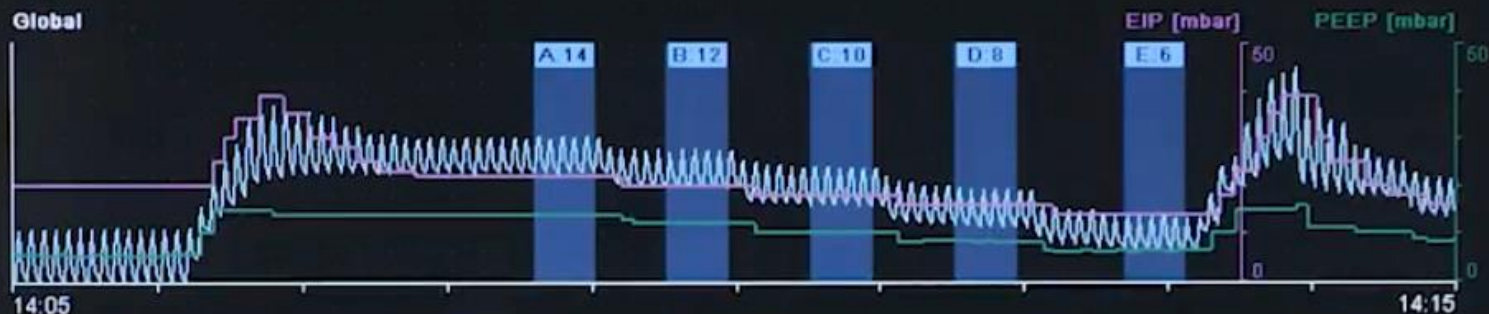


Recrutement alvéolaire



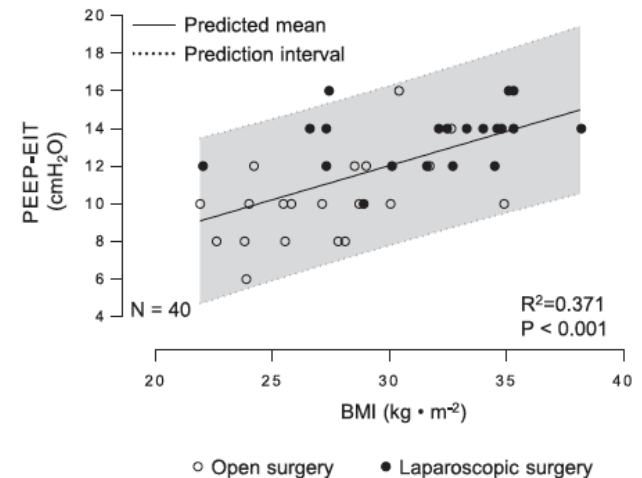
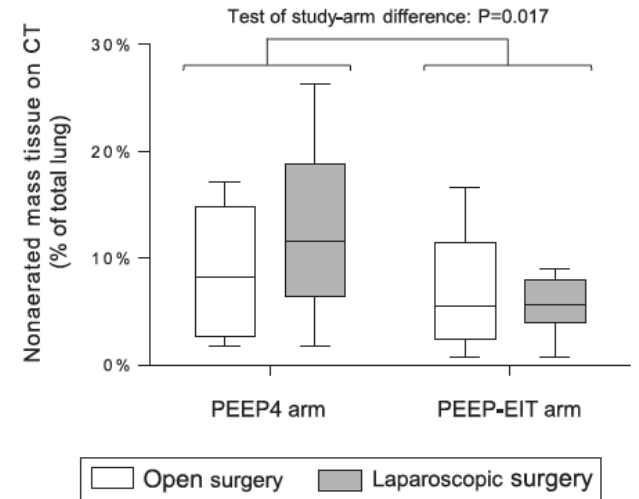
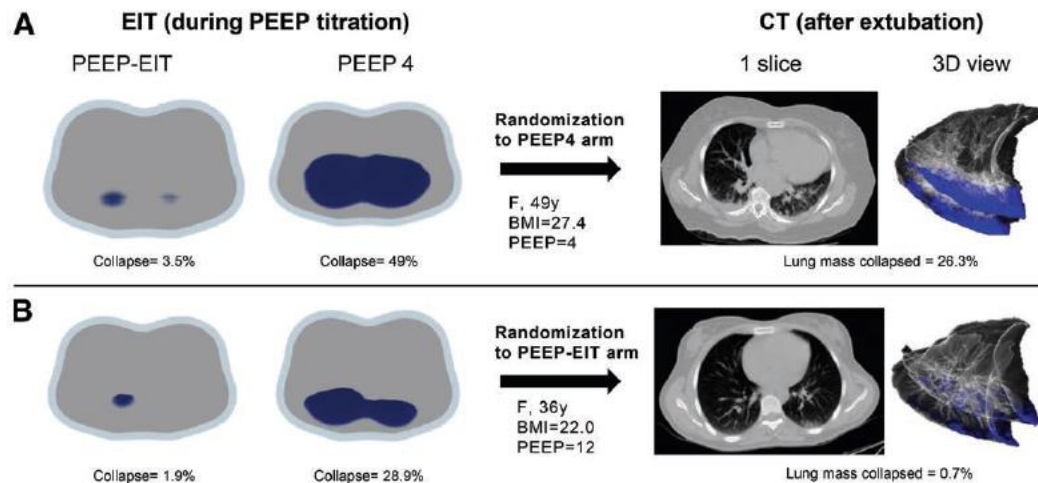
Tomographie par impédance électrique



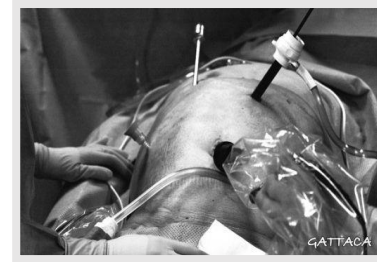


Individual Positive End-expiratory Pressure Settings Optimize Intraoperative Mechanical Ventilation and Reduce Postoperative Atelectasis

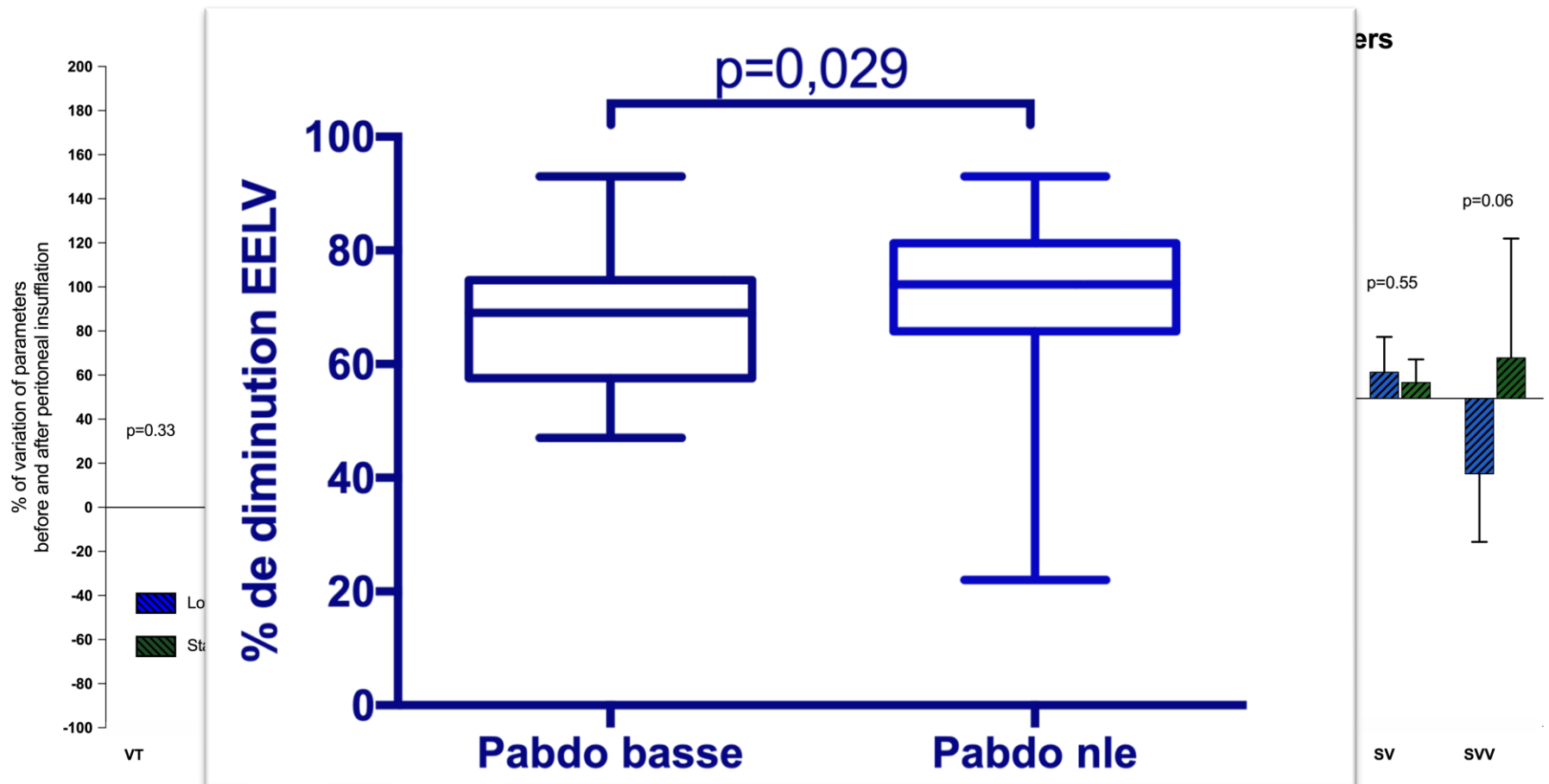
Sérgio M. Pereira, M.D., Mauro R. Tucci, M.D., Ph.D., Caio C. A. Morais, P.T., M.Sc., Claudia M. Simões, M.D., Ph.D., Bruno F. F. Tanelotto, M.D., Michel S. Pompeo, M.D., Fernando U. Kay, M.D., Ph.D., Paolo Pelosi, M.D., F.E.R.S., Joaquim E. Vieira, M.D., Ph.D., Marcelo B. P. Amato, M.D., Ph.D.



Etude PAROS



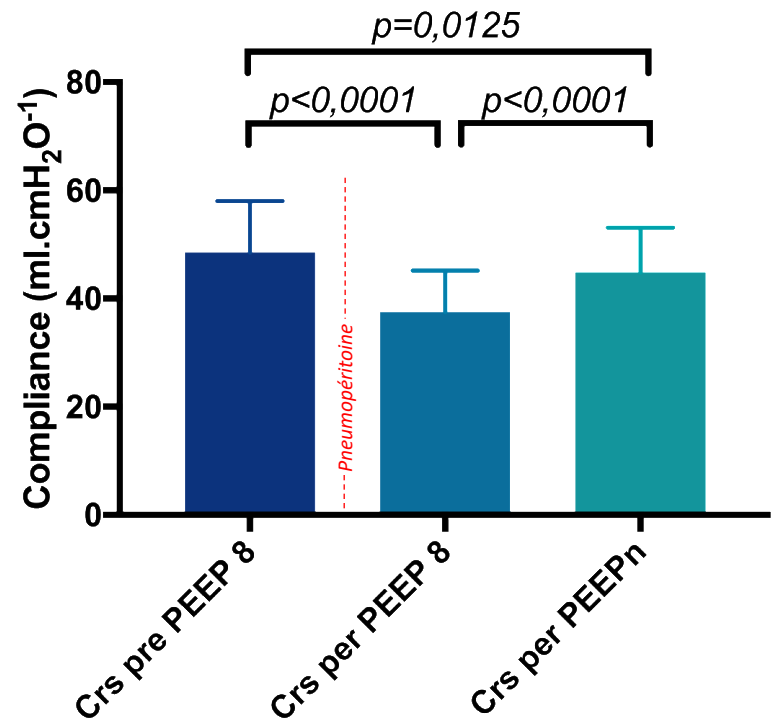
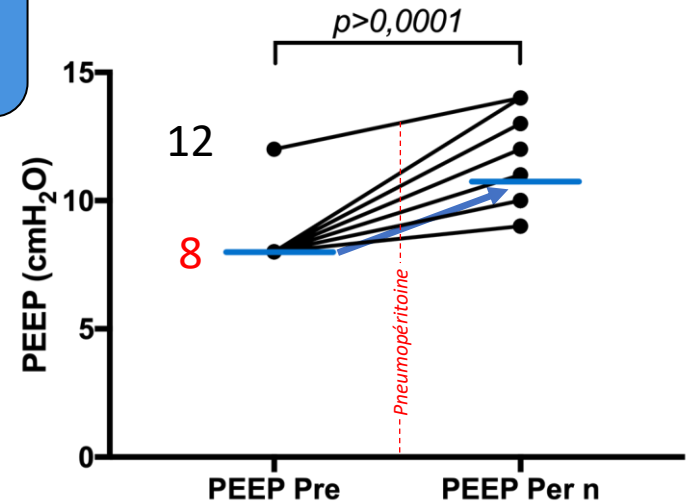
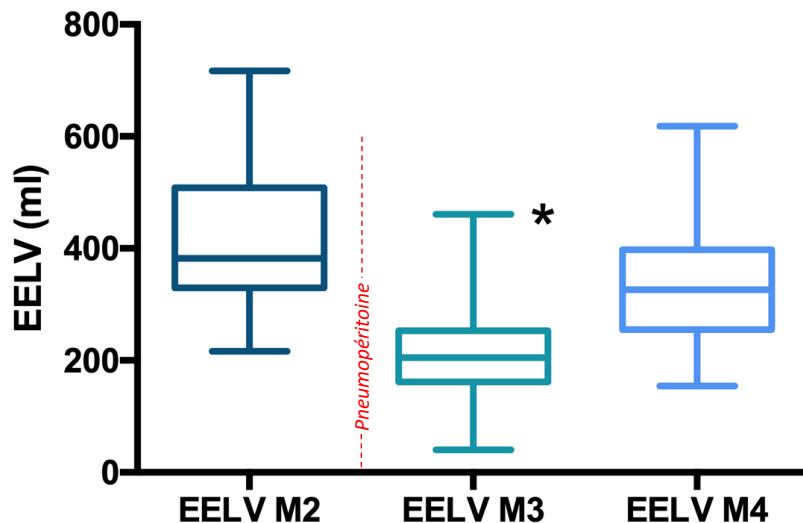
125 patients, étude RCT, chirurgie colorectale sous cœlioscopie + trend :
Pneumopéritoine 12-15 mmHg vs 5-7 mmHg, V_T 8 ml.kg⁻¹ et PEEP 8



Etude PEEP/Coelio

30 patients, chirurgie bariatrique sous
célioscopie:
Pneumopéritoine 12-15 mmHg
 V_T 8 ml.kg⁻¹ et **PEEP 8 cmH₂O** au départ

$$\Delta PEEP = \Delta P_{plat}$$



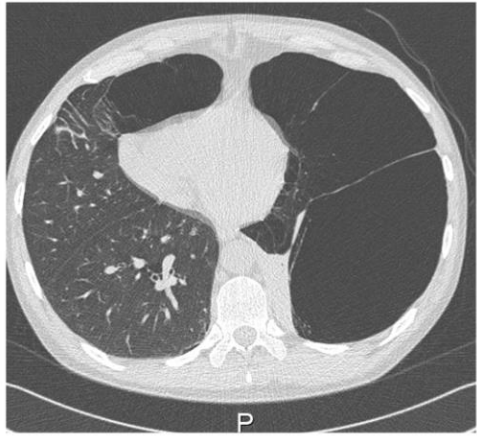
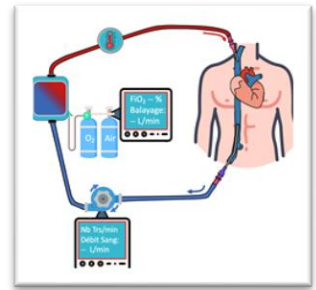
Cas clinique Mme G. BPCO / Vésicule



- BPCO stade 4 BODE à 8
- Test de Marche 6 min: 144 m
- VEMS à 400 ml (18% théorique) VR 268 % DLCO effondrée.
- 58 kgs IMC 21
- PaO₂ 70 mmHg avec 1 litre d'O₂ SaO₂ 95%
- PaCO₂ 41 mmHg pH 7,48 RA 30
- Scinti perfusion du poumon droit 57%
- Cholecystite aigue sur une vésicule biliaire scélo-atrophique très douloureuse +++
- Jamais décompensée avec besoin d'être hospitalisée



Assistance péri opératoire



Patient aigue : SDRA au bloc urgence

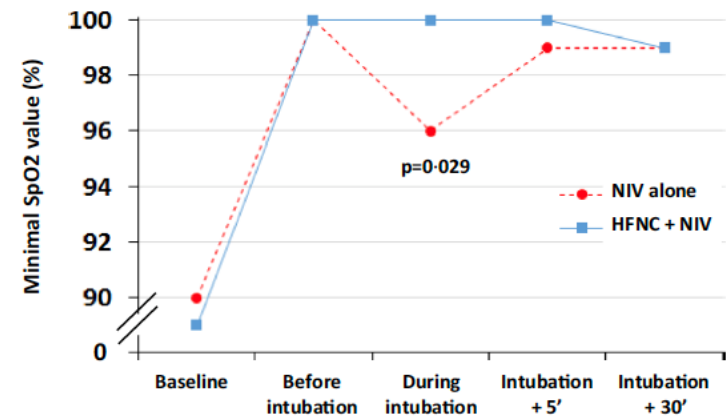
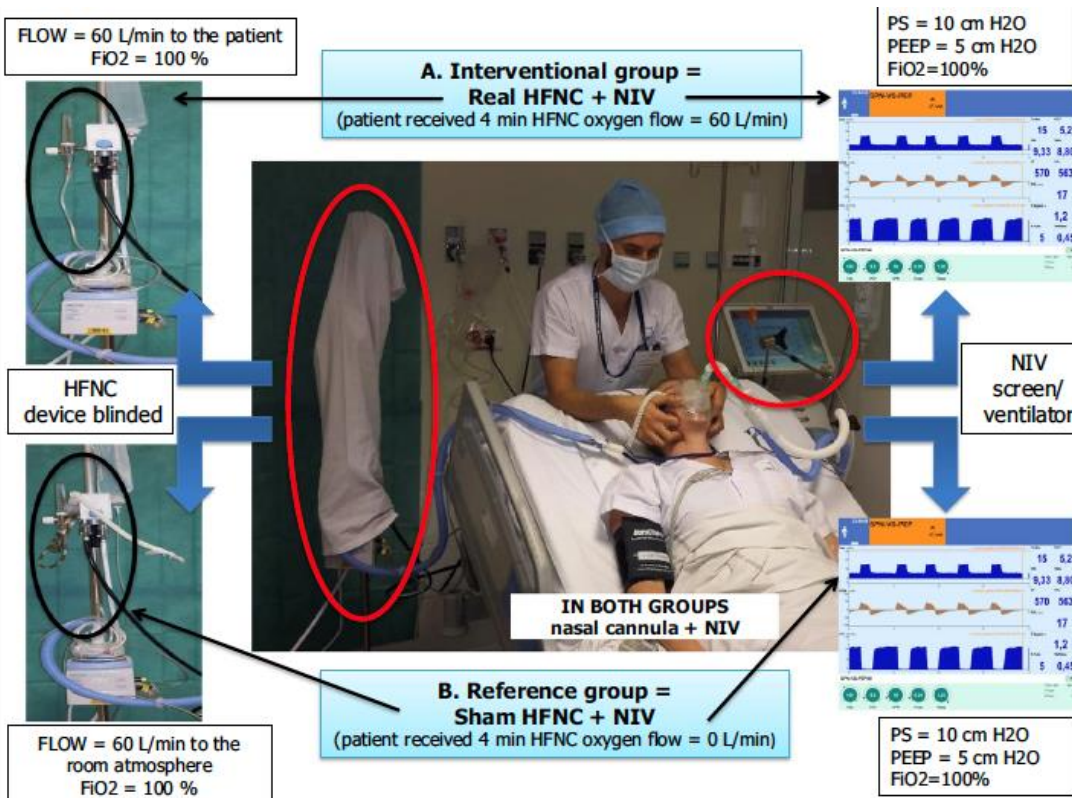


Apnoeic oxygenation via high-flow nasal cannula oxygen combined with non-invasive ventilation preoxygenation for intubation in hypoxaemic patients in the intensive care unit: the single-centre, blinded, randomised controlled OPTINIV trial

Samir Jaber^{1,2*}, Marion Monnin¹, Mehdi Girard¹, Matthieu Conseil¹, Moussa Cisse¹, Julie Carr¹, Martin Mahul¹, Jean Marc Delay¹, Fouad Belafia¹, Gérald Chanques^{1,2}, Nicolas Molinari³ and Audrey De Jong^{1,2}



Intubation



Patient aigue : SDRA au bloc

Ventilation du SDRA:

V_T : 6 ml.kg⁻¹ de PP

PEEP: pour Pplat à 28 cmH₂O max

FR: hypercapnie permissive, limitée par l'auto PEEP

Curares

VVC / artère radiale

NAD / Remplissage

Dysfonction droite échocardiographie?

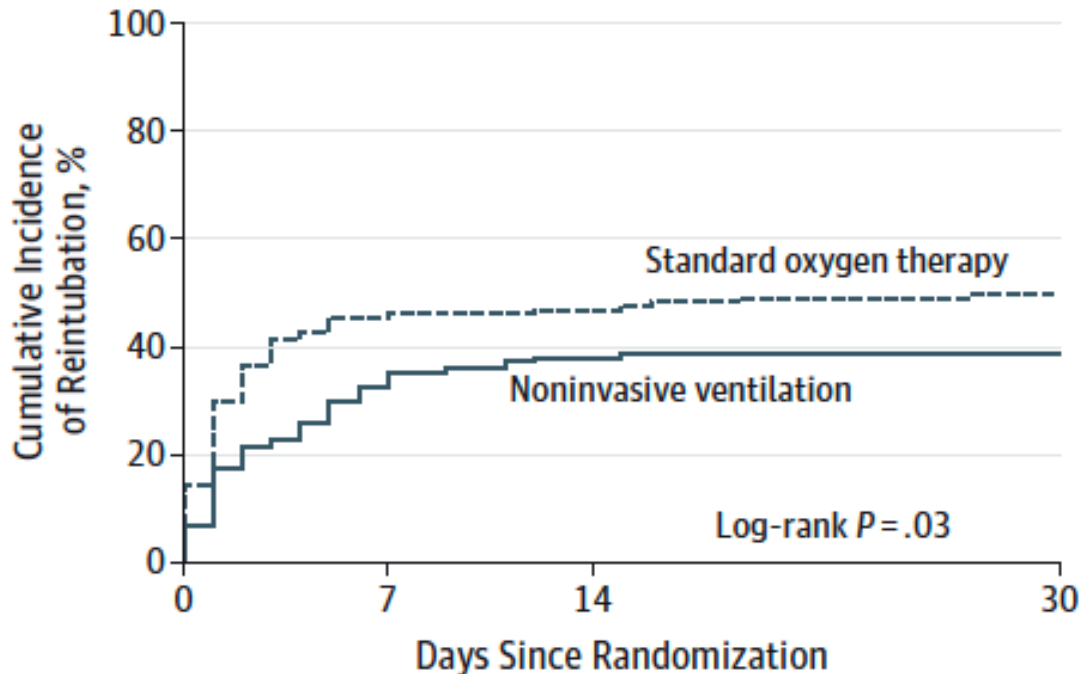
Effect of Noninvasive Ventilation on Tracheal Reintubation Among Patients With Hypoxemic Respiratory Failure Following Abdominal Surgery

A Randomized Clinical Trial

Chir dig

VNI post Op IRA

Samir Jaber, MD, PhD; Thomas Lescot, MD, PhD; Emmanuel Futier, MD, PhD; Catherine Paugam-Burtz, MD, PhD; Philippe Seguin, MD, PhD; Martine Ferrandiere, MD; Sigismond Lasocki, MD, PhD; Olivier Mimoz, MD, PhD; Baptiste Hengy, MD; Antoine Sannini, MD; Julien Pottecher, MD; Paër-Sélim Abback, MD; Beatrice Riu, MD; Fouad Belafia, MD; Jean-Michel Constantin, MD, PhD; Elodie Masseret, MD; Marc Beaussier, MD, PhD; Daniel Verzilli, MD; Audrey De Jong, MD; Gerald Chanques, MD, PhD; Laurent Brochard, MD, PhD; Nicolas Molinari, PhD; for the NIVAS Study Group



Noninvasive Ventilation Reduces Mortality in Acute Respiratory Failure following Lung Resection

IGOR AURIANT, ANNE JALLOT, PHILIPPE HERVÉ, JACQUES CERRINA, FRANCOIS LE ROY LADURIE, JEAN LAMET FOURNIER, BERNARD LESCOT, and FRANCOIS PARQUIN

Surgical Intensive Care Unit, Marie Lannelongue Surgical Center, Le Plessis Robinson, France

Chir tho

VNI post Op IRA

	No NPPV (n = 24) Mean ± SD	NPPV (n = 24) Mean ± SD	p Value*
Age, yr	63 ± 9	58.9 ± 10	0.09
SAPS II at ICU admission	16.8 ± 4.4	16.9 ± 5.4	0.74
Pulmonary function testing			
FVC, % pred	93.2 ± 17.8	101.5 ± 20.0	0.36
FEV ₁ , % pred	80 ± 19.7	78.5 ± 18.6	0.71
TLC, % pred	100.3 ± 18.1	97.7 ± 16.1	0.42
FRC, % pred	117.1 ± 33.5	113.1 ± 30.7	0.80
Predicted postoperative FEV ₁ (%)	61.6 ± 15.9	61.7 ± 13.5	0.90
Arterial blood gases	N = 19	N = 15	
pH	7.41 ± 0.03	7.42 ± 0.02	0.19
PaO ₂ , mmHg	78.7 ± 8.9	67.5 ± 26.8	0.19
Paco ₂ , mmHg	39.4 ± 4.6	34.2 ± 13.3	0.44
Type of ICU admission			
Emergency admission	7	8	0.54
Days in ICU before inclusion	1.7 ± 1.5	2.1 ± 1.9	0.57
Extent of resection			
Lobectomy	14	16	0.53
Bilobectomy	2	0	0.14
Pneumonectomy	7	7	

VNI diminue la mortalité



	No-NPPV (n = 24) Mean ± SD	NPPV (n = 24) Mean ± SD	p Value*
ETMV, n (%)	12 (50%)	5 (20.8%)	0.035
In-hospital deaths, n (%)	9 (37.5%)	3 (12.5%)	0.045
Length of ICU stay, d	14 ± 11.1	16.65 ± 23.6	0.52
Length of hospital stay, d	22.8 ± 10.7	27.1 ± 19.5	0.61
120 - d mortality, n (%)	9 (37.5%)	3 (12.5%)	0.045

Référentiels

