Anne FREYNET
MKDE
Réa Magellan

Spirométrie Incitative

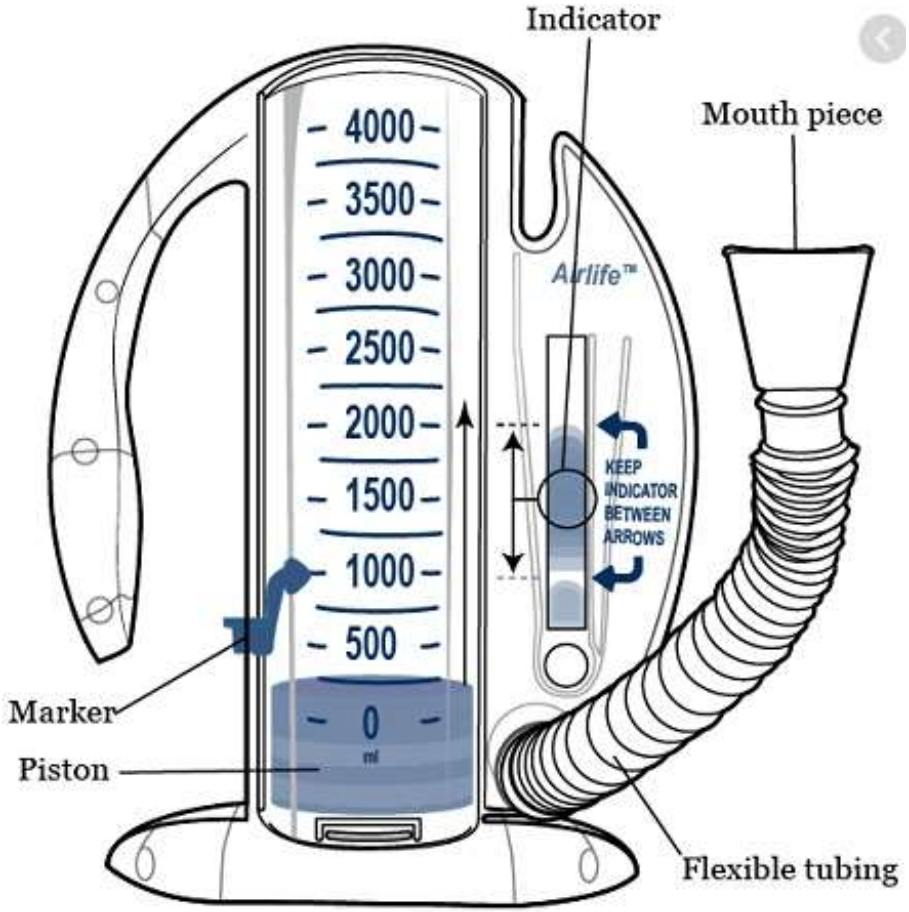
Le Pour

réanimation 2021
PARIS 9-11 JUIN
Paramédicaux
srlf

CHU BDX
CENTRE HOSPITALIER UNIVERSITAIRE BORDEAUX

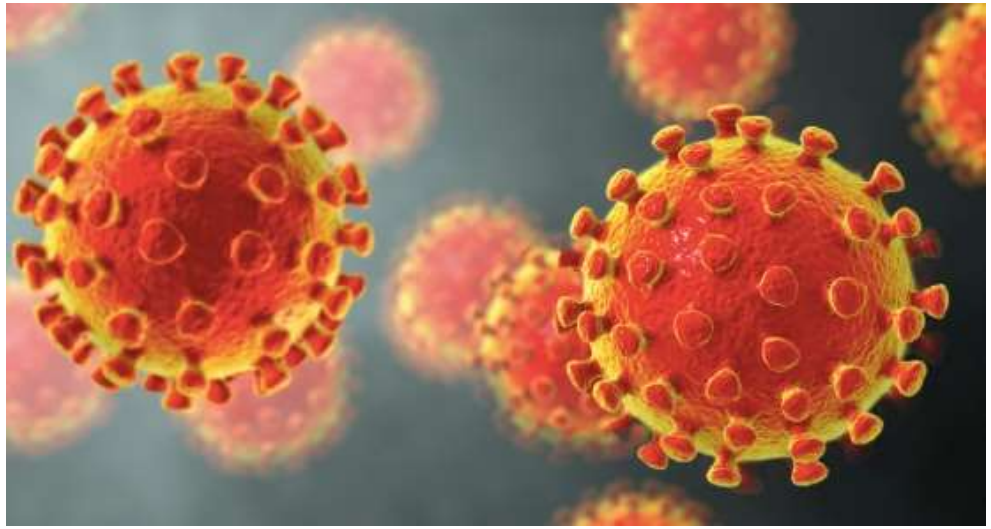
SKR
Société de Kinésithérapie de Réanimation

- Apparemment ne fait pas de mal
- Pas cher
- Facile à utiliser



Mais est ce que ça marche????

Peut-être pas plus que la chloroquine….



Déjà Guillaume Riffard n’a pas osé venir …

2 Cite Share

Clinical Effectiveness of **Incentive Spirometry** for the Prevention of Postoperative Pulmonary Complications.

Eltorai AEM, Szabo AL, Antoci V Jr, Ventetuolo CE, Elias JA, Daniels AH, Hess DR.

Respir Care. 2018 Mar;63(3):347-352. doi: 10.4187/respcare.05679. Epub 2017 Dec 26.

PMID: 29279365 **Free article.** Review.

Incentive spirometry (IS) is commonly prescribed to reduce pulmonary complications, despite limited evidence to support its benefits and a lack of consensus on optimal protocols for its use. ...

3 Cite Share

Incentive spirometry for prevention of postoperative pulmonary complications in upper abdominal surgery.

do Nascimento Junior P, Módolo NS, Andrade S, Guimarães MM, Braz LG, El Dib R.

Cochrane Database Syst Rev. 2014 Feb 8;2014(2):CD006058. doi: 10.1002/14651858.CD006058.pub3.

PMID: 24510642 **Free PMC article.** Review.

AUTHORS' CONCLUSIONS: There is low quality evidence regarding the lack of effectiveness of **incentive spirometry** for prevention of postoperative pulmonary complications in patients after upper abdominal surgery. ...There is a case for large RCTs with high methodologi ...

4 Cite Share

Incentive Spirometry for Prevention of Postoperative Pulmonary Complications After Thoracic Surgery.

Kotta PA, Ali JM.

Respir Care. 2021 Feb;66(2):327-333. doi: 10.4187/respcare.07972. Epub 2020 Aug 25.

PMID: 32843511 Review.

Incentive spirometry is frequently used after thoracic surgery as an adjunct to physiotherapy. ...The problem with studies published to date is that there are many limitations, not least of which is the challenge of achieving patient adherence with performing **inc** ...

PPC bon critère?????

Effectiveness of **Incentive Spirometry** on Inspiratory Muscle Strength After Coronary Artery Bypass Graft Surgery.

Manapunsopee S, Thanakiatpinyo T, Wongkornrat W, Chuaychoo B, Thirapatarapong W.

Heart Lung Circ. 2020 Aug;29(8):1180-1186. doi: 10.1016/j.hlc.2019.09.009. Epub 2019 Oct 24.

PMID: 31735684 Clinical Trial.

Conclusions: Patients in the study group had significantly better recovery of inspiratory muscle strength on day 4 post-CABG than patients in the control group. There was no significant difference between groups for either postoperative pulmonary complications or length of hospital stay.

Recommandations des Journées Internationales de Kinésithérapie Respiratoire Instrumentale (JIKRI)

Recommandations et méthode

Les appareils utilisés doivent être individualisés pour chaque patient afin de respecter les règles d'hygiène. Il est indispensable que chaque patient apprenne à utiliser l'appareil en présence du kinésithérapeute. Le kinésithérapeute contrôle et évalue les capacités de travail du patient, ainsi que sa progression en fonction des buts à atteindre. Les appareils doivent être utilisés uniquement selon les recommandations du constructeur, ce qui implique stricto sensu le respect du mode d'emploi de l'appareil.

En fonction des appareils, le jury préconise une utilisation en mode inspiratoire ou expiratoire :

- *spirométrie incitative inspiratoire :*
Son utilisation permet un travail en mode inspiratoire lent et profond au moins 30 min par jour et au moins 3 fois par semaine *(niveau III)*.
- *Spirométrie incitative expiratoire :*
L'utilisation de l'appareil impose un contrôle de la résistance expiratoire *(niveau III)*.

EBP …..

- Mais si on ne cherchait pas au bon endroit….

Breath-stacking and incentive spirometry in Parkinson's disease: Randomized crossover clinical trial

Rhayssa Ribeiro [a], Daniella Brandão [b], Jéssica Noronha [b], Cibelle Lima [a], Guilherme Fregonezi [a], Vanessa Resqueti [a], Arméle Dornelas de Andrade [b]

[a] Phisiotherapy Department, Universidade Federal do Rio Grande do Norte, Rio Grande do Norte, Brazil
[b] Phisiotherapy Department, Universidade Federal de Pernambuco, Pernambuco, Brazil

Received 3 October 2017, Revised 20 April 2018, Accepted 30 April 2018, Available online 1 May 2018.

moderate PD were included in this randomized cross-over study. Volume variations of the chest wall were assessed before, immediately after, then 15 and 30min after BS and IS performance by optoelectronic plethysmography. Tidal volume (VT) and minute ventilation (MV) significantly increased after BS and IS techniques ($p<0.05$). There was greater involvement of pulmonary and abdominal compartments after IS. The results suggest that these re-expansion techniques can be performed to immediately improve volume.

Comparison of Diaphragmatic Breathing Exercise, Volume and Flow **Incentive Spirometry**, on Diaphragm Excursion and Pulmonary Function in Patients Undergoing Laparoscopic Surgery: A Randomized Controlled Trial.

Alaparthi GK, Augustine AJ, Anand R, Mahale A.

Minim Invasive Surg. 2016;2016:1967532. doi: 10.1155/2016/1967532. Epub 2016 Jul 21.

PMID: 27525116 Free PMC article

Table 2: Comparison of Forced Vital Capacity (FVC) before and after the laparoscopic abdominal surgery in the intervention groups and control group.

Forced Vital Capacity (FVC) (liters (L))	Preoperative (mean ± SD)	Postoperative 1st day (mean ± SD)	Postoperative 2nd day (mean ± SD)	Preoperative versus postoperative 1st day (mean difference)	Postoperative 1st day versus postoperative 2nd day (mean difference)	Preoperative versus postoperative 2nd day (mean difference)
Diaphragmatic breathing exercise ($n = 65$)	2.83 ± .79	2.19 ± .84	2.55 ± .79	0.63 (22.4%) $p < 0.001^{**}$	−0.35 (−16.2%) $p < 0.001^{**}$	0.28 (9.8%) $p < 0.001^{**}$
Flow incentive spirometry ($n = 65$)	2.50 ± .76	1.72 ± .70	2.13 ± .71	0.77 (31.0%) $p < 0.001^{**}$	−0.40 (−23.6%) $p < 0.001^{**}$	0.37 (14.7%) $p < 0.001^{**}$
Volume incentive spirometry ($n = 65$)	2.50 ± .73	1.86 ± .64	2.22 ± .70	0.64 (25.6%) $p < 0.001^{**}$	−0.36 (−19.4%) $p < 0.001^{**}$	0.28 (11.1%) $p < 0.001^{**}$
Control group ($n = 65$)	2.51 ± .80	1.78 ± .65	2.02 ± .67	0.73 (29.2%) $p < 0.001^{**}$	−0.24 (−13.7%) $p < 0.001^{**}$	0.49 (19.5%) $p < 0.001^{**}$

% change. **Highly significant at $p < 0.001$ level.

(i) From our study we conclude that in laparoscopic abdominal surgery patients there is a significant decrease in pulmonary function (FVC, FEV_1, and PEFR) and diaphragm excursion in all four groups on the 1st postoperative day when compared with the preoperative day.

(ii) A greater improvement in pulmonary function and diaphragm excursion between the first and second postoperative day was seen in all experimental groups when compared to the control group.

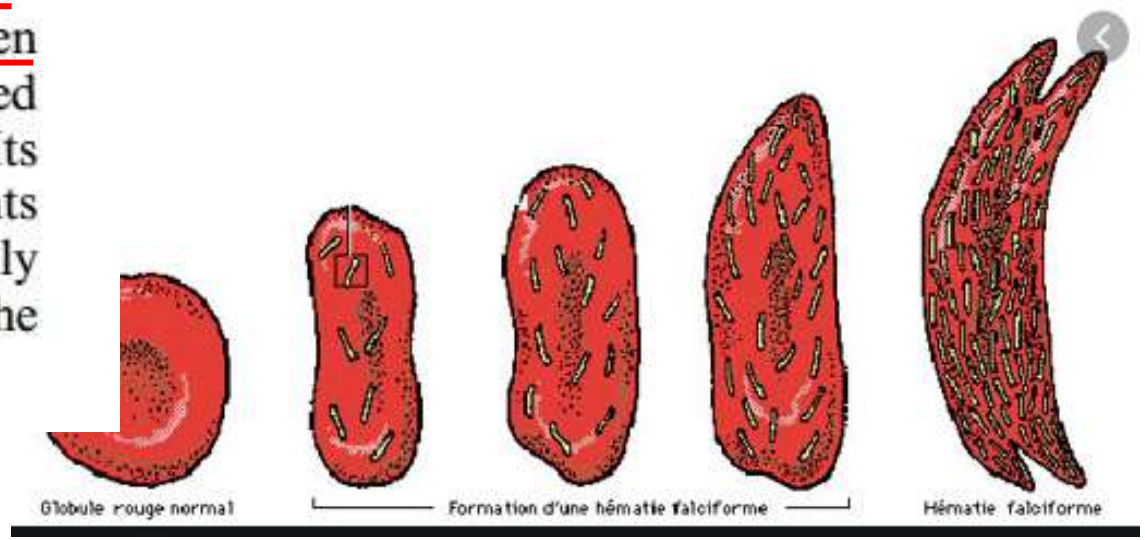
(iii) From our study we conclude that pulmonary function and diaphragm excursion was better preserved in the diaphragmatic breathing exercise group and volume incentive spirometry group when compared with the flow incentive spirometry group and the control group.

The Use of Incentive Spirometry in Pediatric Patients With Sickle Cell Disease to Reduce the Incidence of Acute Chest Syndrome

Fahd A. Ahmad, MD, Charles G. Macias, MD, MPH,†‡ and Joseph Y. Allen, MD†*

(*J Pediatr Hematol Oncol* 2011;33:415–420)

In conclusion, the use of IS among children admitted for SCD with nonpulmonary complaints reduces the risk of developing ACS and the associated need for oxygen therapy, antibiotics in all patients, and reduces the need for transfusions in patients presenting with back pain. Its use should be very strongly encouraged for those patients who are admitted with back pain as this cohort is not only at high risk for progression to ACS but seems to receive the greatest benefit from its mandatory utilization.



Mais finalement où est le vrai pb???

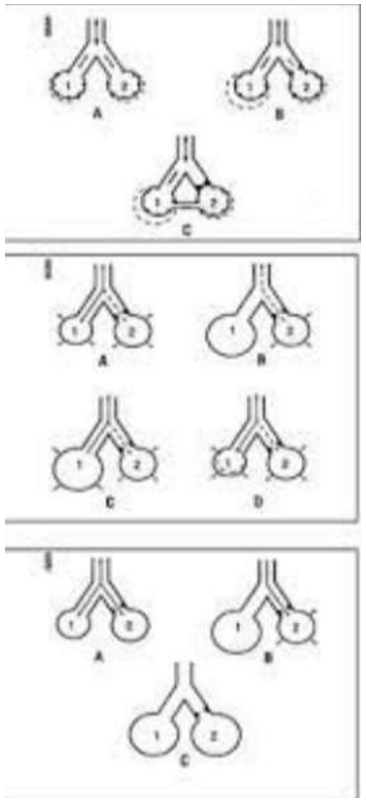
- PB de critère de jugement?
- PB de programme?
- PB de durée d'efficacité ?
- PB de type d'appareil?

Exercices à Débit Inspiratoires Contrôlés (EDIC)

La kinésithérapie respiratoire du poumon profond. Bases mécaniques d'un nouveau paradigme☆

Chest physical therapy of the distal lung. Mechanical basis of a new paradigm

G. Postiaux[1,*]



- Apnée télé-inspiratoire
- Homogénéisation de la répartition Ventilation
- Désencombrement du poumon profond
- Feed-back
- Débit inspiratoire continu : SI top

Research Report

Incentive spirometry and positive expiratory pressure improve ventilation and recruitment in postoperative recovery: A randomized crossover study

Gregory Reychler , PT, PhD, Valeska Uribe Rodriguez , PT, Cheryl Elizabeth Hickmann , PT, Bertrand Tombal , MD, PhD, Pierre-François Laterre , MD, PhD, Axel Feyaerts , MD & ...show all

Pages 199-205 | Received 24 Jan 2017, Accepted 12 Aug 2017, Published online: 27 Feb 2018

- 10 patients chirurgicaux
- SI + PepMask ou PepMask +SI (étude en cross-over)
- EIT
- Effets significatifs sur recrutement et sur ventilation pulmonaire
- Pas de différence entre les de techniques

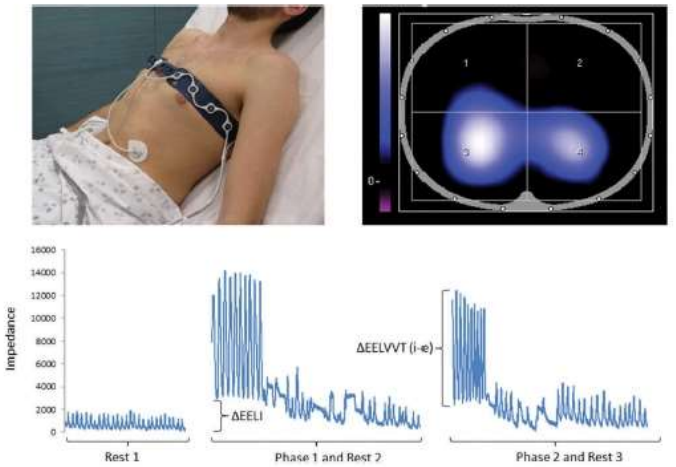


Figure 2. Illustration of EIT: the belt (upper left panel) and a sample of a scan (upper right panel) and a waveform during impedance recording (impedance values are expressed as arbitrary units) (lower panel).

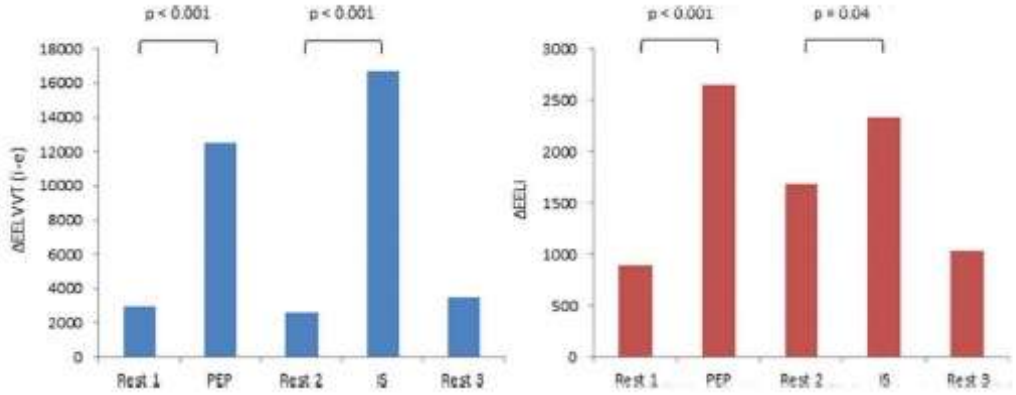


Figure 4. Results of ventilation (ΔEELVVT (*i* – *e*)) (left panel) and recruitment (ΔEELI) (right panel) expressed by mean impedance for each phases (impedance values are expressed as arbitrary units). IS: Incentive spirometry; PEP: positive expiratory pressure.

Review > Respir Care. 2021 Feb;66(2):327-333. doi: 10.4187/respcare.07972.
Epub 2020 Aug 25.

Incentive Spirometry for Prevention of Postoperative Pulmonary Complications After Thoracic Surgery

Prasanti A Kotta [1], Jason M Ali [2]

Despite the lack of evidence, there remains an appetite for persevering with incentive spirometry in the postoperative thoracic surgical patient because it is a relatively inexpensive intervention that motivates many patients to perform regular breathing exercises long after the therapist has moved on to the next patient.

C’est quand même bien pratique…

- Quand le patient ne comprend pas le volume inspiratoire…
- Quand le kiné est débordé…
- Quand le patient marche bien au feed-back…
- Quand on veut une légère résistance inspiratoire…
- Quand on veut une valeur de la CV, l’air de rien…
- En pédiatrie …

CONTROVERSE

Ce qui est sûr…