Spirométrie incitative

Controverse

Kinésithérapeute

CONTRE

réanimation 2021
PARIS 9-11 JUIN

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Les données de la littérature :

- Spirométrie incitative et chirurgie cardiaque
- Spirométrie incitative et chirurgie thoracique
- Spirométrie incitative et chirurgie abdominale
- Spirométrie incitative et traumatisme thoracique
- Spirométrie incitative et chirurgie bariatrique

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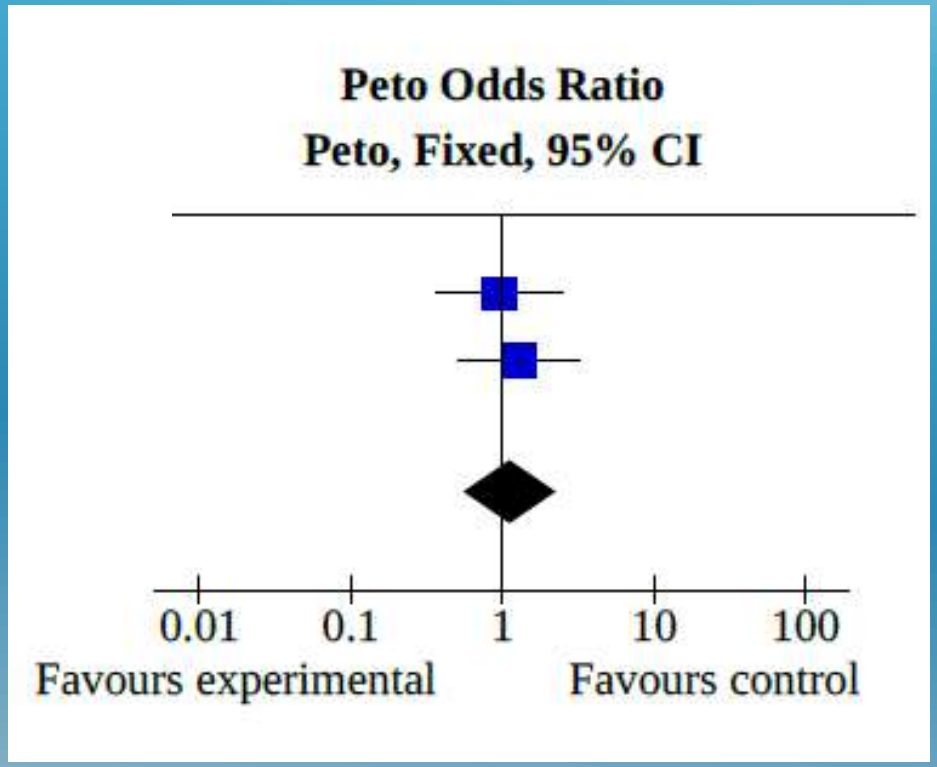
Incentive spirometry for preventing pulmonary complications after coronary artery bypass graft (Review)

Freitas ERFS, Soares BGO, Cardoso JR, Atallah ÁN

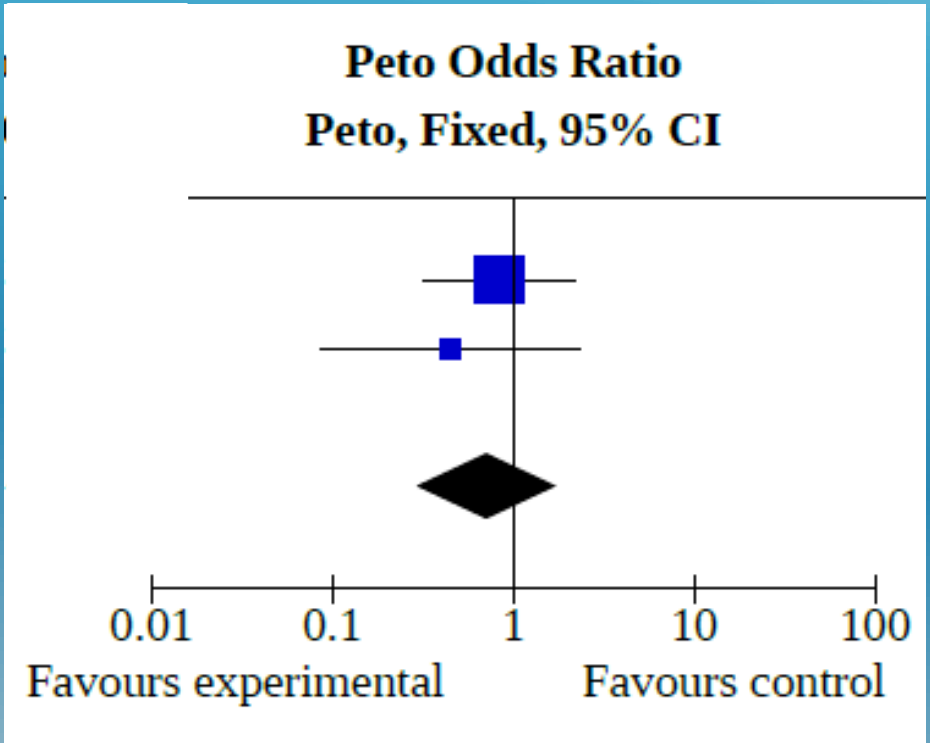


Pas de différence entre spirométrie incitative et kinésithérapie respiratoire conventionnelle pour la prise en charge des atélectasies en post-opératoire de chirurgie cardiaque

Cochrane Database of Systematic Reviews 2012, Issue 9.

Incentive spirometry for preventing pulmonary complications after coronary artery bypass graft (Review)

Freitas ERFS, Soares BGO, Cardoso JR, Atallah ÁN



L'utilisation de la spirométrie incitative après chirurgie cardiaque ne diminue pas le nombre de pneumopathies post-opératoires

Cochrane Database of Systematic Reviews 2012, Issue 9.

Les données de la littérature :

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Incentive Spirometry After Lung Resection: A Randomized Controlled Trial

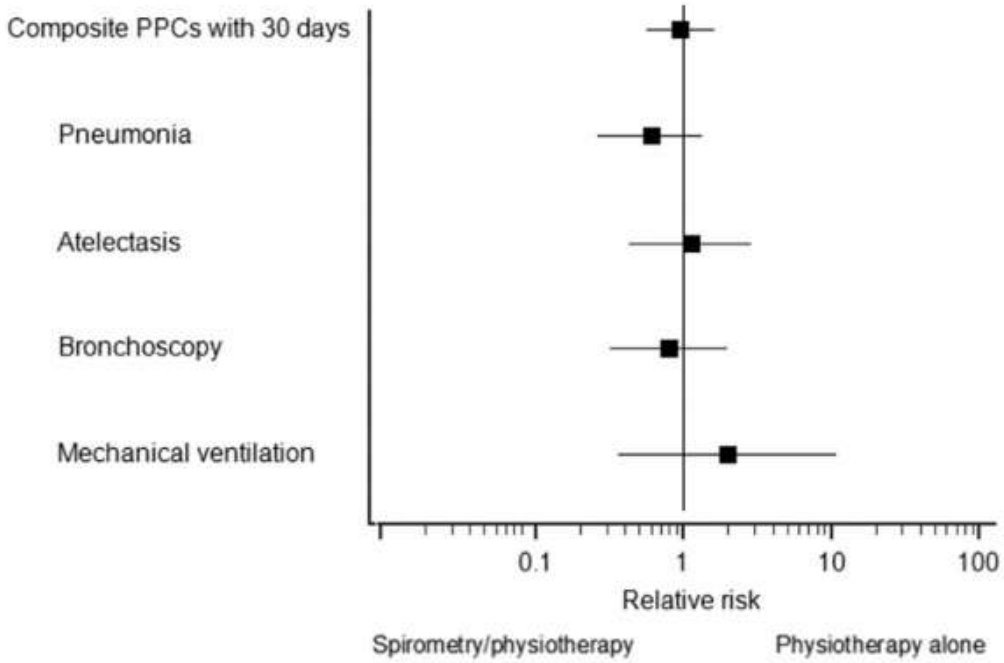
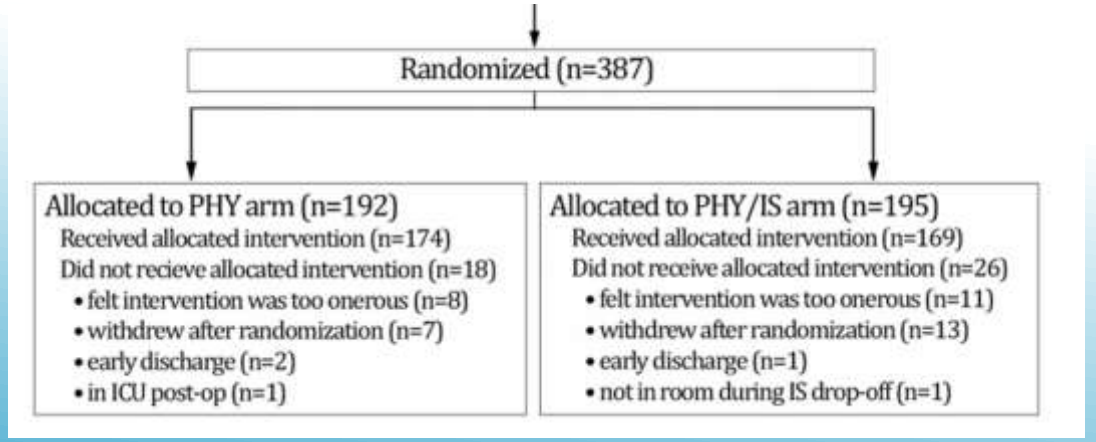


Fig 2. Risk ratios for composite postoperative pulmonary complications (PPC) and individual outcomes. The boxes represent risk ratios, and the lines represent 95% confidence intervals. The vertical line presents the null hypothesis of no difference in PPC rate between the intervention and control arms.



Pas de différence significative entre physiothérapie standard versus physiothérapie standard + spirométrie incitative sur les complications pulmonaires post-opératoire de chirurgie thoracique

Ann Thorac Surg 2018;106:340–5

Les données de la littérature :

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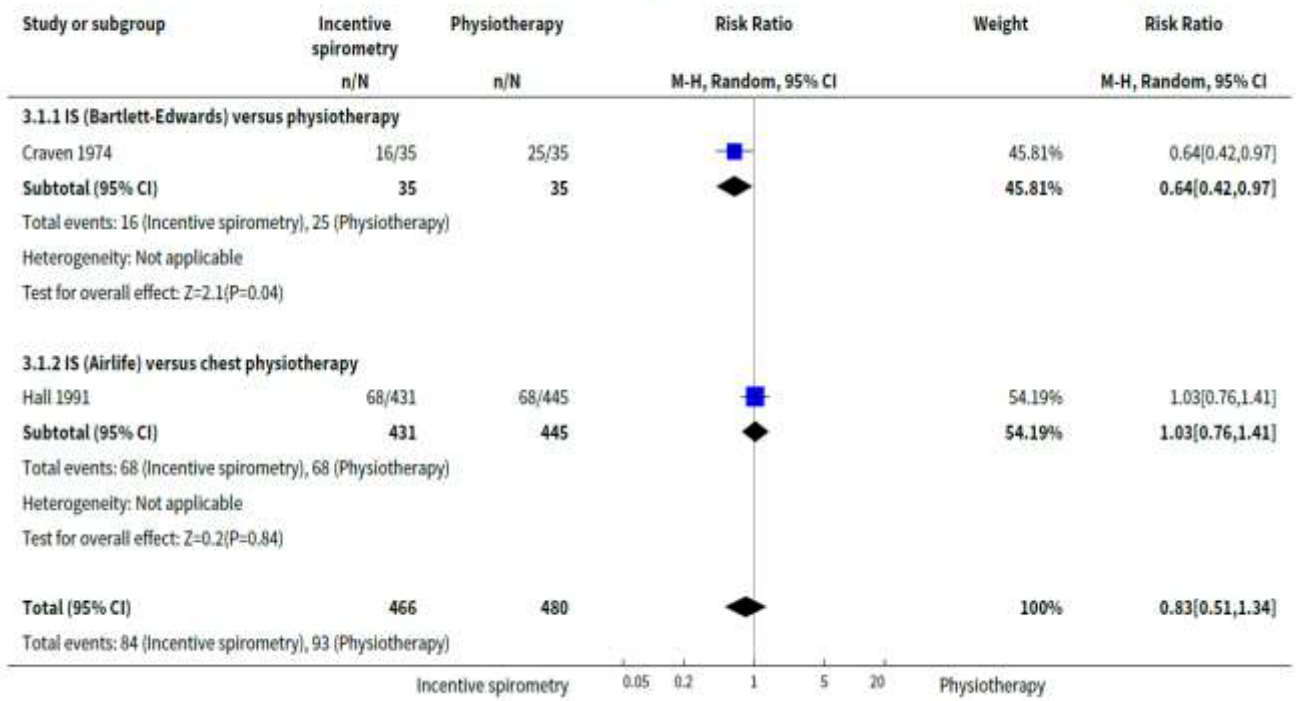
- Spirométrie incitative et traumatisme thoracique
- Spirométrie incitative et chirurgie bariatrique

Incentive spirometry for prevention of postoperative pulmonary complications in upper abdominal surgery (Review)

do Nascimento Junior P, Módolo NSP, Andrade S, Guimarães MMF, Braz LG, El Dib R

Analysis 3.1. Comparison 3 Incentive spirometry versus physiotherapy, Outcome 1 Pulmonary complications.



Study or subgroup	Incentive spirometry n/N	Physiotherapy n/N	Risk Ratio M-H, Random, 95% CI	Weight	Risk Ratio M-H, Random, 95% CI
3.1.1 IS (Bartlett-Edwards) versus physiotherapy					
Craven 1974	16/35	25/35		45.81%	0.64[0.42,0.97]
Subtotal (95% CI)	**35**	**35**		**45.81%**	**0.64[0.42,0.97]**
Total events: 16 (Incentive spirometry), 25 (Physiotherapy)					
Heterogeneity: Not applicable					
Test for overall effect: Z=2.1(P=0.04)					
3.1.2 IS (Airlife) versus chest physiotherapy					
Hall 1991	68/431	68/445		54.19%	1.03[0.76,1.41]
Subtotal (95% CI)	**431**	**445**		**54.19%**	**1.03[0.76,1.41]**
Total events: 68 (Incentive spirometry), 68 (Physiotherapy)					
Heterogeneity: Not applicable					
Test for overall effect: Z=0.2(P=0.84)					
Total (95% CI)	**466**	**480**		**100%**	**0.83[0.51,1.34]**
Total events: 84 (Incentive spirometry), 93 (Physiotherapy)					

Pas de différence significative sur les complications pulmonaires entre spirométrie incitative et physiothérapie standard en post-opératoire de chirurgie abdominale

Cochrane Database of Systematic Reviews 2014, Issue 2.

Les données de la littérature :

- Spirométrie incitative et chirurgie cardiaque
- Spirométrie incitative et chirurgie thoracique
- Spirométrie incitative et chirurgie abdominale
- **Spirométrie incitative et traumatisme thoracique**
- Spirométrie incitative et chirurgie bariatrique

Incentive spirometry to prevent pulmonary complications after chest trauma: a retrospective observational study

Hisashi Dote,[1] Yohichiro Homma,[2] Masaaki Sakuraya,[3] Hiraku Funakoshi,[4] Shigeru Tanaka,[1] and Takahiro Atsumi[1]

Table 1. Comparison of clinical characteristics and outcomes in patients with chest trauma who received early incentive spirometry (IS) and those who did not receive early IS

Characteristic	Early IS group $n = 76$	Non-early IS group $n = 223$	*P*-value
Age, years	66.0 (55.5, 78.3)	67.0 (52.5, 78.0)	0.7
Male gender	52 (68.4)	155 (69.5)	0.9
BMI, kg/m^2	22.2 (19.7, 24.9)	21.8 (19.5, 23.3)	0.07
AIS (chest)	3.0 (3.0, 4.0)	3.0 (3.0, 3.0)	0.004
ISS	19.0 (11.8, 27.5)	13.0 (9.0, 18.0)	<0.001
Hypoxemia at admission	63 (82.9)	107 (48.0)	<0.001
Number of rib fractures	5.0 (3.0, 6.0)	4.0 (2.0, 6.0)	0.06
History of chronic respiratory disease	8 (10.5)	19 (8.5)	0.7
History of chronic cardiac disease	11 (14.5)	23 (10.3)	0.4
Smoking history	23 (30.3)	79 (35.4)	0.5
Anticoagulation therapy before admission	13 (17.1)	37 (16.7)	1
IPPV	17 (22.4)	15 (6.7)	<0.001
NPPV	5 (6.6)	7 (3.1)	0.2
Opioids used for analgesia	22 (28.9)	22 (9.9)	<0.001
Received IS during admission	76 (100.0)	14 (6.3)	<0.001
Surgical fixation of fractured ribs	0 (0.0)	0 (0.0)	1
Flail chest	0 (0.0)	2 (0.9)	1
Pneumothorax	25 (32.9)	87 (39.2)	0.3
Tube thoracostomy or thoracentesis	25 (32.9)	70 (31.4)	0.9
Respiratory physiotherapy	28 (36.8)	26 (11.7)	<0.001
Pulmonary complications	7 (9.2)	15 (6.7)	0.5
Pulmonary infection	6 (7.9)	13 (5.8)	0.6
Adverse events of IS	0 (0.0)	0 (0.0)	1

Data are shown as *n* (%) or median (interquartile range).
AIS, Abbreviated Injury Scale; BMI, body mass index; IPPV, invasive positive pressure ventilation; ISS, injury severity score; NPPV, non-invasive positive pressure ventilation.

Table 2. Multivariate regression analyses for primary outcome among patients with chest trauma who received incentive spirometry

	Adjusted odds ratio (95% confidence interval)	*P*-value
Pulmonary complications	0.71 (0.24–2.16)	0.6
Pulmonary infection	0.76 (0.23–2.47)	0.6
Escalation of oxygen therapy	0.33 (0.03–3.53)	0.4

Pas de différence significative sur les complications pulmonaires entre spirométrie incitative et physiothérapie standard après traumatisme thoracique avec fractures de côtes

Acute Medicine & Surgery 2020;7:e619

Les données de la littérature :

- Spirométrie incitative et chirurgie cardiaque
- Spirométrie incitative et chirurgie thoracique
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- Spirométrie incitative et traumatisme thoracique
- Spirométrie incitative et chirurgie bariatrique

Effect of Incentive Spirometry on Postoperative Hypoxemia and Pulmonary Complications After Bariatric Surgery

A Randomized Clinical Trial

Table 3.

30-Day Postoperative Pulmonary Complications

Postoperative Pulmonary Complication	No. (%) of Patients			*P* Value[a]
	Full Cohort (N = 224)	Incentive Spirometer Group		
		Control (n = 112)	Test (n = 112)	
Any	12 (5.4)	8 (7.1)	4 (3.6)	.24
Type				
None	212 (94.6)	104 (92.9)	108 (96.4)	
Atelectasis	11 (4.9)	7 (6.2)	4 (3.6)	NA
Pneumonia	1 (0.4)	1 (0.9)	0	

L'utilisation de la spirométrie incitative après chirurgie bariatrique ne diminue pas l'hypoxémie ou les complications pulmonaires post-opératoires

JAMA Surg. 2017 May; 152(5): 422–428.

Les données de la littérature :

- Spirométrie incitative et chiru
- Spirométrie incitati
- Spiromét abdominale

traumatisme thoracique

citative et chirurgie bariatrique

Pas de support scientifique à l'utilisation de la spirométrie incitative

Et en plus, un coût non négligeable…:

Financial Impact of Incentive Spirometry

Adam E. M. Eltorai, PhD[1], Grayson L. Baird, PhD[1]

Table 4. Simplified Cost Estimating Equation of Per Patient.

$$IS + (\$_{RT} \times t_{RT}) + (\$_{RN} \times t_{RN} \times 16 \text{ hours}^a/\text{day} \times LOS) = \$12.92 + (\$0.49/\text{minute} \times t_{RT}) + (\$0.60/\text{minute} \times t_{RN} \times 16 \text{ hours}^a/\text{day} \times LOS)$$

IS = Mean IS unit cost ($)
$\$_{RT}$ = RTs' mean per-minute wage ($)
t_{RT} = RTs' spent initially educating a patient to use their IS
$\$_{RN}$ = Nurses' mean per-minute wage ($)
t_{RN} = Minutes per hour nurses spend doing IS-related activities per patient
LOS = Mean hospital length of stay (days)
[a]Number of hours per day patients are not asleep to perform IS: 24 hours-8 hours (recommended number of hours of sleep per night for adults)

Note. IS = incentive spirometry; RTs = respiratory therapists.

Inquiry. Jan-Dec 2018

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- Coût du spiromètre

Inquiry. Jan-Dec 2018

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- Coût du spiromètre

- Coût du temps passé pour l'éducation à l'utilisation de la spirométrie incitative par les physiothérapeutes

Inquiry. Jan-Dec 2018

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- Coût du spiromètre

- Coût du temps passé pour l'éducation à l'utilisation de la spirométrie incitative par les physiothérapeutes

- Coût du temps passé en lien avec la spirométrie incitative par les infirmiers

Inquiry. Jan-Dec 2018

Financial Impact of Incentive Spirometry

Adam E. M. Eltorai, PhD[1], Grayson L. Baird, PhD[1]

Table 5. Per-Patient IS Implementation Cost Estimates Using AMC Data.

IS ($)	+	$\$_{RT}$ ($/min)	×	t_{RT} (min) (95% CI)	+	$\$_{RN}$ ($/min)	×	t_{RN} (min/h) (95% CI)	×	16 h/d	×	LOS (days)	Cost ($) (95% CI)
12.92		0.49		21.6 (1.1-42.2)		0.60		0.7 (0.6-0.8)[a] 1.9 (1.4-2.4)[b]				9	83.98 (65.30-102.72) 187.66 (134.42-240.96)

Coût par patient : 187,66$

Environ 154 euros !

Inquiry. Jan-Dec 2018

Financial Impact of Incentive Spirometry

Adam E. M. Eltorai, PhD[1], Grayson L. Baird, PhD[1]

Using AMC mean data, per-patient cost of IS implementation ranged from $65.30 to $240.96 (Table 5). For the 566 patients who stayed in the AMC's 10-bed cardiothoracic step-down unit in 2016, total annual costs of implementing IS ranged from $36 959.80 to $136 383.36.

Coût par an pour une unité de 10 lits cardiothoraciques : 136 383 $

Environ 111 857 euros !

Inquiry. Jan-Dec 2018

Les données de la littérature :

- Spirométrie incita
- [illegible]
- [illegible] thoracique
- [illegible]ve et chirurgie bariatrique

Pas de support scientifique à l'utilisation de la spirométrie incitative

Un coût non négligeable

Et une thérapeutique qui risque de ne pas être utilisé par les patients !

Evidence regarding patient compliance with incentive spirometry interventions after cardiac, thoracic and abdominal surgeries: A systematic literature review

Aqilah Leela T Narayanan MSc PT[1], Syed Rasul G Syed Hamid FRCS MD[2], Eko Supriyanto PhD[1]

Compliance involves human behaviour and can be rather unpredictable, with marked intra- and intersubject variability (20). Furthermore, it is not a dichotomous entity because it can fluctuate and change (70). Complications, such as pain (71) and cognitive dysfunction (72), are common after major surgeries. These experiences are unique to individual patients (71,72) and may affect activities, such as ISy performance, to varying degrees in the postoperative period. Personal beliefs and perceptions also appear to have some effect on patients' resolute to adhere to ISy prescriptions (73).

- Compliance au traitement imprévisible
- Variabilité intra et inter sujet marquée
- La douleur et la dysfonction cognitive fréquentes après de lourdes chirurgies peuvent affecter la résolutions des patients à respecter les prescriptions de spirométrie incitative

Can J Respir Ther Vol 52 No 1 Winter 2016

Le poids des croyances…

Discordance entre le manque de données scientifiques sur l'intérêt de la spirométrie incitative et les convictions des physiothérapeutes !

Perspectives on Incentive Spirometry Utility and Patient Protocols

American Association for Respiratory Care (AARC) and the nursing societies. RESULTS: A total of 1,681 responses (83.8% completion rate) were received. The clear majority of these respondents agreed that IS is essential to patient care (92.7%), improves pulmonary function (92.0%), improves inspiratory capacity (93.0%), helps to prevent (96.6%) and to reverse (90.0%) atelectasis, helps to prevent (92.5%) and to reverse (68.4%) pneumonia, and is as effective as early ambulation (74.0%), deep-breathing exercises (88.2%), and directed coughing (79.8%). Furthermore, most health care

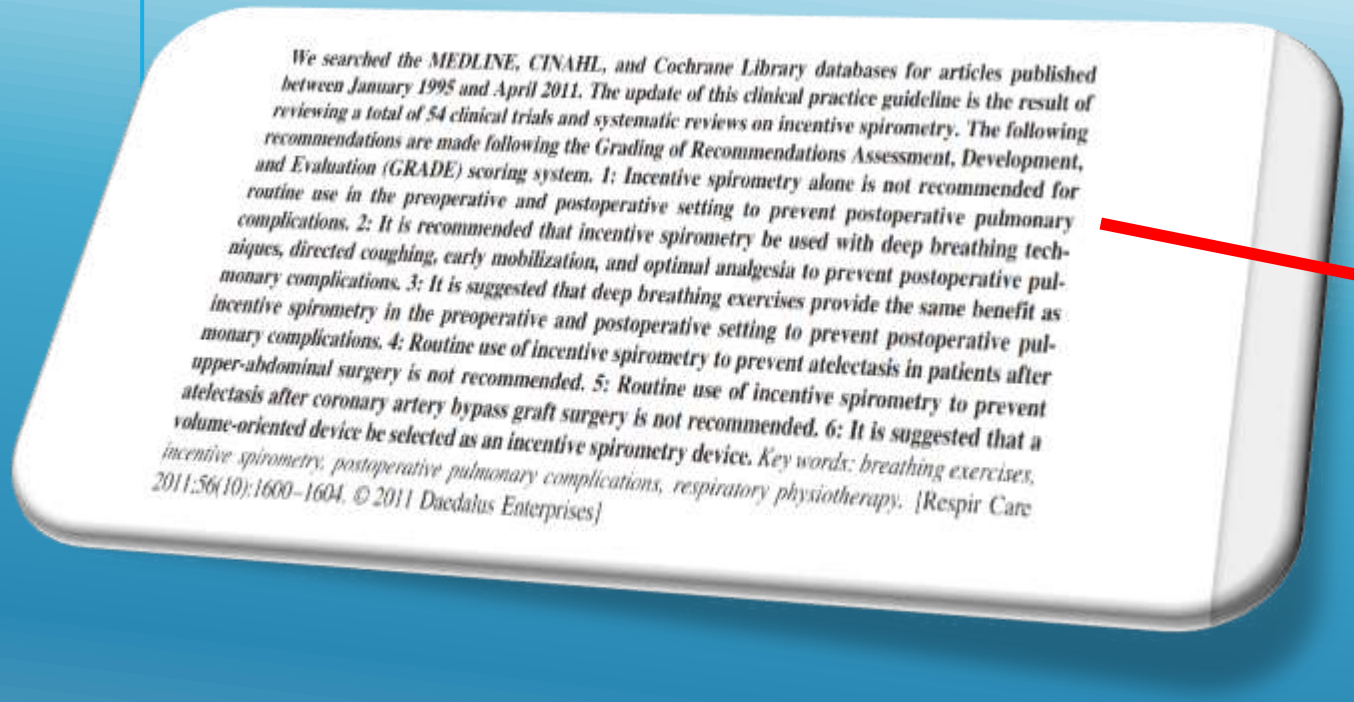
- 92% convaincus que SI améliore la fonction pulmonaire
- 96% convaincus que SI prévient les atélectasies
- 92,5% convaincus que SI prévient les pneumopathies

RESPIRATORY CARE • MAY 2018 VOL 63 NO 5

En résumé

AARC Clinical Practice Guideline

Incentive Spirometry: 2011



We searched the MEDLINE, CINAHL, and Cochrane Library databases for articles published between January 1995 and April 2011. The update of this clinical practice guideline is the result of reviewing a total of 54 clinical trials and systematic reviews on incentive spirometry. The following recommendations are made following the Grading of Recommendations Assessment, Development, and Evaluation (GRADE) scoring system. 1: Incentive spirometry alone is not recommended for routine use in the preoperative and postoperative setting to prevent postoperative pulmonary complications. 2: It is recommended that incentive spirometry be used with deep breathing techniques, directed coughing, early mobilization, and optimal analgesia to prevent postoperative pulmonary complications. 3: It is suggested that deep breathing exercises provide the same benefit as incentive spirometry in the preoperative and postoperative setting to prevent postoperative pulmonary complications. 4: Routine use of incentive spirometry to prevent atelectasis in patients after upper-abdominal surgery is not recommended. 5: Routine use of incentive spirometry to prevent atelectasis after coronary artery bypass graft surgery is not recommended. 6: It is suggested that a volume-oriented device be selected as an incentive spirometry device. Key words: breathing exercises, incentive spirometry, postoperative pulmonary complications, respiratory physiotherapy. [Respir Care 2011;56(10):1600–1604. © 2011 Daedalus Enterprises]

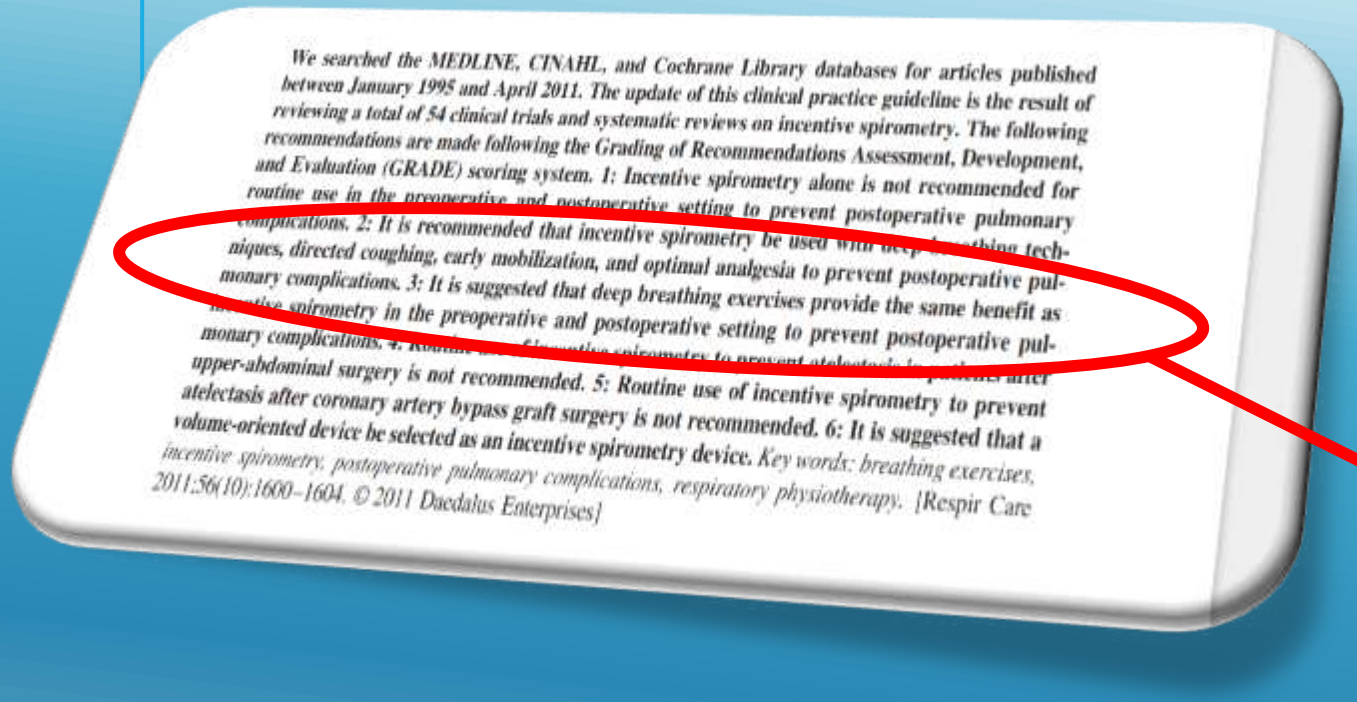
Recommandation de l'association américaine des soins respiratoires :

- Spirométrie incitative seule pas recommandée en pré et post-opératoire
- Les exercices avec de grandes inspirations font aussi bien que la spirométrie incitative

RESPIRATORY CARE • OCTOBER 2011 VOL 56 NO 10

Incentive Spirometry: 2011

AARC Clinical Practice Guideline



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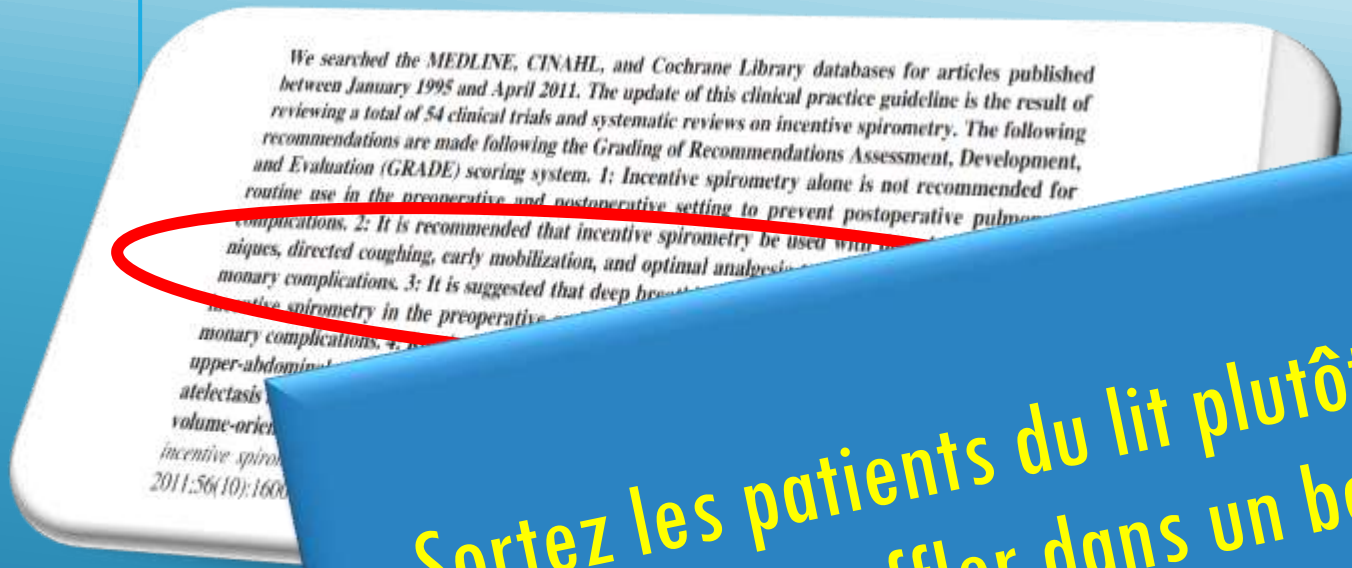
<u>Si vous n'êtes pas encore convaincus et que malgré tout vous voulez utilisez la spirométrie incitative, il FAUT l'associer à :</u>

- Des exercices de grandes inspirations
- Des exercices de toux dirigées
- De la mobilisation précoce

RESPIRATORY CARE • OCTOBER 2011 VOL 56 NO 10

Incentive Spirometry: 2011

AARC Clinical Practice Guideline



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2011;56(10):160

Sortez les patients du lit plutôt que de les faire souffler dans un boulier !

convaincus et que
lisez la spirométrie
ssocier à :

pirations

toux dirigées

- De la mobilisation précoce

RESPIRATORY CARE • OCTOBER 2011 VOL 56 NO 10

Cochrane Database of Systematic Reviews | Review - Intervention

Preoperative inspiratory muscle training for postoperative pulmonary complications in adults undergoing cardiac and major abdominal surgery

Morihiro Katsura, Akira Kuriyama, Taro Takeshima, Shunichi Fukuhara, Toshi A Furukawa Authors' declarations of interest

Version published: 05 October 2015 Version history

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