JOURNÉES FRANCOPHONES

ALVÉOLE

CITÉ DES CONGRÈS DE LYON
10 & 11 MARS 2016

DES OUTILS ET DES HOMMES

ORGANISATION : MARGAUX ORANGE - TÉL 01 42 2 1 15 25 - alveole2016@margauxorange.com - www.congres-alveole.com

Quoi de neuf en réhabilitation pédiatrique?

Dr Laurent MELY

Mucoviscidose, Pneumologie Pédiatrique, Réhabilitation Respiratoire

Hôpital Renée Sabran, Giens VAR

Hospices Civils de Lyon

CRCM
HÔPITAL RENÉE SABRAN-GIENS

Pas de conflit d'intérêt pour le sujet traité

Paediatric exercise training in prevention and treatment

Guido E Pieles,[1,2] Richard Horn,[3] Craig A Williams,[3] A Graham Stuart[1]

- Epidémio : seuls 32% garçons et 15% filles sont/seraient dans les « objectifs » d'activité physique.
- Sous utilisation dans la stratégie thérapeutique pédiatrique malgré :
  - Efficacité/sécurité/bénéfices socio économiques
- Etudes pilotes ont confirmé la faisabilité dans différentes pathologies pédiatriques en particulier respiratoires (asthme/ muco)
- Mais : trop peu d'études sur
  - Physiopathologie et ses conséquences sur le type d'activité à proposer
  - Les ***outils*** permettant de mesurer/quantifier : l'activité physique et l'effet d'un programme
  - Suivi/devenir

Arch Dis Child 2014

- **Quels outils pour évaluer l'activité physique?**

ELSEVIER

Journal of Cystic Fibrosis 14 (2015) e25 – e32

Journal of Cystic Fibrosis

www.elsevier.com/locate/jcf

Review

Physical activity assessment in cystic fibrosis: A position statement

Judy Bradley [a,b,*], Brenda O'Neill [a], Lisa Kent [a,b], Erik H.J. Hulzebos [c], Bert Arets [d], Helge Hebestreit [e], On behalf of the Exercise Working Group European CF Society,

Quels outils pour évaluer l'activité physique?

- ECFS « Exercise Testing Consensus Survey » : reconnu comme important mais peu/pas d'outils utilisés

- 1ere partie: revue des différents outils
  - Actimetres : Sense Wear et ActiGraph et podometre DigiWalker
  - Questionnaires : HAES
  - Journal/agenda

- 2eme partie:
  - Quelle utilisation en pratique clinique?
  - Outils de recherche?
  - Quelles données en retirer?
  - « effet traitement »?

Guidelines

Respiration

Respiration 2015;90:332–351
DOI: 10.1159/000439057

Received: June 30, 2015
Accepted: July 27, 2015
Published online: September 9, 2015

Statement on Exercise Testing in Cystic Fibrosis

Helge Hebestreit[a] Hubertus G.M. Arets[b, c] Paul Aurora[d] Steve Boas[f]
Frank Cerny[g] Erik H.J. Hulzebos[c] Chantal Karila[j] Larry C. Lands[k]
John D. Lowman[h] Anne Swisher[i] Don S. Urquhart[e]
for the European Cystic Fibrosis Exercise Working Group

Statement on exercice testing en CF: comparaison EFX vs tests de terrain

Table 1. Characteristics of full CPET compared to laboratory measurements of peak performance and field tests

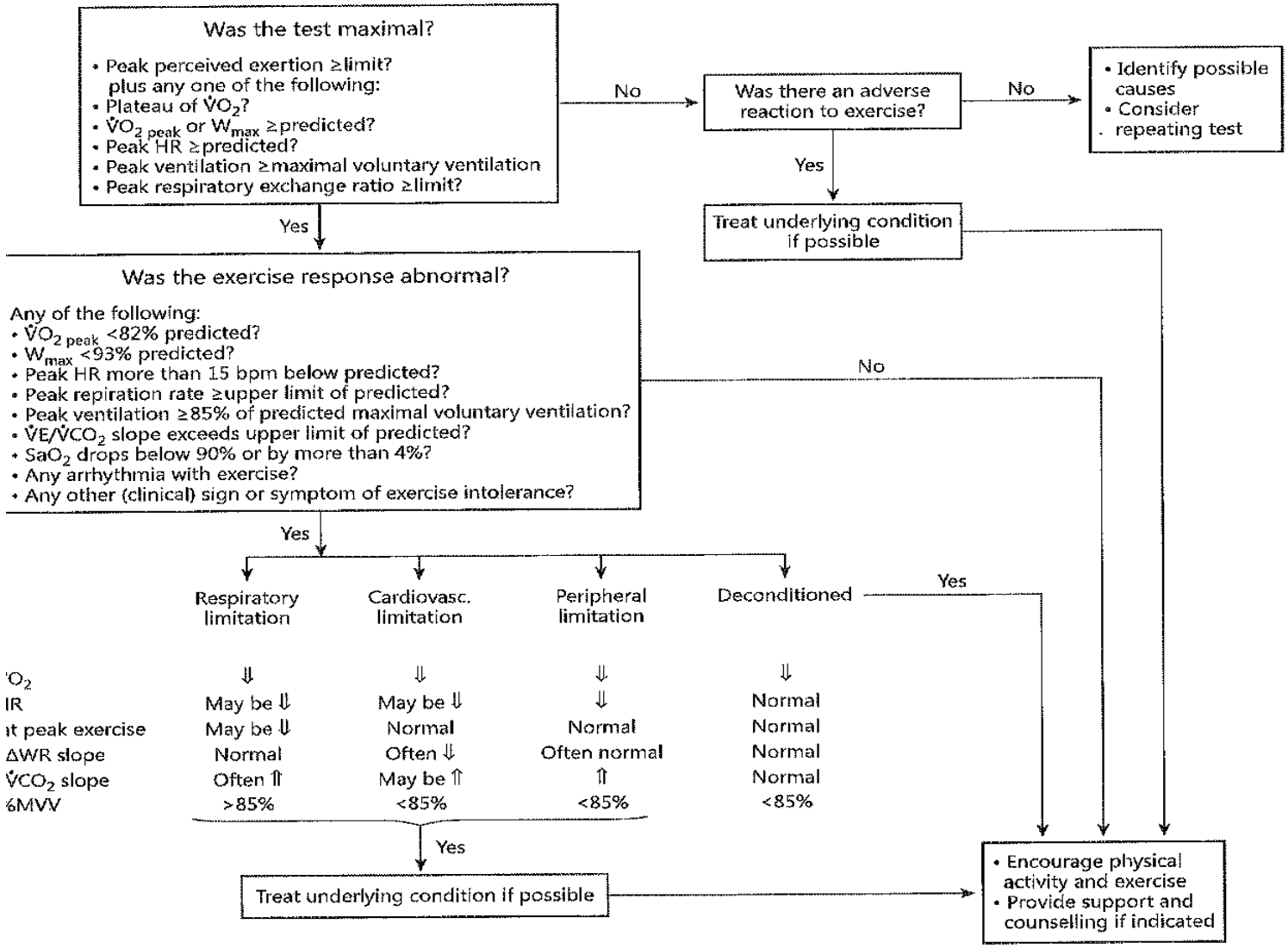
	Laboratory-based exercise tests		'Field' exercise tests		
	full cardiopulmonary exercise test	other laboratory-based exercise tests	6-min walk test	3-min step test	shuttle tests
Equipment needed	Pulse oximeter Metabolic cart with breath by breath gas analyzer Treadmill +/– cycle ergometer	Pulse oximeter Treadmill +/– cycle ergometer	Pulse oximeter Measuring tape Cones	Pulse oximeter 'Aerobics' step Metronome	Pulse oximeter Measuring tape Cones Test CD
Costs for setup, EUR	≈15,000	≈3,000	≈500 (if space available)	≈550	≈500 (if space available)
Additional costs per test (includes staff), EUR	≈100	≈50	≈50	≈50	≈50
Able to measure peak HR, SpO_2 at peak exercise and perceived exertion	Yes	Yes	Usually not in most patients	In some patients	Yes
Time to perform test	6–20 min test plus setup	6–20 min test plus setup	6 min test plus setup	3 min test plus setup	15–20 min test plus setup
Maximal test	Yes	Yes	Not usually for healthy or mild-moderate CF	Not usually for healthy or mild CF	Yes
Suitable across age groups and disease stages	Yes	Yes	No	No	No
Breath by breath gas analysis ($\dot{V}O_2$ measured)	Yes	No	No	No	No
Space required	About 10 m^2	About 10 m^2	30–50 m floor or gym	About 4 m^2	10–20 m floor or gym
Staff required	Cycle ergometry: 1–2 people Treadmill: 2–3 people	Cycle ergometry: 1–2 people Treadmill: 2–3 people	1 person	1 person	1–2 people

Statement on exercice testing in CF : quels tests pour quelles indications?

Table 2. Reasons for exercise testing in CF, recommended testing modes and test protocols

Indication for test	Level of recommendation	Test and measurements
Routine monitoring and assessment of exercise-related symptoms[a]	Preferred test	Cycle ergometry with pulse oximetry and with gas exchange measures using the Godfrey protocol[a]
	Second best options	Cycle ergometry with pulse oximetry but without gas exchange measures using the Godfrey protocol[a] Treadmill exercise with pulse oximetry and gas exchange measures using the Bruce protocol[a] Treadmill exercise with pulse oximetry but without gas exchange measures using the Bruce protocol[a]
Pretransplant assessment	Preferred tests	Cycle ergometry with pulse oximetry and with/without gas exchange measures using the Godfrey protocol[a] Treadmill exercise with pulse oximetry and with/without gas exchange measures using the Bruce protocol[a] 6-min walk test with pulse oximetry
Physical activity counselling/ recommendations/exercise prescription	Preferred tests	Cycle ergometry with pulse oximetry and with/without gas exchange measures using the Godfrey protocol[a] Treadmill exercise with pulse oximetry and with/without gas exchange measures using the Bruce protocol Maximal (incremental) field tests
Interim functional assessment	Preferred tests	Maximal (incremental) tests Submaximal tests Task-specific tests

Statement on exercice testing in CF : interprétation de l'EFX



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EFX : de l'interprétation à la décision médicale
B. Aguilaniu, B Wallaert
ed Margaux Orange 2015

- p209 à 213 §5: EFXi chez l'enfant et l'adolescent
- Indications enfants sains et malades
- Sécurité et conditions de réalisation
- Protocoles standardisés et grandeurs mesurées
- Ref biblio

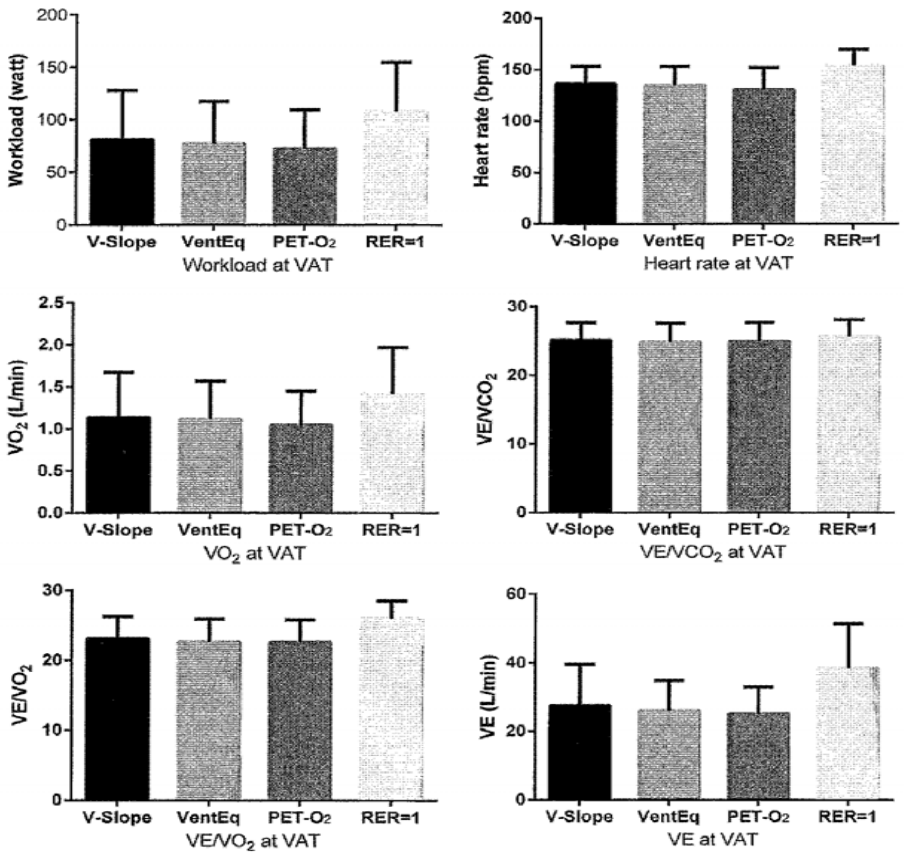
Comparing four non-invasive methods to determine the ventilatory anaerobic threshold during cardiopulmonary exercise testing in children with congenital heart or lung disease

Naomi. C. A. Visschers[1], Erik. H. Hulzebos[1], Marco. van Brussel[1] and Tim. Takken[1,2]

30 enfants :
15 mucos et 15 TGV

Contrairement à la méthode RER=1, les méthodes : V- slope, équivalents respiratoires et PET-O2 sont comparables et reproductibles sans variabilité inter observateur

Méthodes non invasives



Eur J Pediatr (2015) 174:251–257
DOI 10.1007/s00431-014-2387-2

ORIGINAL ARTICLE

Airflow limitation following cardiopulmonary exercise testing and heavy-intensity intermittent exercise in children with cystic fibrosis

Daniel Stevens · Patrick J. Oades · Craig A. Williams

- 19 enfants CF de 13 ans vs 19 témoins / critère : chute d'au moins 10% VEMS post exercice
- 32 vs 5% post EFX p=0.03
- 11 vs 16% post « fractionné »

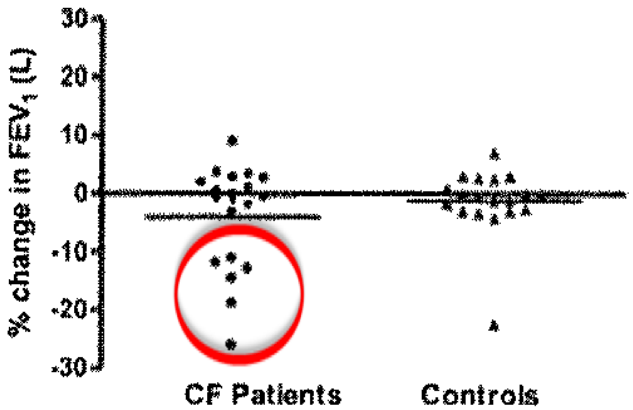


Fig. 1 Percentage change in FEV_1 (L) pre- to post cardiopulmonary exercise testing in the young patients with cystic fibrosis (CF) (*circles*) and controls (*triangles*)

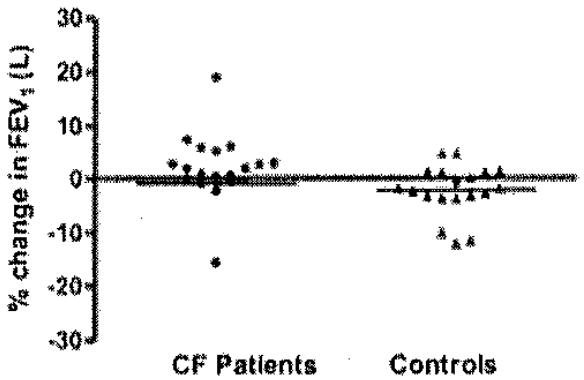


Fig. 2 Percentage change in FEV_1 (L) pre- to post heavy-intensity intermittent exercise in the young patients with cystic fibrosis (CF) (*circles*) and controls (*triangles*). N.B., in the CF group one subject's change in FEV_1 was −54 %, which exceeds the limits of the graph

Ventilatory response to exercise in adolescents with cystic fibrosis and mild-to-moderate airway obstruction

Bart C Bongers[1,2*], Maarten S Werkman[2,3], Tim Takken[2] and Erik H J Hulzebos[2]

- 22 mucos: 14,3 ans VEMS 78,3%
- Etude des paramètres ventilatoires à 25, 50, 75 et 100% de V02pic
- Vs témoins: réponse ventilatoire exagérée (VE/WR augmenté) mais adaptée à l'élimination du CO2 (VE/VCO2 et Pet CO2)
- Conséquences pratiques :
  - Évaluer la réponse ventilatoire sous maximale et pas seulement la VO2pic
  - Evaluer ces données chez des patients dont l'obstruction est plus sévère

A comparaison of the 6-min walk and incremental shuttle walk tests in CF

Saglam et al Pediatr Int 2016 Jan

- 50 ados stables de 14 ans VEMS 88.4%
- Distance TM6 : 596m vs 729m Test Navette $p<0.001$ avec une corrélation modérée $r=0.506$
- FC max TM6 130 (vs 173); grp TM6 <85% max théo alors que 60% patients ont atteint leur niveau max avec test navette
- Dyspnée (BORG) > mais SpO2 =

A Possible Alternative Exercise Test for Youths with Cystic Fibrosis: The Steep Ramp Test

BART C. BONGERS[1,2], MAARTEN S. WERKMAN[1,3], H. G. M. ARETS[4], TIM TAKKEN[1], and H. J. HULZEBOS[1]

- 40 ados mucos 14,7 ans VEMS 86%
- Test rapide, facile, bien toléré, low cost et très bien corrélé à l'EFX dans cette population

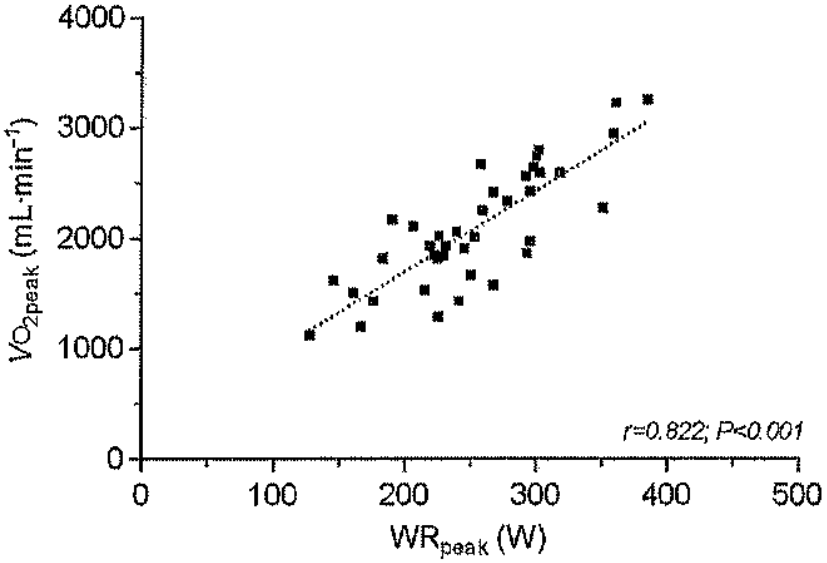


FIGURE 2—The linear relation between WR_{peak} attained at the SRT and $\dot{V}O_{2peak}$ attained at the CPET ($R^2 = 0.676$).

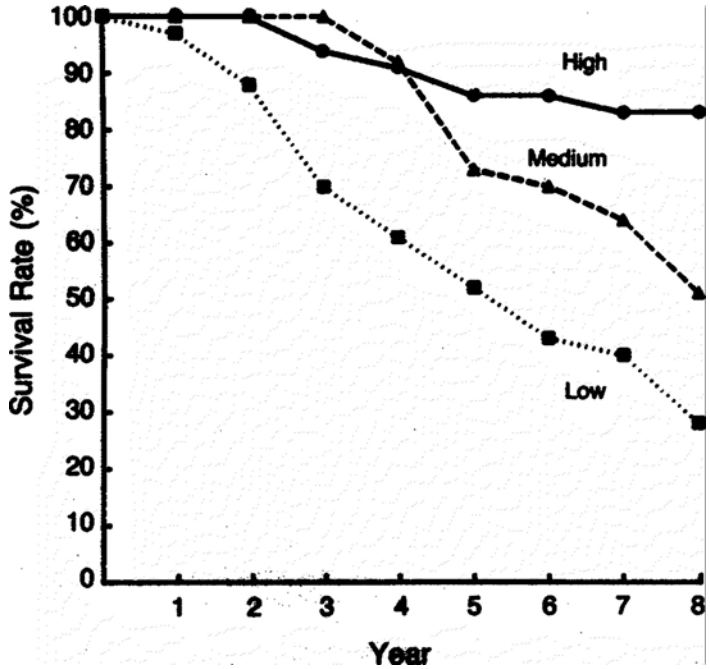
20 min apres B2CA
Ergocyclometre 3 min à 25 Watts puis incrément de 10/15/20 watts ttes 10 sec selon taille avec fce pédalage de 60 à 80
VO2 pic =(8.262xWRpic SRT)+177.096
Durée moy :2min 10 sec
Préférence SRT vs EFX
Intérêt pour Interval training

EFX outil de prédiction

Nixon, NEJM 1992

Moorcroft , Thorax 1997

VEMS
IMC



Review Article

Practical Guidelines: Lung Transplantation in Patients with Cystic Fibrosis

T. O. Hirche,[1] C. Knoop,[2] H. Hebestreit,[3] D. Shimmin,[4]
A. Solé,[5] J. S. Elborn,[6] H. Ellemunter,[7] P. Aurora,[8] M. Hogardt,[9]
T. O. F. Wagner,[10,11] and ECORN-CF Study Group[11]

- Pulmonary Medecine 2014
- §6 :
  - Kiné
  - Type entrainement pré op : IT/O2/VNI
  - Tests : TM6/EFX
  - Réhabilitation post op

Prediction of Mortality in Adolescents with Cystic Fibrosis

ERIK H. J. HULZEBOS[1], HANNA BOMHOF-ROORDINK[1,3], PAULINE B. VAN DE WEERT-VAN LEEUWEN[2], JOS W. R. TWISK[3], H. G. M. ARETS[2], CORNELIS K. VAN DER ENT[2], and TIM TAKKEN[1]

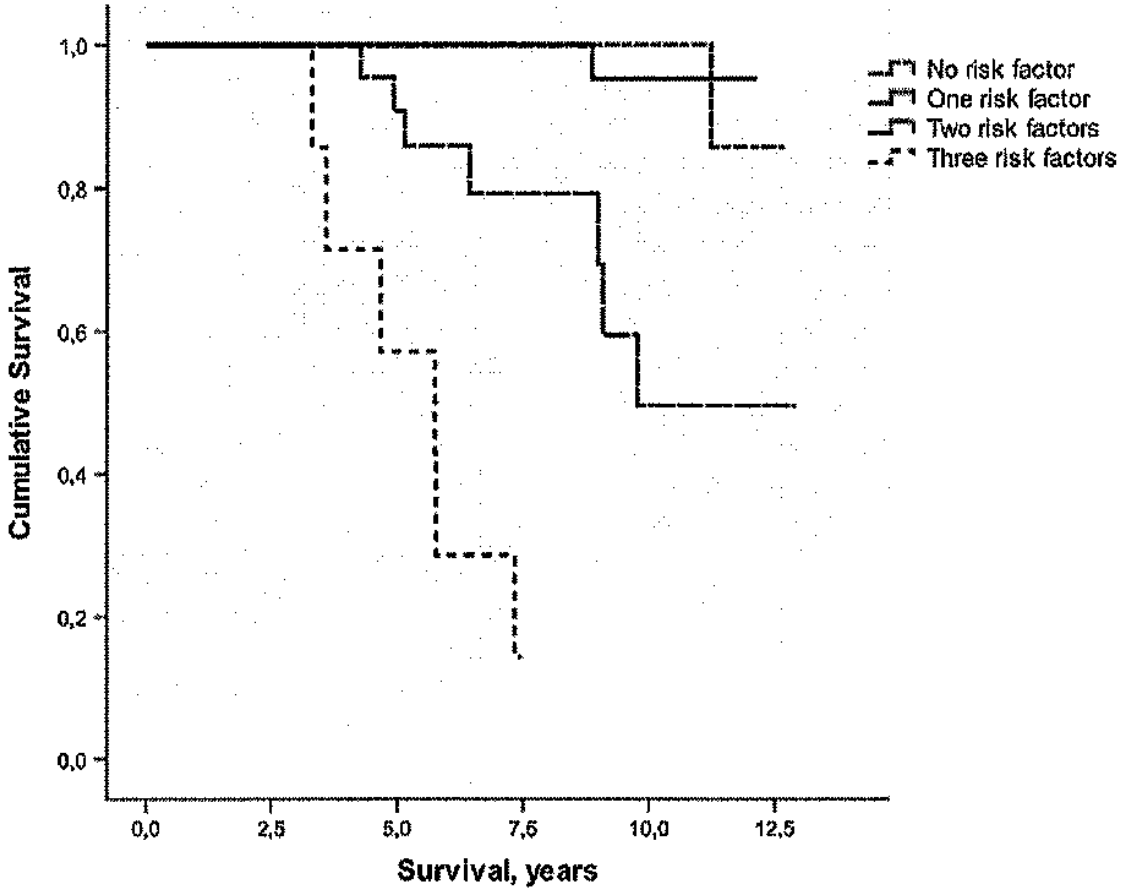
[1]Child Development and Exercise Center, Cystic Fibrosis Center, University Medical Center Utrecht, Utrecht, the NETHERLANDS; [2]Department of Pediatric Pulmonology, Cystic Fibrosis Center, University Medical Center Utrecht, Utrecht, the NETHERLANDS; and [3]EMGO Institute for Health and Care Research, VU University Medical Center, VU University Amsterdam, Amsterdam, the NETHERLANDS

- 127 ados CF 12,7 ans suivis 7,5+/- 2,7 ans
- 9 DC (7%) et 6 Tp° (5%)
- Modèle incluant VEMS>Pic VE/VO2>IMC

TABLE 3. Final three-factor risk model to predict mortality.

	Hazard Ratio	95% CI
BMI	5.54*	1.82–16.83
$FEV_1\%_{predicted}$	17.13*	3.76–78.06
Peak $\dot{V}E/\dot{V}O_2$	5.92*	1.27–27.63

Prediction of Mortality in Adolescents with Cystic Fibrosis



Contents lists available at ScienceDirect

Paediatric Respiratory Reviews

Cochrane Corner

THE COCHRANE COLLABORATION®

Physical exercise training for cystic fibrosis

Thomas Radtke [1,*], Sarah J. Nolan [2], Helge Hebestreit [3], Susi Kriemler [1]

[1] Epidemiology, Biostatistics and Prevention Institute, University of Zurich, Zurich, Switzerland
[2] Department of Biostatistics, The University of Liverpool, Liverpool, UK
[3] Paediatric Department, Julius-Maximilians University, Würzburg, Germany

13 RCT soit 402 patients /suivis moins d'un mois à 3ans/ hétérogénéité/ supervisé ou non/

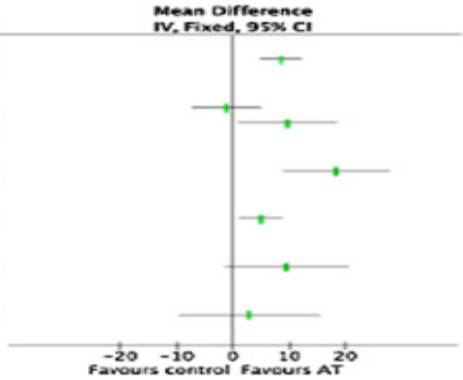
Objectifs principaux: capacité à l'exercice/EFR/QDV

Objectifs secondaires : mortalité/force musculaire/capacité anaérobie/ exacerbations/ATB/diabète/os/événements indésirables
NB : Exclusion études muscles respiratoires

Change in VO_2peak (mL/min per kg BW)

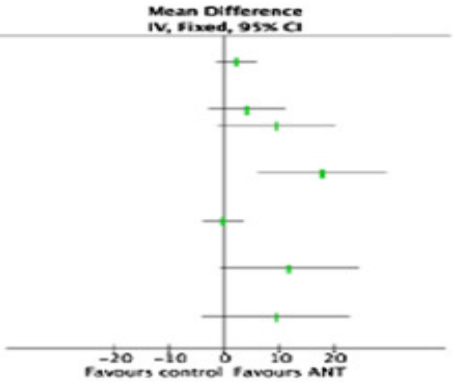
Aerobic training (AT) versus control

Study or Subgroup	Favours control Mean	SD	Total	Control Mean	SD	Total	Mean Difference IV, Fixed, 95% CI
1.1.1 At hospital discharge							
Selvadurai 2002	7.31	6.29	22	-1.22	6.15	22	8.53 [4.85, 12.21]
1.1.2 At 3 months							
Hommerding 2015	1.1	4.6	17	2.3	11.9	17	-1.20 [-7.26, 4.86]
Kriemler 2013	7.26	12.1	15	-2.45	10.3	10	9.71 [0.86, 18.56]
1.1.3 At 6 months							
Kriemler 2013	6.85	12.6	15	-11.48	11.1	10	18.33 [8.95, 27.71]
1.1.4 At 1 month after discharge							
Selvadurai 2002	7.56	6.75	22	2.65	6.02	22	4.91 [1.13, 8.69]
1.1.5 At 6 months off training							
Kriemler 2013	0.16	13.1	14	-9.35	12.1	8	9.51 [-1.32, 20.34]
1.1.6 At 18 months off training							
Kriemler 2013	-4.5	13.8	11	-7.36	12.9	7	2.86 [-9.70, 15.42]



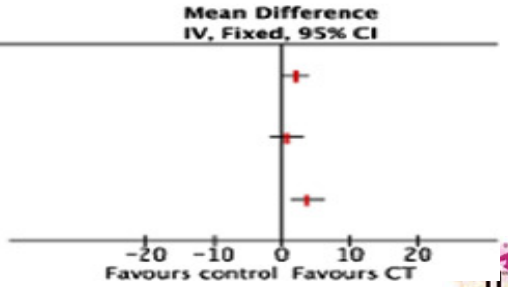
Anaerobic training (ANT) versus control

Study or Subgroup	Anaerobic training Mean	SD	Total	Control Mean	SD	Total	Mean Difference IV, Fixed, 95% CI
2.1.1 At hospital discharge							
Selvadurai 2002	0.73	5.89	22	-1.22	6.15	22	1.95 [-1.61, 5.51]
2.1.2 At 3 months							
Klijn 2004	1.5	2.6	11	-2.45	10.3	9	3.95 [-2.95, 10.85]
Kriemler 2013	7.5	12.8	11	-1.84	12.1	10	9.34 [-1.31, 19.99]
2.1.3 At 6 months							
Kriemler 2013	6.22	13.7	8	-11.48	11.1	10	17.70 [5.98, 29.42]
2.1.4 At 1 month after discharge							
Selvadurai 2002	2.25	6.25	22	2.65	6.02	22	-0.40 [-4.03, 3.23]
2.1.5 At 6 months off training							
Kriemler 2013	2.24	13.6	8	-9.35	12.1	8	11.59 [-1.02, 24.20]
2.1.6 At 18 months off training							
Kriemler 2013	1.9	13.8	8	-7.36	12.9	7	9.26 [-4.26, 22.78]



Combined training (CT) versus control

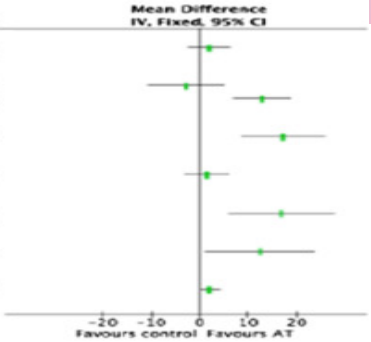
Study or Subgroup	Mean Difference	SE	Mean Difference IV, Fixed, 95% CI
3.1.1 At 3 – 6 months			
Hebestreit 2010	2.04	1	2.04 [0.08, 4.00]
3.1.2 At 6 months off training			
Hebestreit 2010	0.7	1.18	0.70 [-1.61, 3.01]
3.1.3 At 12 – 18 months off training			
Hebestreit 2010	3.73	1.23	3.73 [1.32, 6.14]



Change in FEV_1 (% predicted)

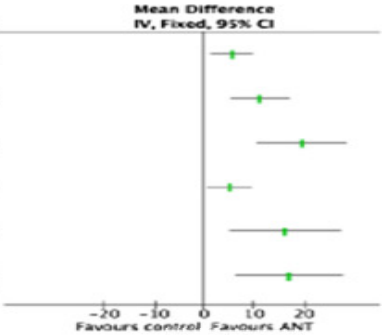
Aerobic training (AT) versus control

Study or Subgroup	Aerobic training Mean	SD	Total	Control Mean	SD	Total	Mean Difference IV, Fixed, 95% CI
1.2.1 At hospital discharge							
Selvadurai 2002	6.54	7.76	22	4.51	6.9	22	2.03 [-2.31, 6.37]
1.2.2 At 3 months							
Hommerding 2015	-1.8	8.6	17	1	14.2	17	-2.80 [-10.69, 5.09]
Kriemler 2013	4.89	8	14	-7.92	6.7	10	12.81 [6.91, 18.71]
1.2.3 At 6 months							
Kriemler 2013	6.17	11.6	15	-11	10.1	10	17.17 [8.59, 25.75]
1.2.4 At 1 month after discharge							
Selvadurai 2002	6.25	7.94	22	4.72	7.15	22	1.53 [-2.93, 5.99]
1.2.5 At 6 months off training							
Kriemler 2013	1.09	13.1	15	-15.83	12.4	8	16.92 [6.07, 27.77]
1.2.6 At 18 months off training							
Kriemler 2013	0.31	13.2	12	-12.14	12	8	12.45 [1.27, 23.63]
1.2.7 Annual rate of change over 36 months							
Schneiderman-Walker 2000	-1.46	3.55	30	-3.47	4.93	35	2.01 [-0.06, 4.08]



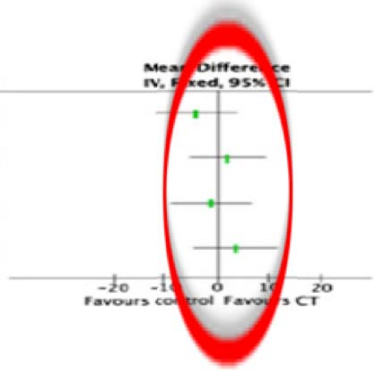
Anaerobic training (ANT) versus control

Study or Subgroup	Anaerobic training Mean	SD	Total	Control Mean	SD	Total	Mean Difference IV, Fixed, 95% CI
2.2.1 At hospital discharge							
Selvadurai 2002	10.09	7.43	22	4.51	6.9	22	5.58 [1.34, 9.82]
2.2.2 At 3 months							
Kriemler 2013	3.19	7.2	11	-7.92	6.7	10	11.11 [5.16, 17.06]
2.2.3 At 6 months							
Kriemler 2013	8.51	10.8	11	-11	10.1	10	19.51 [10.57, 28.45]
2.2.4 At 1 month after discharge							
Selvadurai 2002	9.8	7.81	22	4.72	7.15	22	5.08 [0.66, 9.50]
2.2.5 At 6 months off training							
Kriemler 2013	0.26	12	11	-15.83	12.4	8	16.09 [4.95, 27.23]
2.2.6 At 18 months off training							
Kriemler 2013	4.87	11.5	11	-12.14	12	8	17.01 [6.27, 27.75]



Combined training (CT) versus control

Study or Subgroup	Combined training Mean	SD	Total	Control Mean	SD	Total	Mean Difference IV, Fixed, 95% CI
3.2.1 At 3 months							
Rovedder 2014	-6	16.1	19	-2	7.3	22	-4.00 [-11.86, 3.86]
3.2.2 At 3 - 6 months							
Hebestreit 2010	-2.1	8.4	22	-4.1	11.8	13	2.00 [-5.31, 9.31]
3.2.3 At 6 months off training							
Hebestreit 2010	-6	12.5	18	-4.9	8.7	12	-1.10 [-8.69, 6.49]
3.2.4 At 12 - 18 months off training							
Hebestreit 2010	-5.5	10.1	20	-9.1	12.2	13	3.60 [-4.37, 11.57]

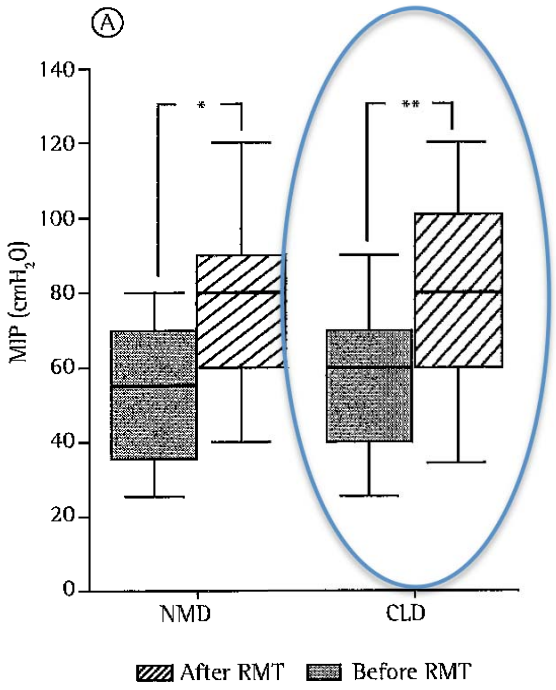


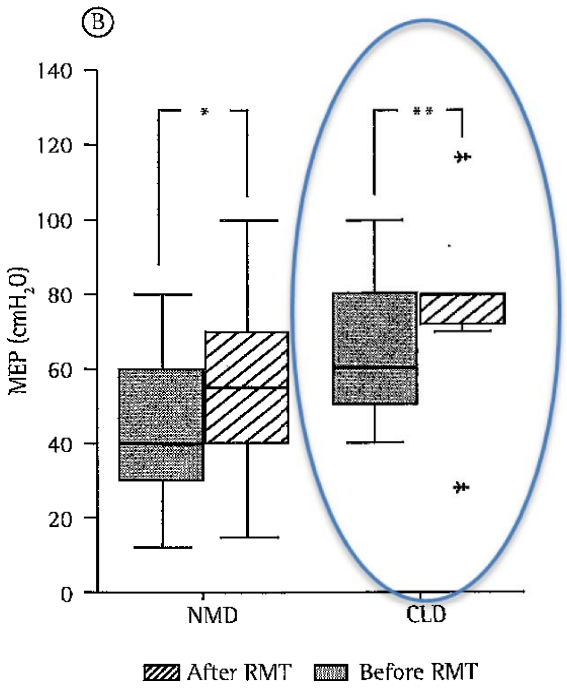
Effects of home-based respiratory muscle training in children and adolescents with chronic lung disease*,**

Efeitos do treinamento muscular respiratório domiciliar em crianças e adolescentes com doença pulmonar crônica

Iván Rodríguez, Daniel Zenteno, Carlos Manterola

- 29 enfants/ados de 5 à 17 ans 18 NMD et 11CLD
- Entrainement des muscles respiratoires sur 6 mois : 3 séries de 3min à 30-50%MIP et 3 séries de 15 expirations 30-50%MEP





J Bras Pneumol 2014

JOURNÉES FRANCOPHONES
CITÉ DES CONGRÈS DE LYON 10 & 11 MARS 2016
ALVÉOLE

Inspiratory Muscle Strength and Endurance in Children and Adolescents with Cystic Fibrosis

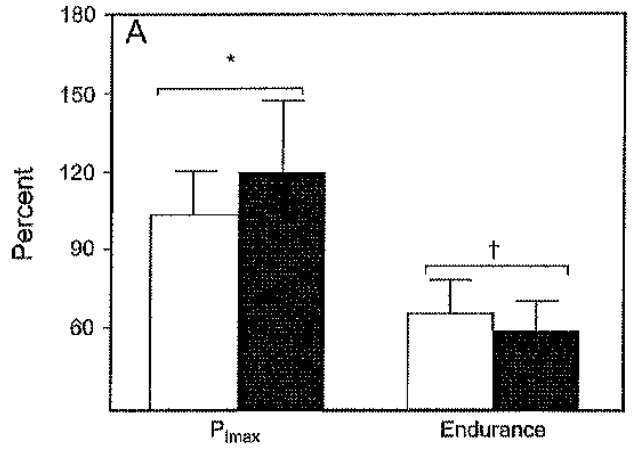
Fernanda M Vendrusculo PT MSc, João P Heinzmann-Filho PT PhD, Taila C Piva PT, Paulo JC Marostica MD PhD, and Márcio VF Donadio PT PhD

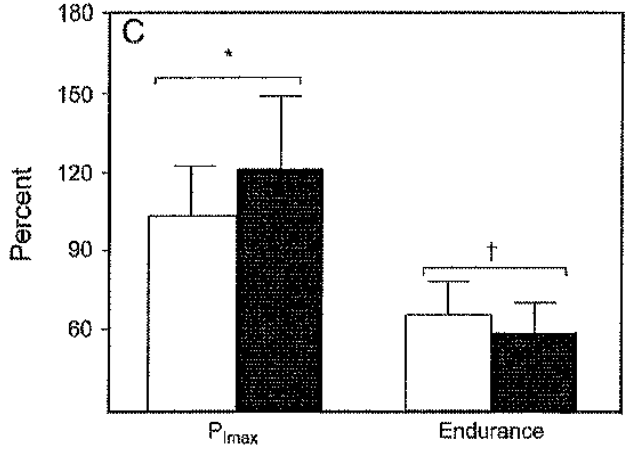
34 CF de 6 à 18 ans vs 68 contrôles

Pimax CF 118 vs 105%
Pas de différence en terme d'endurance 60.9vs 65.3%

Mais dans le groupe sans pyo chronique et VEMS>80% : meilleure Pimax et moins bonne endurance!

Pimax corrélée CVF et VEMS
Endurance corrélée résistances





Exp Physiol 101.3 (2016) pp 421–431

Research Paper

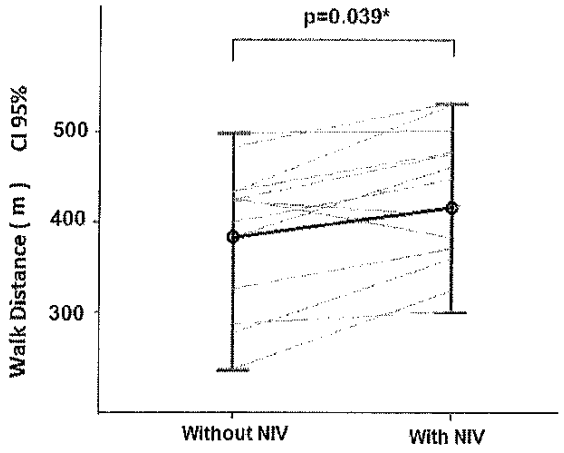
Exercise oxidative skeletal muscle metabolism in adolescents with cystic fibrosis

Maarten Werkman[1], Jeroen Jeneson[1], Paul Helders[1], Bert Arets[2], Kors van der Ent[2], Birgitta Velthuis[3], Rutger Nievelstein[3], Tim Takken[1,4] and Erik Hulzebos[1]

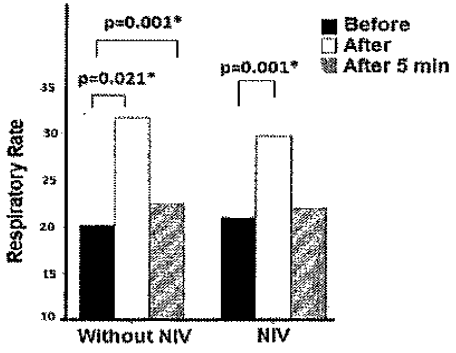
- Y a-t-il des anomalies dans l'oxygénation et/ou le métabolisme oxydatif du muscle squelettique des ados mucos stables (pas inflammation ni pyo chronique/SpO2>94%/VEMS>80%)?

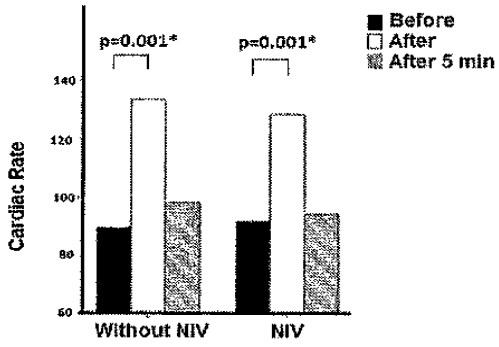
- Pas de différence en spectroscopie/IRM P31 et NIRS avant pendant et apres effort.

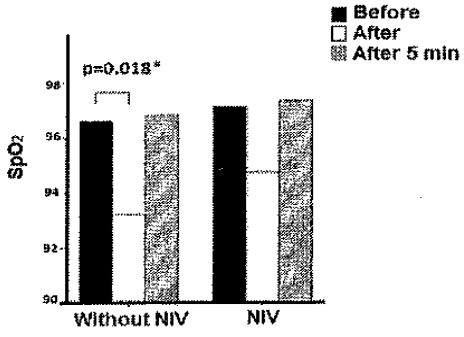
Effects of noninvasive ventilation on treadmill 6-min walk distance and regional chest wall volumes in cystic fibrosis: Randomized controlled trial



13 CF : 7 à 16 ans
VEMS < 80%
TM6 tapis =/- VNI bipap 12/6
Distance/EFR/volumes pulmonaires
Ccl : optimisation de la ventilation et oxygénation et augmentation de la distance sous VNI







Cibelle Andrade Lima Respiratory Medicine 2014

ORIGINAL ARTICLES

www.jpeds.com • THE JOURNAL OF PEDIATRICS

Physical Exercise Recommendations Improve Postural Changes Found in Children and Adolescents with Cystic Fibrosis: A Randomized Controlled Trial

Cláudia S. Schindel, MsC[1], Patrícia X. Hommerding, PhD[2], Denizar A. S. Melo, PhD[3], Rafael R. Baptista, PhD[4], Paulo J. C. Marostica, PhD[5], and Márcio V. F. Donadio, PhD[1,3]

Table V. Comparison of the variation between the control and intervention groups after 3 months of follow-up

Variables	Control (n = 17)	Intervention (n = 17)	P	ES
Lung function (Δ)				
FEV_1 (%)	2.7 ± 12.8	−1.8 ± 8.6	.24	0.41
FVC (%)	1.8 ± 12.2	−0.41 ± 6.8	.52	0.22
$FEF_{25\%-75\%}$ (%)	7.3 ± 24.2	−3.8 ± 13.9	.11	0.56
Postural evaluation (Δ)				
Head tilt (°)	0.56 ± 2.4	−0.7 ± 1.8	.59	0.07
Scapular girdle tilt (°)	0.26 ± 1.7	−0.38 ± 1.2	.21	0.43
Pelvic tilt (°)	1.74 ± 3.6	−0.05 ± 4.8	.23	0.42
A-P trunk tilt (°)	−0.34 ± 1.4	−0.09 ± 2.2	.70	0.14
Cervical lordosis (°)	1.8 ± 2.5	−1.8 ± 2.6	.0003	1.41
Thoracic kyphosis (°)	1.2 ± 2.8	−1.2 ± 2.6	.01	0.89
Lumbar lordosis (°)	3.2 ± 6.7	−0.94 ± 4.9	.05	0.71
Lateral chest distance (cm)	0.93 ± 1.0	−0.07 ± 1.2	.01	0.91
Anteroposterior chest distance (cm)	0.45 ± 1.4	0.34 ± 1.1	.08	0.63
Abdominal protrusion (cm)	0.56 ± 1.3	−0.34 ± 1.1	.04	0.75
Static baropodometry (Δ)				
Mean pressure (kgf/cm^2)	7.5 ± 8.5	0.0 ± 0.0	.001	1.25
Area of contact (cm^2)	4.3 ± 5.6	−3.2 ± 8.8	.01	1.02
Anterior displacement (%)	1.3 ± 11.4	−2.8 ± 8.1	.24	0.41
Dynamic baropodometry (Δ)				
Duration of the step (ms)	28.4 ± 166.8	48.9 ± 117	.68	0.14
Maximal pressure (kgf/cm^2)	0.23 ± 0.9	−0.04 ± 0.2	.24	0.41
Area of contact (cm)	56.4 ± 22.1	50.81 ± 13.1	.38	0.31

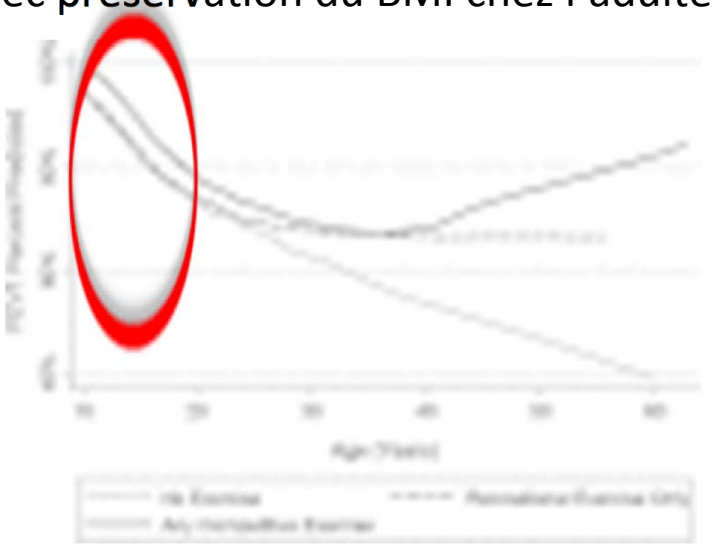
34 CF: 7 à 20 ans
Phase 1 : déviations posturales + marquées chez CF
Phase 2 : 3 mois activité physique de leur choix 3x/semaine 20 min plus 2/sem 20min streching
Réduction lordose cervicale et lombaire , cyphose thoracique, protrusion abdominale…

RESEARCH ARTICLE Open Access

Self-reported exercise and longitudinal outcomes in cystic fibrosis: a retrospective cohort study

Joseph M Collaco*, Scott M Blackman, Karen S Raraigh, Christopher B Morrow, Garry R Cutting and Shruti M Paranjape

1038 CF Twin sibling study
75% rapportent un exercice physique régulier
Chez >10ans : 46% compétition, 38.8% loisir, 15.2 rien
L'exercice est associé avec :
- meilleur VEMS de base mais pas génotype CFTR
- réduction du déclin du VEMS et avec préservation du BMI chez l'adulte mais pas l'enfant de 10/17 ans



Hypothèses:
Pas d'effet à court terme mais effet cumulatif à long terme
Types d'activité différents chez l'enfant aérobie +anaérobie

Dans tous les cas : promouvoir dès l'enfance l'activité physique!

Longitudinal relationship between physical activity and lung health in patients with cystic fibrosis

Jane E. Schneiderman[1,2,3], Donna L. Wilkes[1,2], Eshetu G. Atenafu[4], Thanh Nguyen[2], Greg D. Wells[1,3], Nancy Alarie[5], Elizabeth Tullis[6], Larry C. Lands[7], Allan L. Coates[1,2], Mary Corey[8] and Felix Ratjen[1,2]

212 CF 7 à 17 ans suivis 9 ans médiane 5.21 ans

Au départ 5.47=/-2.78 heures HPA (Habitual Physical Activity) H>F

Sur la durée le déclin moyen du VEMS 1.63%/an et HPA augmente 0.28h/j/an

L'augmentation de l'activité est associée à un déclin plus lent du VEMS
Groupe + actif : activité + 0.59h/j et VEMS -1.39%/an
Groupe - actif : activité - 0.15h/j et VEMS -1.90%/an

Une des 1ères études prospective longitudinale qui démontre une effet + de l'activité physique sur le VEMS

Qualité de vie et activité physique : 2 études « contradictoires »

Effects of an Educational Intervention of Physical Activity for Children and Adolescents With Cystic Fibrosis: A Randomized Controlled Trial
Hommerding , Respir Care 2015

2 grpes 17 CF : 13.4 ans, VEMS 95.5%
VO2pic 35 ml/kg/min.

Exercices aérobie, supervision téléphonique

A 3 mois : augmentation de l'activité physique mais pas de items QDV

Quality of life is associated with physical activity and fitness in cystic fibrosis
Hebertsreit, BMC Pulmonary Medecine 2014

70 CF >12 ans VEMS >68.6%
VO2pic 37.4 ml/kg/min

Suisse : supervisé 3X30 min centre Fitness ou Allemagne : ajouter 3X60 min/sem qlqsoit sport

A 6 mois : amélioration du score de QDv directement et significativement relié aux modifications d'activité physique

Physiological response during activity programs using Wii-based video games in patients with cystic fibrosis (CF)

Tamara del Corrala,J Cystic Fibrosis 2014,

24 CF 12.6 ans VEMS 93.8%

VO2 ml/min	FC bpm
Wii fit : 553	124
TM6 : 1024	159
Wii acti : 1232	159
Wii train : 1252	163

Alcohol and Marijuana Use and Treatment Nonadherence Among Medically Vulnerable Youth

Elissa R. Weitzman, ScD, MSc[a,b], Rosemary E. Ziemnik, BS[c], Quian Huang, BS, MPH[c], Sharon Levy, MD, MPH[b,c]

- 403 de 9 à 18 ans dont 25% asthme et muco

TABLE 2 Substance Use Prevalence Among High School Youth With Chronic Medical Conditions, in Aggregate and By Medical Condition

	Total	Asthma and Cystic Fibrosis	Type 1 Diabetes	Inflammatory Bowel Disease	Juvenile Arthritis
	n (%)	*n* (%)	*n* (%)	*n* (%)	*n* (%)
No past year substance use	197 (60.1)	52 (65.0)	52 (64.2)	45 (52.9)	48 (58.54)
Past year alcohol use	121 (36.5)	26 (32.1)	29 (34.9)	34 (39.5)	32 (39.02)
Binge drinking[a]	40 (37.7)	4 (17.4)	12 (48.0)	15 (46.9)	9 (34.62)
Ever use of marijuana	83 (25.4)	17 (21.3)	25 (30.9)	28 (33.3)*	13 (15.85)
Past year marijuana use	67 (20.6)	11 (13.8)**	19 (23.8)	25 (29.8)	12 (14.63)**
Past 4 wk marijuana use	28 (9.5)	2 (2.8)	13 (17.1)***	10 (13.9)***	3 (3.95)
Any past year substance use (alcohol or marijuana)	131 (39.9)	28 (35.0)	29 (35.8)	40 (47.1)	34 (41.46)
Past year use of both alcohol and marijuana	57 (17.4)	9 (11.3)	19 (23.5)	19 (22.4)	10 (12.20)

- 32% avouent des oublis de trt avec RR 1,79 « buveurs »

CONCLUSION

- L'exercice et la réhabilitation sont reconnus comme faisant partie de l'arsenal thérapeutique en pathologie respiratoire pédiatrique
- Les différentes modalités de réentrainement et réhabilitation commencent à se préciser
- Disposons d'outils qui permettent de mesurer la capacité à l'effort mais aussi la force et l'endurance des muscles respiratoires et même le métabolisme et l'oxygénation du muscle
- Bénéfices à « long terme » : mortalité/déclin VEMS, QDV?
- RDV dans 2 ans…

Merci de votre attention

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