



**La désaturation au test de marche
implique-t-elle la prescription d'O₂ pour la
déambulation ? : POUR**

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pas de conflit d'intérêt



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C'est évident ?

The fact that we all need oxygen to survive make the benefit of supplemental oxygen in hypoxemia seem obvious.

It is not.

NEJM (27/10/2016)



De quoi parle-t-on ?

- Désaturation ?
 - saturation < 88-90 %
 - chute > 4 %
 - durée
- Test de marche ?
 - 6 minutes / navette(ISWT) / endurance(ESWT)
- Oxygène de déambulation ?
 - au besoin / « short burst »



De quoi parle-t-on ?

- Chez qui ?
 - OLDD
 - BPCO non OLDD en RR
 - BPCO non OLDD au laboratoire
 - ILD
 - HTP
- Profil ?
 - répondeur
 - non-répondeur
 - répondeur négatif



De quoi parle-t-on ?

- Fréquent ?
- Peut-on le prédire ?
 - quantification emphysème CT
 - DLCO
- Conséquences ?
 - mauvais pronostic (mais pas d'évidence que maintenir la normoxemie durant l'effort améliore la survie)
 - augmentation de la PAP et des résistances pulmonaires (mais pas d'effet sur la PAS ou sur les résistances systémiques)



Un peu de physiologie ...

Causes d'hypoxémie:

- inadéquation ventilation/perfusion
- shunt
- diffusion
- hypoventilation alvéolaire
- diminution du contenu en O₂ du sang veineux qui va aux poumons
- altitude



Un peu de physiologie ...

L'apport d'O₂

- diminue la stimulation hypoxique des corps carotidiens
- vasodilate la circulation pulmonaire
- augmente le contenu artériel en O₂
- diminue l'hyperinflation dynamique



Un peu d'histoire ...

EFFECT OF OXYGEN ON EXERCISE ABILITY IN CHRONIC RESPIRATORY INSUFFICIENCY

USE OF PORTABLE APPARATUS

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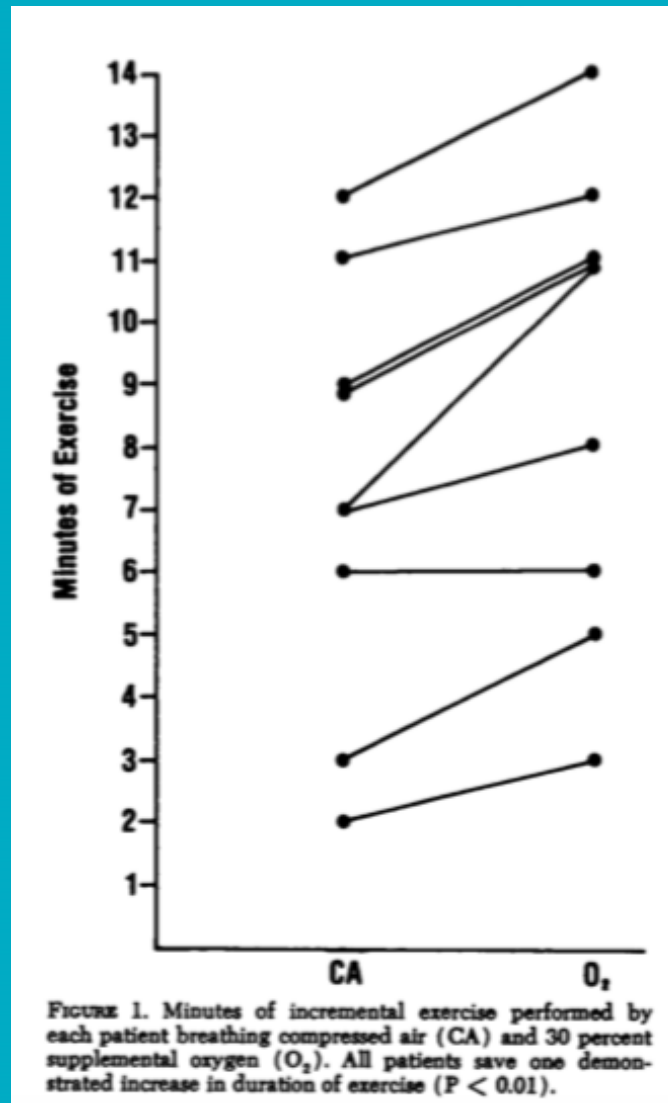
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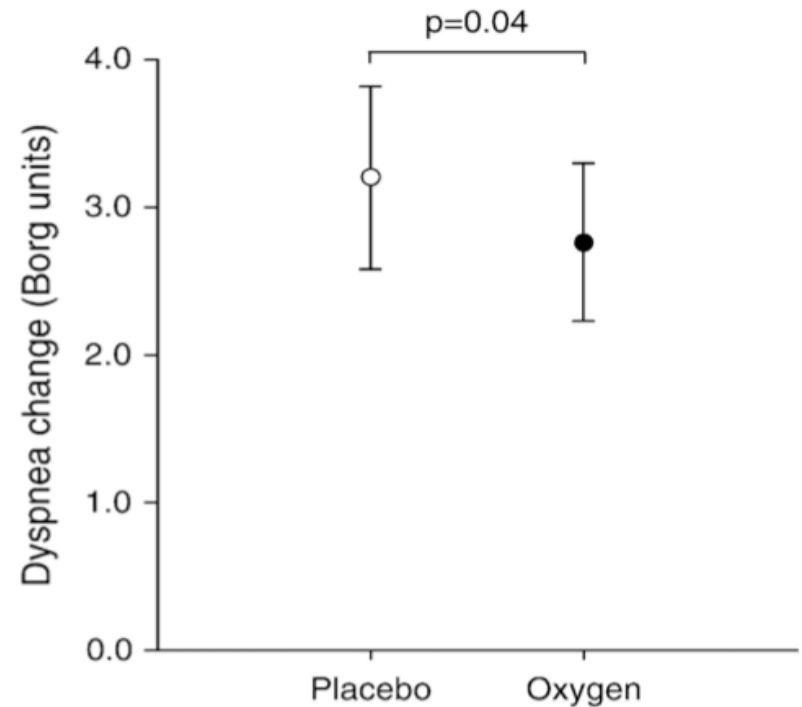
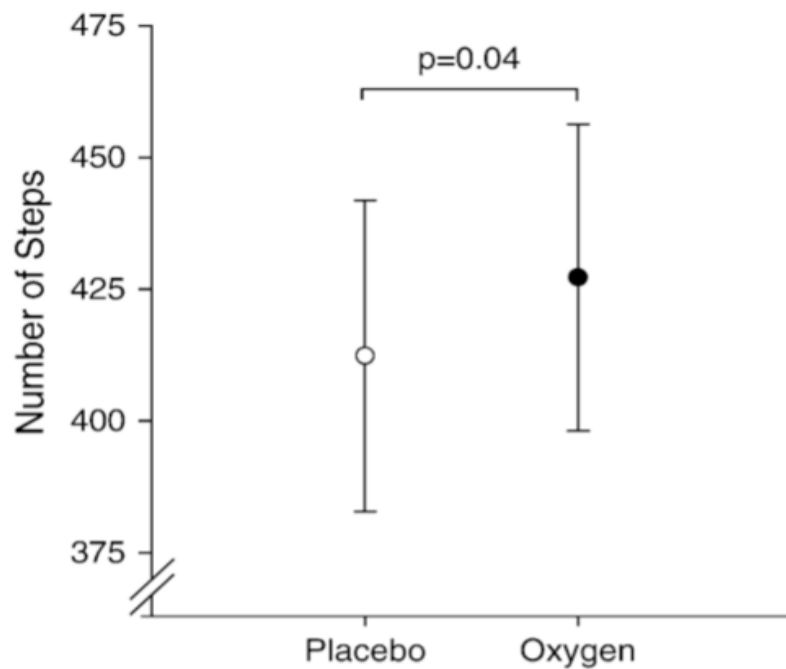
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Un peu d'histoire ... Et maintenant ?



Et maintenant ?



Et maintenant ?

Table 2 Comparison of the effect of oxygen therapy and air on recovery times

	Recovery time with oxygen (s)			Recovery time with air (s)			Mean difference (oxygen minus air) (95% CI)	p Value
	Median	IQR	Mean	Median	IQR	Mean		
Activity 1								
Objective	65	55	90	120	95	145	-55 (-115 to +5)	0.07
Subjective	170	98	169	165	160	201	-32 (-85 to +20)	0.21
Activity 2								
Objective	58	78	104	110	120	129	-25 (-96 to +47)	0.48
Subjective	180	120	207	230	150	241	-35 (-76 to +6)	0.09
Mean of activities 1 and 2								
Objective	75	82	97	110	62	135	-38 (-81 to +5)	0.08
Subjective	186	110	186	240	140	219	-34 (-69 to +2)	0.06

IQR, interquartile range.



Et maintenant ?

Table 2. – Responses to constant work rate exercise with different inspired oxygen fractions in patients with chronic obstructive pulmonary disease

Parameter	F_{I,O_2}				
	0.21	0.30	0.50	0.75	1.00
Endurance min	4.2±0.5	7.8±1.0*	10.3±1.9*.#	10.8±1.0*.#	9.6±0.8*.#
Isotime values					
Breathlessness Borg	6.7±0.6	4.4±0.4*	4.0±0.4*	3.3±0.4*	4.4±0.5*
HR bpm	121±4	111±5*	107±3*	105±3*	105±3*
V'_{CO_2} L·min ⁻¹	0.95±0.11	0.85±0.11	0.85±0.12	0.86±0.14	0.85±0.12
P_{ET,CO_2} mmHg	41.2±1.4	43.7±1.5	42.9±1.3	41.5±1.3	41.5±1.3
IC L	1.39±0.14	1.59±0.14*	1.72±0.14*	1.68±0.12*	1.71±0.11*
IRV L	0.29±0.05	0.48±0.06*	0.54±0.06*	0.53±0.04*	0.55±0.07*
V'_E L·min ⁻¹	30.6±3.3	26.4±3.4*	26.1±3.6*	25.4±2.9*	24.2±3.5*
V_T L	1.10±0.11	1.12±0.12	1.18±0.12	1.15±0.09	1.06±0.12
V_T/IC %	79.9±3.0	69.6±3.5*	65.5±4.3*	68.4±2.1*	64.0±4.7*
T_I/T_{tot}	0.36±0.02	0.36±0.01	0.38±0.01	0.37±0.01	0.36±0.02
T_E s	1.44±0.12	1.69±0.16*	1.83±0.15*	1.75±0.11*	1.78±0.16*
V_T/T_I L·s ⁻¹	1.47±0.14	1.20±0.11*	1.17±0.12*	1.11±0.11*	1.09±0.12*
S_{a,O_2} %	91.0±1.1	98.0±0.8*	99.7±0.2*	99.7±0.2*	99.9±0.1*

Isotime refers to the time at which the room air test ended. HR: heart rate; V'_{CO_2} : carbon dioxide output; P_{ET,CO_2} : end-tidal partial pressure for CO₂; IC: inspiratory capacity; IRV: inspiratory reserve volume; V'_E : minute ventilation; V_T : tidal volume; V_T/IC : tidal volume as a % of IC; T_I/T_{tot} : duty cycle; T_E : expiratory time; V_T/T_I : mean inspiratory flow; S_{a,O_2} : arterial oxygen saturation; *: p<0.05 versus 0.21 F_{I,O_2} ; #: p<0.05 versus 0.30 F_{I,O_2} .



Et maintenant ?

	Oxygen-training Group	
	Before Training	After Training
Work rate, W	54 (25)	67 (24)*
SBP, torr	197 (23)	188 (26)*
DBP, torr	94 (10)	92 (8)*
Heart rate, beats/min	125 (22)	128 (22)
$\dot{V}O_2$, L/min	0.89 (0.22)	0.93 (0.27)
V_{CO_2} , L/min	0.90 (0.28)	0.95 (0.30)
$\dot{V}E$, L/min	34 (8)	39 (10)*
V_T , L	1.06 (0.21)	1.21 (0.32)
f, breaths/min	30.9 (4.1)	32.6 (5.0)
Breathlessness	6.3 (2.5)	6.7 (2.1)
Leg fatigue	5.4 (2.4)	4.6 (2.7)
Lactate, mmol/L	4.2 (2.8)	4.8 (2.3)
SaO ₂ , %	94 (3)	93 (4)

	Oxygen-training Group	
	Before Training	After Training
Work rate, W	40 (18)	
Time, min	6.6 (3.0)	21.4 (10.1)*
SBP, torr	197 (24)	179 (25)*
DBP, torr	92 (9)	83 (12)
Heart rate, beats/min	122 (22)	120 (19)
$\dot{V}O_2$, L/min	0.89 (0.22)	0.84 (0.21)
V_{CO_2} , L/min	0.86 (0.26)	0.81 (0.24)
$\dot{V}E$, L/min	33 (7)	34 (8)
V_T , L	1.1 (0.3)	1.2 (0.3)
f, breaths/min	30.1 (3.9)	28.9 (3.3)
Breathlessness	7.9 (1.4)	5.3 (2.3)*
Leg fatigue	5.6 (2.3)	3.6 (2.4)
SaO ₂ , %	94 (3)	93 (4)



Et maintenant ?

Table 2. – Health-related quality of life (HRQL) measures for 41 patients

	Baseline	Δ cylinder oxygen-cylinder air	p-value
Disease specific HRQL			
CRQ[#]			
Dyspnoea (5–35)	16.6 (5.3)	2.0 (0.9)	0.02
Fatigue (4–28)	15.3 (4.9)	1.8 (0.7)	0.02
Emotional function (7–49)	34.3 (8.0)	3.3 (1.2)	0.006
Mastery (4–28)	19.5 (4.8)	1.8 (0.7)	0.008
Total (20–140)	85.8 (18.5)	8.8 (2.8)	0.002
HAD[*]			
Anxiety (0–21)	5.6 (4.1)	-1.6 (0.6)	0.009
Depression (0–21)	4.3 (2.5)	-1.0 (0.5)	0.05
Generic HRQL			
SF-36[#]			
Physical functioning (0–100)	33.0 (18.8)	1.6 (3.5)	0.6
Role physical (0–100)	15.2 (27.3)	16.8 (5.5)	0.01
Bodily pain (0–100)	73.4 (26.3)	5.3 (5.0)	0.3
General health (0–100)	42.9 (22.8)	6.1 (2.9)	0.04
Vitality (0–100)	48.3 (20.5)	2.9 (3.0)	0.3
Social functioning (0–100)	67.1 (24.2)	10.5 (5.2)	0.05
Role emotional (0–100)	60.2 (44.2)	18.3 (7.7)	0.02
Mental health (0–100)	75.6 (14.7)	4.0 (2.7)	0.1

Data are presented as mean (SD) for baseline and mean (SE) for Δ cylinder oxygen-cylinder air. CRQ: chronic respiratory questionnaire; HAD: hospital anxiety and depression; SF-36: short-form-36 health survey questionnaire. [#]: higher scores indicate better HRQL; ^{*}: higher scores indicate worse emotional function.

Et donc ?

Différences

- dans la définition de la désaturation
- dans le type d'effort réalisé
- dans le type de population étudiée

Etudes avec air comprimé

Faible nombre de patients inclus

Refus de poursuivre l'O2

Pas d'étude récente



Et donc ?

It is difficult to draw any firm conclusion about the use of ambulatory oxygen therapy in COPD patients not meeting criteria for LTOT.

To date there are insufficient data to draw conclusions regarding the effectiveness of ambulatory oxygen to improve exercise capacity or exertional dyspnoea in people with ILD.

Cochrane 2015/2016

