



« Besoins énergétiques induits par l'exercice précoce chez le patient critique »

Accepté par le comité d'éthique

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Introduction

- REE determination is of high relevance to avoid both **overfeeding** and **underfeeding**
- Measured REE by indirect calorimetry has been shown to be **considerably increased** in critically ill when compared with predictive equations.
- Proposed correction factors seem not to be adequate since they do not take into account **changes** occurring during illness evolution.
- Patients are mobilized early.
- No recommendation exists whether it is necessary to improve nutrition when early mobilization is performed.

Methods

Indirect Calorimetry

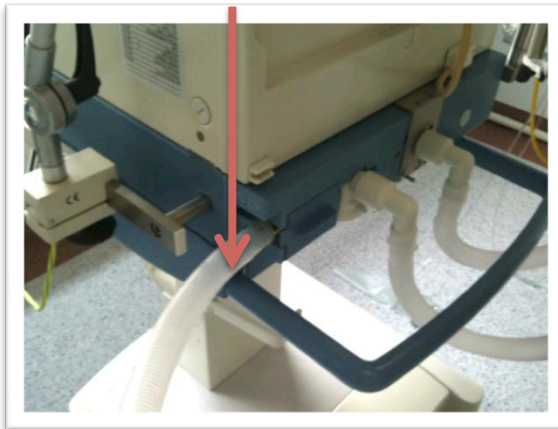
- VO_2 and VCO_2
- kcal/24h (Weir)



Canopy



Expiratory



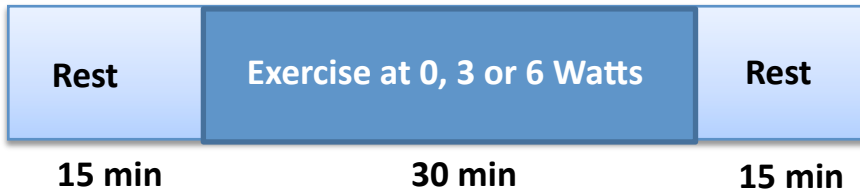
Inspiratory



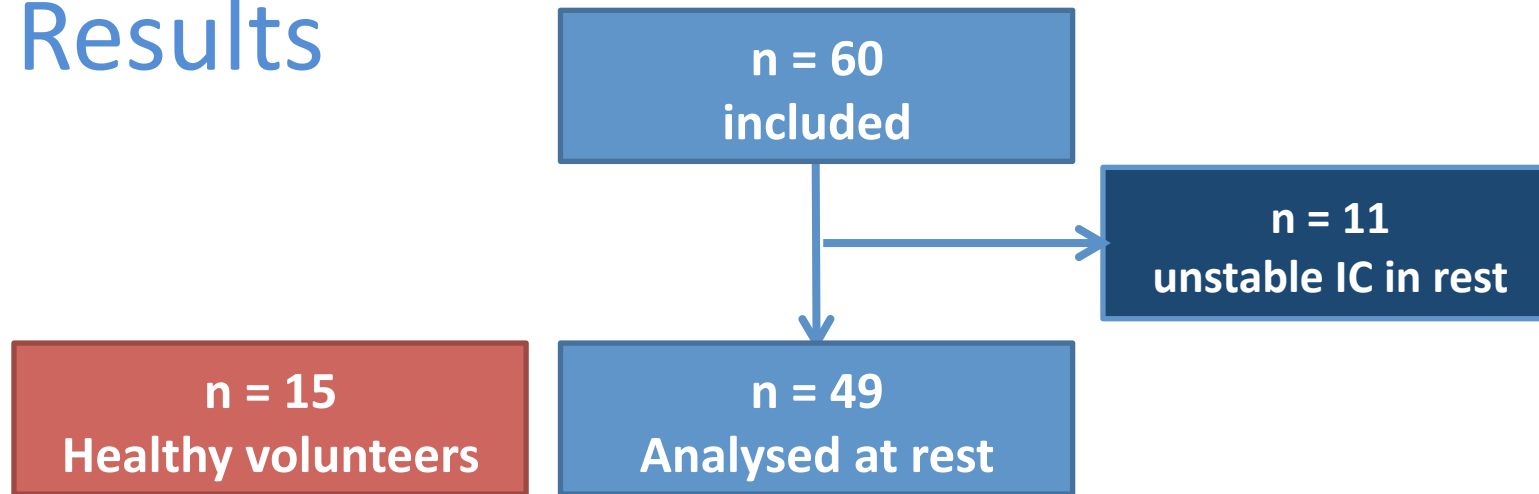
Methods

Energy expenditure in critically ill performing early physical therapy

Hickmann CE, et al Int care Med 2014



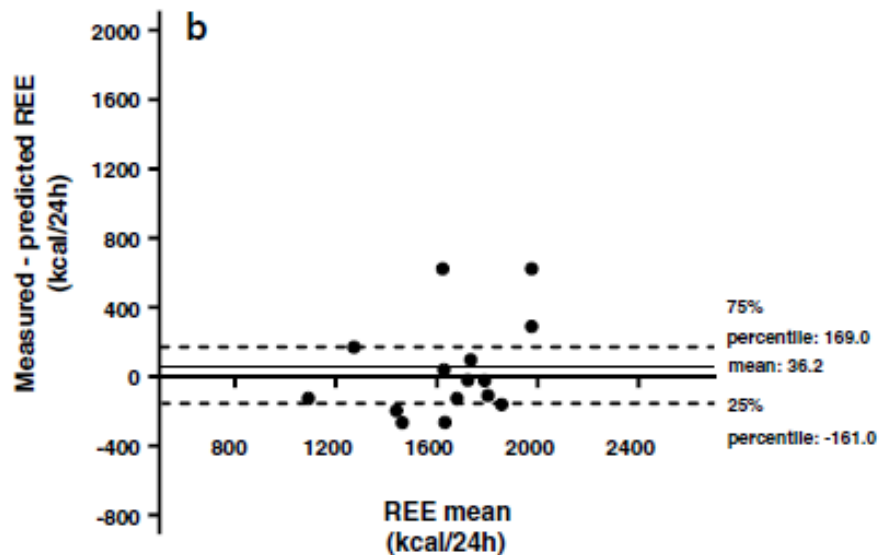
Results



Results

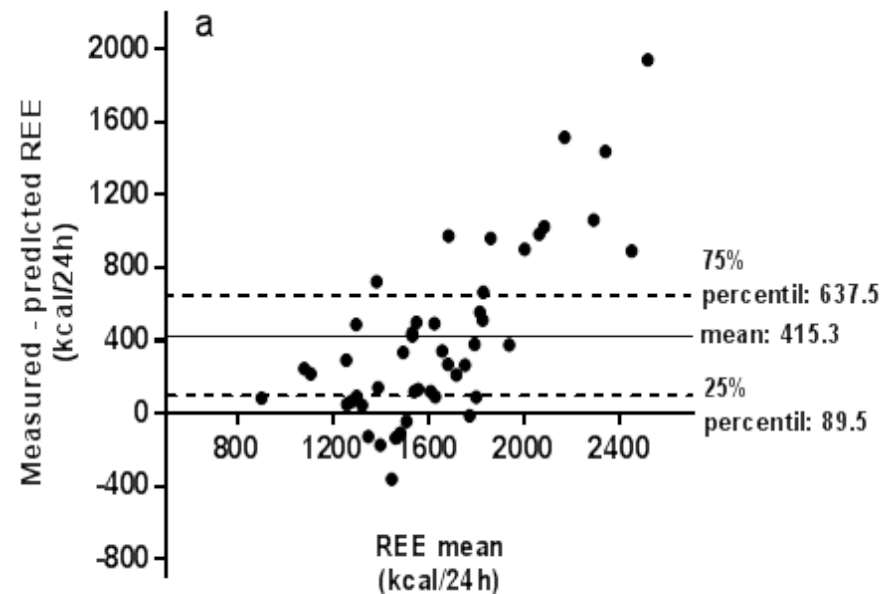
Blant-Altman analyse

Controls (n=15)



No difference between IC measurement & predictive equations

Patients (n=49)



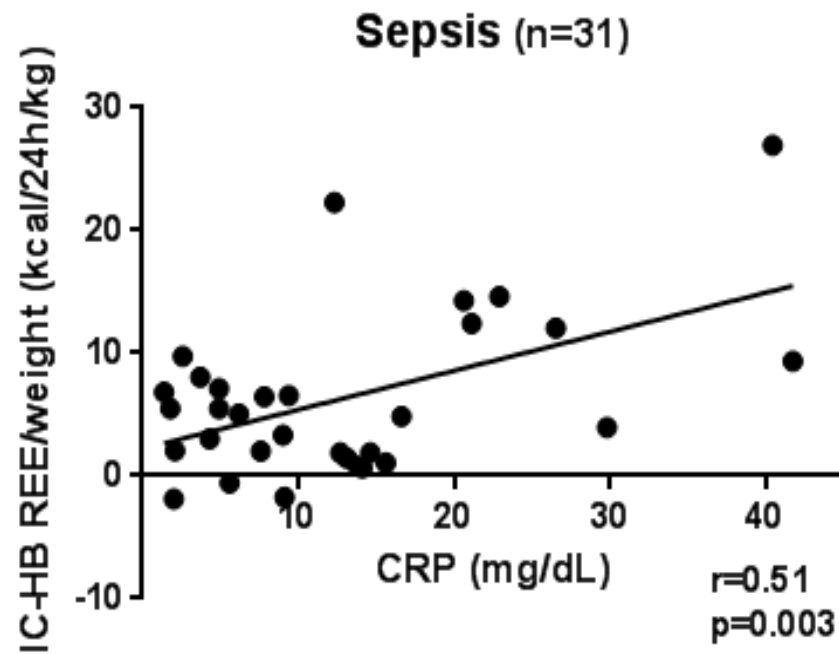
IC REE 29% > Harris-Benedict ($p < 0.001$)

IC REE 23% > Fleisch ($p < 0.001$)

IC REE 16% < Faisy-Fagon ($p < 0.05$) (n=19)

Results

Correlation with C-reactive protein (CRP) a marker of systemic inflammation



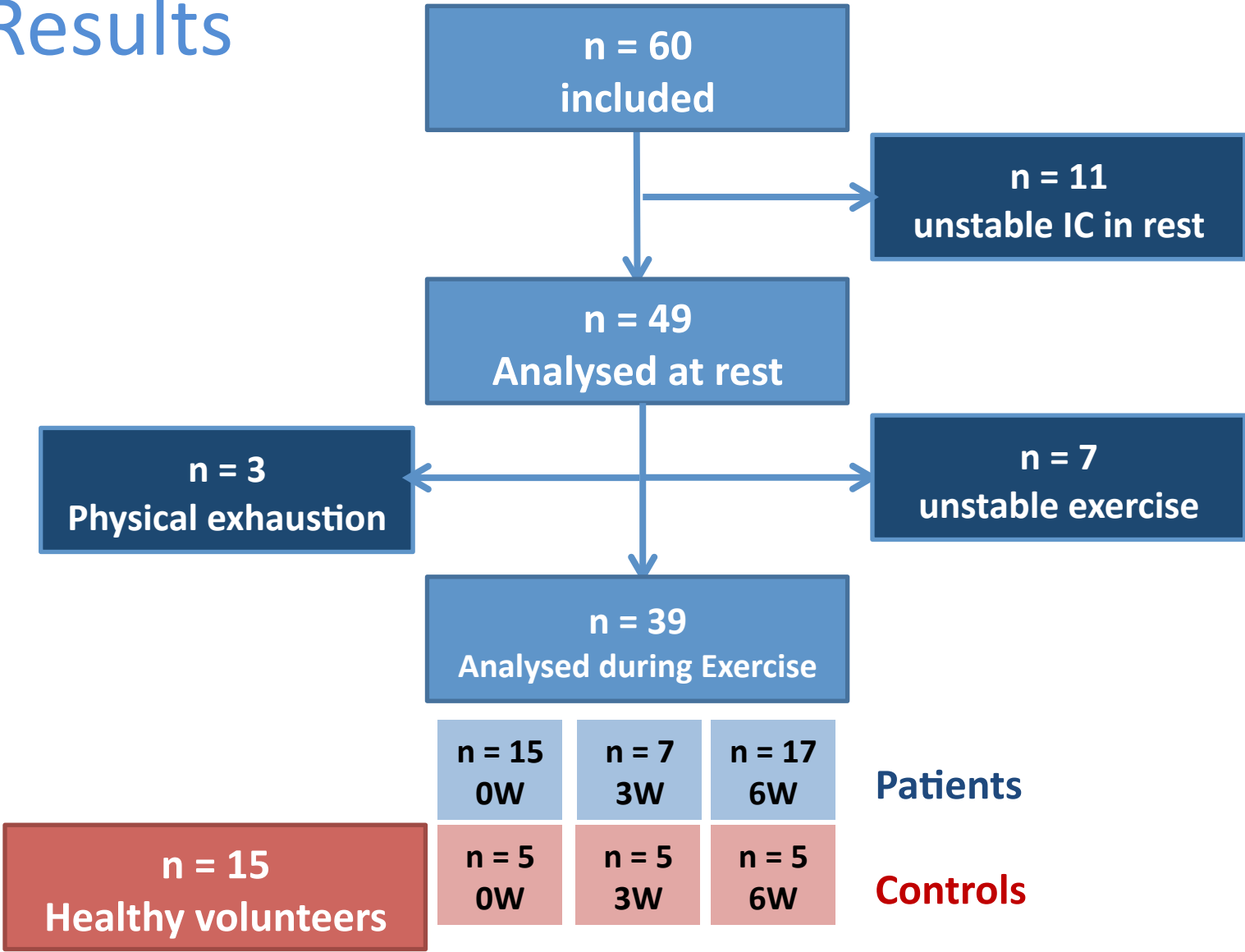
$$\Delta \text{IC-HB/kg} = 2.217 + 0.3182 [\text{CRP}]$$

Patient 70 kg.
CRP = 25 mg/dL
HB = 1500 kcal/24h

$$\begin{aligned} \Delta \text{IC-HB/kg} &= 2,217 + 0,3182 * 25 \\ &= 10,17 \\ &= 10,17 * 70 \text{ kg} \\ \Delta \text{IC-HB} &= 712 \text{ kcal/24h} \end{aligned}$$

$$1500 + 712 = 2212 \text{ kcal/24h}$$

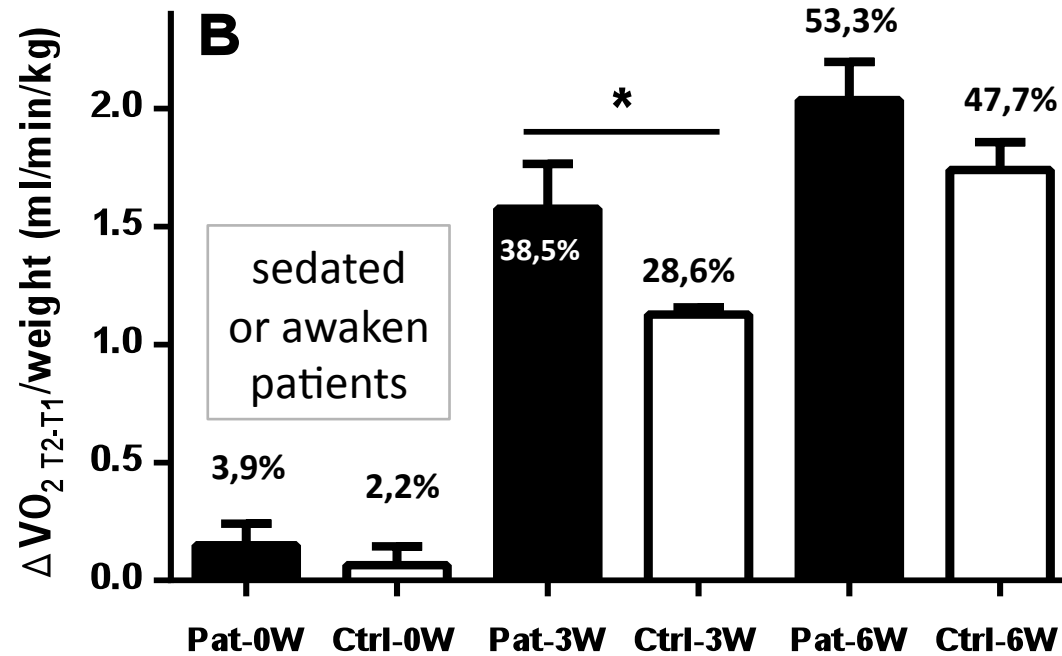
Results



Results

Characteristics / Groups:	Pat-6W	Pat-3W	Pat-0W	Excluded
	(n = 17)	(n = 7)	(n = 15)	(n = 10)
Age ^a	53 (22-79)	63 (37-80)	65 (38-85)	71 (35-90)
Male ^b	17 (100)	5 (71)	10 (67)	9 (90)
APACHE II score ^c	15±7	16±4	22±6	22±5
SOFA score ^c	5±5	6±2	11±5	8±3
SAS ^c	4±0	4±0	3±1	4±0
Mechanical ventilation ^b	2 (12)	-	13 (87)	4 (40)
Vasopressor use ^b	5 (29)	2 (29)	8 (53)	2 (20)
Sedative drugs use ^b	5 (29)	2 (29)	9 (60)	3 (30)

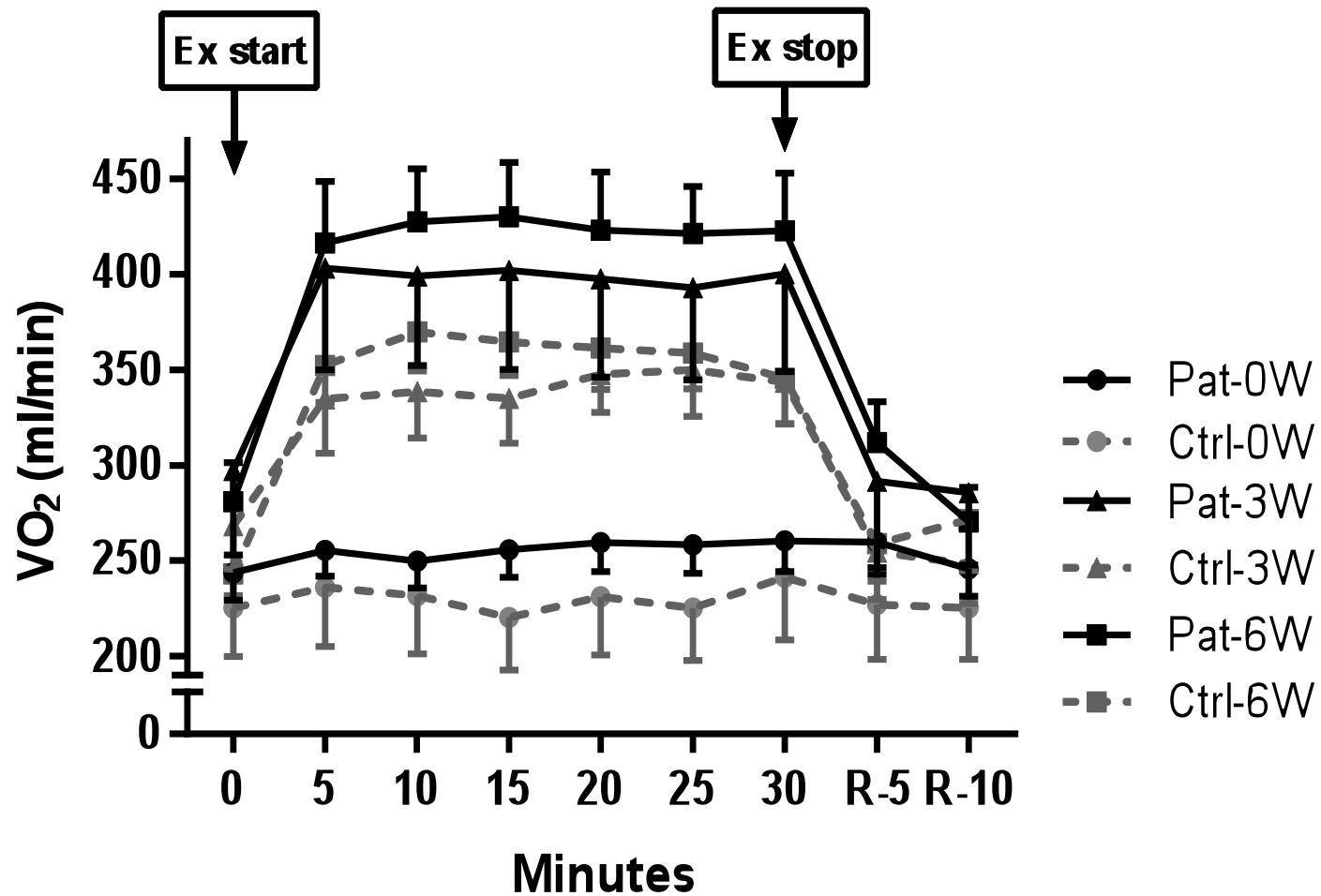
Results



Heart Rate	1.6 % ($p=0.28$)	9.9% ($p=0.02$)	12.8% ($p<0.001$)
Resp Rate	1.4% ($p=0.59$)	16.8% ($p=0.03$)	30.3% ($p<0.001$)
PAM	1.2% ($p=0.79$)	5.6% ($p=0.36$)	6.9% ($p=0.23$)

Blood lactate was not modified.

Results



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Discussion

Very Early Passive Cycling Exercise in Mechanically Ventilated Critically Ill Patients: Physiological and Safety Aspects - A Case Series

Ruy Camargo Pires-Neto^{1,2*}, Yurika Maria Fogaça Kawaguchi¹, Adriana Sayuri Hirota¹, Carolina Fu^{1,3}, Clarice Tanaka^{1,3}, Pedro Caruso⁴, Marcelo Park⁵, Carlos Roberto Ribeiro Carvalho⁴

- 20 min of passive exercise
- Deeply sedated an MV patients
- Was not associated with significant alterations in hemodynamic, respiratory or metabolic variables even in those requiring vasoactive agents.

We found similar observations together without sedation!!

No data with active exercise.

Conclusion

- Inflammatory response contributes to metabolism alterations.
- This simple inflammation marker could be used to adapt stress factor and help clinician to adjust caloric intake when IC is not accessible or cannot be performed for technical reasons.

$$\Delta \text{IC-HB/kg} = 2.217 + 0.3182 [\text{CRP}]$$

Conclusion

- Increased energy requirement for physical activity was only present for active exercise and seems to differ with healthy population.
- For the tested exercise duration and intensity, nutritional adjustment is not indicated.
- The impact of prolonged active mobilization should be further investigated.



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Merci – Dank U – Thank you - Gracias