

The profile of heart rate training zones in non-elite rower across a winter training phase

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Introduction:

- The use of heart rate zones (HRZ) to add quality to training is now common practice in endurance athletes.
- HRZ may be determined from interpolated heart rate (HR) blood lactate (BLa) relationships in laboratory based fitness tests.
- The aim of this study was to profile typical HRZ derived from laboratory based exercise testing in non-elite rowers throughout a winter training phase.

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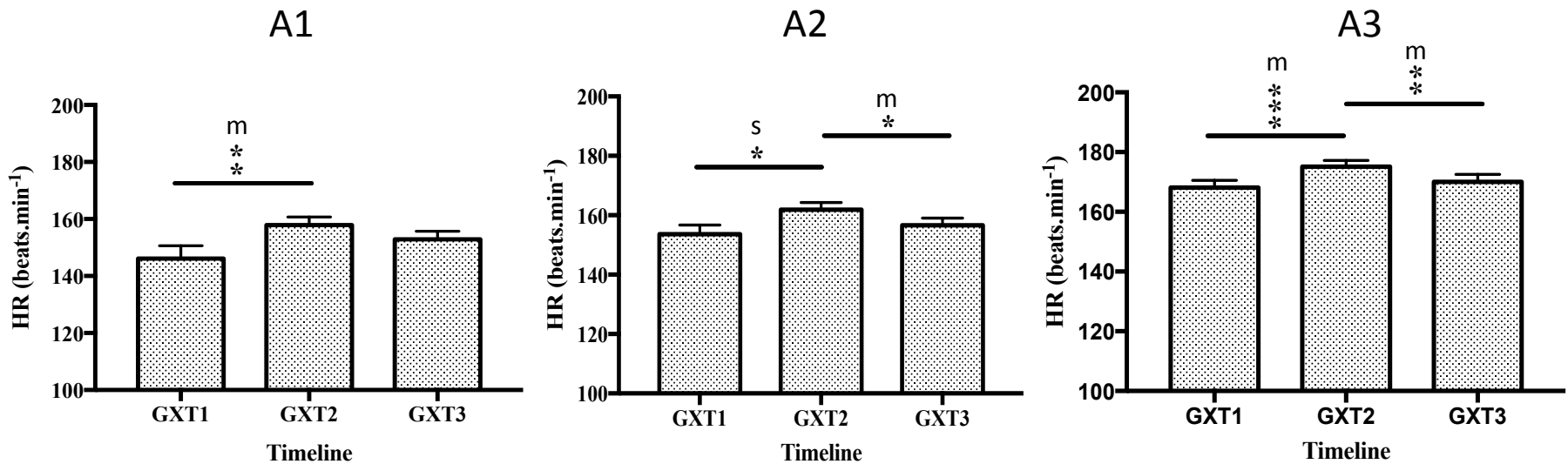


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Methods:

- 18 senior male rowers performed GXT in early (GXT1), middle (GXT2) and late (GXT3) winter training phase.
- Individual aerobic HRZ interpolated at BLA:
 - $<1 \text{ mmol.L}^{-1}$; HRZ A1, easy active recovery
 - $1.0\text{-}1.5 \text{ mmol.L}^{-1}$; HRZ A2, aerobic conditioning
 - $2.0\text{-}3.0 \text{ mmol.L}^{-1}$; HRZ A3, high aerobic intensity
- Curve fitting procedures were performed on individual HR and BLA responses to incremental exercise.
- Analysis of variance (ANOVA) and *post-hoc* analysis (Tukey) allowed for detection and quantification of changes in mean HRZ across the training phase.

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Results:

- Significant effect of time on mean HRZ ($P < 0.05$)
- *Post-hoc*: Significant change in mean HRZ A1, A2, A3 between GXT1 & GXT2; and in HRZ A1 and A2 between GXT2 & GXT3.
- No significant change in HRZ between GXT1 & GXT3.

m = moderate effect size, s = small effect size (Cohen's d)

$P < 0.05$ significant effect of time on mean HRZ

* $P < 0.05$, ** $P < 0.005$, *** $P < 0.0005$, significant difference between GXT

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Discussion:

- Aerobic metabolism supplies 75-80% of the energy demands for a 2000-m rowing race (Nilsen et al. 2002). Therefore training should emphasise aerobic intensities.
- HR is a preferred mode of exercise intensity prescriptions (Achten & Jeukendrup, 2003) and a reliable measure of such intensities in endurance sports (Becque *et al.* 1993).
- Shifts in metabolic and HR responses of non-elite rowers showed significant variation over a winter training phase.
- This suggests the need for serial modification of HRZ training prescriptions throughout winter training phase in non-elite cohorts.

Nilsen, T., *Intermediate Rowing Physiology*, in *The FISA Coaching Development Programme*, T.S. Daigneault, M, Editor. 2002, FISA: www.worldrowing.com

Achten J & Jeukendrup AE (2003). Heart rate monitoring: Applications and limitations. *Sports Med* **33**, 517-538.

Becque MD, Katch V, Marks C & Dyer R (1993). Reliability and within subject variability of VE, VO₂, heart rate and blood pressure during sub-maximum cycle ergometry. *Int J Sports Med* **14**, 220-223.

