

## Recalibration of calculated VO2max against measured VO2max.

VO2 max can be calculated from peak work load, according to Brudin, pp 251-254 in Jorfelt, L and Pahlm O: Kliniska arbetsprov, Lund, Studentlitteratur 2013 ISBN 9789144083834).

In the "Fotboll" study, we have measured VO2max in 22 athletes using Jaeger Oxycon equipment. In this short paper, we describe how we calculated their theoretical VO2max. This resulted in the following regression equation (see also scatterplot 2 below):

$$\text{VO}_{2\text{ max}} \cdot \text{kg}^{-1} \cdot \text{min}^{-1} = 0.95x - 1.254, r=0.79, R^2=0.63.$$

##

Recalculate the factor "K" (for details, consult "Kliniska arbetsprov" page 253 eq. 3 and 8). The different components of "K" can be added. K1 is at steady state and K2 follows the ensuing increase in load.

Calculations:

$$K1 = 6 \cdot (100)^5 \text{ according to eq 8.}$$

$$K2 = (W_{\text{max}}^6 - 100^6) / 30 / 6 \text{ according to eq. 3.}$$

$$K = K1 + K2 = 6 \cdot (100)^5 + (W_{\text{max}}^6 - 100^6) / 30 / 6$$

Convert K to Wmax6' according to eq 6.

$$W_{\text{max}}6' = (K/6)^{0.2}$$

Enter K into eq 11 and calculate the comparable load at a 6 min steady state cycling, Wss.

$$W_{\text{ss}} = W_{\text{max}}6' \cdot (1 - 0.2(1 - 50/W_{\text{max}}6')^5) \text{ (males)}$$

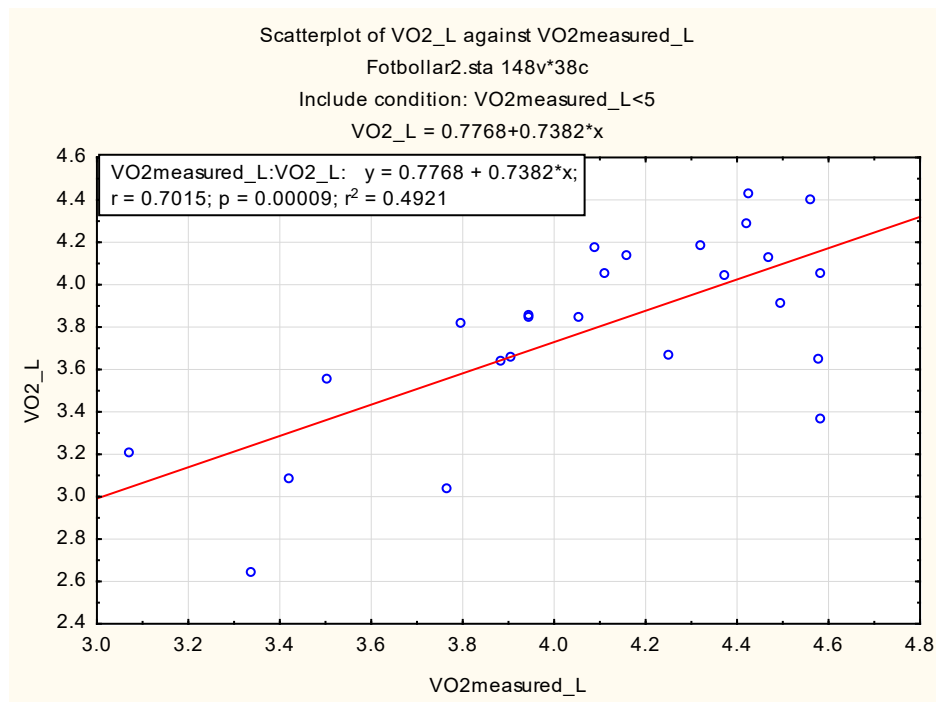
Estimate max VO2 in eq 12 according to I Åstrand ("Arbetsfysiologi", Norstedt publisher, Stockholm 1986).

$$\text{VO}_2 = 12.7W_{\text{ss}}/\text{BM} + 4.6$$

The factor 4.6 is the basal metabolism per kg and "BM" is body mass expressed in kilos.

This results in the following relationship between calculated and measured VO2:

## Scatterplot 1



If adjusted for body mass, VO2 per kg relates better ( $0.96*VO2measured$ ).

## Scatterplot 2

