# 1 Introduction.

Since 1999 we have our rebreathing diffusion option.available.
The reproducibility and interpretation has always been a point of discussion.

The predicted values where always too high, and differently corrected than published in the literature.
The predicted DLCO rb is not a predicted as usually calculated but depends on the ***measured*** Alv. Ventilation and Alv Volume.

This document describes the introduction of a new parameter that will be the new normalized estimated DLCO rb value.
After a discussion with the author, H. STam, he created a new exponential formula for the KCO from his study, this formula now, needs to be implemented.

# 2 New parameter

KCOst = KCO calculated according to the following formula:

**KCOrbN = ((44,584949202 + (-30,79427195*exp(-0,084992119*{V'A measured})) -1,825664937 * {VArb measured} - 0,087302371*{Age})) / 16,66667**

**KCOrbN in mmol/min/kPa**

KCOrbN% = KCOrb measured / KCOrbN

# 3 Formula TLCOrb and KCOrb

$$\text{TLCOrb} = 60 * \tau_{CO} * \frac{\left\{FRC_{STPD} + (V_D + V_{fill})_{STPD}\right\}}{P_{amb} - 6.25hPa} * \frac{1000}{22.4l/mol}$$

with: $\tau_{CO}$ = time constant in [1/sec]

Pamb = ambient pressure in kPa

$FRC_{STPD}$ = FRC at 0°C, 101.3 kPa, dry

$V_D$ = apparatus dead space, which is added to the filling volume

$V_{fill}$ = filling or starting volume of the rebreathing system

The unit of the so calculated TLCOrb is: $\left[\frac{mmol}{kPa \cdot min}\right]$

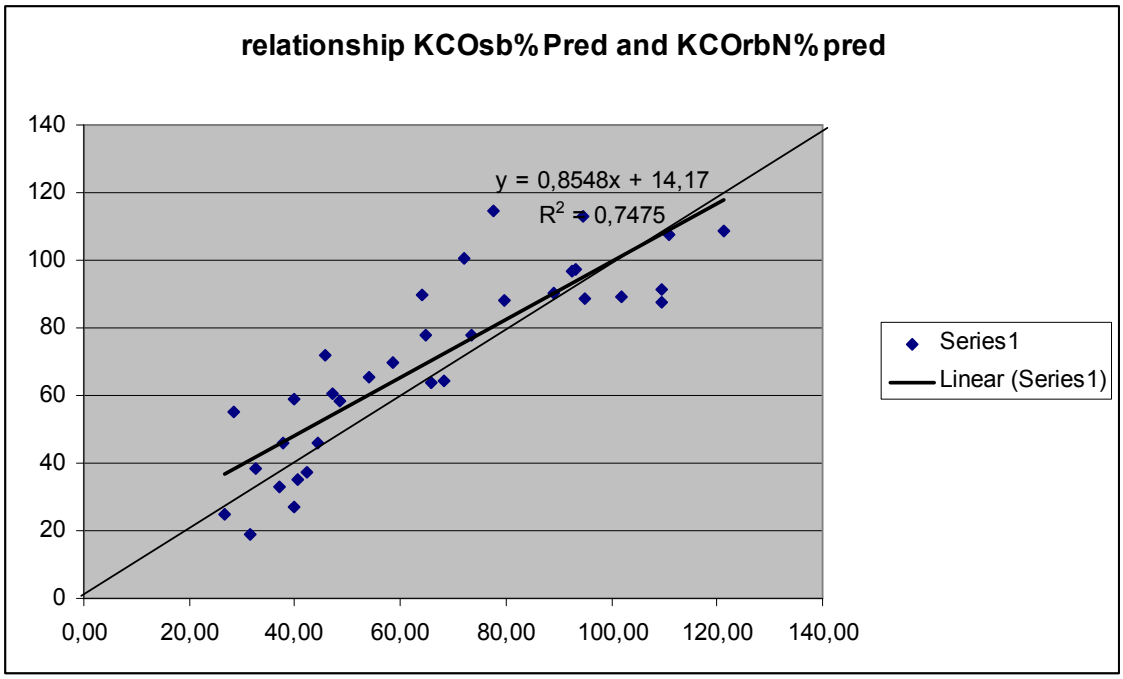
**KCOrb**

The Krogh-Factor KCO is calculated by:

$$KCO = \frac{TLCO_{rb}}{VA_{rb}}$$

## 4 Correlation between %DCO single breath and KCOrbN%KCOrb resp KCOcrb%KCoPred

New formula




Population of 60 patients, involving COPD, Asthma, Healthy, Emphysema

Especially below 50% KCOsb Pred, the rebreathing technology is very interesting.