Breathwork

Classic

Overview of physiological effects of Wim Hof Method Breathwork , Sascha Burkhardt (thx to Hannes Zedel)

30 x, approx 1'30 à 2'00

1'30 fast but often used by WH. => One Breathe in/ out=3 s

"Fully in" maximum inhale

"Let it go" FRV=functional residual volume,

("neutral relaxed lung state"

Hyperventilation

O2 +

CO2 –

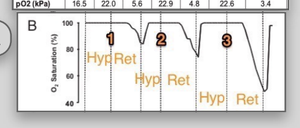
Heart Rate ++

more O2 in the lungs

easier O2 saturation of haemoglobine

A weak hyperoxemia effect (SPo2 from 97-98 to 100% at sea level).

pC02 (kPa)	4.49	2.11	4.01	2.03	3.76	1.69	3.48
pO2 (kPa)	16.5	22.0	5.6	22.9	4.8	22.6	3.4



Bohr-Effect –

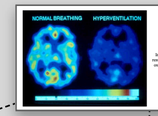
Alcalosis (blood pH ++)

higher O2 affinity of haemoglobine, less O2 released

reduced blood flow

Vasoconstriction

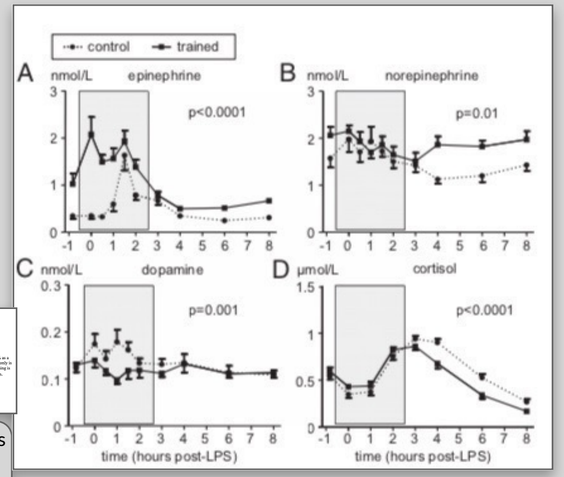
Brain Hypoxia (02-) Glucose-



Effects of Overbreathing on Cerebral O2: Vasoconstrictive effects
Reduction of O2 Availability by 40 Percent
(Red = more O2, dark blue = least O2)

In this image, oxygen availability in the brain is reduced by 40% as a result of alkalosis induced vasoconstriction. Not only is oxygen availability reduced, but glucose (vital to brain functioning) is also markedly reduced as a result of cerebral vasoconstriction.

Altered state of consciousness



Hypocalcemia

Tingling

muscle spasm

binding of calcium to albumin ++

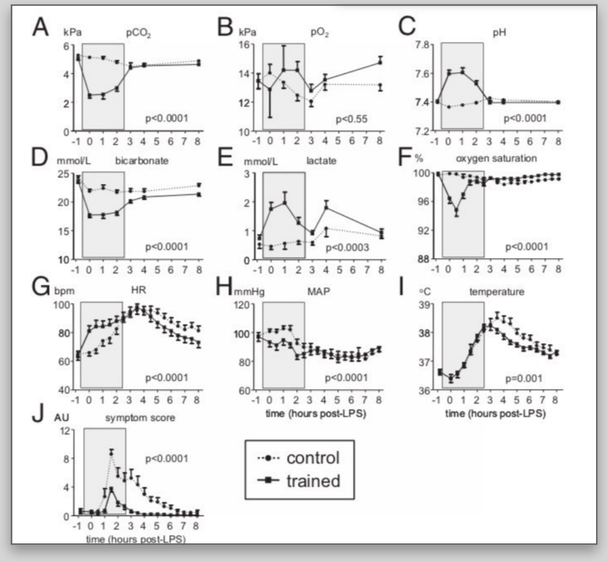
Stimulation of renal compensation

urine ph +

Nociceptor neuron sensitivity i– (temporary inactivation of ASICs)

Analgesic effects ++

delay of urge to beathe in the following retention phase



1'30'' ore more

Retention

FRV=functional residual volume,

("neutral relaxed lung state")

General intermittent Hypoxia

Brain intermittent Hypoxia

Only when stepping over the urge to breathe to some degree

hypercapnia (CO2++)

Heart Rate –

NO++ Sinus

transport NO lungs

15''

Inhale, Hold

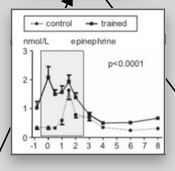
NO++ Airways

Vasodilation

blood pressure –

Open Airways for next round

Adrenaline ++



Analgesic effects ++

proinflammatory cytokines TNF-α, IL-6, and IL-8 - - (attenuation of the innate immune response)

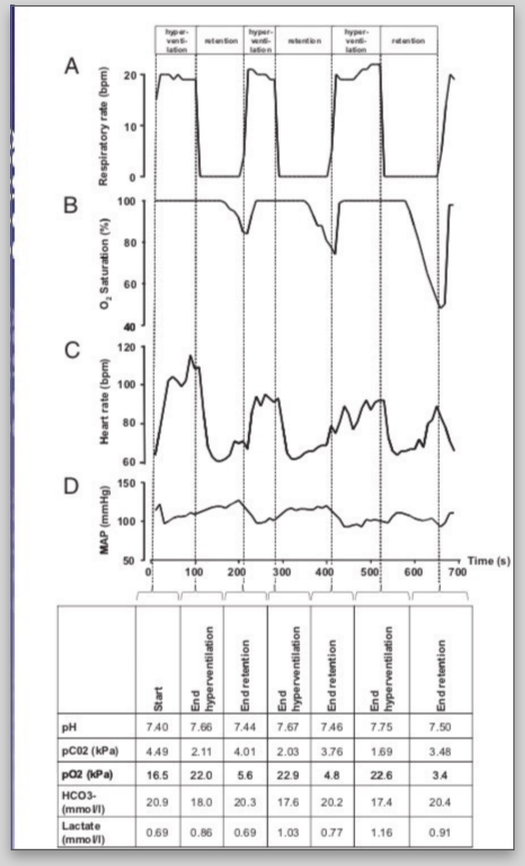
anti-inflammatory cytokine IL-10 ++ (attenuation of the innate immune response)

leucocytes ++ approx . (+10% to + 20%) upregulation of adaptive immunity probably via adrenaline or HIF1a and complementing factors

blood pressure +

ear ringing

Altered state of consciousness



	Start	End hyperventilation	End retention	End hyperventilation	End retention	End hyperventilation	End retention
pH	7.40	7.66	7.44	7.67	7.46	7.75	7.50
pC02 (kPa)	4.49	2.11	4.01	2.03	3.76	1.69	3.48
pO2 (kPa)	16.5	22.0	5.6	22.9	4.8	22.6	3.4
HCO3- (mmol/l)	20.9	18.0	20.3	17.6	20.2	17.4	20.4
Lactate (mmol/l)	0.69	0.86	0.69	1.03	0.77	1.16	0.91