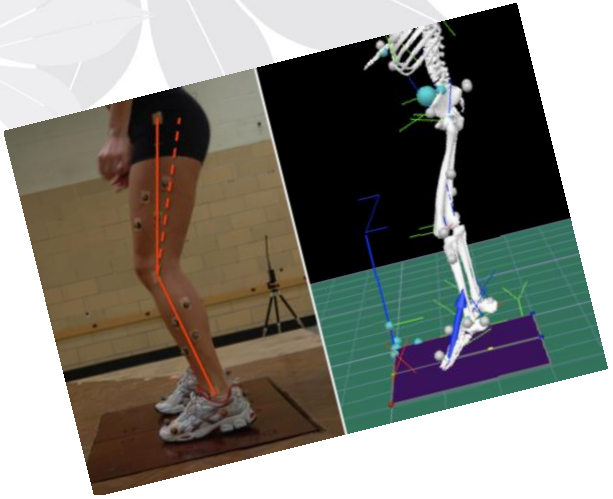
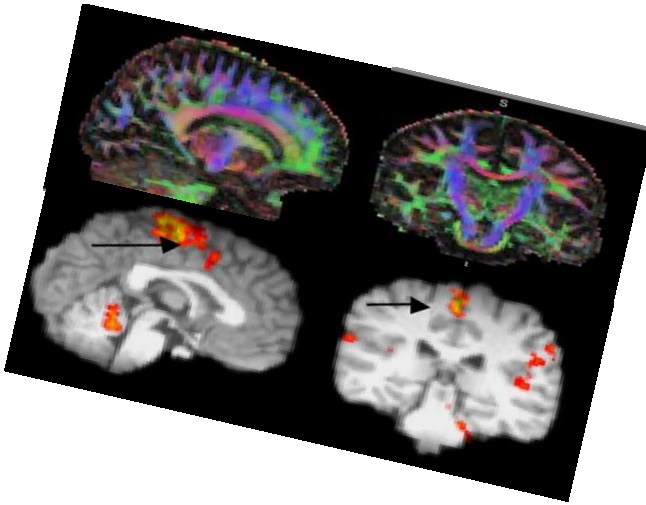
THE OHIO STATE UNIVERSITY
WEXNER MEDICAL CENTER

Training Mask

MOVES Lab at The Ohio State University

Nicole Hilton, Wesley Yao, Kristen Looman



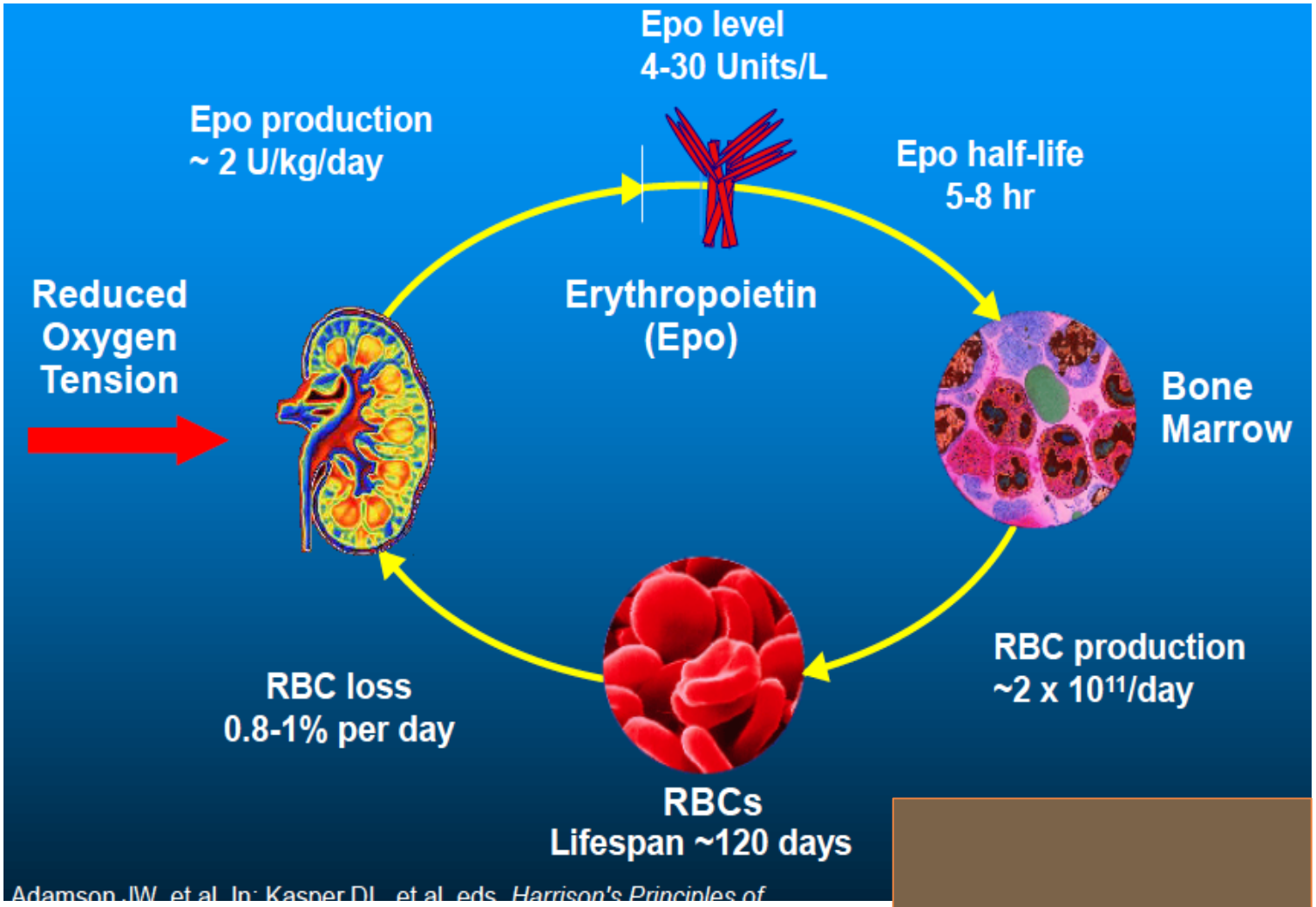


3/4/2015

Live High & Train Low

- Living (~20 h/ d) at High (~2400 m) Altitude & Training at Low (<1000m) Altitude Improves Aerobic Performance in Some Athletes
- Responding Athletes (~50%) will stimulate Erythropoietin & Increase Their Red Blood Cell Mass
- It Takes Several Weeks for Such Adaptations to Occur
- Improved Aerobic Performance Results from More Red Blood Cells Allowing Elevated Maximal Aerobic Power & Improved Buffering
- Hypobaric (High Altitude) Hypoxia Is More Effective Than Normobaric Hypoxia (Lowering Oxygen Percentage of Inspired Gases at Sea Level)
- Nitrogen Tents & Masks Are Two Methods Employed to Elicit Hypobaric Hypoxia

Normal Red Blood Cell Production Maintained By Erythropoietin



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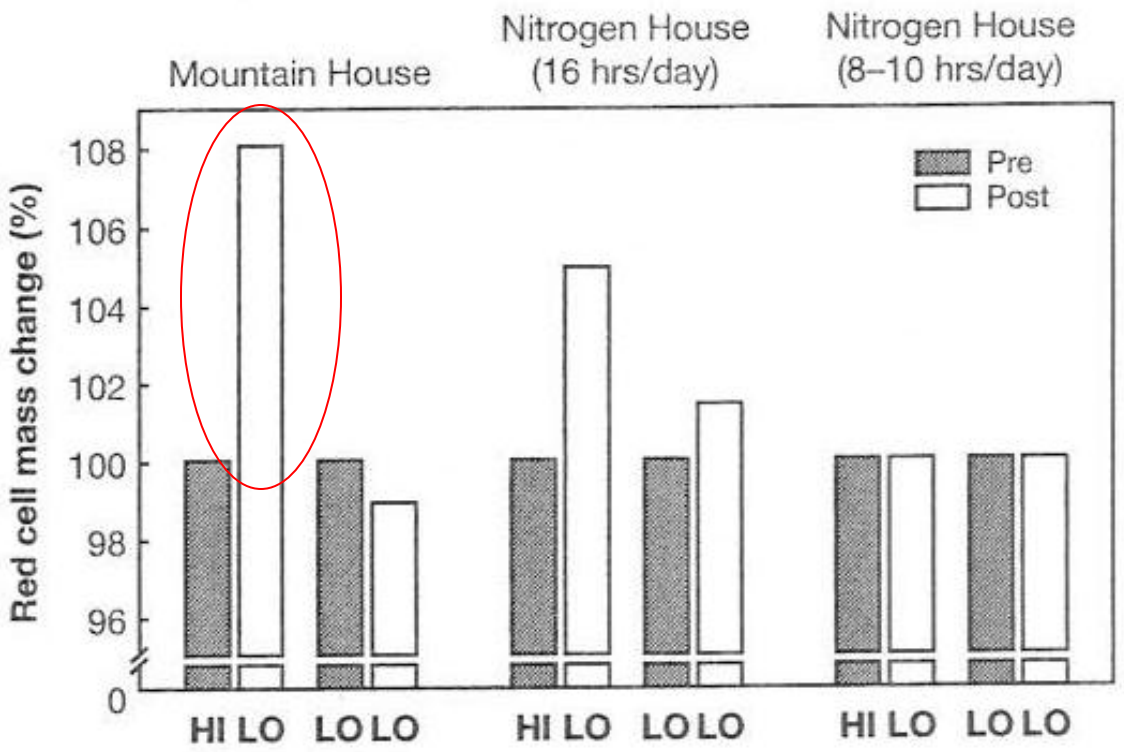
Erythrocyte Volume Expansion with Normobaric (Nitrogen House) & Hypobaric (Mountain House) Exposure



Levine & Stray-Gunderson Hypoxia & Exercise 2008

TRAINING MASK 2.0

SHOP

HOLDS FIRMLY IN PLACE

Ear straps hold the Training Mask 2.0 firmly in place during your most intense workouts.

NEOPRENE SKIN

Durable, washable, neoprene conforms to your face to create an air-tight seal. Various colors and styles available.

3 SIZES AVAILABLE

Available in Small, Medium, and Large to fit any body type and create a comfortable fit.

AIR RESISTANCE VALVES

Strengthen your diaphragm by adjusting Training Mask 2.0's resistance valves to simulate different altitudes. 12,000 feet too intense? Start at 3,000 feet and work your way up.

TRAINING MASK 2.0 VALVES

VARIABLE RESISTANCE CAPS

Training Mask's resistance caps allow you to increase resistance as you build your stamina and strength.

ADJUSTABLE FLUX VALVE SYSTEM

Quickly increase resistance by shutting off air inlets to simulate high altitude training situations.

TURN ON THE INTENSITY

Snap-on snap-off caps allow you to adjust the resistance on the go. Pump new life into old routines and make fatigue and training plateaus a thing of the past.

FROM 3,000 FT TO 18,000 FT

Each Training Mask 2.0 includes 7 resistance caps and 3 flux valves allowing you to increase your altitude as you increase your lung capacity and oxygen efficiency.

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Claimed Benefits of Mask Use

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journal homepage: www.elsevier.com/locate/phb

Brief communication

Popularity of hypoxic training methods for endurance-based professional and amateur athletes

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Alverez-Herms et al 2015

1. **Professional endurance athletes were 4.5 times more likely than amateur endurance athletes to undertake hypoxic training**
2. **Live High-Train Low was the most popular hypoxic training method (52% professional and 80% amateur)**
3. **Live High-Train High also used (38% professional and 20% amateur)**
4. **Professional athletes tended to use more evidence based hypoxic training methods, sought advice from expert reliable sources, and had more realistic expectations of potential performance gains**
5. **Approximately 1/3 (25%-30%) suffered an illness during hypoxic training**

PLOS ONE | PLOS ONE | DOI:10.1371/journal.pone.0114072 December 4, 2014

RESEARCH ARTICLE

Effect of Acute Exposure to Moderate Altitude on Muscle Power: Hypobaric Hypoxia vs. Normobaric Hypoxia

Belén Feriche[1]*, Amador García-Ramos[1], Carmen Calderón-Soto[2], Franchek Drobnic[3], Juan G. Bonitch- Góngora[1], Pedro A. Galilea[3], Joan Riera[3], Paulino Padial[1]

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- **This Seems Like a Very Tenuous Claim – Not Consistent With High Altitude Exposure!!**
- **Acute exposure to natural moderate altitude as opposed to simulated normobaric hypoxia leads to gains in 1RM, movement velocity and power during the execution of a force-velocity curve in bench press.**

Hypoxic Training: Effect on Mitochondrial Function and Aerobic Performance in Hypoxia

PAUL ROBACH[1], THOMAS BONNE[2], DANIELA FLÜCK[3,4], SIMON BÜRGI[4], MARCO TOIGO[3,4,5], ROBERT A. JACOBS[3,4], and CARSTEN LUNDBY[3,4]

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- **Conclusions: data suggest that, in moderately trained subjects, 6 weeks of hypoxic training possesses no ergogenic effect at sea level.**
- **It is not excluded that hypoxic training might facilitate endurance capacity at moderate altitude; however, this issue is still open and needs to be further examined**

What It Does

- Simulates receiving less oxygen, as if you are at a higher altitude
- 3 valves for different altitude settings
- Causes you to take deeper breathes
- Induces diaphragmatic breathing

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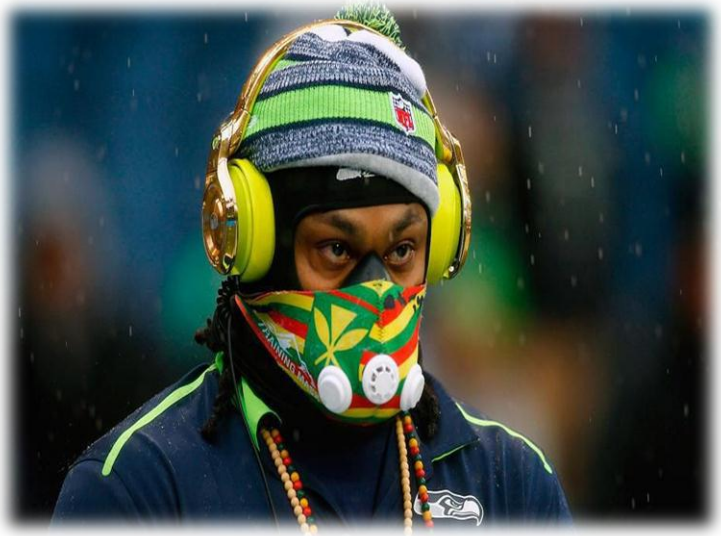
Claimed Pros

- Learning how to take deeper breathes. The deeper you breath, more oxygen to your body. (Do athletes need training to increase alveolar ventilation – seems unlikely?)
- Attempts to increase lung capacity.
- Does it provide inspiratory resistance to possibly train diaphragm? If so then might be small benefit
- Gives athletes a confidence boost because they think they are getting an upper hand in training (i.e., working harder)



Cons

- Cannot consciously change breathing patterns after mask removal
- Less oxygen will cause quicker physiological exhaustion
- Could hinder skill development due to changed breathing patterns
- Skill-based workouts: getting tired faster reduces amount of skill work training time
- Amount of exposure is not great enough for physiological benefits
- Physiological adaptation associated with altitude will not take place

Cons

- Will not increase red blood cell count
- Feeling of working harder, but less physiological effect due to lower overload capacity capabilities
- May not allow for adequate muscle development
- Still have the same amount of air in lungs
- Any positive acclimatization effects may be negated by a de-training effect as the athletes are usually not able to exercise with as much intensity at high altitudes to sea level

Current Recommendations

- **We do not recommend the mask for training.**
- **Possible risk of de-training could occur due to incapability of training at high intensity for longer duration.**
- **It puts the athlete in the opposite situation of the Live High: Train Low Principle**

Questions

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Special Thanks
Michael Sawka, PhD

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