

MANDI KAUR
U CHANGE 1 LIFE

*The Science
& Art of
Breathing*





Breathing requires a sophisticated motor program to ventilate the lungs and respond appropriately to physiological challenges and changing environmental conditions.

Breathing movements depend on pump, resistance and accessory muscles.

The gas-exchanging surface of human lungs, consisting of $\sim 5 \times 10^8$ alveoli each measuring $200 \mu\text{m}$ in diameter, is roughly half the size of a tennis court ($\sim 70 \text{ m}^2$) but is contained in a volume of < 3 litres.

The Deceptive Simplicity of Breathing



AT REST, WE INHALE AND EXHALE ~5 LITRES OF AIR PER MINUTE (~10 × 500 MILLILITRE BREATHS PER MINUTE, CONTAINING ~ 1 LITRE OF O₂); WE EXTRACT FROM THE INSPIRED AIR ~250 MILLILITRES OF O₂ PER MINUTE TO SUPPORT METABOLISM AND ADD TO THE EXPIRED AIR ~200 MILLILITRES OF CO₂ PER MINUTE.

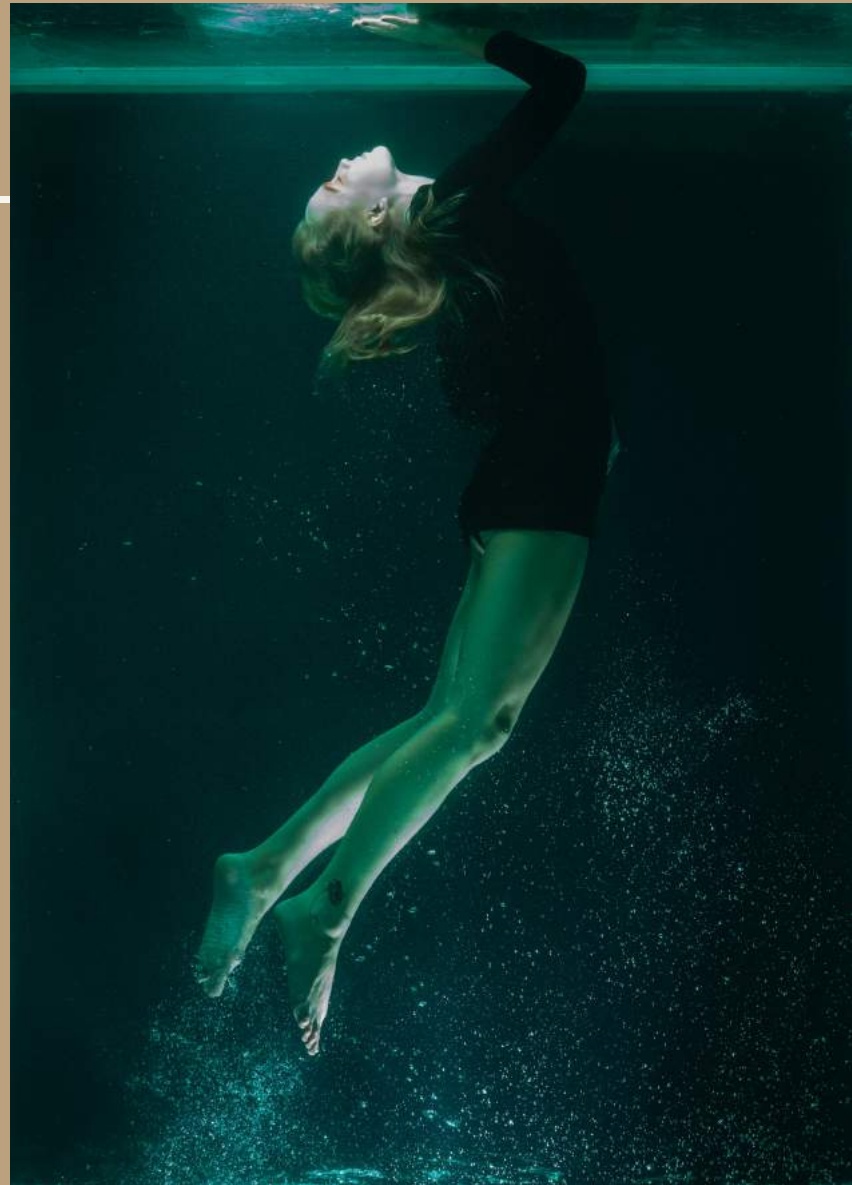
Breathing: Statistics

U Change 1 Life

The regulation of breathing

It relies on feedback from peripheral and central chemosensors. Carotid bodies, at the branch point of the carotid arteries, monitor the partial pressure of O₂ (pO₂), the partial pressure of CO₂ (pCO₂) and pH in arterial blood and signal to the brainstem via the glossopharyngeal nerve (cranial nerve (CN) IX).

U Change 1 Life



*The
timing &
pattern
of each
breath is
important*



The timing & pattern of each breath is important

