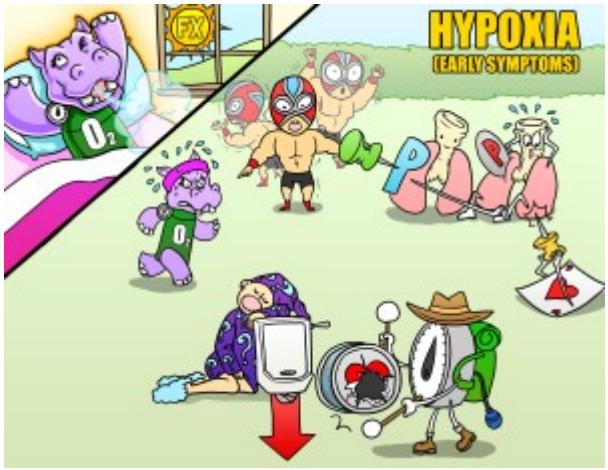
Hypoxia (Early Symptoms)

Low oxygen in the blood (hypoxemia) leads to hypoxia, which is the condition of inadequate tissue oxygenation at the cellular level. It can be a life-threatening problem and lead to fatal cardiac dysrhythmias. As the stages of hypoxia progress, the early symptoms of hypoxia can manifest. Depending on the underlying causes of hypoxia, patients often show varying degrees of symptoms.



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Diaphoresis
Sweaty-sweatband
Compensatory release of catecholamines like epinephrine and norepinephrine increases metabolic demand possibly leading to excessive perspiration, termed diaphoresis. It can sometimes be a sign of an underlying medical condition, especially in the absence of a triggering event like aerobic exercise. This is the body's attempt to control metabolic demand by decreasing heat by increasing moisture on the skin to decrease ambient temperature.

Restlessness
Restless-wrestler
The body's response to decreased oxygenation in the bloodstream releases catecholamines like epinephrine and norepinephrine. These catecholamines activate a sympathomimetic response ("fight or flight" response) and can produce feelings of apprehension, restlessness, and irritability.

Tachypnea
Tac-P-lungs
Central and peripheral chemoreceptors, found in the brain and peripheral nervous system, respectively, detect hypoxemia and stimulate a respiratory response by increasing the lung's ventilatory rate and depth.

Dyspnea on Exertion
Disc-P-lungs with Exertion
An increased demand of oxygen for cellular aerobic respiration and a decreasing available supply of oxygen in the bloodstream produces the feeling of dyspnea with further exertion. To correct this imbalance, the demand for oxygen must decrease or the availability of oxygen must increase.

Tachycardia
Tac-heart-card
The heart's response to decreasing available oxygen in the bloodstream leads to tachycardia. An increasing heart rate with a preserved or increased stroke volume increases cardiac output (heart rate x stroke volume = cardiac output) of oxygenated blood to the body's tissues.

Hypertension
Hiker-BP
Tachycardia increases blood pressure (hypertension) and is a compensatory (corrective) sign of early hypoxia. However, if metabolic demand increases and/or oxygen supply drops despite such compensatory signs, the body cannot sustain nor survive these conditions.

Arrhythmias
Broken Arrhythmia-drum
The heart is very sensitive when detecting low oxygen levels. When available oxygen decreases without a compensatory response to correct the problem, the cardiac muscle (myocardium) can sustain cellular damage and death. Cellular death of the myocardium disrupts both the electrical signal through the heart and the heart muscle's ability to contract, resulting in the development of dysrhythmia or arrhythmia.

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Decreased Urine Output

Down-arrow Urinal

In response to early-hypoxia, hypertension, loss of total body water through diaphoresis (e.g. dehydration), and increasing cellular demand for oxygen can lead to problems in the kidneys. These problems arise from decreasing serum (bloodstream) availability through the kidneys and decreased perfusion to the kidney's cells (nephrons), marking dysfunction to concentrate and produce urine.

Unexplained Fatigue

Question-mark Sleepy-guy

A feeling of extreme tiredness occurs as both a compensatory response to decreased metabolic demand, improving the availability of oxygen in the bloodstream, and as a result of decreased oxygen to parts of the brain (e.g. decreased cortical activation). This fatigue may occur as an early or late symptom.

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