

Wireless Electromagnetic Stimulator of Diaphragm (WESD)

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Breathing is considered to be an indication of human survival because it's crucial for ordinary functioning of the body. Several organs are involved in keeping an adequate level of ventilation like lungs, intercostal muscles, diaphragm and others. Moreover, this process is controlled primarily by the respiratory center in the brain stem.

On the other hand, many serious risks like development of cancers, heart failure, and damage of tissues and organs are involved with the cessation of breathing during asleep which is often defined as "sleep apnea". In our research we focus on treating cases which affect the contraction of the respiratory muscles which directly associated with respiratory distress; such as central sleep apnea which is also associated with neuromuscular diseases like: Parkinson's disease, Alzheimer, and Amyotrophic lateral sclerosis, we also consider cases that cause phrenic nerve injuries which prevents the diaphragm from getting the message to breath.

We are also discussing some of the existed devices which have been the frontline treatments for such sleep-breathing related problems like CPAP and the diaphragm pacing system and their related side effects such as discomfort.

We are suggesting DESD as a better treatment, because it represents an alternative way to stimulate the diaphragm when brain doesn't send the proper signals of contraction or when the signals themselves aren't transmitted properly through the phrenic nerve. With DESD we suggest to give an alternative electrical stimulation to the diaphragm during sleeping using wireless power transmission technologies.