



Epilepsy Centers Without Walls

The NINDS's Epilepsy "Centers without Walls" (CWOW) were created by NIH leadership in recognition of the profound need for a revitalized commitment to research on epilepsy. NINDS, in conjunction with the epilepsy research community, conceptualized the idea of a series of centers without walls as teams of investigators that would come together, regardless of their geographical locations, to attack specific challenges in epilepsy research that require multidisciplinary approaches.

What is Epilepsy?

Epilepsy is a spectrum of brain disorders characterized by spontaneous seizures, which are caused by disruptions in the brain's electrical activity.



1 in 26 individuals in the U.S. will develop epilepsy at some time in their life (mostly young children and the elderly)



30 million worldwide have epilepsy



60% of epilepsy cases have unknown causes



1 out of 3 individuals with epilepsy is not responsive to anti-seizure treatments

Center for SUDEP Research

SUDEP is the sudden, unexpected death of someone with epilepsy, who was otherwise healthy.

There are at least 2,750 cases of SUDEP in the U.S. every year

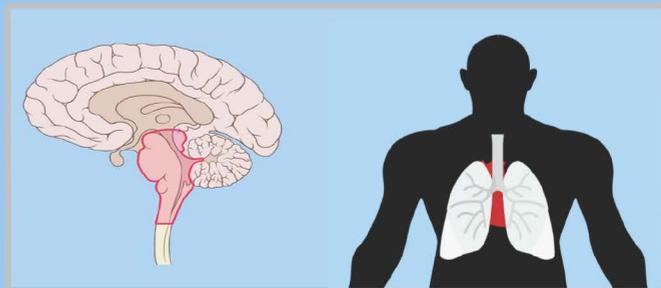


15% lifetime chance of epilepsy resulting in SUDEP
source: CDC

SUDEP is hypothesized to be caused by seizures that induce structural defects and neural circuit malfunction in areas of the brainstem (midbrain, pons, and medulla; indicated in pink) that control cardiovascular and/or respiratory functions.



35% lifetime chance of refractory epilepsy resulting in SUDEP
source: CDC



The Center for SUDEP Research brings together 40 physicians, neuropathologists, cardiologists, pulmonologists, and data scientists from across the U.S. and U.K. to develop a detailed clinical SUDEP database and to investigate the respiratory and cardiovascular origins of SUDEP.

Projects include:



DNA sequencing of individuals who have died of SUDEP



Structural analysis of brains from individuals with SUDEP



Mouse models of molecular basis of changes identified in individuals with SUDEP



Development of induced pluripotent stem cells from individuals with or at risk for SUDEP to study autonomic, neuronal and cardiac function



Identification of brain pathways by which cortical seizures affect cardiorespiratory function



Identification of biological signatures (blood and other tissues, medical imaging) of SUDEP



Tracking of physiological changes during patient stays in epilepsy monitoring units.

