



# Tonic-Clonic Seizures

Tonic-Clonic (grand mal) seizures are electrical disturbances that disrupt normal brain function. Tonic-clonic seizures are what most people think of when they think of a seizure. Tonic-Clonic seizures combine the characteristics of tonic and clonic seizures. Tonic means stiffening, and clonic means rhythmical jerking. Tonic-Clonic seizures vary a lot among people with epilepsy. During the tonic phase, muscles stiffen, a cry or groan is often heard, one loses consciousness, and the afflicted person may bite their tongue or inside of their cheek.

**336,000 KIDS**  
HAVE AT LEAST  
**ONE SEIZURE**  
ANNUALLY



**4 in 10**

live in homes at or close to the poverty level



**3 in 10**

live in homes without enough food



# Tonic-Clonic Seizures

Tonic-Clonic is rare. Many people will have only one Tonic-Clonic seizure in a lifetime. For some, the seizures will require anti-seizure medications to prevent a recurrence.

Some may experience rhythmic muscle contractions, stiff muscles, rhythmic muscle contractions, or muscle quivers. Other characteristics of a Tonic-Clonic aura or pins and needles are feeling mental confusion or confusion following a seizure. It is reported that as many as 65% of people with epilepsy experience auras. Also common is blue skin from poor circulation, drooling, fainting, headache, leaking of urine, lip and tongue biting, or sleepiness. Losing control of the bladder or bowel as the body relaxes is common.





*Children's Brain Institute*

# Tonic-Clonic Treatments



Tonic-clonic seizure treatments can involve medication, surgery, dietary therapy, nerve stimulation, or a combination of these approaches. Several antiepileptic drugs (AEDs) are used to treat tonic-clonic seizures. Which drug should be used depends on the individual patient, not on the seizure type only. Valproic acid is often used for those who have multiple seizure types, including generalized tonic-clonic seizures. Newer medications like zonisamide, topiramate, and levetiracetam work as well if not better than older antiepileptic drugs and have better side-effect profiles. The older first-generation AEDs such as phenytoin, carbamazepine, phenobarbital, valproic acid, and topiramate can result in a baby being born with a birth defect.





# Tonic-Clonic Treatments



Some patients with generalized tonic-clonic seizures respond well to Vagus nerve stimulation. Stimulators are surgically implanted and a wire is threaded to the left vagus nerve. New, non-invasive vagus nerve stimulators, which don't require surgical implantation, have been approved in Europe to treat seizures.

Studies indicate that a ketogenic diet substantially reduces seizure frequency in 50% of patients placed on the diet. A ketogenic diet should be an option to improve seizure control in younger patients whose condition is refractory may benefit from a ketogenic diet.

