general anesthesia. Barbiturates are an older type of medication including phenobarbital, which are not often used due to high levels of addiction and a very narrow window of effectiveness before serious problems occur. Barbiturates may still occasionally be used to control seizures. Other categories of medications used as anxiolytics include selective serotonin reuptake inhibitors (SSRIs) such as celexa (Citalopram), fluoxetine (Prozac), and sertraline (Zoloft); serotonin-norepinephrine reuptake inhibitors (SNRIs) such as venlafaxine (Effexor XR); and tricyclic antidepressants such as amitriptyline (Elavil). Although these drugs may not work as quickly as CNS depressants, they have very little dependence issues.

Insomnia and Medications

Insomnia (trouble sleeping) is a common complaint from patients. Sometimes barbiturates are used to induce sleep by depressing the CNS (slowing heart rate, respirations). They are also used to help the patient relax before a minor procedure or general surgery. Other newer non-narcotic benzodiazepine hypnotics such as zolpidem (Ambien) and eszopiclone (Lunesta) help to promote sleep with fewer side effects. Both types of medications target the same portion of the brain, but the newer non-narcotic medications are able to target just the areas promoting sleep without depressing the entire CNS. These medications are therefore becoming the preferred sleep aids, but they continue to pose a possible addiction risk. Therefore, they should be used on a limited basis.

Barbiturates and Antiseizure Medications

Barbiturates are also used to control seizures (A Closer Look 13.2). Barbiturates that are **hydantoins,** such as phenytoin (Dilantin), delay sodium from crossing the neural membranes. This effect decreases the potential for too much electrical activity and calms the cell. Hydantoins are the drug of choice for tonic-clonic (grand mal) and partial seizures. Other barbiturates such as phenobarbital (Luminal) are used for tonic-clonic and febrile seizures in children. Succinimides such as ethosuximide (Zarontin) comprise a class of antiseizure drugs that delay the movement of calcium over the neurons. Like hydantoins, they relax nerve cells. The succinimides are the drugs of choice for absence (petit mal) seizures.

The reason that traditional antiseizure medications decrease seizure activity has long been poorly understood. Researchers eventually discovered, however, that the naturally occurring **gamma-aminobutyric acid (GABA)** is a neurotransmitter inhibitor. In other words, GABA inhibits abnormal electrical activity in the brain, and an increased presence of this amino acid decreases seizure activity (Fig. 13-2). The discovery led researchers to look for agents that could affect GABA activity. An example of this category of drug is vigabatrin (Sabril). Benzodiazepines such as diazepam (Valium) can also intensify the effect of GABA transmitters in the brain and allow more GABA to reach the receptors in the brain to trigger the actions needed to suppress abnormal electrical activity. Other medications that work as anticonvulsants are lamotrigine (Lamictal), tiagabine (Gabitril), topiramate (Topamax), and carbamazepine (Tegretol).

A CLOSER LOOK 13.2: Seizures

Abnormal electrical activity in the brain can cause seizures. A patient may have a diagnostic test called electroencephalography (EEG) to detect seizure activity. Seizures may be mild (petit mal) or severe (grand mal). The most severe seizure is called **status epilepticus.** In this instance, the patient is having a tonic-clonic (grand mal) seizure that lasts for longer than 30 minutes and cannot regain consciousness. Because the patient is not breathing during this episode, there is a high risk for brain damage and death without immediate medical intervention, usually with IV benzodiazepines such as Valium.