Brain Injury and General Rehabilitation Information Series

MEDICAL ISSUES
Seizures & Stroke Risk

A Service of
Santa Clara Valley Medical Center
What Are Seizures?
A seizure occurs when a particular area of the brain fires spontaneously without voluntary control. It can result in an unexpected sensation (visual image, smell, sound, feeling or taste), motor activity (head, eyes, or limb shaking), and/or change in alertness, ability to speak or understand. During a seizure, it is impossible for the person to voluntarily stop this activity even if they are awake and alert. A seizure usually lasts only seconds to minutes. Rarely, it can continue for 5 to 10 minutes without stopping. Loss of bowel or bladder control or tongue-biting may accompany a seizure. After a seizure, the person may be drowsy, weak, confused or have difficulty speaking.

Seizures are very common after brain tumors, arteriovenous malformations (AVM), strokes, and traumatic brain injury (TBI). High fever, sleep deprivation and extreme fatigue, drug and alcohol use, and metabolic disturbances can increase the risk of seizures if someone has had a brain injury.

Disclaimer:
This information in this booklet is not meant to replace the advice of a medical doctor. Persons should consult qualified physicians regarding specific medical concerns or treatment.

For more information or to schedule a SCVMC Clinic appointment, call 408 885--5920 or 800-314-4611
Are There Medications?
Antiepileptic medications (AEDs) are often used to prevent or treat seizures after any of the above medical conditions. If a person has not had a seizure and is on medication, your physician will want to discuss the ongoing need for AEDs, because they all have side effects that may be greater than the risk for seizures. Even if a person has had a seizure, it may be unnecessary to continue AEDs if the risk for recurrent seizures is low. This is particularly true if the only seizure occurred in the first week post-injury.

What If Someone Has a Seizure?
It is very important to be a close observer as to what happens during a seizure, so that you can explain what occurred to physicians and nurses who will be treating it. It is also important to help the person having the seizure from hurting themselves during and after the episode by doing the following:

1. Loosen tight clothing, particularly around the neck.

2. If the person is sitting in a chair, hold them so they won’t fall or tip the chair over.

3. Get him/her to the ground safely if possible.

4. Turn them and their head to the side so that anything in the mouth, even saliva, does not block the airway.

5. Call for help. Call the person’s physician. Make sure that you have a record of all the person’s medications (dose and frequency) when calling.

6. If the person stops breathing or the seizure does not stop after 3-4 minutes, CALL 911.
Common Antiepileptic Medications (AEDs)

Some of the common AEDs are listed below. Each has been associated with birth defects, so continued use during the first 20 weeks of pregnancy must be evaluated carefully by the patient and treating physicians.

**Phenytoin and fosphenytoin (Dilantin, Cerebyx)**
Available in IV, extend release capsules, tablets, liquid
*Advantages*: partial or generalized seizures, 1/day dosing if capsule, can be loaded PO or IV
*Disadvantages*: gingival growth demands meticulous gum care, facial hair growth, slowed thinking, rashes (20%), facial changes, ataxia, osteoporosis/bone loss after prolonged use. Liver and bone marrow effects. Blood tests to monitor level.

**Carbamazepine (Tegretol)**
Available in tablets or liquid, no IV preparation
*Advantages*: Partial or generalized seizures. May stabilize mood, outbursts, agitation, tremor
*Disadvantages*: 2-3 x / day dosing, ataxia, double vision at high doses. Mild slowed thinking. Bone marrow effects require blood tests, rashes (20%)

**Valproic acid (Valproate, Divalproex)**
Available in capsules or liquid, no IV preparation
*Advantages*: Petit mal seizures, generalized seizures, some partial seizures. May stabilize mood, outbursts, agitation, tremor
*Disadvantages*: 2-3 x/day dosing. Liver effects require blood tests, rare pancreatitis, thrombocytopenia.

**Phenobarbital**
Available in IV, tablets, liquid preparations
*Advantages*: partial or generalized seizures, 1 x/day dosing
*Disadvantages*: Sedation, slowed thinking, rashes (20%), withdrawal seizures
Blood levels are readily available for all of medications on the left. Therapeutic levels are just guidelines. Some people require higher than “therapeutic” levels for control of their seizures.

Clonazepam (Klonopin)
Available in tablets
Advantages: generalized seizure. 1-2 x/ day dosing
Disadvantages: sedation, slowed thinking, withdrawal seizures

Gabapentin (Neurontin)
Available in capsules only
Advantages: Minimal effect on blood level of other drugs, ideal for adding as second agent, no additional blood tests necessary. May help neuropathic pain
Disadvantages: 3-4 x /day dosing, sedation

Felbamate (Felbatol)
Available in tablets
Advantages: 2nd agent
Disadvantages: 2-3 x/day dosing, Liver, bone marrow toxicity, alters metabolism of other AEDs. Weight loss, headache

Lamotrigine (Lamictal)
Available in tablets
Advantages: add on or monotherapy
Disadvantages: alters metabolism of other AEDs. Rash, tremor, ataxia, dizziness, headache, weight gain.

Topiramate (Topamax)
Available in tablets
Advantages: Lennox-Gastaut syndrome, partial seizures, minimal AED interactions
Disadvantages: dizziness, drowsiness, kidney stones
Determining the probable cause of a stroke is important so that further strokes can be prevented. The most common risk factors for stroke that can be altered are high blood pressure, certain forms of heart disease and vascular disease, smoking, high cholesterol, uncontrolled diabetes, and certain hypercoaguable states. Family history or tendency towards vascular or heart disease obviously cannot be altered.

Some of the measures taken to reduce stroke risk are listed below:

**High blood pressure management:** Maintaining adequate blood pressure during the first 2-3 weeks after a thrombotic stroke is important in promoting recovery. Often weight loss and following a low salt diet are sufficient to control hypertension. If medications are required, it is advantageous to find one that is effective, convenient to take, affordable, and has minimal side effects. Fortunately many effective antihypertensive medications are available. Those that have been shown to decrease mortality and recurrent cardiovascular disease include the following classes of medications: thiazide diuretics, beta-blockers, and angiotensin converting enzyme (ACE) inhibitors.

**Heart disease management:** Of all types of heart disease, atrial fibrillation is the most common contributor to strokes. If the heart rhythm cannot be converted to sinus rhythm, then lifetime anticoagulation with warfarin is recommended. Because warfarin interacts with food and other medications, this will require frequent blood tests to monitor the coagulation activity of your blood. Treating your heart disease optimally will also improve your activity tolerance and energy level.

**Aspirin or another anti-platelet aggregation medication** may be prescribed to prevent further thrombotic strokes. One baby or reg-
ular aspirin tablet is usually enough to obtain the desired effect. However, some people will have recurrent strokes despite aspirin use or be intolerant of aspirin. In those instances, clopidogrel (Plavix) or ticlopidine (Ticlid) may be recommended. Ticlopidine requires frequent blood monitoring for bone marrow depression.

**Smoking** accelerates cardiovascular and cerebrovascular disease in addition to contributing to lung, throat and bladder cancer. If you can possibly stop smoking and avoid second-hand smoke, your risk for recurrent stroke or a heart attack will decrease almost immediately.

**High cholesterol** can be managed by diet alone in some people. This usually requires decreasing total caloric intake and fat intake. Dietary counseling is helpful in learning healthier eating habits. You may also need one of several cholesterol-lowering medications.

**Diabetes mellitus** increases the risk of all kinds of vascular disease. Good control of blood sugar, e.g., keeping your sugars below 120-140 mg% can delay the onset of diabetic complications. This usually requires good dietary habits in addition to prescribed insulin or oral hypoglycemic medications.

**Hypercoaguable states**, such as sickle cell disease, lupus anticoagulants and homocysteinemia are more common in younger individuals who have strokes without the above risk factors. The diagnosis of these conditions often requires many blood tests that are sent to special laboratories. These conditions can be hereditary, so if you find that you have one of them, it may be important for certain family members to be tested, so that they may be able to be treated before a stroke or vascular event occurs.

**Surgery** for aneurysms, AVMs, or carotid artery stenosis or narrowing may be indicated to prevent further strokes.