

## **Pathways To Comfort: Dealing With Pain And Brain Injury A Companion Guide To The Road To Rehabilitation Series**

### **Step 6: Drug Therapy**

#### **Why are medications used for problems associated with brain injury?**

The basic unit of the nervous system is the neuron or nerve cell. Billions of these cells connect with one another to transmit information from one part of the brain to another. The messages are passed on by chemicals (neurotransmitters) released by one cell and absorbed by the next cell down stream. With brain injury, the cell's ability to produce these neurotransmitters is reduced by either interference with production or with release or with absorption. This results in a change in the brain's ability to process information. Medications that are prescribed after brain injury improve the brain's natural ability to produce and utilize neurotransmitters. The medications act as a "cast" for the neuron to allow more normal activity during recovery. In situations where the neuron fails to recover its function, medications are then used as "splints to allow the most "normal" neuron function possible.

#### **What factors influence the physicians' choice of medication?**

Four principles of medication selection are needed:

- **Target symptom:** What is the problem that is to be addressed by drug intervention? This could include problems such as headache, insomnia, dizziness, depression and impulsivity. By defining the problem specifically, medication effects can be weighed against the likelihood of spontaneous improvement. Also, the underlying neurochemical problem can be addressed if the region of the involved area is known or if the problem has a known neurochemical deficiency.
- **Route of administration:** Can the medication be given orally, by injection, by inhalation or by some other route? The speed of absorption is largely determined by the route of administration. Problems associated with toxic levels can be accelerated, too.
- **Onset of action:** How long does it take the medication to work? This factor depends upon the speed at which the medication crosses from the bloodstream into the neuron and, then, the speed with which it alters the neurotransmitter activity.
- **Side effect profile:** All medications have side effects and their risk/benefit ratios must be considered. These include whether the side effects are potentially permanent, as in tardive dyskinesia, or temporary, as with dry mouth.

#### **What types of medications are used after traumatic brain injury?**

Anticonvulsants can be used not only to prevent seizures, but also to decrease irritability, improve frustration tolerance, decrease headache and stabilize mood swings.

Antidepressants act to increase two neurotransmitters serotonin and norepinephrine, and can be used for explosive episodes, emotional instability, headache relief, chronic pain management and insomnia as well as typical depressive symptoms. Antianxiety agents which are related to diazepam can be used for muscle tension/spasticity, but they can worsen short-term memory if used on a long-term basis. Short-term use is appropriate if closely supervised by the physician. Buspirone is also used to decrease aggressive impulses. Neuroleptics are generally used infrequently for agitation and aggressive behavior. They may be required in severe cases of delusional thinking or hallucinations. Anti-Parkinson agents are used to increase endurance, cognitive and physical, and to improve swallowing in certain patients. They can also improve initiation and mood. Psychostimulants are used to decrease daytime drowsiness, and to increase mood temporarily. Long-term use must be monitored closely by a physician. Anticholinergic agents can be used to increase tolerance for certain types of dizziness, increase endurance and to relieve insomnia at the beginning of the night. Antihypertensives are used for headache management, aggressive behavior and impulsivity. Narcotic antagonists can be used for self-injurious behavior, bulimic symptoms (bingeing on food and purging) and suicidality.

**Will I become dependent on them?**

Although not addictive in the typical sense of the word, these medicines all must be started and stopped under the supervision of a physician. Abruptly stopping anticonvulsant and antianxiety medications can cause seizures and hallucinations. Stopping antidepressants without tapering the dose can result in insomnia and agitation. Suddenly stopping antihypertensives can cause rebound elevation in blood pressure.

**Won't they have side effects?**

All medications have a main therapeutic effect and side effects. Your physician can work with you to find a medicine that is effective with the fewest side effects. Occasionally, side effects must be tolerated if no other option exists.

**If I am not depressed, why do I need an antidepressant?**

Antidepressants work by increasing the amount of either serotonin or norepinephrine at the neuronal connections called synapses. In addition to depression, this effect may be useful in vascular headache management, chronic pain syndromes, sleep disorders and balance problems. Some degree of depressed mood is expected after brain injury because of the reaction to the changes experienced. When these mood changes are severe or include early morning awakening, appetite change, weight, change and other neurovegetative symptoms, antidepressants may be indicated.

**If I am not having seizures, why do I need an anticonvulsant?**

Anticonvulsants act to decrease the irritability of the neuron. In the most extreme situation, a seizure occurs. This irritability can also cause agitation, aggressiveness and headaches. The use of an anticonvulsant may help.

**When I can stop my medications?**

Before stopping your medications, you should always inform your physician. If you develop a serious side effect, contact your doctor or go to the nearest emergency room. Be sure to bring all your medications with you so the doctor will know exactly what you are taking.

**Can I take over-the counter medicines, vitamin supplements or health foods?**

You need to check with your physician first. While some medications will not be affected, others may either increase or lose their effect with these substances.

**Can I drink a beer, a glass of wine or a mixed drink with my medicine?**

Mixing alcohol with your medications is not a good idea. Although some physicians allow moderate use if no previous history of substance abuse exists, any amount of alcohol may alter the effectiveness of these medications.

**Can I use other recreational drugs?**

No. If you do experiment in this manner, you may counteract the positive effect of your medications. Discuss your thoughts with your physician to find another method to deal with stress.

**Where can I go for more information?**

Contact your local Brain Injury Association at 888-334-2424 for names of physicians who specialize in medication management in your area.

**About the Author**

Gregory O'Shanick, MD has worked since 1981 in all aspects of neuropsychiatry and neurorehabilitation. After 10 years in academic medicine and research, he founded the Center for NeuroRehabilitation Services in Richmond, VA where he is Medical Director. His national involvement in brain injury initiatives includes serving on the Injury Prevention Section of the CDC, the Brain Injury Task Force of the American Psychiatric Association, the Program Committee of the American Society of Neurorehabilitation, and most recently, the Board of governors of the American Academy for Certification of Brain Injury Specialists.