

NEVADA NEUROSCIENCE FOUNDATION™

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Nevada Neuroscience Foundation

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Articles received and published may be edited at the editor's discretion.

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Neuroscience Foundation

Noninvasive Brain Stimulation Future Trends in Neurology and Neurorehabilitation

STEVEN A. GLYMAN MD



The response of the nervous system to brain injury is a complex process. The repair process that follows a brain injury is due to a population of surviving neurons; some of which are restorative, and others that are inhibitory in nature that block or slow recovery of normal brain function. Comprehensive rehabilitation programs have led to better outcomes in patients who have incurred brain injury, however, there have not been substantial advances in clinical treatment of brain injury in many years. Pharmacologic research has failed to develop medications which are restorative or neuroprotective. Stem cell therapy, while a possible treatment for neurologic disease, remains an unproven technology, with substantial potential risk.

Over the past decade, a growing body of work has developed which suggests that electrical stimulation of the brain may be useful in restoring function to the damaged nervous system. Deep brain stimulation with implanted electrodes is used routinely to treat Parkinson's disease, tremor, dystonia, and chronic pain. Clinical trials are being pursued studying the use of deep brain stimulation in epilepsy, stroke, depression, obsessive compulsive disorders, cluster headache, and eating disorders.

Non-invasive methods of brain stimulation using transcranial direct current stimulation (tDCS) or repetitive transcranial magnetic stimulation (rTMS) have shown potential in several pilot studies and proof of concept trials. Further data is necessary before these methods become clinically useful, however several therapeutic areas are being investigated.

Continued on page 2

Noninvasive Brain Stimulation

Continued from page 1

tDCS can influence the neuronal activity of humans. Low amplitude direct current is transmitted through the skull to the surface of the brain via electrodes applied directly to the scalp. The effect of this transcranial current on neuronal membranes can be prolonged, lasting long after the stimulus has been removed. rTMS uses a different more focused method to stimulate smaller more specific regions of the brain using a directed magnetic field to induce electrical currents in the brain. When these treatments are given repetitively they have the potential to modify brain activity.

The combination of repetitive transcranial magnetic stimulation with functional MRI has allowed researchers a better understanding of

the mechanisms involved in recovery after brain injury. In stroke victims, for instance, regions of the brain have been identified which help neurologic recovery, other areas have been identified which inhibit recovery. Using rTMS methods, researchers have been able to promote recovery of function, by blocking regions of the brain which seem to be preventing return of normal brain function.

At the present time, this technique is not ready for widespread clinical use, but the results have been intriguing. In chronic pain, rTMS has been shown to be effective in decreasing pain by 20-45%. Hand function and language function has demonstrated improvement using rTMS after a stroke. Parkinsons patients have shown benefit using a high frequency rTMS protocol, with improved gait and complex motor function lasting up to a month after treatment. Several studies have shown a decrease in seizures in patients treated with rTMS. Recently tDCS has been shown to be beneficial in Alzheimers patients by improving word recognition memory in a recent clinical trial.

More research needs to be done to determine the proper sites of stimulation, frequency of stimulation, and the number of treatments. This research offers tremendous hope for untreatable conditions and adjunctive non-pharmacologic treatment for otherwise refractory conditions. Furthermore, these methods offer an insight into the hidden functions of the brain. At this time, it remains unclear what role transcranial electrical and magnetic stimulation will play in the treatment and rehabilitation of neurologic disease. It is however, a technology that bears watching.



What's New in Parkinson's Disease 2008?



By Eric Farbman, M.D.

One of the most common questions I get asked in the office is about what is new with regards to Parkinson's disease (PD). Patients want to know if there are any new treatments available, whether there are any new tests for PD, and if there are any new research trials that might be available. With the upcoming PD seminar, as well as my recent attendance at the Movement Disorders Society meeting in Chicago, I thought this would be a good time to provide a clinical update on PD.

It has not been all bad news, however. Neupro has not been taken off of the market in Europe, and the company is attempting to bring the manufacturing processes over to the United States. There is optimism that the patch will be back by June, 2009. When it was available, the patch was only approved for mild-to-moderate Parkinson's disease, but when it comes back it may also be approved for more severe disease, with higher dose patches available.

Another new medication in the dopamine agonist family is extended-release ropinirole (Requip XL®). This medication is similar to

Perhaps most exciting on the medication front is the ADAGIO trial. This trial is suggestive that taking rasagiline (Azilect®) can actually slow the disease down.

In many respects this has been a trying year for the clinical treatment of Parkinson's disease. Early this year the rotigotine patch (Neupro®) was taken off of the market, not because of safety issues, but because of concerns of the medicine crystallizing on the patch (instead of going into the body). This made the dosing of the patch unreliable. Istradefylline, which is a novel compound for the treatment of PD based in part on the caffeine molecule, did not receive an approval letter from the FDA. The company which makes this medication is working on answering the questions posed by the FDA, but it is a slow process. More recently another promising compound known as Spheramine®, which was designed to bring dopamine to the brain in spheres, did not show efficacy and its development has been halted by the drug companies.

original Requip, but only needs to be taken once a day. This should prove easier for patient compliance, and it may help "smooth" out drug levels in the body. At the meeting in Chicago, there was also a poster about a similar once-a-day pramipexole (Mirapex®), although this is not yet available.

Perhaps most exciting on the medication front is the ADAGIO trial. This trial is suggestive that taking rasagiline (Azilect®) can actually slow the disease down. This means that even if the medication has no effect in the present, it may benefit the patient in the future. It is unclear whether this is specific to the Azilect, or whether the point is to take any medication. Nevertheless, it is a sign of things to come if we finally have a disease-modifying therapy.

Continued on page 4

What's New in Parkinson's Disease 2008?

(continued from page 3)

On the non-medication front, the evidence for exercise in PD continues to pour in. There is a very vigorous study from USC that supports exercise training in PD. We have long had good animal evidence for this, but we are finally starting to get the evidence we need in actual PD patients.

With regards to tests for PD, there is not much to report. PD is mostly a clinical disease; that is, one is diagnosed by his/her symptoms, and not by the results of an MRI, blood test, or biopsy. In the research setting, one can obtain a PET scan or SPECT scan of the brain. These scans can show actual dopamine in the brain, or, in the case of PD, dopamine loss. There is optimism that a dopamine SPECT scan may get approval in the United States by 2010. Most patients will not need this test, but it will be useful for those with unusual symptoms, or for those in whom assistance is needed in differentiating PD from the atypical Parkinsonian disorders.



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With regards to clinical research, there are still many trials going on. Our office is involved with or will soon be involved in several trials. One trial involves the rotigotine patch for advanced patients as mentioned above. We may also be involved in a trial which is a combination of immediate-release and extended-release levodopa/ carbidopa, in order to give patients a more effective regimen than is currently available. We are also hoping to be involved in trials that treat some of the other symptoms of PD besides the motor ones. We are hoping to be involved in trials that treat hypotension (low blood pressure), which often causes PD patients to have feelings of dizziness or lightheadedness. Another trial may be for a medication to treat constipation, which afflicts nearly all PD patients to one degree or another. Don't be surprised if you are asked to participate in a clinical trial during your office visit!

Finally, there is the area of stem cell research as well as gene therapy. The fruits of this research are still many years away. Nevertheless, there are many sites that are researching different ways of essentially "regrowing" the areas of damage in the brain of PD patients. This area of research is exciting, but it is still very experimental, and one should only undergo surgery for stem cells or nerve growth factors in the context of a clinical trial.

Although this year has seen several setbacks in the medications used to treat PD, there is nevertheless an optimism regarding the research and treatment of PD, and I share this optimism. Although the results of the research can never come too quickly for those who share the burden of this disease, I do think we will have some important breakthroughs in the not-too-distant future. I have not even discussed the laboratory-based research, only that which is immediately applicable to patient care. I encourage patients to share in the optimism that I feel.



FOOD & NUTRITION

by Bonnie Johnson, MS, RD



Tuna “Burgers” with Spinach and Lemon

Tuna, like salmon, is a good source of omega-3 fatty acids which have been recognized for their health benefits from a healthy heart to lessening the symptoms of depression. When buying canned fish, be sure to purchase “water-packed” for the most omega-3s. These are great served “steak-style” without a bun alongside a green salad dressed with vinaigrette. Makes 3-4 burgers.

INGREDIENTS

1-6 oz. can tuna packed in water, drained well
½ cup bread crumbs
1 large egg
¼ teaspoon of jarred crushed garlic
½ teaspoon dried basil
1 tablespoon lemon juice

¼ cup chopped onion, you can buy frozen chopped onion in the freezer section of most stores
2 oz frozen spinach, thawed and squeezed to remove as much water as possible; it should be about ¼ cup
Black pepper
1 tablespoon olive oil

DIRECTIONS

- ◆ Drain canned tuna well.
- ◆ In a medium-sized mixing bowl, stir together egg, garlic, basil, lemon juice, onion and spinach until well combined. Stir in tuna and bread crumbs until moist. Season with black pepper.
- ◆ Heat a large frying pan over medium-low heat. Form tuna mixture into burgers. Add olive oil to pan and evenly coat the bottom of pan.
- ◆ Cook patties until golden brown or about 4-5 minutes per side. Don't touch patties through the first few minutes of cooking to let the proteins “set” and hold the burgers together...flipping or moving them too much will cause them to fall apart.

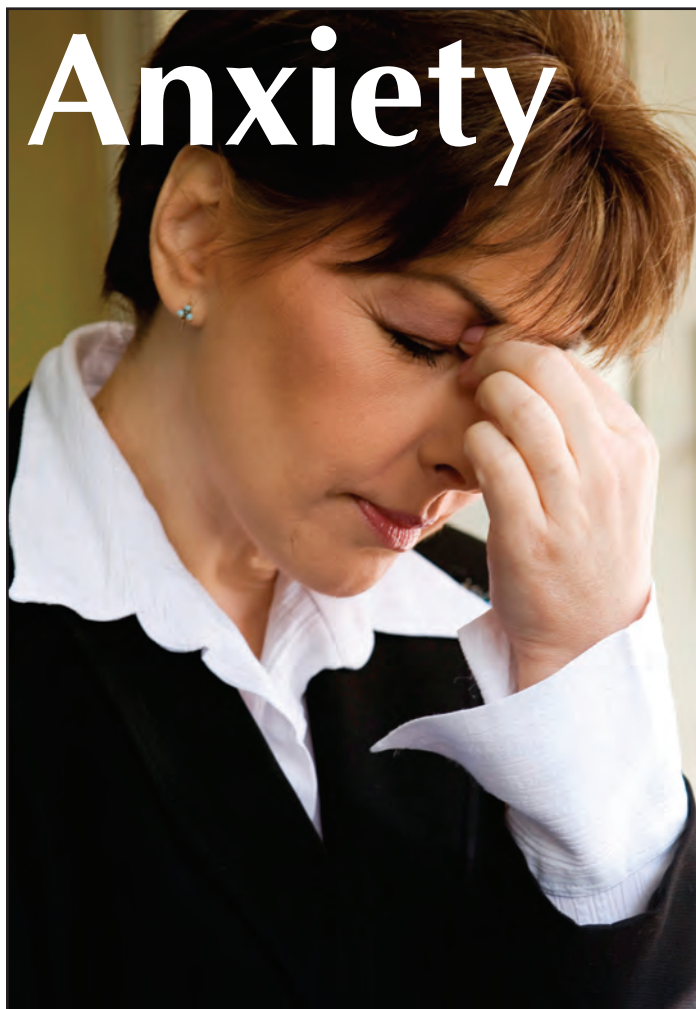
FREEZING TIP

- ◆ Double the recipe and make extra patties for a later meal. Put them on a cookie sheet in the freezer for a few hours. Once they've frozen through, transfer to a freezer bag or container and store for 1-2 months. To thaw, put in the ‘fridge for about 6 hours. Then cook in an oiled pan as directed.

NUTRITION INFORMATION PER SERVING

| | |
|--------------|--------|
| Calories | 125 |
| Total fat | 2.3 g |
| Carbohydrate | 10 g |
| Fiber | 1 g |
| Protein | 14.8 g |
| Calcium | 5% DV |
| Vitamin A | 32% |
| Iron | 10% |





Anxiety

By Marilyn Howell, MFT

*Adapted from the MS Quality of Life Project, May 2008
Reprinted with permission*

understand that I was experiencing a flare-up. I thought my condition would never improve, I was going to deteriorate, and I was going to die early. My future — all my dreams and plans — was not going to happen as I had hoped. And so I cried. The next day I went to work and tried to pretend that nothing was wrong. I couldn't mess this up — never before had I so needed the job and the medical insurance it provided.

I didn't get better for a while. Instead I got worse and missed more work. I learned through my husband's online research (I wasn't able to read easily at this time) that it was important to reduce stress and get good sleep. My response? I felt like someone had pointed a gun at me and then told me to relax. I also learned, however, that some of what I was experiencing was not MS but fear — or anxiety. This also upset me. I am a mental health professional. I expected I would handle it better. To say I did not handle it well is putting it mildly. I would describe myself as a basket case. I felt like I was a nut. I judged myself and found myself wanting.

Anxiety — Just reading the word may make you nervous. Anxiety is just a fancy name for fear and it can manifest itself in many ways. Which have you experienced?

- ◆ A sick feeling in your stomach?
- ◆ Palpitations? Trembling? Sweating?
- ◆ Cold hands? Light-headedness?
- ◆ Inability to focus on current tasks at hand?
- ◆ A feeling of impending doom not necessarily connected to reality?
- ◆ A combination of these?

My anxiety started when I was 53, and began to suspect that I might have MS. I was falling, couldn't walk a straight line and had poor balance. The day I got my diagnosis I literally cried all night. I knew so little about the disease — which made everything worse. I didn't

CAUSES OF ANXIETY

Why is there so much anxiety related to MS? Well, let's start with the absolute unpredictability of the disease. You never know what is waiting around the corner. What will it be like when I wake up tomorrow? Will my symptoms ease up or will they worsen? Will additional symptoms appear? Will I have enough energy to accomplish what I hope to get done?

In addition, there are so MANY symptoms. Has MS affected your vision? Your mobility? Your hands? Your speech? Your cognition? This multiplicity of symptoms fosters anxiety. At first, every little thing might be frightening. However, with wisdom gained from experience, when

Anxiety (cont.)

something new appears, you may be more inclined to think, “This too shall pass.”

The other major anxiety producer is lack of knowledge. I think about the day of my diagnosis. Once I heard the words Multiple Sclerosis, I really wasn't tracking what else my neurologist said. He gave me pamphlets and brochures, but I wasn't ready to read much absorb the information. I walked out with incomplete information and my mind filled the gaps with incorrect beliefs — and my anxiety grew.

ACTIONS TO TAKE

Get Information — Get information about your disease so you can understand your options. Even if you don't fully understand it now, you will be able to better understand it over time. Even bad news is better than not knowing.

Be Proactive About Your Drugs — Pay close attention to the drugs you take. If one has a side effect that affects your quality of life, get back to your doctor to discuss other possibilities. If you're not satisfied with your neurologist's treatment plan for you, consider seeking advice from another neurologist.

Talk to someone — Remember what we learned as Brownies? Make new friends but keep the old. Talk with your friends. Join a support group. Write down your feelings. You may go through a grief reaction to being diagnosed with MS. You may have to grieve the former direction of your life before you can get on with your new one. Having someone to talk to will help you through this process.

Get Outside Yourself — It's hard at first — you are consumed with how you physically feel the possible implications of the diagnosis and the uncertainty of the future. But, getting outside



*Everyone struggles with something.
...Yes, I have MS,
but MS does not have me.*

yourself can help. Focusing on something outside of your MS will help you live with your disease, not become your disease. You will have to make modifications in your life to accommodate for the changes in your body. Be proactive in this process.

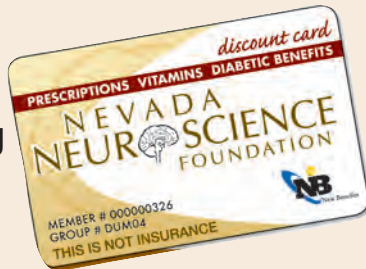
Stay in the Moment — It is so easy to get wrapped up in worry. “What about this?” “What about that?” “How can I cope with such and such?” Instead, try to focus on living your life the way it is at this moment in time. Think about your present quality of life. What can you do today to make it better? How can you add more joy or fun into your life? Then make it work.

Yes, MS makes life seem more unpredictable. In reality, however, life IS unpredictable. Life can change in an instant — so very much is out of our control. Everyone struggles with something. We are not alone. When I look back on the difference between November 9th and November 10th — the day I learned of my MS diagnosis — I realize that the only real difference is that on November 10th I had new information. Yes, I have MS, but MS does not have me. I believe it is the same for you.



R_x Discount Cards

In 1999, nearly 2.7 billion prescriptions were dispensed, costing Americans up to \$110 billion on medications.



The cost of prescriptions continues to rise in the current healthcare market, leaving many to pay outrageous prices on the medications they need most. Thankfully, there is an answer to lowering prescription costs, a Discount Medical Card just for Nevada Neuroscience members!. This program is **not insurance**, and assures members the lowest available prices on prescription drugs. And best of all, it's **free!**

Already have insurance? This product can still save you money! Many types of insurance don't cover experimental drugs, or prescriptions not covered under the insurance formulary. Discounts with this card cover an **open formulary** of medications, and can even provide discounts that are cheaper than your insurance co-pay. Unlike programs that restrict medications on their "approved list", the open formulary allows a doctor to prescribe the most effective medication to treat a particular ailment or condition.

Members of this program achieve savings between 10% and 60% on a variety of short term and acute care medications. Some members have even found greater percent savings on products that they would normally paid out of pocket. Unlike insurance, the Nevada Neuroscience Discount Medical Card has no limits on the number of times it can be used, no co-pays, no health restrictions or maximums, and the benefit is **good for your spouse and all legal dependents!**

Amazed? This card is also easy to use. The member simply presents the membership card to the pharmacist with the prescription. The pharmacist calculates the discount and the member pays the discounted price at the point of sale. It's that easy! If you already have insurance, just simply present both your insurance and the pharmacy card, and the pharmacist will give you the lowest price.

Not sure if your provider is listed? The Neighborhood Pharmacy Program is contracted with over **56,000 national and regional pharmacy chain stores as well as independent pharmacies nationwide**. Some of our chains include Wal-Mart, Walgreens, CVS, and many more. To check if your provider is listed, visit rxpricequotes.com. Members can also call a convenient toll-free number to locate providers as well.

Another great convenience provided by the Discount Medical Card is the member's ability to look up drug discount prices online at their specific contracted pharmacy. At rxpricequotes.com, members can not only look up the price of their specific medication, but can view prices of other pharmacies close to their home to locate the best prices available. Members have the ability to be proactive shoppers with their prescription medications, obtaining the best discounts possible.

The Nevada Neuroscience Discount Medical Card also provides a convenient mail-order prescription program where members can simply call a toll free number for price quotes on products. Members are able to maximize savings on maintenance medications with this program. Prices are at least 10% below AARP.

Continued on page 10.

SAVINGS FOR YOU AND YOUR ENTIRE FAMILY!

Third Annual Gala

The Nevada Neuroscience Foundation (NNF) will continue its efforts to assist members in the Las Vegas community with neurological disorders by hosting its third annual fundraising dinner and gala, "Where Angels Gather," on Thursday, October 30. The event allows the non-profit organization to help fund diagnosis, disease education, mental health resources and social service support for both individuals and their care partners.

The gala will begin at 6:00 p.m. at the Venetian Resort Hotel & Casino, Titian Ballroom at 3355 Las Vegas Boulevard South.

The gala will also include unique entertainment, an extensive silent and live auction, raffle and an impressive dinner.

The evening-attire event offers numerous exposure opportunities for local businesses, including event and table sponsorships and ads in the exclusive gala program journal. For more information about gala reservations, auction item donations or advertising/sponsorship opportunities, contact NNF Program Director Wendee Johns at 702.836.1227 or via email at wjohns@nvneuroscience.com.



Each year hundreds of angels gather in support of very special members of our community.

People whose lives are forever changed by one of many devastating neurologic diseases.

On this night, we invite you to join us.
BECOME AN ANGEL...
Make a difference in our community.

where angels GATHER

**NEVADA NEUROSCIENCE FOUNDATION
3RD ANNUAL GALA & FUNDRAISER**

Thursday, October 30, 2008

The Venetian Resort-Hotel-Casino, Titian Ballroom

6:00 PM – Silent Auction & Cocktails

7:30 PM – Dinner & Entertainment

Delectable cuisine inspired by
James Beard Award Winner
Chef Luciano Pellegrini of



For ticket information visit our website at
NVNEUROSCIENCE.COM or call 702.836.1227.

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Health Care Hero Award

NEVADA BUSINESS .COM
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BUSINESS**
JOURNAL

HEALTHCARE
HEROES

**Congratulations to Nevada Neuroscience Foundation
Executive Director**

Karla Jay

**For receiving a 2008 Healthcare Hero Award
sponsored by the Nevada Business Journal**

R_x Discount Cards (cont.)

All medications are conveniently delivered to your home at no additional charge, with no postage or dispensing fees added. If the member finds a price lower than the mail order price from a local retail pharmacy, the Mail Order Pharmacy will beat the price by \$5.00 on medications priced at \$10.00 or more. This savings guarantee provides members with peace of mind in knowing that with the mail order program, they will achieve the lowest prices possible on medications!

Many of our members have attained significant savings on their prescriptions. Gina Lyon of Las Vegas, NV spoke highly of her prescription savings. *"I've been very impressed so far with this discount card! I purchased Simvastatin, which is regularly \$76.00, for only \$24.22. The antibiotic Cefuroxime was regularly \$89.99, and I only*

paid \$17.91! Atenolol was only \$4.00! I usually had to pay \$58.70 for this medication before my discount card came along. This is a great product!"

Suzanne K of Las Vegas, Nevada can spend her savings on herself and her son. *"This card has been a lifesaver for me with two young boys and no insurance. I was able to purchase my prescription for \$18.00. I used to have to pay \$65.00 before I got this wonderful card. Now I can take my sons to the movies for an afternoon of fun with the money I saved!"*

Many Americans are spending far too much on their prescriptions. The cutting edge solution to prescription savings is here! Head over to nvneuroscience.com for your free pharmacy card and start saving today!



RESEARCH NEWS

Volunteers Needed for Clinical Research Trial

The University of Nevada School of Medicine is seeking volunteers to participate in a clinical research trial. The division of Neurology is currently conducting clinical trials for:

Parkinson's Disease
Relapse Remitting Multiple Sclerosis
Secondary Progressive Multiple Sclerosis
Epilepsy
ALS

For more information about these opportunities,
please call Margie at (702) 671-5093.

Make a Donation to NNF

....the work of a few can change the lives of many.

Name _____

Street Address _____

City _____ State _____ Zip _____

E-mail _____

Phone _____

Gift Amount

\$25 \$250 \$5,000

\$50 \$500

\$100 \$1,000 other _____

This gift is in honor of in memory of

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Las Vegas, NV 89106

Thank you for your gift!

Would you like to be added to our mailing list?

Yes! Please add me to your mailing list.

I am primarily interested in:

Parkinson's MS Other _____

Name _____

Street Address _____

City _____ State _____ Zip _____

E-mail _____

Phone _____

Clip and mail this form to:
Nevada Neuroscience Foundation
840 S. Rancho Dr. Ste 4 Box 613
Las Vegas, NV 89106

UPCOMING CLINICS

ALS Clinics - Wednesdays, October 15, November 19, and December 10, 1 - 5 p.m.

University Health Systems Patient Care Center, 1707 W. Charleston, Suite 220, Las Vegas, NV 89102

Persons diagnosed with ALS seeking multidisciplinary care should attend this unique approach to total care. Schedule appointment through ALS of Nevada at 777-0500.

MDA Clinics - Mondays, October 6, November 10, and December 8, 8 a.m. - 4 p.m.

University Health Systems Patient Care Center, 1707 W. Charleston, Suite 220, Las Vegas, NV 89102

Persons diagnosed with Muscular Dystrophy, including ALS, who are seeking multidisciplinary care in a clinic setting should attend this clinic. Schedule appointments through MDA at (702) 822-6920.

National Parkinson Foundation Support Groups

Las Vegas Support Group

Sutton Terrace Retirement Community
3185 E. Flamingo Rd. Las Vegas
April 1, May 6, June 3, 1-3 p.m.

Mesquite Support Group

First American Credit Union
590 W. Mesquite Blvd., Mesquite
April 23, May 28, June 25, 1-3 p.m.
(702) 346-6500 for info.

Pahrump Support Group

Desert Greens Club House
350 W. Wilson, Pahrump
April 3, May 1, June 5, 9:30-11:30 a.m.
(775) 537-1015 for info.

St. George Support Group

(435) 632-2697 for info.

Summerlin Support Group

Seville Terrace Retirement Community
2000 N. Rampart, Las Vegas
April 10, May 8, June 12, 1-3 p.m.

Call (702) 836-1216 for updates
or visit our website at
www.nvneuroscience.com