Dear Friends,

After a cool and sometimes rainy spring, summer is finally upon us! Now it’s time to re-connect with friends at our annual BBQ. We hope you can join us on Wednesday July 8th at our usual spot in Nancy Boyd Park in Martinez from 12 to 3pm. Your invitation and directions are on page four.

Our Center continues to be busy. We have been very fortunate to have some extremely bright and friendly folks helping out in the lab this past year. A huge thank you goes out to Selvi, Carl, Michelle and Giana for running our weekly Stroke Support/Speech Group. We would like to congratulate Selvi for her acceptance into the UCSF Neuropsychology Externship Program and Michelle for her acceptance into the Speech Language Pathology Masters Program at Cal State East Bay. While they will both be greatly missed, we are very proud of their accomplishments and wish them nothing but the best in their future endeavors. Meanwhile we’d like to welcome three new interns, Eric Byrd, Kevin Dalziel and Rita Barakat who are volunteering at the Center this summer to learn more about aphasia as they prepare to go to grad school.

In addition, we recently received great news about the funding of 2 new grants which will allow us to further our research and continue our investigations into the fascinating workings of the human brain as it relates to language.

We hope that you are doing well, and we hope to see you for the upcoming picnic. Stay cool and see you soon!

Sincerely,
Nina Dronkers, Ph.D.
Director
Center for Aphasia & Related Disorders
Language and the Brain
Nina F. Dronkers, Ph.D.

From the time of the ancient Egyptians, scientists have been trying to understand how the brain processes language. How is it that we understand each other when we speak? How do we pick the words we want to convey and how do we string them together so that they make sense to our listeners? What happens in the brain when we read, write, or speak another language? These questions have fascinated linguists, neurologists, psychologists, and clinical neuroscientists for many years, and have been the topic of much scientific research.

Though language is a very complex function, most textbooks oversimplify language and focus on just two areas on the left side of the brain: Broca’s area and Wernicke’s area. Broca’s area has been suggested to be responsible for the production of language, and Wernicke’s area, the role of language comprehension. A bundle of nerve fibers, the arcuate fasciculus, joins the two regions (see Figure 1).

In our research, we have found that language cannot simply be reduced to two components; language is far more complex and infinitely more interesting than that. For starters, think about what your brain has to do if you want to produce a sentence. Your brain has to think about the concept you want to convey and then choose the words and sounds that reflect that concept. It also has to apply the proper grammatical rules, so that other speakers of your language will understand you. Then, it has to send the movement plan to your lips, tongue, jaw and larynx, so that they produce the right words you want to say. The most amazing part is that it does all of these things in milliseconds, and it all happens automatically in most people without giving it much conscious thought at all.

Individuals Who Have Aphasia
The complexity of language becomes apparent when someone loses the capacity to use it. The term, “aphasia”, describes precisely such a situation. Aphasia is a disruption in language that results from an injury to the brain. At our VANCHCS Center for Aphasia and Related Disorders in Martinez, we have had the opportunity to learn from our patients who have aphasia. Typically, the people we see have suffered a stroke, or “brain attack” that has compromised their ability to use language. Some cannot speak at all, some can only speak in single words, while others produce speech easily but the wrong words tend to come out. We assess their language difficulty in great detail and relate their specific problems to the areas of the brain that have been damaged, as measured with magnetic resonance imaging (MRI). In this way, we have been able to assess the brain areas that are important for language.

The main thing we have learned is that numerous areas of the brain process language, not just two Broca’s and Wernicke’s area. We know this because our patients have sustained brain injuries in areas of the brain besides just Broca’s and Wernicke’s areas and still suffer some form of language impairment. In fact, we and other scientists have identified several additional brain structures that are important for different aspects of speech and language. These areas work together to form a complex brain network that supports language.
Language and the Brain (continued)
Nina F. Dronkers, Ph.D.

To understand this network, we also have to understand how these brain areas communicate with each other. These regions we have been studying do not work in isolation; they connect to each other via “axons”, nerve cell fibers that relay information to other nerve cells. When axons travel long distances, they group together to form bundles that can we can trace with an MRI scanner. In a recent study, we identified six fiber bundles that were associated with language comprehension (see Figure 2).

![Figure 2: Six fiber bundles now believed to be involved in language comprehension as revealed by diffusion MRI in a single participant. A far more extensive network is being discovered than proposed in the classic model shown in Figure 1. The direct and indirect segments of the arcuate fasciculus (Af), the inferior longitudinal fasciculus (ILF), the inferior occipito-frontal fasciculus (IOFF), the middle longitudinal fasciculus (MdLF), and transcallosal projections, consistent with the tapetum, are shown. (Figure adapted from Turken & Dronkers, 2011).](image)

**How Do Patients Benefit from This Research?**
Our motivation for doing this research is to be able to use it to help patients who are suffering from speech and language deficits. Since we have worked with hundreds of aphasic individuals over the years, we have come to learn that injury to certain brain areas ultimately results in specific persisting deficits. When we work with someone who has just had a stroke, we use this information, combined with the images from the patient’s MRI, scan to help both the patient and caregivers understand what has happened to them, how the person’s language was affected, and what they can expect to see a year later. We know which deficits need directed treatment and which will resolve spontaneously with time. By looking at regions that have been injured vs those that are spared, we can also advise on treatment strategies that make use of the intact brain regions. Thus, we have been able to concentrate our resources on the long-term problems that will impact the patient’s communication the most, and direct patient and clinician time appropriately.

*If you would like more information about our work, please contact Nina Dronkers at the Center for Aphasial and Related Disorders, 150 Muir Road, Martinez, CA. Tel: 925-372-2925.*
Stroke Support Group

Annual Summer Picnic!

When
Wednesday, July 8th, 12:00-3:00 p.m.

Where
Nancy Boyd Memorial Park, 261 Church Street corner of Church St. & Valley Ave. in Martinez

What to bring
A dish or drink to share if you can.
Questions? Call Juliana at (925) 372-4649

Directions to Nancy Boyd Park:
♦ From Hwy 4, take Alhambra Ave. exit
♦ Go South on Alhambra Ave. for 3/4 mi.
♦ Turn left on Truitt Ave.
♦ Make first left on Valley Ave. to park
PROTECT YOUR SKIN FROM THE SUMMER SUN

SUNSCREEN
- Use sunscreen with SPF 30 or higher that contains both UVA and UVB protection
- Reapply sunscreen every 2 hours and after sweating or swimming
- Use sunscreen before the expiration date or within 3 years of purchasing

CLOTHING
- Cover exposed skin with comfortable, loose-fitting clothing
- Choose clothing items made with tightly-woven fabric
- Keep clothing dry to maximize sun protection benefits
- Wear darker colors whenever possible

HATS
- Wear wide-brimmed hats to protect your head, ears, face, and neck
- Choose hats with tightly-woven fabric, such as canvas
- Avoid wearing hats that contain holes, such as straw hats
- Apply sunscreen to your ears and neck when wearing a baseball cap

SUNGLASSES
- Wear wrap-around sunglasses for the best protection
- Choose glasses that offer near-full protection against UVA and UVB rays

SHADE
- Spend as much time in the shade as possible between 10 a.m. and 4 p.m.
- Wear protective clothing and sunscreen even in shady areas

Source: www.cdc.gov
Game Zone

Summer Days Word Scramble

Unscramble the words, then use the highlighted letters to figure out the secret message.

Hint: The secret message is scrambled too.

cheab
ensrsecun
esbabla
oplo
iacnotva
rbueecba
reamwntelo

® puzzles.to.y4k0.com

School's Out!
Watermelon
Barbecue
Vacation
Pool
Baseball
Sunscreen
Beach
Stroke Recovery Resources

Stroke and Aphasia Web Sites
- American Stroke Association: www.strokeassociation.org
- National Stroke Association: www.stroke.org
- StrokeNet: www.strokenetwork.org
- Aphasia Software Links: http://www.aphasiasoftwarefinder.org/

Stroke Support Groups in East Bay
- Stroke Support and Communication Group at VA Martinez
  150 Muir Road (126R), Martinez, CA 94553
  Contact: Juliana Baldo, (925) 372-4649, meets every Wednesday 1pm-3pm in Building R4
  Email: juliana@ebire.org
- California State University East Bay Aphasia Group
  Mailing Address: Cal State East Bay, Speech, Language & Hearing Clinic, MB# 1097A
  Communicative Sciences and Disorders, 25800 Carlos Bee Blvd., Hayward, CA 94542
  Contact: (510) 885-3233.
  Email: ssimirn@csuhayward.edu
- Stroke and Head Injury Support Group
  Washington Hospital, Washington West, Anderson Auditorium C, 2000 Mowry Ave., Fremont, CA 94538
  Contact: Karen Benedetti, (510) 818-6253
  Mailing Address: Karen Benedetti, Washington Hospital, Rehab Dept., 2000 Mowry Ave., Fremont, CA 94538-1716
- Cal State University Sacramento Aphasia Group
  Maryjane Reese Language, Speech, and Hearing Center
  6000 J St., Shasta Hall 172, Sacramento, CA 95819-6071
  Contact: Darla Heggie, Clinic Coordinator, 916-278-6601

Stroke Support Groups in North Bay
- Interpersonal Skills - Stroke Support Group
  College of Marin, Disabled Student Services Program, 835 College Ave., Kentfield, CA 94904
  Contact: Maureen Green, M.A., CCC-SLP, (415) 457-8811 ext. 7702

Stroke Support Groups in SF/Peninsula
- CHMC Community Health Resource Center
  2100 Webster Street, San Francisco, (415) 923-3155. Classes and written information.
  The Stroke Survivor Support Group meets the first Thursday of the month from 1:00 to 2:30 p.m.
- Stroke/Communication Group/Acquired Brain Injury Program
  City College of San Francisco, John Adams Campus, DSPS Dept., 1860 Hayes St., San Francisco, CA 94117.
  Note: Must call to register, this is a Group Speech Therapy Course.
  Contact: Jodi Kaplan, M.S., CCC-SLP, or Joyce Foreman (415) 561-1005.
  E-mail: jforeman@ccsf.org

Exercise Program for Individuals with Physical Disabilities
- Project Recovery, Monday – Thursday, 1:00 p.m. – 4:00 p.m.
  Family YMCA, Mt. Diablo Region, Contact: Libby Luxemberg (925) 687-8900.

Bay Area Clinical Trials
(Universities frequently run various clinical trials with persons who have experienced a stroke. You may find one you are interested in learning more about/participating in. We do not promote any organization’s clinical trials, but offer these for your information only.)
- UCSF: http://www.ucsfhealth.org/clinical_trials/index.html
- Stanford: http://med.stanford.edu/clinicaltrials/
- UC Davis: http://www.ucdmc.ucdavis.edu/medicalcenter/clinicaltrials/
Aphasia News
Center for Aphasia and Related Disorders
150 Muir Road 126 (s)
Martinez, CA 94553

http://www.ebire.org/aphasia

Newsletter Information
If you would like to receive this newsletter or you have comments/suggestions, e-mail Juliana at julana@ebire.org, call her at (925) 372-4649 or write to:

Center for Aphasia and Related Disorders
VA Northern Calif. Health Care System
150 Muir Road 126R
Martinez, CA 94553

We welcome your comments and questions!

Center Members & Affiliates
Nina Dronkers
Juliana Baldo
And Turken
Krista Schendel Parker
Brian Curran
Janet Patterson
Carl Ludy
Stephanie Ries
Tim Herron
Vitoria Piai
Selvi Paulraj
Michelle Miler
Giana Cirolia
Rita Barakat
Kevin Dalziel
Eric Byrd

We would also like to thank the members of the Stroke Support Group and their families, the Speech Pathology staff, and all of our wonderful research participants.

The Center for Aphasia and Related Disorders is supported by the VA Northern California Health Care System, the VA Medical Research Program, the National Institutes of Health, and the University of California at Davis and San Diego, as well as through generous donations from private foundations and individuals. Please feel free to contact Dr. Dronkers at (925) 372-2925 if you would like more information.