Researchers image brains of infants with autism risk

By Jim Dryden

Autism researchers at the Skandalaris Center and the Olin Business School for a promise to kiss the Olin Cup after receiving the $70,000 investment award from N. Botteron, M.D., principal investigator of an autism study.

Researchers from the University of Pennsylvania and an associate professor of child brain development in children at risk for autism spectrum disorders by virtue of having an autistic sibling.

The study builds on two key findings. The first is that children with autism tend to have larger brains — between 5 percent and 10 percent larger by age 2 — than children who don’t have the disorder. Data from pediatricians measuring head circumference suggests the enlargement could begin at the end of a child’s first year of life.

The second finding suggests the onset of social deficits associated with autism usually cannot be detected until the end of the first year.

“Our don’t need much about brain development in children with autism or children at risk for autism, but we do know that symptoms start very early,” said Kelly Botteron, M.D., principal investigator at the WUSTL study site and associate professor of child psychiatry and of radiology.

“We think that it is very important to learn about the changes in early brain development that may be associated with autism,”

Botteron’s team is joining researchers from the University of North Carolina, the University of Washington in Seattle and Children’s Hospital of Philadelphia, collecting MRI brain images from children as young as 6 months old. The project also includes a data-coordinating center at the Montreal Neurological Institute in Canada.

“We’re recruiting kids as young as possible — even during the mother’s pregnancy — for interviews and screenings, and then they come to see us for brief testing and to have MRI scans at 6 months,” said Botteron, a child psychiatrist at St. Louis Children’s Hospital.

“They come back for more scans and more testing at 12 months and again at 24 months.”

The WUSTL portion of the Infant Brain Imaging Study uses MRI imaging to get a very detailed look at the brain’s anatomy. The investigators also perform diffusion tensor imaging, which provides information about how the various structures in the brain connect to one another while the baby is resting.

A new brain-imaging study is shedding light on what it means to “get lost” in a good book — suggesting that readers create vivid mental simulations of the sounds, sights, tastes and movements described in a textual narrative while simultaneously activating both regions used to process similar experiences in real life.

“Psychologists and neuroscientists are increasingly coming to the conclusion that when we read a story and really understand it, we create a mental simulation of the events described by the story,” said Jeffrey M. Zacks, Ph.D., a professor of psychology in Arts & Sciences and of radiology in the School of Medicine, director of the Dynamic Cognition Laboratory and a co-author of the study.

The study, forthcoming in the journal Psychological Science, is one of a series in which Zacks and colleagues use functional magnetic resonance imaging (fMRI) to track real-time brain activity as students read a story.

Readers build vivid mental simulations of narrative situations, brain scans suggest

By Gerry Everding

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Students entrepreneurs awarded $75,000 in annual Olin Cup

By Melody Walker

An online tutoring service and a device designed to help athletes detect ear damage are the winners of the 2008 Olin Cup competition for entrepreneurs presented by the Olin Business School and the Skandalaris Center for Entrepreneurial Studies.

Two winning companies, Virtual Nerd and Verto, emerged from an original field of 38 entrants — a WUSTL record — to earn a $70,000 investment award and a $5,000 cash prize, respectively.

“We had a great diversity of ideas and entrepreneurs this year,” said Ken Harrington, director of the Skandalaris Center. “I am impressed by the quality of the ideas and how much they advanced their ventures during the yearlong competition.”

The five finalists, which were a personalized children’s book publisher, a concert recording company and a vocabulary-building game in addition to the winners, presented their business ideas to an audience in Graham Chapel following an Assembly Series question-and-answer session with entrepreneur Maxine Clark, founders of CRC and of Build-A-Storm Workshop.

All new business ventures begin with an idea. For M.D./Ph.D. student Leo Shmuylovich, co-founder of Virtual Nerd, the idea for an interactive, multimedia tutorial Web site to help students in math and science came while he was tutoring students one-on-one.

Shmuylovich is earning a doctorate in physics and a medical degree. He holds a bachelor of science degree in chemical engineering from Cornell University.

Shmuylovich wanted to be able to offer students the advantage of tutoring and make it affordable. With business partner Josh Salcman, the two have invested their own time and money to create an interactive site that tracks students’ questions and progress, which can be shared with parents and teachers to improve the learning process.

Both of Virtual Nerd’s young entrepreneurs admitted they were “stunned and shocked” — in a good way — about winning the $70,000 investment award.

“It was a great competition, and we learned a lot about our own business,” said Shmuylovich, whose business card reads “Chief Scientific Nerd.”

“Winning puts some lightness in our step,” he said. “It’s very motivating and very exciting.”

Seth Hargert, founder and CEO of Verto and a student in Olin’s executive MBA program, came up with his award-winning idea for custom-fit earbuds while participating in an Ironman competition.

A fan and manufacturer of triathlons, Hargert extended use of his i94 earbuds was uncomfortable for patients and process personal information and stories.

Nicole Saper, Ph.D., lead author of the study, said findings demonstrate that reading by is no means a passive exercise. Rather, readers mentally simulate each new situation encountered in a narrative. Details about actions and sensations captured by the text and integrated with personal knowledge from past experiences.

These data are then run through mental simulations using brain scan images from children as young as 6 months old.
The Interplay between man and technology

The development of high-performance game-playing computer programs has been one of the major successes of artificial intelligence research. This is evident in the ground-breaking work of computer scientist David Adelsberg. It is not only an example of the potential of artificial intelligence but also an indication of the importance of ethical considerations in the development of such technology.

Speer created the CheckOut project to build a computer program capable of winning human World Checkers Champions. Since its inception in 2013, the program has made remarkable progress. It is now capable of playing against the best human players, and it has been proven to be a valuable tool for research in the field of artificial intelligence.

Speer said that winning this competition became a personal quest. He will talk about the interplay between people and technology in his talk "Computer and Human: Perfection at Checkers."

To appreciate this story, one must be aware of the detailed knowledge of computer science and checkers. "One夜中的Checkers: Challenging Human Players in a Non-Athlete World" (2007) chronicles the technical achievements of Checkers, including the solids solid of how computers "think" when they play, and offers valuable insights into human nature.

A key to the success of Checkers is Speer's ability to think like a computer scientist. From 2005-08, he was the head of a computer science research project to build a computer program capable of playing against the best human players. He earned a bachelor's degree in computer science from the University of Pennsylvania in 1993 and a doctorate in mathematics and a computer scientist from the University of Waterloo in Waterloo, Ontario.

The researchers hypothesized that activity-specific brain regions would increase at several different feature changes, while other brain regions would be selectively activated by only one feature change. This was found to be true.

Changes in character locations (e.g., "went through the front door into the kitchen") were associated with increases in regions in the temporal lobes that are selectively activated when people view pictures of motion.

In summary, the data support the view that readers construct mental simulations of events when reading stories.

The researchers had carefully planned and carried out the studies so that they knew the important features of the story were changing, and they had coded the data on all feature changes that were important for comprehension.

A Discussion About Race and Identity

An expert in human memory, Henry "Roddy" Roediger III, will deliver the annual Phi Beta Kappa Lecture. His talk, the Compton Lecture, will explore the concepts involved in human memory, his most recent research focuses on applying cognitive psychology to improve learning in educational situations.

Morgan Appendix

7 p.m. April 1, Graham Chapel. In 2005, Spurlock received an Oscar nomination for "Super Size Me," an indictment of Americans unhealthy eating habits. His film "Whale-Watcher in Jodhpur: Basima Bin Laden?" was released in 2008.

This is the Congress of the South Lounge.

Richard Martin

4 p.m. Wednesday, Lounge. The distinguished scholar in Homeric poetry and ancient history will deliver the Big Ten Lecture in the Classics.

David Watschke's research centers on the way in which Homer was appreciated as performance art in his time and compared ancient Greek poetry with modern rap.

The Dreams' Guys

7 p.m. April 9, Graham Chapel. Watschke is a member of a minority group in the pop culture, and he will explain the way in which popular reading—also called "middlebrow" reading—has influenced American culture.

For more information about the study, contact Lisa Finkel at (314) 935-6502 or visit infantsibs-stlouis.org/index.php.

Autism

Five-year study will follow infants over time—From page 1

Researchers tested 225 infants, a sample that is representative of children who develop autism and the infants without autism, to determine if there were differences in their brain development.

"We saw no differences in brain development between the groups," said Dr. ARGS. "The findings suggest that the brain development in the children with autism is different from the typical brain development in children without autism."

The researchers concluded that differences in brain development may help to identify children who are at risk for developing autism and provide insights into the underlying causes of the disorder.
Scientists uncover new genetic variations linked to psoriasis

**BY CAROLINE ARBANAS**

T wo international teams of researchers at Washington University in St. Louis and the University of Utah have uncovered a new genetic variation linked to the skin disease psoriasis. The finding, published online in *Nature Genetics*, will help scientists understand the underlying biological processes and may eventually lead to targeted drugs and treatments, Bowcock said.

In an extensive study of 1,436 American patients with psoriasis, an autoimmune disease that occurs when the body’s immune system wrongly attacks the skin, researchers scanned nearly 450,000 single-nucleotide polymorphisms (SNPs) in each of the genomes of 1,409 psoriasis patients and compared the DNA variations with those in 1,456 healthy controls.

They initially discovered 21 suspect variants associated with psoriasis and then tested the validity of these variants in another group of psoriasis patients and controls. This revealed seven confirmed variants, all of which appear to contribute to the risk of the disease. Five of the variants cluster in two distinct pathways.

A second study of 2,831 patients with psoriasis looked for links between the disease and copy number variations, in which a gene is produced in multiple copies. Bowcock and his colleagues in Barcelona, Spain, and elsewhere found that the absence of two skin genes — LCE3B and LCE3C — increases the risk of psoriasis.

Both genes normally are activated after an injury to the skin. The researchers suspect the absence of the genes could lead to an inappropriate immune response, which may cause the inflammation that is a hallmark of the disease.

"Until now, all of the genes linked to psoriasis have been involved in the immune system," Bowcock said. "But psoriasis is a disease of the immune system, and it makes sense that we would eventually find genes in the skin that are involved in the disease."

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**Faculty recognized for outstanding achievements**

Ugsten School of Medicine faculty were honored last Friday at the 2009 Distinguished Faculty Awards ceremony at the P. Newman Education Center. This is the second year for the awards, which were created to recognize outstanding achievements in clinical care, patient care, service, research and teaching.

The award recipients were selected from 49 nominees.

These dedicated and talented individuals have made significant and lasting contributions to the School of Medicine," said Larry J. Shapiro, M.D., executive vice chancellor for medical affairs and dean of the School of Medicine. "Our awardees' efforts have touched the personal and professional lives of countless patients, families and caregivers. In the process, they have enriched our academic community and our institution beyond inimmensurable ways."

The award recipients are as follows:

**Distinguished Clinician Awards**

L. Michael Brust, M.D., professor of medicine and of neurology

Steve A. Edmondson, M.D., professor of medicine

Douglas M. Fairbanks, M.D., professor of obstetrics and gynecology

Robert J. Rothbaum, M.D., professor of pediatrics

Krisz Tempteoff, M.D., professor of anesthesiology and of neurological surgery

**Distinguished Educator Awards**

Clinical Fellow Mentoring

Gerald Medoff, M.D., emeritus professor of medicine and of microbiology

Graduate Student Teaching

Carolyn Baum, Ph.D., the Elias Michael Director of the Program in Occupational Therapy and assistant professor of occupational therapy and of neurology

House Staff Teaching

Eugene H. Rubin, M.D., Ph.D., professor of psychiatry

Fundamental Research Mentoring

Andrew C. Heath, D. Phil., the Eugene H. Rubin, M.D., professor of psychiatry and associate professor of genetics

**Distinguished Community Service Awards**

P. Sessions Cole, M.D., the Park J. White, M.D., Professor of Pediatrics and professor of cell biology and physiology

David R. Lay, Ph.D., associate professor of occupational therapy and of neurology

A.F. Molloy, M.D., associate professor of pathology

W. Benjamin L. Young, Ph.D., assistant professor of medicine and of developmental biology

**Distinguished Investigator Awards**

Maurizio Corbetta, M.D., the Norman H. Stepp Professor of Neurology and professor of radiology and of anatomy and of neurology

Janet Lin, Ph.D., assistant professor of medicine and of radiation oncology

**Distinguished Service Award**

Robert P. Moch, Ph.D., the Alumni Endowed Professor of Cell Biology and Neurobiology and professor of medicine, of psychiatry and of obstetrics and of gynecology

F. Merritt, M. D., Ph.D., professor of pathology and immunology

Joseph H. Steinbach, Ph.D., the Russell D. and Mary B. Shelden Professor of Anesthesiology and professor of anatomy and neurobiology

The Daniel P. Schueller Award for Distinguished Work in Clinical and Translational Science

Michael D. Dalbey, M.D., the William and Dorothy E. Ferring Family Chair in Pediatric Cancer and Related Diseases and professor of pediatrics, of neurology and of biostatistics.

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**Major immune system branch has life to learn**

**BY MICHAEL C. PERRY**

Half of the immune system has a hidden talent, School of Medicine researchers have discovered.

They found the innate immune system, long recognized as a specialist in rapidly and aggressively combatting invaders, has cells that can learn from experience and fight better when called into battle a second time. Scientists previously thought such ability was limited to the immature immune system's innate immune branch, the adaptive immune system.

The finding, published online in the Proceedings of the National Academy of Sciences, will help scientists better understand the immune system and new ways to modulate its responsiveness to invading pathogens. It also may help in understanding the immune system's response process, like that found in some genetic disorders and conditions such as AIDS, which leave people vulnerable to infections.

Vaccines take advantage of a property researchers have come to know as memory. They train adaptive immune cells that can recall, in recognition of a prior invader and more quickly and effectively attack the invader if it returns. By exposing the immune system to a weakened or dead version of a pathogen such as measles, a vaccine stimulates the body so that it can much more effectively respond to naturally occurring infections or recognize certain agents.

"The new finding suggests that adaptive immune cells can be trained to fight back more effectively after an initial stimulation — but the cells are not adaptive immune cells. They are the innate immune system's natural killer cells, which can switch between an active infection-fighting state and a dormant, resting state," Bowcock said. "We're calling this new property "memory-like," and senior author Wayne M. Yokoyama, M.D., the Sam J. and Audrey Loew Russell D. and Mary B. Shelden Professor of Medicine, professor of pathology and immunology and a Howard Hughes Medical Institute investigator. "Natural killer cells can't specialize in recognition of a particular pathogen, but we found that once they've been activated, they can respond more easily and effectively to the next call for activation."
Campus concerts in the
Department of Music

By Cynthia Georgelas

The Department of Music in Arts & Sciences continues its spring 2009 concert series with an array of events that will entertain, educate and inspire music-loving audiences in the St. Louis and surrounding areas.

This year’s offerings range from international jazz greats Marc Copland, Gary Peacock and Bill Stewart, who performed Friday, Feb. 13, at the 560 Music Center (co-sponsored with Jazz at Holmes), to Domini

The programme of the afternoon includes a performance by the Woman's Building Ensemble, which is a group of performers and scholars from the Department of Music in Arts & Sciences, noted additional highlights of the spring 2009 concert series.

Program

March 1. A program of Broadway by By the Band, Kern and George Gershwin, to be introduced by Todd Decker, Ph.D., professor of musicology, and featuring Wustl students.

March 9. A lecture symposium under the direction of Dan Prescher, with performances of orchestra and wind ensembles.

March 22. An intimate program titled "Virgilina, Voice and Violin" and featuring violinist and harpsichordist Charles Metzler, the new president of the Friends of Music. Metzler’s group supports the Department of Music in Arts & Sciences, music studies and research, while encouraging WUSTL students and faculty in their musical scholarship and creativity.

March 30. "Unofficial Leningrad, 1967," to be presented in partnership with the Leningrad Symphony Orchestra and featuring some of the city’s most noted artists, with an introduction by Peter Schmid, Ph.D., assistant professor of musicology.

"A full display of our large ensembles — the Jazz Band, the Concert Choir and the Symphony Orchestra — for the Chancellor's Concert April 26th is an annual favorite," Mac

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The School of Engineering & Applied Sciences will honor 24 distinguished alumni at the 2008 WUSTL Alumni Awards banquet at 7 p.m. Feb. 19 at the St. Louis County Club. The school also will present the Deans Award to two individuals and one Yugoslavia Student Award.

Dean's Award

Stephen R. and Camilla T. Reuser were honored at the 2008 WUSTL Alumni Awards banquet in recognition of their philanthropy and service to the school and the University.

Stephen Brauer, current vice chair of the Board of Trustees and chair of the School of Engineering and Applied Science, joined the board in 1991. He has championed WUSTL across the world's premier universities and helped build a leading engineering school. Stephen Brauer is a former U.S. ambassador, a fellow of the University of Chicago, and a member of the Corporation of Brown University. He is chairman of the board of directors of W.L. Gore & Associates, Inc., a major manufacturer of doctors and degrees and conducted research in microanalysis, including software implementation development and hardware construction.

Distinguished Alumni Awards

Dr. Heiko Behnken's journey to space from the judging process

Outstanding Mechanical Engineer at WUSTL earned recognition as an outstanding mechanical engineer. His exceptional performance during the March 2008, completed his first mission to the International Space Station (ISS) and helped build a leading engineering school. Stephen Brauer is a former U.S. ambassador, a fellow of the University of Chicago, and a member of the Corporation of Brown University. He is chairman of the board of directors of W.L. Gore & Associates, Inc., a major manufacturer of advanced materials. His innovative work on the ISS and his contributions to society include the development of advanced materials and the advancement of science and technology.

Young Alumni Award

The No. 2 men's basketball team will host a week of special events including Monday night’s Basketball Night, Tuesday’s Memorial Scholarship Fund 5K, Wednesday’s Alumni Achievement Awards, and the presentation of the Engineering Week on campus.

Men's basketball unbeaten in UAA

The No. 2 men's basketball team wrapped up its conference play last weekend at home with a pair of victories over New York University (73-55) and Brandeis University (82-57).

Women on five-game winning streak

The No. 16 women's basketball team completed season sweeps of No. 14 New York University (73-55) and No. 21 Brandeis University with victories Feb. 13 at the WU Field House.

Visit gwbweb.wustl.edu/ for more information on the Gephardt Institute.

Olin Club Members all benefit participants from the judging process — from page 3

and prone to falling out of his ears. With a background in mini-microtechnology, psychology, neurolinguistics, and orthopedics, Burstig invented a non-contact imaging device digitally scan an individual's ear and produce a 3-D ear impression that can be used in further research. Olin Club members are also protected by a new ear tip that attaches to their cell phones. This device is designed to help young ears and produce a new way to communicate. This innovative device is being used to study infant hearing.
Notables

Of note

Elizabeth Haswell, Ph.D., assistant professor of biology in Arts & Sciences, has received a four-year, $406,562 subaward from the California Institute of Technology for research titled "Biophysical, Structural and Functional Analysis of Trans-sensory Channels." Shirley Schomberg, Ph.D., professor of physical therapy, cell biology and physiology and of neurology, has been selected to receive the Richard W. Bowlwing-Sidney E. Erbhard Orthotic Clinical Practice Award from the Orthopedic Section of the American Physical Therapy Association (APTA). The award, which honors Sahrmann's outstanding contribution to the clinical practice of orthopedic physical therapy, will be presented at the Combined Sections Meeting of the APTA in February.

Thaddeus Stepanenbk, M.D., Ph.D., assistant professor of neurology, cell biology and immunology and of developmental biology, has received a two-year, $380,000 grant from the NIH for research titled "Identification of Colitogenic Bacteria in an Animal Model of Ulcerative Colitis." Hillary H. S. Ng, Ph.D., M.D., the Edward Mallinckrodt Professor and chair of pathology and immunology and professor of molecular microbiology, has received a two-year, $310,000 grant from The Broad Foundation for research titled "In Vivo Function of Cytokine Disease Susceptibility Gene AIM in Intestinal Inflammation..." Thomas A. Woolsey, M.D., the George H. and Ethel R. Bishop Scholar in Neuroscience and professor of neurological surgery, of anatomy and neurobiology, of cell biology and physiology and of biomedical engineering, was awarded the Science Educator Award at the Society for Neuroscience annual meeting. The award was made to a neuroscientist who has made significant contributions in educating the public about the field.

Speaking of

Robert McCarter, Ph.D., and Norman Moore Professor of Architecture and chair of the Architecture Graduate Program, gave two invited lectures in November: "Embassings of the Sky: Louis Kahn and the Light-Giving Well" at the AIA New York Center for Architecture, and "Louis I. Kahn: The Eternal and the Sacred" at the National Building Museum. McCarter is part of the Architecture Lecture Series at Kansas State University.

DUC architects win award for design

Tori/Kobus & Associates Inc., the Cambridge, Mass., architecture firm that designed the Danforth University Center, has received a 2009 Palladio Award for its work on the new student center that opened last August. The Danforth University Center won the "New Design and Construction — More than 30,000 Square Feet" award in the "Commercial, Institutional and Public Projects" category of the Palladio Awards program. The Palladio Awards honor outstanding achievements in architecture. Awards were named in honor of Andrea Palladio, the Renaissance architect who created modern architecture for his time while using models from the past for inspiration and guidance.

Campus Author

Kathleen F. Brickley, J.D., the James Carr Professor of Criminal Jurisprudence

Environmental Crime: Law, Policy, Prosecution


"Environmental Crime: Law, Policy, Prosecution" offers a critical perspective on the intersection of environmental law and criminal law. It is the first law school text devoted exclusively to the study of environmental crime. "The advent of modern environmental legislation in the 1970s and '80s ushered in an era of increased public and congressional support for sending polluters to jail," said author Kathleen F. Brickley, J.D., the James Carr Professor of Criminal Jurisprudence. "When my casebook publisher approached me about writing an environmental crime book, I viewed it as a unique opportunity to build on my previous work on environmental criminal enforcement — colleagues, co-workers and patients alike. He has been there for me — to discuss the role of the university in a democratic society.

Nassief, associate professor of neurology, 43

A dullah M. Nassief, M.D., one of the region's premier experts on stroke, died Feb. 3, 2009, of coronary artery disease while playing soccer, one of his favorite pastimes. He was 43.

Nassief, associate professor of neurology, was co-director of the Cerebrovascular Disease Section in the Department of Neurology. He also was director of the Neurology Residency Program at the School of Medicine and of the Clinical Stroke Center and of Access and Rehabilitation Services at Barnes-Jewish Hospital. Nassief spearheaded the team that set up a Rams-Barnes-Jewish Hospital's naming of a Primary Stroke Center by the Joint Commission, the first specialty accreditation in any area of medicine obtained by the hospital. He played a central role in developing Washington University Medical Center as one of the premier stroke centers in the country. Nassief was a compassionate, caring physician and a dedicated teacher," said David M. Holtzman, M.D., the Andrew B., and Gretchen P. Jones Professor and head of the Department of Neurology. "He had an encyclopedic knowledge for clinical things," Holtzman said. "He had a very special person," said Jim Miao Lee, M.D., Ph.D., associate professor of neurology and director of the Cerebrovascular Disease Section in the Department of Neurology. "He had a presence and a sincere way of connecting with people. He touched many hearts — colleagues, co-workers and patients alike. He will be dearly missed." Nassief earned a medical degree at King Saud University College of Medicine in Riyadh, Saudi Arabia, in 1989. He completed residencies at King Fahad Hospital in Riyadh and at the University of Vermont. He completed two years of fellowship training in cerebrovascular disease at Washington University School of Medicine before joining the faculty in 2000. Nassief was an admired and recognized teacher who won several teaching awards, including the F. A. E. H. Elman Award for Teaching Excellence in the School of Medicine and the prestigious Washington University School of Medicine Distinguished Clinical Teacher of the Year Award in 2006. He also received clinical teaching awards from students in 2000, '03, '04 and '05. Nassief is survived by his wife, Shian, and two young sons, Fhatir, 8, and Sammy, 5. A memorial service will be held in St. Louis at a later date.

— Beth Miller

Feb. 12, 2009
**Substance behind theory**

**Van Dillen studies how movement contributes to pain**

Washington University — about five miles from where she grew up with her parents, two brothers and three sisters — has been here ever since.

"I heard there was a job at Washington University," she says. "Not knowing who to contact to apply, I called the admissions office of the physical therapy program. I was fortunate because Dr. Steven J. Rose, then the director of the Program in Physical Therapy, was also the director of the physical therapy clinical services at the Irene Walter Johnson Institute of Rehabilitation (IWI) — Steve was a nationally renowned scientist and clinician in the field of PT."

"Fortunately, I didn't know that at the time, or I would really never have gone there," she laughs.

Rose, Ph.D., hired her, but "not knowing exactly where she would work, but she knew she would be at "Walter Johnson" and that it would be a good fit."

Van Dillen began as a staff physical therapist in their Neurology Service at IWI. Within 18 months, she was moved to a senior physical therapy position and later into a role focused on incident prevention and supervision. Under her leadership, physical therapy clinicians built a comprehensive service for neuromuscular rehabilitation that included acute care, inpatient and outpatient rehabilitation and home care. The clinicians followed patients across levels of care to see how the treatments impacted symptoms — this included discharge to home care. The clinicians followed patients across levels of care to see how the treatments impacted symptoms — this included discharge to home care. The clinicians followed patients across levels of care to see how the treatments impacted symptoms — this included discharge to home care.

"Before this system, a therapist would see a patient in the hospital and would not know how the treatment affected the patient in the home after discharge," Van Dillen says.

Van Dillen says, "The clinics following patients across levels of care...are not rare. How to best direct acute direct service care to help the patient manage after discharge..."

**Evidence-based care**

In the 1980s, Van Dillen became increasingly bothered by the lack of evidence-based treatment in the field. She returned to school to earn a master's degree in health science in physical therapy at WUSTL, which gave her hands-on experience with the research process. Van Dillen said her master's experience made it clear that if she wanted to conduct sound research, she needed more training.

"I decided that I needed to go back and really learn the scientific process well to effectively examine anything we were providing to patients in PT really made a difference," she says. "Around this time, Jane, a researcher from the profession to identify clinical evidence as well as basic science evidence underlying PT, and my generation instead bridged the gap."

*When Dr. Rose came to Washington University in 1979, he initiated a research agenda for PT and brought the education, clinical care and research together*, she says. "This approach was unique, and brought the education, clinical care and research together in the hospital and in the community."

Van Dillen pursued a doctorate in experimental psychology at WUSTL and studied under Richard Abrams, Ph.D., professor of psychology in Arts & Sciences, in his perceptual-motor laboratory. The work served as a model to conduct very structured experiments of movement behavior in humans and to get background in research design and analysis that could be applied to a different area of investigation.

After she earned a doctorate, Van Dillen began studying musculoskeletal pain and injury. She identified that in the typical challenges of grant searching, she has to battle the barriers associated with breaking into new territories."

With great funding, her team has studied trunk movement in people with low back pain who regularly participate in racquet sports, a repetitive activity.

The researchers proposed that trunk movements used repeatedly in the racquet sport would contribute to the development of stereotypical movement strategies that people use in other activities. The repetition of the same movement strategies during the day was proposed to contribute to the low back pain.

"Using a structured clinical examination and laboratory procedures, we subgroup people with low back pain into specific movement pattern they consistently display and the associated symptoms," Van Dillen says. "We can then examine what factors contribute to why they move in a particular way. This gives us a basis for treatment, where we focus on modifying the contributing factors to alleviate the related low back pain symptoms and functional limitations."

Van Dillen is conducting a Phase I clinical trial that involves people with low back pain based on their movement and alignment patterns identified with a standard clinical examination. Participants are then randomly assigned to one of two treatments to determine which results in the best outcomes.

Van Dillen's published work has taken her around the world — she has attended conferences in Spain, the United Kingdom, Canada and Australia. She's set to go back to Australia this year to attend the University of Queensland for a conference on treatment of the spine.

"Linda is a wonderful citizen of our program and has brought us great distinction," says Susan Deusinger, Ph.D., executive director of the Program in Physical Therapy and professor of physical therapy and of neurology. "Her logical and organized approach makes her a wonderful researcher."

In the meantime, Van Dillen stays busy with her friend Mark Mieners and enjoys entertaining in their Central West End condominium.

"We like to cook, so when people come into town to work with us in our laboratory, we will have a few people from the lab, and a few faculty members come over. It gives us a chance to get to know everyone away from the work setting," she says.

**Linda Van Dillen**

**Education:** B.S., 1979, University of Missouri-Columbia; M.H.S., 1985, and Ph.D., 1994, Washington University

**Titles:** Associate professor of physical therapy and of orthopedic surgery, director, Musculoskeletal Analysis Laboratory

**Family:** Married to Mark Mieners; mother, Rose Van Dillen; brothers: James and Don Van Dillen; sisters: Nancy Don Van Dillen; brothers: Jennifer and Mark Mieners; 20 nieces and nephews

**Hobbies:** Spending time with family, cooking, tennis, cycling, being up with the world by reading *The Economist* and *Businessweek* and biographies and autobiographies of political figures.

钟: [from bottom left] Friend Mark Mieners, nephew Matthew Hurst, niece Kim Hurst, nephew Jeff Hurst, niece Katie Hurst and Linda Van Dillen.