



Paul B. Beeson
Career Development Awards
In Aging Research Program

2010 Report
Featuring the 2008 Scholars

The Paul B. Beeson Career Development Awards in Aging Research Program

About Paul B. Beeson, MD (1908-2005)



Paul B. Beeson, a distinguished physician, researcher, and teacher, was the inspiration behind the creation of the Paul B. Beeson Career Development Awards in Aging Research Program. It was his vision to increase the number of physicians with a combined clinical, academic, and scientific expertise to deliver optimal care for a growing older population.

At the time of his death, Dr. Beeson was professor emeritus of medicine at the University of Washington. Though retired, he remained active in the field of aging research, attending meetings and advising many Beeson Scholars. In his long and distinguished career, he profoundly influenced the career paths of many physicians and was stalwart in his concern for the care and dignity of patients.

To date, 162 physician-scientists throughout the United States and the Island of Ireland have emerged as leaders in the field, changing the landscape of geriatric medicine and aging research. They serve as a testament to his enduring legacy not only providing the best possible care for older adults, but also taking on the mantle of training the next generation of leaders.

Sponsors

National Institute on Aging
National Institute of Mental Health
National Institute of Neurological Disorders and Stroke
The Atlantic Philanthropies
The John A. Hartford Foundation
The Starr Foundation
The NIH Office of Dietary Supplements
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National Institute on Aging
American Federation for Aging Research

Message from AFAR's Executive Director



Stephanie
Lederman

This report recounts the 15th year of the Paul B. Beeson Career Development Awards in Aging Research Program and focuses on the 2008 Scholars. We are proud of their remarkable research, which ranges from elucidating the genetic basis for age-related disease to examining outcomes in clinical care. Their research is already making its way into the annals of scientific

literature and is beginning to make an impact on clinical practice.

We are also proud of the strength and resilience the Beeson Program has shown in the face of recent economic challenges, including an austere funding environment and the precipitous economic downturn the country has endured over the last couple of years.

Much of that strength comes from an enthusiastic willingness to collaborate. This enthusiasm infuses every area of the Beeson Program. Our scholars work together on research projects. Our leaders and mentors help the scholars advance their careers and make a strong impact in age-related medicine. And our public and private partners collaborate to maintain and further develop the program funding and reach.

In fact, the Beeson Program has become a model of cooperation between foundations and government entities. As we enter our sixth year of partnership with the National Institute on Aging, we continue to find and nurture the very best talent in age-related medical research. We are grateful for the continued support of the Atlantic Philanthropies, the Starr Foundation, the National Institutes of Health Office of Dietary Supplements and an anonymous donor. We are also extremely pleased to announce that our cooperative associations are broadened even further, as the National Institute of Mental Health and the National Institute of Neurological Disorders and Stroke are joining the Beeson partnership. We are equally pleased that the John A. Hartford Foundation has renewed its commitment in support of additional cohorts.

We believe this collaborative spirit will not only keep the Beeson Program strong through the challenges of the immediate future, but will also broaden and strengthen the program's scope and influence in ways we have yet to imagine.

A handwritten signature in dark ink that reads "Stephanie Lederman". The signature is fluid and cursive, with a long horizontal flourish at the end.

Stephanie Lederman

"The Beeson Program has become a model of cooperation between foundations and government."

Beeson Program Strengthened by Broader Public-Private Partnership

The Beeson Program partners extend a warm welcome to the National Institute of Mental Health and the National Institute of Neurological Disorders and Stroke, both of which announced they would join as program partners in 2010. Mental health disorders such as depression disproportionately affect older adults, as do neurological problems such as stroke. The program partners also express their deepest gratitude to the John A. Hartford Foundation, a founding partner, which has renewed its support through 2012. A leading philanthropy in age-related fields, the John A. Hartford Foundation has been central to the Beeson Program's success over the past 15 years.

National Institute of Mental Health (NIMH)

NIMH is one of the 27 research institutes and centers that constitute the National Institutes of Health (NIH). Since its founding in 1949, NIMH has followed a mission to transform the understanding and treatment of mental illnesses, paving the way for prevention, recovery and cure. NIMH generates research and supports training to fuel investigation into the causes of mental disorders; determine when, where and how to intervene; develop new and better interventions; and strengthen the public health impact of NIMH-supported research. To reach these goals, NIMH divisions and programs emphasize translational research that spans from bench to bedside to practice.

"NIMH strives to nurture talented physician-scientists and to enhance the impact of their research on the enormous public health burden that mental illnesses have across the lifespan," says NIMH Director Thomas R. Insel, MD. "We hope to underwrite such support targeted at our growing aging population through the Beeson Program."

National Institute of Neurological Disorders and Stroke (NINDS)

The mission of NINDS, a member institute of the NIH, is to reduce the burden of neurological disease—a

burden borne by people all over the world in every age group and segment of society. To support its mission, NINDS conducts, fosters, coordinates and guides research on the causes, prevention, diagnosis and treatment of neurological disorders and stroke. It provides grants-in-aid to public and private institutions and individuals in the field, operates a program of contracts for funding of research in selected areas, provides individual and institutional fellowships in neurological fields, and collects and disseminates research information related to neurological disorders.

NINDS recognizes it is crucial to encourage and support researchers who are proficient in clinical aspects of aging, particularly neurological disorders such as stroke and dementia that are common among older adults. The Beeson Award provides protected time and mentoring in a strong research environment to help young scientists establish themselves in this critical field.

The John A. Hartford Foundation

The John A. Hartford Foundation is a committed champion of health care training, research and service system innovation that helps ensure the well-being and vitality of older adults. Its overall goal is to increase the nation's capacity to provide effective, affordable care to its rapidly increasing older population. Today the John A. Hartford Foundation is a leading philanthropy with a sustained interest in aging and health. Through its grantmaking, the John A. Hartford Foundation seeks to enhance and expand the training of doctors, nurses, social workers and other health professionals who care for elders, and to promote innovation in the integration and delivery of services for all older people.

"Research on aging encompasses many areas of investigation and care: from the very basic biology of aging processes to clinical and social care needs," says Corinne Rieder, EdD, executive director of the John A. Hartford Foundation. "The Beeson Program clearly addresses these needs by creating an outstanding network of the top scientists in the country, who are helping tackle the many research and clinical challenges of geriatric medicine—challenges that will only become more urgent in the future."

Letter from Edward H. Koo, MD

Chair of the Program Advisory Committee



Edward Koo

It is my great pleasure to introduce the 2008 Beeson Scholars, who are featured in this report. The program began with support from a group of nonprofit organizations and foundations in 1994. In 2004, the National Institute on Aging joined this effort in the first National Institutes for Health-private partnership of this nature. Since the program's inception, 162 scholars

have received more than \$86 million in research grant support. Our scholars have made important contributions to every area of age-related medical research. Whether in the biology of aging, age-related diseases, health outcomes, health services or clinical management issues, their efforts have helped enhance health and quality of life for older adults.

Like the classes before them, the 2008 scholars are studying a broad array of topics, from vascular disease and Alzheimer's disease to functional recovery in post-acute care and improving surrogate decision making for critically ill elders. Together, they represent a balanced spectrum of research that spans from bench to clinic and beyond. Although scientific research is often a slow and painstaking process, some of the work from the 2008 class is already bearing fruit. For example, the August 2009 edition of the *Journal of the American Medical Association* featured results from Dr. XinQi Dong's Beeson-supported investigation into self-neglect among older patients—a problem that results in a significantly higher rate of mortality. Perhaps most striking about this particular class, however, is the number of Beeson Scholars looking into the role and treatment of comorbid

conditions among older adults. More than half of all elders face the challenge of coping with two or more coexisting medical conditions. As our aging population rapidly swells, developing insight and knowledge into the medical treatment of patients with co-morbidities has become critical.

This should come as no surprise. Developing models for treating patients with multiple conditions requires a cross-disciplinary perspective with which our scholars are already very familiar. From the Beeson Annual Meeting to the Hartford/AFAR Collaborative Research Award—which has given Beeson Scholars the opportunity to do collaborative work across disciplines—the Beeson Program has always strongly encouraged moving beyond the boundaries of narrowly focused scientific investigation to explore the novel and often pioneering insights that can occur among researchers from seemingly disparate areas of study.

We look forward to seeing our scholars assume leadership roles not only in research, but also in administration and policymaking of the 40 institutions from which they come. To this end, we will continue to work hard to attract the very best clinician-scientists and physician-researchers to the Beeson Program, mentoring them to help in their investigative work and career development, offering unparalleled networking opportunities and encouraging collaboration in every way possible.

A handwritten signature in dark ink, reading "Edward H. Koo". The signature is written in a cursive, flowing style.

Edward H. Koo

The Power of Numbers

AFAR, which co-administers the Beeson Program with the National Institute on Aging (NIA), is introducing a plan to facilitate, harness and utilize the collective wisdom and influence of the entire network of U.S. Beeson Scholars, now 157 strong. Traditionally, each scholar has contributed independently to the expansion of the geriatric workforce and the advancement of knowledge, as well as affecting policy in geriatric medicine and aging research.

As a group, however, they can increase their power to transform the field exponentially by aggregating their influence, providing bridges between specialties and establishing themselves as a cohesive group with diverse interests and a common goal. The plan will test two approaches:

Advocacy. Scholars will have the opportunity to develop a skill set in advocacy, connecting with policymakers at the institutional, local, state and national levels. The Beeson Annual Meeting will offer workshops and breakout sessions that include strategies for coalition building, negotiation, media relations, message development and communicating with government.

Outreach. AFAR will encourage Beeson Scholars to reach out to the broader medical research community to raise awareness of geriatric medicine and aging research.

Through a John A. Hartford Foundation grant, AFAR will create an outreach fund that will provide resources to the scholars to bring the issues of aging and age-related diseases and conditions to the forefront of their specialty associations and beyond. The fund could, for example, help organize and support aging-focused symposia at meetings and conferences, allowing scholars to present their Beeson-supported research findings and other activities.

Profiles in Achievement

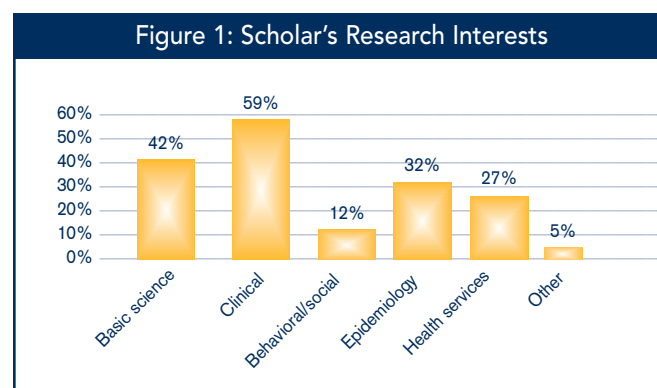
The Beeson Program continues to be an unqualified success, providing vitally important financial and

professional support to clinically-trained faculty at a critical juncture in their careers. The award allows Scholars to develop expansive research agendas in pursuit of new and promising ideas, significantly advances their career paths, and enables them to take on prominent leadership roles both at their home institutions and within the broader field.

Recently, the results of three surveys have provided a more detailed portrait of the Beeson Program's achievements.

Career Impact

A survey conducted in 2009 reaffirms that the Beeson Award has made a significant impact on the careers of Beeson Scholars. The survey included quantitative and qualitative questions. As the graph below shows, scholars represent a broad array of research interests, ranging from basic science to health services.

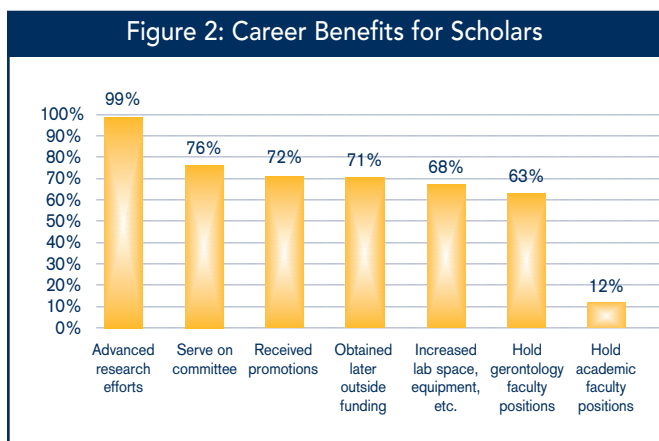


Nearly 90 percent of the scholars responded to the survey, providing information on a variety of benefits the Beeson Program has brought to their careers. They most often mentioned:

- Timing, length, duration and flexibility of financial support
- Protected time for research and relief from administrative and clinical duties
- Networking, annual meetings and the opportunity to interact and collaborate with peers, mentors, leaders in aging, researchers from different disciplines and NIH/NIA staff

- Mentoring by local mentors and program committee
- The interdisciplinary nature of the program
- Opportunities for career development through coursework, conferences and additional training

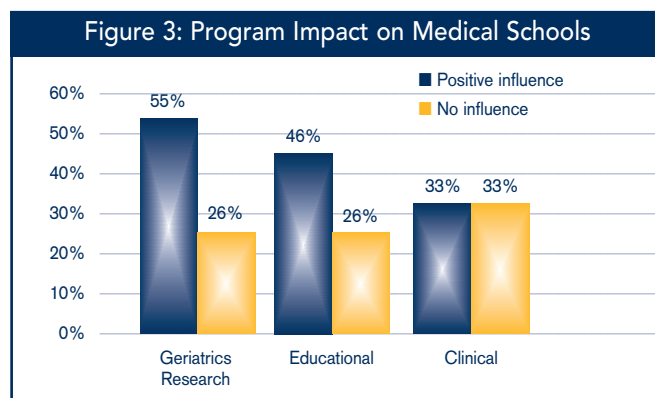
As a result of their Beeson Award, many scholars reported they now carry greater influence with the leaders of their institutions, as well as with peers and trainees. As the chart below illustrates, nearly all have advanced their research and most have received promotions, served on committees at their institutions, received subsequent extramural funding and/or hold faculty positions in geriatrics or related fields. A significant number have also moved into leadership positions.



Benefits Beyond the Scholars

The AFAR survey demonstrates that the Beeson Program benefits not only the scholars themselves but also their home research institutions and beyond to the policy arena. For example, many scholars lead the way in obtaining program project awards for their institutions, including the National Institutes of Health Clinical and Translation Science Award, National Institute of Aging Alzheimer's Disease Research Centers Award, Geriatric Research Education and Clinical Centers funding and NIA Pepper Center funding. In fact, more than a quarter of the scholars have undertaken local, state and/or national advocacy efforts to influence public policy on science and age-related health policy.

In this regard, the Atlantic Philanthropies commissioned Gregg Warshaw and Elizabeth Bragg from the University of Cincinnati to evaluate the program's impact beyond the individual scholars. They evaluated whether the presence of Beeson Scholars at an institution led to enhanced geriatrics education and clinical experiences for medical students and residents. They also assessed the extent to which scholars influence the discipline of geriatric medicine. Academic leaders at U.S. medical schools were surveyed and more than a quarter of respondents ranked the Beeson Program as one of the five most important influences on advancing the field of geriatrics in the past 15 years. The broad results of their responses are illustrated in Figure 3.



Funding and Publishing after Beeson

The AFAR analysis shows that seven out of ten scholars go on to obtain extramural funding for their work. A 2007 NIA survey, which compared application success rates and average number of publications of Beeson Award recipients with regular K08/K23 award recipients from 2004 to 2006, showed that NIA/Foundation Beeson Award recipients clearly achieved more in terms of publication productivity and subsequent grant support.

Overall, the results of the surveys unequivocally show that the Beeson Program is providing needed financial support to physician-scientists at a critical juncture in their careers. They have been able to pursue new and promising areas of research that would not have been possible with conventional funding, and many have taken on prominent leadership roles at their institutions and within the field.

Sarwat Chaudhry, MD
Assistant Professor of Medicine
Yale University School of Medicine

MENTORS:
Thomas Gill, MD
Harlan Krumholz, MD

Comorbidity and Functional Outcomes in Older Patients with Heart Failure



Chaudhry

Sarwat Chaudhry, MD, developed her keen interest in geriatric heart failure during her experience as the director of science for a large, multi-center clinical trial designed to examine the effect of remotely monitoring patients with heart failure. As the enrollment of participants began, she was struck by the complexities of the trial's

older patients, whose diminished resilience and range of impairments had not been fully considered in the traditional disease-focused model of care. All had been recently hospitalized for decompensated heart failure, in which the heart can't pump enough blood to meet the body's needs. But they also arrived with multiple co-existing, chronic diseases and geriatric impairments ranging from vision and hearing loss to depression and cognitive decline. Their poor day-to-day functioning, in fact, often seemed to limit the self-care required for best managing their heart failure—a constraint that may not be well recognized by clinicians.

"I've been really impressed by how complicated and frail these patients are. After heart failure hospitalization, many of them don't recover their functional or cognitive status," Dr. Chaudhry says.

Despite a growing recognition of the importance of patient-centered care, she says most efforts at quantifying health care quality and aligning "pay for performance" incentives still focus exclusively on individual diseases. Clinical decision-making for older patients, she believes, should be based on helping them attain their goals, including maintaining their functional abilities and identifying and treating those psychological, cognitive, sensory and physical impairments that can be modified.

Given the high prevalence and poor outcomes associated with heart failure in older people, a primary aim of Dr. Chaudhry's Beeson-funded research is to determine how geriatric impairments affect patients' prognosis. A big question is whether these

impairments might make good therapeutic targets of their own to help improve how well patients can access healthcare services and recover independent functioning. "The idea behind our work is that we're missing a bigger-picture view of heart failure in older people," she says.

Heart failure requires extensive, daily self-care by patients. "This isn't a condition like appendicitis, for instance, where you have an acute condition, you go in for a procedure and you're done," she explains. Doctors commonly tell their heart failure patients to weigh themselves daily, monitor their sodium intake and adhere to a complicated drug regimen. "The geriatric impairments we're studying are likely to impede patients' abilities to carry out these basic self-care tasks."

With the assistance of Beeson mentor Thomas Gill, MD, Dr. Chaudhry designed a series of complementary projects to help determine which impairments hold the greatest importance in determining patient outcomes. "Being part of the Beeson community, attending the meetings and connecting with a network of mentors who are leaders in aging research has been invaluable," she says. The funding and protected time has allowed her to carve out her own research niche and has helped her develop skills as the leader of an interdisciplinary research team.

Dr. Chaudhry's projects include an analysis of large, national data sets and a prospective clinical study that enrolls older patients at the time of their hospitalization for decompensated heart failure and assesses them 30 days after discharge. "What we're finding is that these impairments not only are very common but oftentimes are more severe than clinicians realize," she says. "They appear to have a direct influence on what patients are able to comprehend at the time of discharge in terms of instructions and need for follow-up care." Her continued observations could pave the way for a clinical trial to test the benefit of assessing and managing geriatric impairments during a particularly critical period: when older patients are first hospitalized for heart failure.

Stephanie Cosentino, PhD

Assistant Professor of Neuropsychology
Columbia University College of Physicians and Surgeons

MENTORS:

Yaakov Stern, PhD
Janet Metcalfe, PhD

Awareness of Deficit in Alzheimer's Disease



Cosentino

During her graduate training in clinical neuropsychology, Stephanie Cosentino, PhD, spent her days assessing the memory, language and cognitive abilities of patients with Alzheimer's disease. "I had such different interactions with patients based on their self-awareness," she says. "And it occurred to me that this wasn't

something that we were formally evaluating. We didn't understand what drove its variability."

Some patients were keenly aware of their decline, while others seemed entirely unaware. "Some people would walk in and say, 'I'm scared. There's something wrong with me. I need to be evaluated,'" Dr. Cosentino recalls. "And then the next day someone would come in and say, 'I don't need to be here. My wife made me come.' And then you evaluate them and they have the exact same cognitive profiles."

Although neuropsychology specializes in assessing memory, language, and other aspects of cognition, she emphasizes that "we have nothing to objectively measure people's self-awareness or their metacognition."

A primary aim of Dr. Cosentino's Beeson project is to fill in the gap by developing a rigorous and objective way to assess patients' ability to evaluate their own thinking skills and memory loss. "Part of the goal in establishing an objective test is to help us dig down and understand the roots and mechanisms that underlie disordered awareness," she explains.

Another goal is to bring the phenomenon of low self-awareness in Alzheimer's patients to the attention of both healthcare professionals and caregivers. "It's challenging when someone sits across from you and says, 'Everything is fine. I don't have a problem.' You want to respect someone's independence but it's also important for us to know, do they have a fundamental problem in evaluating themselves?"

Does reduced self-awareness, for example, lead patients to engage in activities that are no longer safe, such as

driving? Raising awareness of their limitations—perhaps through a carefully designed evaluation—could extend independence or reduce caregiver burden.

To carry out her research, Dr. Cosentino modified a standard memory test. Throughout the test, study participants are asked to evaluate themselves and make predictions about whether or not they'll remember specific information. The result is a personal assessment of memory performance that can be compared to how well they actually remember. The volunteers also receive in-depth interviews to examine how self-awareness impacts decision-making related to medication management, and they undergo structural and functional brain scans to identify regions critical to self-awareness.

In a pilot study, Dr. Cosentino found that high performance on her test was highly related to clinical readings of patients' awareness. "People who are aware that they have memory problems are good at making predictions in the course of the test," she says. "But patients who have less awareness struggle to evaluate themselves on an item-by-item basis to determine how well they're doing. These results give us an idea about the errors that lead to reduced awareness day to day."

Dr. Cosentino appreciates how her primary Beeson mentor, dementia expert Yaakov Stern, PhD, has been instrumental in helping her understand issues related to her study design and data analysis. Co-mentor Dr. Janet Metcalfe, MD, has helped her learn about methodologies used to study metacognition. And former Beeson Scholar Jason Karlawish, MD, has guided Dr. Cosentino in her evaluation of decision-making capacity and quality of life as they relate to self-awareness. As part of her training, she took courses in neuroimaging.

"One of the things that have been great about the Beeson Award is that it exposes me to a much broader picture of aging research," she says. "The award pulls you into this amazing community of people who help you see where your research fits into it all."

XinQi Dong, MD

Associate Professor of Medicine & Nursing
Rush University Medical Center

MENTORS:

Denis Evans, MD

Terry Fulmer, PhD, RN

Consequences of Self-Neglect in a Biracial Population of Older Adults



Dong

Elder self-neglect is broadly defined as the neglectful behavior of an older adult that can threaten his or her own health and safety. To XinQi Dong, MD, the converging trends of a fast-growing population of elders and increasing reports of self-neglect underscored the need for an interdisciplinary network of experts to help avert the potentially deadly consequences.

The behavior, Dr. Dong says, can manifest in a number of ways. "Elders who self-neglect often reject necessary resources or support, or refuse or fail to provide themselves with adequate food, water, clothing, shelter, personal hygiene and safety precautions," he explains. Someone might regularly leave a hot stove unattended, for example, or refuse to seek treatment for significant infections.

A recent survey by the National Adult Protective Services Association suggests that elder self-neglect is on the rise. "In addition, some of our recent work would indicate that elder self-neglect is associated with alarming mortality," Dr. Dong says.

According to the results of a study led by Dr. Dong and published in the *Journal of the American Medical Association*, there was a nearly six-fold increase in an individual's risk of death during the year after an elder was identified as being self-neglectful. For the most severe cases, the mortality risk rises 15-fold during the first year. "After the first year, there's a somewhat lower, but still significant increase in mortality risk," he says.

Dr. Dong has had a long-standing interest in elder abuse and neglect, working with multiple national and international nonprofit organizations on human rights and violence prevention. "It's not only a clinical interest, but also an affirmative advocacy interest," he observes.

When he arrived in Chicago, he found an ideal partner to pursue his research interests in Joyce Gallagher, Commissioner of the Chicago Department on Aging. They formed a citywide Well-Being Taskforce to engage a wide range of agencies. The taskforce has already trained nearly 50,000 city and community workers who have regular contact with seniors to be the eyes and ears of the community. This taskforce formed the basis for the successful legislative effort to amend the Illinois Elder Abuse and Neglect Act in 2008, expanding guidelines, services and legal remedies. "It was a privilege to work with lawmakers and people from vastly diverse backgrounds which led to the unanimous passing of this bill," Dr. Dong says.

Dr. Dong's Beeson research project on the link between self-neglect and health outcome is embedded within the Chicago Health and Aging Project (CHAP), which began in 1993 in racially and ethnically diverse neighborhoods. Dr. Dong and his team matched the CHAP data with social service data, and National Death Index and Medicare data to assess mortality and health services use.

His primary Beeson mentor, Denis Evans, MD, is the principal investigator of the CHAP study. "Dr. Evans provided an enormously supporting environment," Dr. Dong says. Another mentor, Terry Fulmer, PhD, RN, is dean of the College of Nursing at New York University and a leading expert in elder abuse and neglect. "She has also provided incredible guidance over the years, not only on the research but for my development as well."

For Dr. Dong, the Beeson Award has helped ease the difficulty in balancing demands on his time by protecting his research efforts.

Eventually, Dr. Dong hopes to better quantify the continuum and consequences of self-neglect, as well as how specific risk or protective factors associate with varying degrees of severity. Such efforts, he says, "all have a singular purpose of effecting positive changes in the lives of the self-neglecting seniors."

Susan Hardy, MD, PhD

Assistant Professor of Medicine

University of Pittsburgh Medical Center

MENTOR:

Stephanie Studenski, MD, MPH

Functional Recovery in Post-acute Care



Hardy

During her medical training, Susan Hardy, MD, PhD, made a startling observation while conducting clinical work in a nursing home. "I was seeing patients who, when they first came to the nursing home for their therapy, were actually still quite sick," she says. Many were so ill that they had trouble making any progress, which is how Medicare

determines whether a patient can continue receiving therapy. "The way the nursing homes were set up wasn't ideal for this new, sicker group," she says.

Dr. Hardy had already been using epidemiological data to study how people recover from disabilities. Her new observations gave her the chance to take that general knowledge about recovery and apply it to a clinical setting. Accordingly, her Beeson research examines how people regain their ability to function after being in the hospital, specifically patients who receive physical or occupational therapy through home healthcare or nursing homes. The goal is to determine whether significant differences exist in patient outcomes and to establish guidelines about who should get what kind of therapy.

Changing demographics already have altered the kinds of patients that rehabilitative care settings see most often. Instead of being hospitalized for afflictions such as strokes or fractures, older patients are more likely to have medical issues such as heart failure, pneumonia or a bad urinary tract infection. Previously, they might have stayed in the hospital longer, but increased pressure to reduce hospital stays means patients who arrive for rehab are, in many cases, still ill. "And I think that makes it hard for them, especially initially, to successfully participate in their therapy and get better," Dr. Hardy says.

To help pave the way for a clinical intervention, she is pursuing two related studies. The first analyzes a national Medicare beneficiary survey, allowing her to ask what determines whether a patient receives rehabilitation after being hospitalized, and where such care occurs. The survey provides "before" and "after"

snapshots of each hospitalized patient's functional abilities, helping to point out differences.

For a second study conducted in Pittsburgh, Dr. Hardy says, "We're looking at how sick people are, medically, when they first enter the nursing home for therapy, and how their medical illness affects their ability to regain function and activities of daily living." In other words, how well can patients walk around or bathe and dress themselves? Does their blood pressure drop when they stand up or do they get short of breath while walking?

The Beeson Award, Dr. Hardy says, has provided a golden opportunity to share research ideas with a wide variety of other people conducting aging research. In particular, the annual meetings have bolstered her research into how fatigue affects recovery—a major complaint among older hospitalized patients. The topic has become a hot area of inquiry and the award has given her the chance to connect with experts on the causes and underlying physiology of fatigue.

The award has likewise helped with her training, allowing her to take coursework on how to use Medicare claims data. "I'm finding now that not only has that been good for the Beeson research, but it's really helped me help other people use this data set," she says. Dr. Hardy notes that she has relied on her Beeson mentor, Stephanie Studenski, MD, MPH, for guidance in her research.

In the end, figuring out which problems are most common for patients undergoing post-hospitalization rehab could pave the way for new evaluations to ensure that health issues are quickly communicated to a physician, nursing staff or other caregivers. That increased awareness, in turn, may help give every patient a better chance of recovering and returning home.

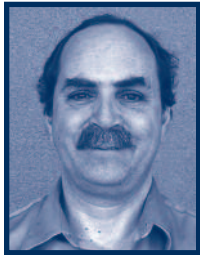
Paul B. Rosenberg, MD

Assistant Professor of Psychiatry and Behavioral Sciences
Johns Hopkins University School of Medicine

MENTORS:

Constantine Lyketsos, MD
Martin Pomper, MD, PhD
Marilyn Albert, PhD

PET Imaging of Microglial Activation in Alzheimer's Disease



Rosenberg

As a board-certified geriatric psychiatrist, Paul Rosenberg, MD, saw more than his share of patients with Alzheimer's disease and dementia. "I had a largely clinical job in a veteran's hospital, and I got frustrated," he recalls. "I was working with my Alzheimer's patients in clinic, and I would prescribe the existing drugs and they didn't do much."

So he decided to be part of the solution.

Since answering a help-wanted ad for an Alzheimer's specialist at Johns Hopkins University, Dr. Rosenberg's research has spread in new directions, all aimed at finding better treatments for the disease.

The need has never been greater. As many as 5.3 million adults in the United States were living with Alzheimer's in 2009—a number that could triple by 2050, according to the Alzheimer's Association. The disease is becoming a national and even worldwide epidemic, Dr. Rosenberg says, because of the aging population. "It's actually a disease of better health. People live longer, and they get Alzheimer's disease," he says.

His overall mission to help reverse that trend falls into two main categories. "One is to design and implement clinical trials of new treatments for Alzheimer's and the other is to learn how to develop biologic markers of pre-symptomatic disease," he explains. "And the big picture is, if we're ever going to cure this disease, we have to prevent it, and the way to prevent it is to diagnose people before they have symptoms."

A more immediate goal of Dr. Rosenberg's Beeson-supported research is to clarify how brain inflammation is linked to the disease by finding a reliable marker of that inflammation. "On the one hand, it's pretty clear that inflammation in the brain is part of how neurons die in Alzheimer's disease," he says. On the other hand, such neuroinflammation may be part of the process by which the brain rids itself of the toxic amyloid beta proteins

associated with Alzheimer's telltale plaques. "One of the reasons I want to develop a biomarker is that we'll never understand the balance between these two until we can measure the process," he says.

Dr. Rosenberg is exploring whether a new radioactive marker used in combination with a standard positron emission tomography (PET) scan—an imaging tool commonly used to look at the functional activity of organs—might provide the first accurate measurements of such neuroinflammation. One of his Beeson mentors, Martin Pomper, MD, PhD, pioneered the use of the marker, known as DPA-713, to image human brains. Because the marker binds to an inflammation-associated protein whose activity may increase during Alzheimer's, Dr. Rosenberg may be able to ask whether early-stage patients who have more inflammation are more likely to progress faster.

His Beeson Award has been crucial for letting him learn how to design and conduct clinical trials and to get up to speed on PET data collection and modeling, "one of the most technical things I've ever done."

Another major benefit, Dr. Rosenberg says, has been the protected time to pursue his many other collaborative projects. One is exploring whether a particular beta-blocker, a drug more commonly associated with fighting hypertension, might also slow the progression of Alzheimer's disease. For another, he is collaborating on a rehabilitation strategy to improve memory in people with mild cognitive impairment. For a third, he is testing the hypothesis that the stress of hip surgery may alter the physiology of patients with pre-dementia syndromes, thus hastening the onset of cognitive impairment.

"I'm developing my own ideas," he says. "Every one of these areas takes a huge amount of preparation time before you're actually gathering data." With the Beeson Award's strong emphasis on supporting both training and research, however, "these different pieces are all bearing fruit."

Joseph S. Ross, MD, MHS

Assistant Professor of General Internal Medicine
Yale University School of Medicine

MENTORS:

Albert L. Siu, MD, MSPH
Harlan M. Krumholz, MD, SM

Impact of Publicly Reporting Hospital Outcome Measures for Older Adults



Ross

Can public reporting on the quality of hospital-based care really make a difference in improving patient outcomes? To date, the scant evidence has been decidedly mixed, according to Joseph Ross, MD, MHS. "There's no landmark study that says, 'We started public reporting and care got better.'"

However, I don't think you can get better if you're not measuring performance," he says.

A more definitive answer may be forthcoming as Dr. Ross and colleagues gear up for a major analysis of whether Medicare's public reporting initiatives have had any effect on hospital quality and performance. The effort has been aided by his work with an interdisciplinary group of researchers to provide Medicare with the statistical models needed to measure and then publicly report on a range of performance criteria. Among the models created so far, the team has created ones that measure 30-day mortality rates for heart attack, heart failure, or pneumonia patients. More recent models are measuring 30-day readmission rates for heart attack and heart failure, and outcomes for stroke and angioplasty.

Each model incorporates Medicare claims and assesses clinical data to identify major predictors of outcome. After accounting for important demographic and clinical characteristics, a vetted model can provide a basis of comparison among hospitals. "If they're reporting this publicly, perhaps patients will look at this information and then try to go to that hospital or go to physicians who work with that hospital," Dr. Ross says. "But the more likely scenario is that by reporting this information, hospitals will want to compete against each other, and they'll compete on this quality measure and try to achieve better outcomes."

Medicare's public reporting on hospital-based measures, which began in July 2007 with mortality rates

for heart attack and heart failure, is just now yielding enough data for a vigorous analysis. Even with the statistical models, however, Dr. Ross knows the results may not be clear-cut, and that public reporting alone may not be enough to improve care. But the prospect of being flagged for poor performance could be an important motivator for doctors. "If you don't measure it, you're not going to pay attention to it and try to improve your performance," he says.

With his longstanding interest in health policy, he says, the Beeson Award has allowed him to conduct clinically relevant research that can change policy and lead to better care. "I feel amazingly fortunate; I'm doing exactly what I had hoped to be doing when I decided to become a physician," he says. Dr. Ross credits his primary mentor, Albert Siu, MD, as a big reason for that success. "He not only looks out for me around the institution, but he's been instrumental in helping me to understand the field of geriatrics and identify the important clinical issues deserving scrutiny," Dr. Ross says. Another "incredibly supportive" mentor, former Beeson Scholar Harlan Krumholz, MD, leads the team that has developed the statistical models of hospital-based care.

The award also has helped Dr. Ross look ahead to the next phase of his career. As a healthcare policy specialist, he focuses mostly on hospital care for older adults because Medicare is the top source for national data. "But as a primary care physician, I think that what we really need are measures of performance on physicians outside of the hospital." He says patients are far more capable of making decisions about where to go when they're choosing a doctor instead of choosing a hospital when they're seriously ill.

After assessing whether researchers can reliably measure and report on the performance of healthcare providers, Dr. Ross sees the outpatient setting as "the next frontier" in his continuing goal of trying to create positive change in the quality of patient care.

Steven Russell, MD, PhD

Instructor in Medicine
Harvard Medical School

MENTORS:

Ronald Kahn, MD Richard Miller, MD, PhD
Andrzej Bartke, PhD Gary Ruvkun, PhD
Nir Barzilai, MD

Adipocyte Insulin Signaling in Metabolism and Aging



Russell

A little mouse with an unusually long life has propelled Steven Russell, MD, PhD, into the forefront of longevity research.

The long-lived mouse is abbreviated FIRKO, which stands for Fat-specific Insulin Receptor KnockOut. The mouse is particularly interesting because it lives about 18 percent longer than normal and remains thin

despite eating as much or more as mice without the mutation. "In fact, if you overfeed the mouse, it remains thin," Dr. Russell says. "You can't make this mouse fat." Unlike some other long-lived mice that are dwarfed, however, a FIRKO mouse grows to a normal size. The rodent is also resistant to developing diabetes as it ages, a common mouse malady. "Ultimately, if you could understand how it was working, perhaps you could develop a drug or a treatment that would allow us to confer some of the same health and longevity benefits on people," he says.

Adding the equivalent of another 14 years to the human lifespan would be a major breakthrough, but Dr. Russell must first gain a deeper understanding of how FIRKO mice remain so healthy and long-lived. If the function of the insulin receptor, which helps regulate blood sugar levels, is blocked in all body tissues, mice come down with diabetes. The genetic trick that has allowed scientists to knock out the receptor only within the fat of FIRKO mice can't be replicated in humans, but Dr. Russell believes the FIRKO mouse could still lead to human therapies. Although the insulin receptor is knocked out only in fat cells, he explains the entire animal is resistant to diabetes and lives longer. "There must be communication between the fat and the rest of the mouse to coordinate this slower rate of aging," he says, "and so there has to be something that circulates in the blood to do that."

With his Beeson research, Dr. Russell is working to understand how the genetically modified fat communicates with the rest of the body, preserving health and promoting longevity. "Identifying that circulating 'factor X' could lead to a drug that modulates the effects of aging," he says. As a part of that effort, Dr. Russell is testing whether knocking out the insulin receptor in the fat cells of adult mice confers the same longevity and resistance to obesity and diabetes as seen in mice that have had the knockout since birth.

Of the Beeson Award's many benefits, one of the biggest has been his ability to hire a research assistant to help with his many lines of scientific inquiry. "It obviously accelerates progress to have another pair of hands, rather than doing it all on my own," he says. With the award in hand, Dr. Russell successfully applied for additional funding that allowed him to hire a second research assistant. "I've expanded my lab from one to three on the strength of the Beeson Award," he says. Dr. Russell likewise credits the continuing support and "very positive" interactions with Beeson mentor Ronald Kahn, MD, and co-mentors Andrzej Bartke, PhD, Gary Ruvkun, PhD, Richard Miller, MD, PhD, and Nir Barzilai, MD, for helping him move forward with his research.

Solving the mysteries of long-lived mice, Dr. Russell says, could dramatically change the way in which doctors care for older patients. "As our patients age, we try to treat each of their aging-associated problems and diseases individually as they develop. This is a piecemeal approach," he says. "What the studies of long-lived mice have shown is that not only do the mice live longer but they're also healthier as they age, so you're not just increasing the lifespan; you're increasing the healthspan." The ideal approach for human medicine would be a single intervention that prevents or delays multiple age-related problems, and he believes that studying the unique features of the FIRKO mouse will bring him closer to that tantalizing possibility.

Arthur Simen, MD, PhD
Assistant Professor of Psychiatry
Yale University School of Medicine

MENTORS:
Amy Arnsten, PhD
Angus Nairn, PhD
Sherman Weissman, MD
Jane Taylor, PhD

Epigenetic Factors in Vulnerability to Aging and Stress



Simen

Performance in an area of the brain known as the prefrontal cortex declines as we age. The most evolutionarily advanced of the brain's parts, the prefrontal cortex mediates psychological functions that are critical to perform activities of daily living and live independently.

On the cellular level, an intricate network of neurons determines the cortex's ability to perform properly. For his Beeson project, Arthur Simen, MD, PhD, is focusing on the molecular mechanisms that make this neuronal network tick. "These mechanisms, we think, are really important in a wide variety of neuropsychiatric conditions that develop in the elderly, including diseases like Alzheimer's disease and other dementias," he says.

One factor that seems to keep everything in balance is chromatin, a complex of proteins tightly wrapped around our chromosomal DNA. Altering the structure and function of chromatin, research suggests, changes the way in which genes are switched on and off. These differences in gene expression, in turn, may determine how well neurons do their jobs. "So we're really focused on understanding how aging affects the state and function of chromatin as it pertains to the functioning of neurons in the prefrontal cortex," Dr. Simen says.

Dr. Simen is conducting detailed behavioral and cognitive analyses on mice of various ages to determine how well their prefrontal cortex is functioning. He and his colleagues are then examining how the chromatin complex and levels of gene expression in the rodents' prefrontal neurons might be modified. "If you can imagine a Venn diagram with these three overlapping circles of behavior, chromatin, and gene expression," he says, "we're interested in their intersection: genes that show changes in expression because of chromatin changes, and that are related to the behavioral dysfunction we see in the mice."

Identifying candidates that are central to the behavioral, chromatin, and gene expression changes,

he says, "would be very important because we think these would become excellent gene targets for the development of pharmaceutical agents to slow this age-related process."

According to Dr. Simen, the Beeson Award came at an absolutely critical point in his career. It enabled him to make significant progress on his scientific goals, mentor a growing group of students and post-doctoral fellows in his lab, and also solidify his connections with members of the aging-related research community at Yale. "I've spent most of my life training to be a physician-scientist and I'm very committed to helping others through my work," he says. "But it's impossible to devote oneself to such work without significant financial and other resources."

Another essential element has been the professional advice and support of Dr. Simen's Beeson mentors. His primary mentor, Amy Arnsten, PhD, is a well-respected leader in the research arenas of prefrontal function and aging. "She has been helpful to me in strengthening my knowledge of the anatomy of the area and in experimental approaches to studying prefrontal function," he says. His co-mentors have likewise proven invaluable resources in helping him develop his techniques and in advancing his career.

So far, one major surprise in his results has been the high number of gene candidates related to immune function. "Although aging is ultimately affecting the function of neuronal networks in the prefrontal cortex," Dr. Simen says, "it seems that immune cells in the brain are also playing a role, and there may be a role as well for other cell types."

He and his colleagues are developing new methods to understand the shifting molecular interactions between these multiple cell types in the brain. "But what's really exciting and hopeful about this is that these changes are reversible," he says. "And so we're very excited about the prospect of developing, in the future, some new approaches to change these signaling events to try to improve brain functioning."

Farzaneh Sorond, MD, PhD

Assistant Professor of Neurology
Harvard Medical School
Brigham and Women's Hospital

MENTOR:

Lewis Lipsitz, MD

Hypoxia-inducible Transcription Factor 1 (HIF-1) in Vascular Aging



Sorond

Stroke, dementia, and white matter disease: many neurological disorders of aging result from a gradual or sudden drop in blood flow to the brain. "I'm a neurologist, so I see a lot of neurological complications of aging that really go back to the blood vessel," says Farzaneh Sorond, MD, PhD. "And while we have come a long way in understanding how aging vessels

might affect the heart or our other organs, there's not a lot out there about the brain and it's been difficult to study it in humans."

Dr. Sorond hopes her Beeson research will add to that dearth of knowledge by granting a greater understanding of how the blood vessels of the brain work normally, and how aging alters that function. "I'm not about to stop the aging process of the brain," she says. "But it may be possible to lessen age-related disability and slow the drop in quality of life from dementia, falls, or gait disorders. The big picture is to prevent that vascular dysfunction in the brain, so that aging occurs without so much loss or neurological disability."

To learn more about how blood vessels regulate flow to the brain as we age, Dr. Sorond is focusing on a critical regulatory protein named HIF-1. The HIF-1 protein regulates the balance of oxygen in our bodies, and accumulating evidence suggests the protein helps to increase blood flow in the brain. "We think that this protein is decreased in aging, so how does that affect brain blood flow?" And if, as she suspects, decreased levels reduce blood flow, could ramping up the protein partially reverse the effects of aging on the blood vessels?

As part of her project, Dr. Sorond is measuring the baseline and drug-induced levels of HIF-1 in healthy younger and older adults. One arm of her research examines the impact on blood flow six hours after protein levels have been elevated via an intravenous drug, while another arm investigates whether volunteers taking the widely available

nutritional supplement quercetin for six months receive any blood flow or cognitive benefits through a sustained boost of the protein.

An observed impact in the healthy older population, she says, "would have huge implications." Demonstrating that the intravenous drug activates HIF-1 enough to have an effect could spur testing of its potential for treating acute stroke patients. And any net benefit from quercetin might bolster clinical trials to see whether it helps patients with a mild cognitive impairment potentially linked to a more gradual drop in blood flow. A separate project is even exploring how the flavanol compounds of cocoa may protect blood vessel health.

According to Dr. Sorond, everything comes back to one central question: "How does the vessel change with aging and what can we do to modify changes that have detrimental implications?"

The Beeson Award, "allowed me to lead and drive a project. I was involved in a lot of projects before but I never had time to focus on the questions that I found most appealing and challenging." Having the freedom to do so has allowed her to collect enough data to pursue new opportunities. "My publications have almost doubled in the past year," she says, "and as a result of that I have now started a lot more collaborations because people are now more familiar with what I do."

Dr. Sorond credits her primary Beeson mentor, Lewis Lipsitz, MD, as being instrumental in guiding her through the process of formulating research questions and then designing studies and protocols to answer them. The Beeson-sponsored meetings she's attended have been particularly rewarding. "There are just amazing links and collaborations that develop there that have broadened the horizons for what I will do next," she says. "It's very hard to do this without a system that supports you, and that's been critical."

Michael Steinman, MD

Associate Professor of Medicine in Residence
University of California, San Francisco School of Medicine

MENTORS:

Seth Landefeld, MD, MPH
Ralph Gonzales, MD, MSPH
Kenneth Covinsky, MD, MPH

Guideline Adherence in Elders with Multiple Comorbidities



Steinman

An estimated one-tenth of hospitalizations among senior adults can be attributed to an adverse drug reaction. For Michael Steinman, MD, the statistic highlights the tricky balancing act in prescribing medicine to older patients. “The right answer isn’t to be fearful and not prescribe anything, nor should we ignore adverse reactions and

prescribe indiscriminately,” he says. “The obvious answer is somewhere in between the two, but how exactly to find that balance is a huge challenge.”

With his Beeson project, Dr. Steinman is hoping to provide equilibrium by better defining the risks and benefits of medication among those with coexisting chronic conditions or comorbidities. In particular, he is examining the extent to which frailty and other age-related conditions might increase an older patient’s risk of adverse drug reactions. A major goal is to find tools that will help doctors refine their assessments of drug therapies, and then use that information to help guide the decision-making for individual patients.

Dr. Steinman’s research also supports an increasing role for monitoring side effects. Many of the most common drug reactions can cause significant discomfort, such as gastrointestinal distress, constipation, dizziness, or a persistent dry cough. Less common but more serious reactions, such as falls, cardiac arrhythmia, or loss of consciousness, can be life threatening. Adverse reactions can’t always be predicted, but identifying early indications of trouble once a course of medication has begun could allow doctors to mitigate the risk and thus minimize the harm.

Dr. Steinman describes these elements of his research as two sides of the same coin. “Being able to better understand how frailty and other geriatric characteristics affect the risk of developing adverse drug reactions can help doctors make better prescribing choices for vulnerable patients,” he says. And given doctors’ limited ability to predict who will develop a side effect, getting smarter about identifying and remediating adverse reactions once

they have already started is critical to minimizing suffering and the severity of consequences.

During his medical residency, Dr. Steinman remembers being struck by how having libraries full of information about treating patients often didn’t translate into effective interventions. “There is a big gap between what we know we should do for patients and what we actually do,” he says. Drawing on his clinical experience in geriatrics at the San Francisco VA Medical Center, he became aware of the need for a broader framework of guidelines to safeguard the drug prescription process. More importantly, he asks, can that information be used to improve outcomes among older patients?

According to Dr. Steinman, the Beeson Award has been invaluable in helping him apply his research toward that end. “At my first Beeson meeting I was taken aback by how much of a sense of community and support there was. It wasn’t just a source of funding to support my work—it provided the support of mentors and people who are not only willing but actively interested in helping me with my ideas, advancing my career, and providing opportunities,” he says. Dr. Steinman describes his primary mentor, Seth Landefeld, MD, MPH, in similar terms. “Dr. Landefeld has been a fantastic mentor. He is a great source of advice and ideas, but more than that, he is deeply committed to my success.”

Dr. Steinman’s early work has already provided some unexpected insights on which patients are most susceptible to adverse drug reactions. Studies have suggested that the risk of an adverse reaction rises with the number of prescribed drugs. More surprisingly, however, Dr. Steinman’s preliminary data suggest that frailer people aren’t necessarily at higher risk for such reactions. Rather, the danger seems to depend more on how a patient’s prescription list varies over time.

If confirmed with other data sets this could be good news for elders who are frail, decreasing the risk for adverse drug reactions and allowing patients to reap the benefits of drug therapies.

Stephen Todd, MD
Senior Clinical Research Fellow
Queens University, Belfast

MENTOR:
Peter Passmore, MD

Investigation of Platelet Beta-secretase Activity in Alzheimer's Disease



Todd

About five years ago, a discovery by researchers at Queens University in Belfast, Northern Ireland, hinted at a potential new test for Alzheimer's disease that could avoid the dreaded and invasive spinal tap used by many clinicians. Stephen Todd, MD, is now following up on that work to demonstrate whether an enzyme known as A β -secretase, which can be readily measured in blood platelet cells, just might make an effective biomarker for both Alzheimer's risk and its progression.

Blood platelets are usually associated with the clotting function of blood. But the cells also contain all the ingredients needed to form the Alzheimer's-associated beta (A β) amyloid protein, the key ingredient of the disease's characteristic plaques. The primary enzyme responsible for beta amyloid production, A β -secretase, is likewise easy to get to through the platelets, offering a far more accessible way to assess its activity than sampling cerebrospinal fluid through a spinal tap.

In a group of 400 volunteers, half with early-stage Alzheimer's disease, Dr. Todd and his colleagues observed an average 17 percent jump in A β -secretase enzyme activity levels within the blood platelets of the Alzheimer's patients. The increase, although slight, was significant enough to warrant a closer look. Among volunteers with normal memory, the enzyme's relative activity varied as much as four-fold.

"So our hypothesis was that perhaps those who initially did have a higher level five years ago would tend to be the subjects who would then have memory problems or perhaps develop Alzheimer's disease in the course of the follow-up," he says. "Obviously, time will tell whether that proves to be the case or not."

For his Beeson project, Dr. Todd is hoping to provide an answer by following up with as many of those original volunteers as possible. Another question is whether the initial activity of A β -secretase measured in patients with

Alzheimer's disease predicted their subsequent course of disease.

Separate preliminary evidence suggested that a standard Alzheimer's treatment, a class of drugs known as acetylcholinesterase inhibitors, may influence the A β -secretase levels in blood platelets. A second part of Dr. Todd's research will study the drugs' effects on enzyme activity in a small group of Alzheimer's patients compared to other patients who either have refused treatment or haven't yet been prescribed the medication.

During a two-year stint of post-graduate research completed as part of his medical training, Dr. Todd realized he thoroughly enjoyed the science and wanted to integrate more of it into his career. Encouragement to pursue his research interests came from Peter Passmore, MD, an expert in Alzheimer's and dementia at Queens University, who is now serving as Dr. Todd's Beeson mentor.

According to Dr. Todd, the Beeson Award "certainly has allowed me to continue to develop as a researcher and progress in my career, and could be a stepping stone to getting further fellowship awards from funding bodies on this side of the Atlantic." The funding has given him the freedom to branch out on his own, and the Beeson meetings have provided valuable opportunities for networking and meeting leaders in the field of aging research.

With the ultimate goals of finding better biomarkers of Alzheimer's disease, Dr. Todd believes that A β -secretase blood platelet levels should not be considered alone. "In time, I think the general consensus will evolve toward a combination of some neuroimaging techniques along with perhaps blood tests or spinal taps that will help refine the clinicians' judgment after their assessment of the patient and the standard neuropsychological testing," he says.

For Alzheimer's disease, adding another effective diagnostic tool to the mix—especially one that only requires a simple blood draw—could give doctors the head start they need to make a difference in the lives of their patients.

Douglas White, MD, MAS

Associate Professor of Critical Care Medicine
University of Pittsburgh Medical Center

MENTORS:

Seth Landefeld, MD
Robert Arnold, MD

A Randomized Trial to Improve Surrogate Decision-making for Critically Ill Elders



White

About one in five elderly Americans will die in a hospital intensive care unit (ICU). But research suggests that current models of care for critically ill older patients are failing to ensure that decisions about their care remain sufficiently centered on their values and that their families receive adequate support.

"We know that families quite often experience a great deal of turmoil making end-of-life decisions for elderly, critically ill patients, and also struggle to make decisions that are consistent with the patients' values," says Douglas White, MD, MAS. Sometimes families lack the information they need and other times it's just emotionally difficult to make good surrogate decisions.

To help address those concerns, Dr. White pioneered an intervention model to provide multiple kinds of support to the families of older, critically ill patients. The new model features the addition of a family support counselor to the clinical team. On the same day a patient is admitted to the ICU, the counselor establishes a relationship with the patient's family, and remains the contact person throughout the hospital stay.

The plan builds on established interventions intended to help patients navigate difficult medical systems. "Here, we're having a person help the family navigate the ICU, in terms of things like visiting hours, where to sleep, and what all of the machines are in the patient's room," he says. "We supplement this with emotional support that we think will come from this empathic, consistent presence that is the family support counselor."

To provide communication support, the counselor arranges frequent meetings between clinicians and the family, and helps the family prepare for those meetings and conducts debriefings afterward. "For

family members of patients whose survival is unlikely," he says, "we integrate an anticipatory grief component of the intervention, which helps the family say goodbye in whatever ways are culturally most appropriate."

The overall design is built upon a growing body of evidence that suggests bereavement outcomes are worse when families believe they weren't well prepared for a loved one's death. "What we're seeking to do is to help the family in this very tight timeline and very stressful circumstance to achieve some measure of preparation for the patient's death in the ICU," he says. Upon the completion of a pilot test to help refine the process, Dr. White hopes to enroll 175 critically ill older patients and their families in a randomized trial to examine the true impact of a family support counselor. "The key outcome measures are the family members' levels of depression and anxiety three months after the ICU stay, and their perceptions of the patient-centeredness of care," he says.

The Beeson Award, Dr. White says, has been a crucial source of assistance, allowing him to hire and train a full-time family support counselor. Beyond the chance to improve the experience of families in geriatric critical care settings, the Beeson Program has let him develop his skills as a leader in the field, including his role as director of the University of Pittsburgh Program on Ethics and Critical Care Medicine. His diverse mentoring team has been another pillar of support, with the inclusion of world-class geriatrician Seth Landefeld, MD, and Robert Arnold, MD, one of the leading experts on communication and decision-making in palliative care. "The Beeson Award has let me bring these two great minds together," Dr. White says.

Heather Whitson, MD

Medical Instructor

Duke University School of Medicine

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Harvey Cohen, MD

Eleanor McConnell, RN, PhD

Miriam Morey, PT, PhD

Carl Pieper, DrPH

Developing Interventions to Improve Function in Seniors with Comorbidity Conditions



Whitson

Dr. Heather Whitson sees the rise of an increasingly complex geriatric population as a distinctly 21st Century phenomenon. "The defining feature of geriatric patients is not so much their chronological age as it is the level of disease accumulation and conditions that are co-occurring," Dr. Whitson says. "My interest is in how we can get smarter in the way we treat those patients."

Dr. Whitson's interest draws from personal experience. She remembers how her grandmother struggled with both vision loss and cognitive decline, and how a low-vision rehabilitation program was compromised by her grandmother's memory problems.

For her Beeson project, Dr. Whitson chose to study older adults living with the same two conditions as her grandmother. "Those two occur together more commonly than you'd expect just by chance," she says. In addition, some scientists believe vision loss may accelerate cognitive decline. Some of Dr. Whitson's early results suggest that people living with both conditions are at greater risk of disability than people living with either one.

Studying 101 older patients referred to low-vision rehabilitation at Duke University, Dr. Whitson found in her initial analysis a high rate of cognitive impairment and a significant amount of marginal impairment, or a smaller but still meaningful difference from normal cognitive function. From her observations, Dr. Whitson discovered that those patients with subtle cognitive impairment suffered the sharpest declines in functional ability over the few months they were studied.

In low-vision rehabilitation, one common intervention is a closed-circuit television with an adjoining platform that allows a newspaper, letter, or recipe card to be magnified and projected onto the screen. A cognitively intact person may be able to master the setup in a matter of minutes. The process can prove far trickier for an older person with cognitive

difficulties—particularly if the instruction fails to accommodate this extra challenge.

More than 600 interviews with patients and their companions helped to prove the point. "Much of what they told us was things like, 'Keep it simple. We have too much information,'" Dr. Whitson says. She also learned that, for those with cognitive deficits, training must be reinforced quickly and often to be effective. A companion or caregiver who can sustain the rehabilitation program at home should be trained as well.

Based on what she's learned, Dr. Whitson hopes to develop an enhanced rehabilitation program better suited for people with cognitive deficits. "This is the perfect place for comparative effectiveness research," she says. Will the extra effort to reinforce the teaching, involve companions, and help older patients maintain their daily routines pay off? And if so, will the improvement be enough to justify the added expense?

Cognition and vision, in turn, could become a prototype for studying the larger issue of comorbidity. In other words, what global lessons in how to manage complicated patients might be gleaned from closely examining common and disabling pairs of diseases?

Thanks to the Beeson Award's "critically helpful" logistical support, Dr. Whitson built a team of specialists to help design and pilot-test a new intervention. The award also has given her time to explore the field of complexity science and consider how it might help inform her work on complicated disease interconnections.

"It's not just money, like a lot of grants are," she says of the Beeson Award. "It's kind of an initiation into a scholarly community." That community is already serving as a rich source of networking, collaborations, and mentorships, including "invaluable big picture insights coupled with detailed week-by-week guidance" from her Beeson mentor Dr. Harvey Cohen, director of Duke's Center for the Study of Aging and Human Development and an expert in comorbidity as well as collaborative research. The added support has been key in helping her focus on her ultimate goal: helping older patients with chronic conditions maintain their hard-earned independence.

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About the American Federation for Aging Research (AFAR)

AFAR is a nonprofit organization whose mission is to support biomedical research on aging. It is devoted to creating the knowledge that all of us need to live healthy, productive, and independent lives. Since 1981, AFAR has awarded approximately \$120 million to more than 2,600 talented scientists as part of its broad-based series of grant programs. Its work has led to significant advances in our understanding of aging processes, age-related diseases, and healthy aging practices. AFAR communicates news of these innovations through its organizational web site www.afar.org and educational web sites Infoaging (www.infoaging.org) and Health Compass (www.healthcompass.org).

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