



Marco Pahor, M.D.

## CHALLENGING TIMES

Dear friends and colleagues,

We started 2020 recognizing a great milestone when in February the University of Florida Institute on Aging celebrated its 15th anniversary. It was a noteworthy birthday for a now-thriving institute that at its birth started in a trailer as we foraged for computer equipment and office furniture.

Together we built a center that is now at the forefront of aging research.

Our celebration would be short-lived. The coronavirus pandemic soon arrived in force and upended the lives of untold Americans. It challenged our patients and students. And it demanded our best efforts despite the isolation and difficulties imposed by this deadly pestilence.

Some of us worked from home while continuing important research. Our clinicians stepped in to care for those older adults who are among the most vulnerable populations threatened by COVID-19. As the world self-isolated, these clinicians stood by their posts.

After one of our physicians, Mariam Mufti, M.D., was among the first to notice the danger of delirium experienced by elderly COVID-19 patients, she worked with a group of UF Health Shands hospitalists and nurses to develop a program to mitigate those dangers. One way was to help isolated patients communicate with family via computer tablet.

Institute faculty member Mamoun Mardini, Ph.D., led work on a smartwatch app to provide wearers with a reminder when they touch their face, an innovative effort to prevent the spread of the virus.

And institute professor Todd Manini, Ph.D., created an online survey to measure the impact of the pandemic on older adults.

The pandemic demonstrated the power of the institute's collaborative approach to medicine and research. We continue to provide our best in these trying times. And we will work with steadfastness so that we remain a leader in aging research through the next 15 years.

Marco Pahor, M.D.  
Director, UF Institute on Aging

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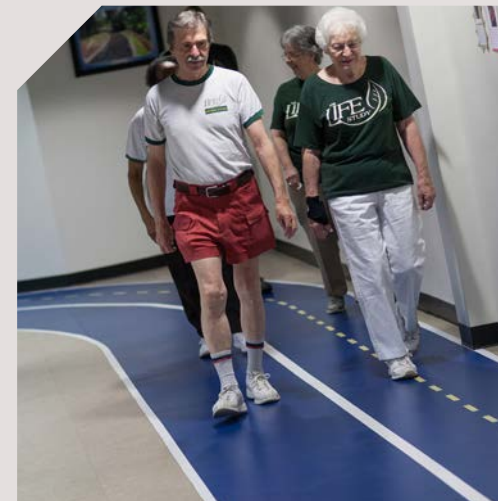
... the (LIFE) study is still paying dividends.  
It's made a huge difference in public health.”

— Marco Pahor, M.D.

## A LIFE'S WORK

One of the most consequential geriatric projects, not just at University of Florida Health but in the nation, marked its 20th anniversary in 2020. And the final chapter is not yet written for the Lifestyle Interventions and Independence for Elders, or LIFE, study.

It was 2000 when Marco Pahor, M.D., then a researcher at Wake Forest University, conceived the idea of a big project to determine the benefits of exercise in seniors with major mobility disability. He didn't realize he was beginning a 20-year odyssey.



This photo was taken before the COVID-19 pandemic began in early 2020.

Pahor, director of the UF Institute on Aging, led a consortium of eight universities or research centers that concluded in 2014 that moderate physical activity helped adults ages 70 to 89 maintain their ability to walk and stave off major mobility disability.

That, however, wasn't the end of it. To date, the LIFE study has generated at least 115 peer-reviewed studies, 19 ancillary studies and 38 independently funded grants and clinical trials. Scientists today continue to draw on the data the study generated.

Just as important to Pahor are the lives LIFE has improved, and the

scientists whose careers were enhanced by the research. Pahor estimates 59 early-career scientists have benefited from the study.

“It shows that persistence pays,” Pahor said. “It took a lot of energy to keep the team together. And the study is still paying dividends. It's made a huge difference in public health.”

The Journal of the American Geriatrics Society recognized that hard work.

“Those of us who glimpsed at the dedication, commitment and tenacity of Pahor and colleagues over these years can only be moved, humbled in fact, by the efforts that it took to get here,” the journal said in an editorial. “How many of us would be willing to devote 20 years of our lives to seeing a trial through?”

# BATTLING COVID-19 DELIRIUM

Another COVID-19 patient was in the throes of delirium. And her doctor felt utterly helpless.

UF Health geriatrician Mariam Mufti, M.D., an assistant professor in the UF College of Medicine's division of general internal medicine and a faculty member at the UF Institute on Aging, had been called to help a dementia patient with a history of behavioral disturbances.

Unfortunately, some of the major tools to fight delirium were off the table for Mufti because of the coronavirus pandemic. Family couldn't comfort the woman. Anti-delirium medications couldn't be restarted because of her COVID-19 treatment. Volunteers who might normally sit with elderly patients to talk and keep them oriented were no longer allowed.

"It was a perfect storm of things COVID-19 made worse," Mufti said. "The simple things can make a difference with delirium. But in this case, my options were limited due to the pandemic."

The scene was being repeated with other physicians at UF Health Shands Hospital and across the nation. It was as if the pandemic had been perfectly designed to thwart the efforts of medical professionals, especially those treating older adults. Physicians recognized early in the pandemic that delirium was increasing in patients, the condition perhaps exacerbated by changes in the brain caused by COVID-19 itself.

Being hospitalized in a pandemic can be absolutely terrifying. Patients are isolated in a room, unable to leave or have visitors. Medical personnel are dressed in protective gear giving them the vague appearance of otherworldly creatures.

"Imagine that you're sick and confused and the people coming in to take care of you look like space aliens," said Nila Radhakrishnan, M.D., chief of the UF College of Medicine's division of hospital medicine. "One of the worst things you can do for someone who is at risk of delirium is to put them in a room by themselves."

The solution was collaborative. Radhakrishnan, with important assistance from Mufti and others around the health system, created a new UF Health program to give back to patients some of what the coronavirus had stolen. They adapted UF Health's existing delirium prevention protocol to serve in the time of COVID-19, assigning "delirium prevention champions" to a COVID-19 unit. These were nurses who would individually engage with patients. The goal was to interact with patients to keep them grounded and orientated.

"They would provide that additional human touch that is so important to these patients in isolation," Radhakrishnan said.

Champions kept patients in touch with family who were unable to visit through videoconferencing on iPads or smartphones.

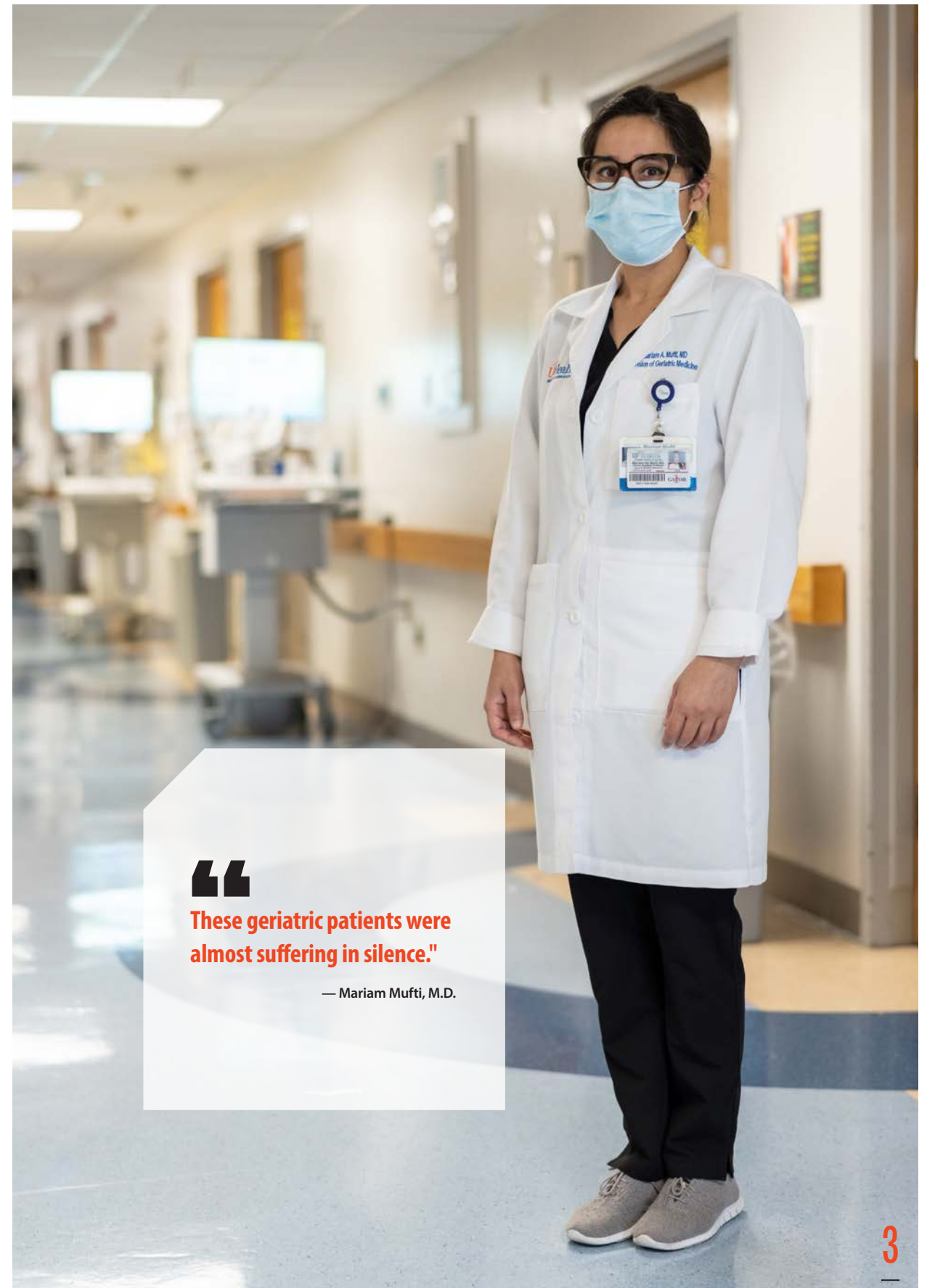
"These are husbands and wives who might under normal circumstances be sitting by the bedside the whole day," said one champion, Jennifer Melara, R.N.

The champions also talked to patients and got to know them. They provided cognitive stimulation. It was concierge care that made a huge difference in the lives of the patients. And it worked.

The program helped dozens of patients through the pandemic. Caregivers noticed a reduction in delirium.

"These geriatric patients were almost suffering in silence," Mufti said.

UF Health caregivers help relieve that isolation.



**These geriatric patients were  
almost suffering in silence."**

— Mariam Mufti, M.D.



# CANCER AND AGING

As we age, the specter of cancer becomes a heightened concern. “Age is the greatest risk factor for most cancers,” said Dejana Braithwaite, Ph.D., a faculty member at the UF Institute on Aging. “What we’re experiencing as a society is rapid population aging, increased life expectancy. These epidemiological and demographic trends are driving this increase in the burden of cancers in our communities.”

Braithwaite joined UF Health Nov. 1, with a strong focus on the nexus of cancer and aging, as a professor in the UF College of Medicine’s departments of aging and geriatric research and epidemiology. She also joined the institute’s executive committee in a leadership position.

Additionally, Braithwaite serves in a leadership position at the UF Health Cancer Center as associate director for population sciences. She is developing strategic goals to address the region’s cancer burden through expansion of research in cancer population sciences.



Dejana Braithwaite, Ph.D.

Braithwaite was previously a faculty member at Georgetown University School of Medicine.

Leading a team of multidisciplinary researchers, Braithwaite is establishing an innovative cancer population laboratory in collaboration with cancer advocacy and community advisory groups. Her focus is on the epidemiology of cancer, particularly in aging and underserved populations.

“We’re focused on conducting research along the cancer continuum, from etiology to prevention through to treatment and survivorship, to meet the needs of the communities we

serve,” Braithwaite said.

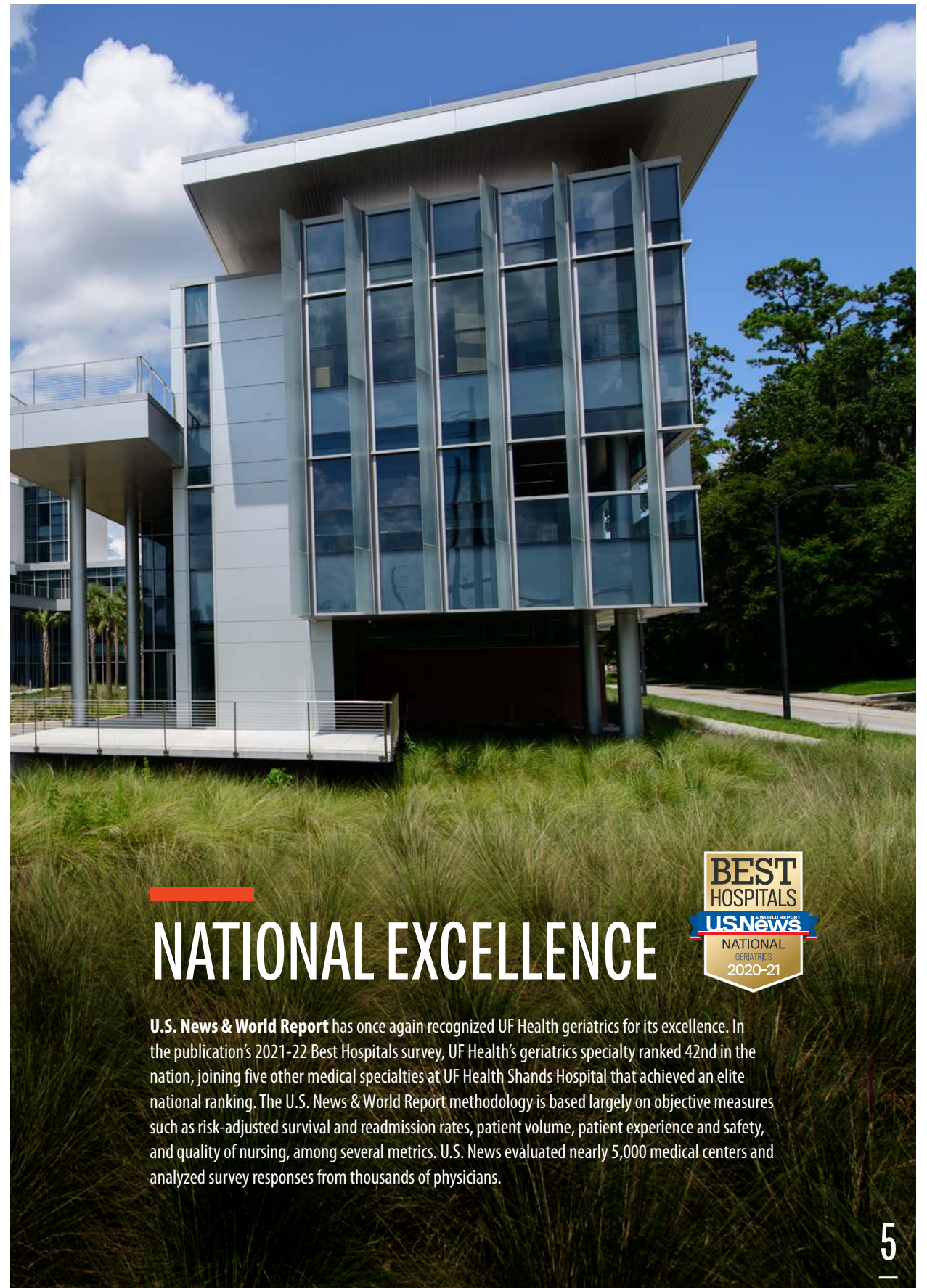
The hope is that research better reveals how aging affects cancer risk, cancer detection and response to treatment, especially in individuals with impaired function, such as dementia or other comorbidities, among other areas of focus.

“We want to involve the various research communities around the different colleges and institutes of UF and bring all that expertise to bear on an emerging topic that is so important to the communities we serve,” said Braithwaite.



**Age is the greatest risk factor for most cancers.”**

— Dejana Braithwaite, Ph.D.

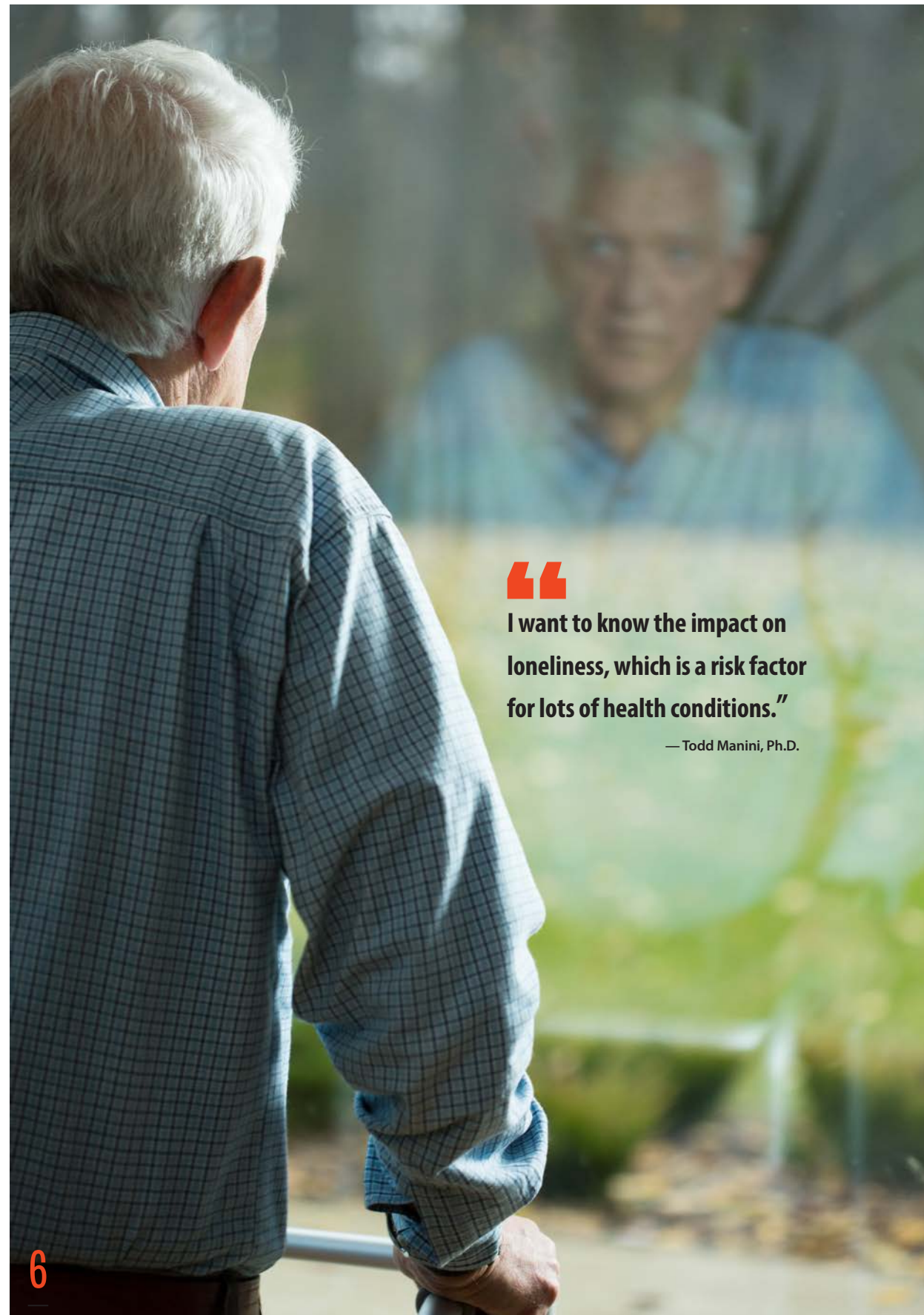


## NATIONAL EXCELLENCE



**U.S. News & World Report** has once again recognized UF Health geriatrics for its excellence. In the publication’s 2021–22 Best Hospitals survey, UF Health’s geriatrics specialty ranked 42nd in the nation, joining five other medical specialties at UF Health Shands Hospital that achieved an elite national ranking. The U.S. News & World Report methodology is based largely on objective measures such as risk-adjusted survival and readmission rates, patient volume, patient experience and safety, and quality of nursing, among several metrics. U.S. News evaluated nearly 5,000 medical centers and analyzed survey responses from thousands of physicians.





**I want to know the impact on loneliness, which is a risk factor for lots of health conditions.”**

— Todd Manini, Ph.D.

## PANDEMIC BURDEN

Many Americans faced the emotional and lifestyle consequences of the self-isolation caused by the coronavirus pandemic. Lack of contact with friends and family. Loneliness and depression. Diminished exercise.

These consequences might be magnified in a vulnerable population such as older adults.

A UF Institute on Aging researcher launched a study during the pandemic using an online survey to determine the impact of the coronavirus pandemic on the lives of older adults. The results will eventually help scientists target educational, policy and behavioral interventions designed to regain or modify the life activities of older adults after the health crisis abates.

“A part of this is a discovery process,” said principal investigator Todd Manini, Ph.D., a professor and institute faculty member. “We’re trying to understand the trends over time as the pandemic continues to evolve. It’s a unique circumstance to look at the impact of being in a world with limited human contact.”

Lessons learned during this crisis will become part of the toolbox available to scientists were another pandemic to occur.

“We’re taking the pulse of this population of older adults,” he said.

Many survey questions sought to determine whether the pandemic changed the behavior of participants. Did they stop taking medication due to news coverage of COVID-19? How often do they visit places outside the home? What about exercise? Questions also targeted depression, anxiety, worry and sleep, among other things.

“I want to know the impact on loneliness, which is a risk factor for lots of health conditions,” Manini said. “I want to know if seniors are now more likely to use technology, mobile technology, iPads, iPhones, smart technology, Facetime. I want to know if COVID-19 has changed people’s perception of using telehealth. I want to understand how media exposure is correlated with people’s anxiety about COVID-19.”

“We’re at a unique place in time where we can study how loneliness, social isolation, anxiety and depression change over time,” he said.



# 2019-20 HIGHLIGHTS:

76

faculty

107

affiliate  
members

7

clinical  
physicians

11

affiliated  
UF colleges

- Agricultural and Life Sciences
- Dentistry
- Education
- Engineering
- Health and Human Performance
- Liberal Arts and Sciences
- Medicine
- Nursing
- Pharmacy
- Public Health and Health Professions
- Veterinary Medicine

68

active  
research grants

\$135.5

million in active  
research grant  
funding

200

peer-reviewed  
publications

## UF Claude D. Pepper Older Americans Independence Center: Key research findings

### Painful knees

Knee osteoarthritis, or knee OE, is a pervasive musculoskeletal condition, often exacerbated by movement-evoked pain. Our results support the hypothesis that among those people with knee OE pain, non-Hispanic Black study participants have significantly greater knee pain with movement and lower functional levels, despite similar levels of perceived stress. However, perceived stress was more strongly related to movement-evoked pain in non-Hispanic Black subjects compared with non-Hispanic white counterparts. Our study demonstrates important ethnic/racial differences in movement-evoked pain and function. Perceived stress also had a stronger effect in movement-evoked pain in non-Hispanic Black subjects, suggesting that perceived stress may more strongly influence pain with physical movement in this population.

**Booker S, Cardoso J, Cruz-Almeida Y, Sibille KT, Terry EL, Powell-Roach KL, Riley JL 3rd, Goodin BR, Bartley EJ, Addison AS, Staud R, Redden D, Bradley L, Fillingim RB.**

*Movement-evoked pain, physical function, and perceived stress: An observational study of ethnic/racial differences in aging non-Hispanic Blacks and non-Hispanic Whites with knee osteoarthritis. Exp Gerontol. 2019 Sep;124:110622. doi: 10.1016/j.exger.2019.05.011.*

### Circadian clock

The circadian clock is an evolutionarily conserved regulatory mechanism that allows organisms to adapt, respond and entrain to their environment.

Exercise has been proposed as a zeitgeber — from the German, “time giver,” an external stimulus affecting our circadian rhythms — for the muscular circadian clock mechanism. However, this has not been well-defined and it isn’t known if exercise timing induces directional shifts in the muscle clock. Our study assessed the effect of one bout of endurance treadmill exercise on the skeletal muscle clock in mice and a bout of muscle contractions in vitro. Our findings demonstrate that muscle contractions tied to exercise can directly influence the expression of muscle clock components in a time-of-day dependent manner.

**Kemler D, Wolff CA, Esser KA.**

*Time-of-day dependent effects of contractile activity on the phase of the skeletal muscle clock. J Physiol. 2020 Sep;598(17):3631-3644. doi: 10.1113/JP279779. Epub 2020 Jul 1. PMID: 32537739; PMCID: PMC7479806.*

### Iron and aging

Iron is one of the most abundant transition metals in living organisms and is involved in multiple biochemical processes. An iron imbalance is a hallmark of aging and functional decline, along with chronic inflammation and dysfunction of the mitochondria, the energy powerhouse of cells. We studied in a sample of older and younger participants total iron content, the expression of certain iron transporters and mitochondria damage in muscle biopsies. Our results suggest that altered iron metabolism during aging predisposes to the generation

of oxidants, which are reactive molecules that damage cells. In particular, iron dysfunction and systemic inflammation might be a key element in functional decline. Disruption of iron metabolism in certain muscle cells might be a novel target for eventual drug interventions.

**Picca A, Mankowski RT, Kamenov G, Anton SD, Manini TM, Buford TW, Saini SK, Calvani R, Landi F, Bernabei R, Marzetti E, Leeuwenburgh C.**

*Advanced Age Is Associated with Iron Dyshomeostasis and Mitochondrial DNA Damage in Human Skeletal Muscle Cells. 2019 Nov 27;8(12):1525.*

### Avoiding mobility disability

Mobility problems that lead to further disability in older adults can be addressed through exercise interventions. Unfortunately, health-related quality of life systematically declines with advancing age. We analyzed data from the Lifestyle Interventions and Independence for Elders, or LIFE, study, which compared physical activity to health education among 1,635 sedentary older adults at risk of mobility disability. We found that both groups’ quality of life declined over time. But those assigned to the physical activity group experienced a slower health-related quality of life decline compared with those in the education group. We concluded that declining mobility measured by physical performance is associated with lower quality of life in sedentary older adults. Exercise can slow that decline.

**Groessl EJ, Kaplan RM, Rejeski WJ, Katula JA, Glynn NW, King AC, Anton SD, Walkup M, Lu CJ, Reid K, Spring B, Pahor M.**

*Physical Activity and Performance Impact Long-term Quality of Life in Older Adults at Risk for Major Mobility Disability Am J Prev Med. 2019 Jan;56(1):141-146. doi: 10.1016/j.amepre.2018.09.006.*

### Muscle wasting

Sarcopenia is the loss of muscle mass and strength as we age. Scientists have made considerable efforts to define exactly what sarcopenia means. After all, if we can more accurately identify patients who are at risk, more older adults will benefit from treatments to help stave off this debilitating condition. The Sarcopenia Definitions and Outcomes Consortium was formed to address this issue. Our strategy was to use a variety of methods, including X-ray bone density analysis, to identify older adults with slow walking speed, a good indicator of sarcopenia. We found that grip strength consistently identified older adults with slowness from those without. Results will inform researchers about useful methods to best identify older adults at risk of this muscle wasting condition.

**Manini TM, Patel SM, Newman AB, Trivison TG, Kiel DP, Shardell MD, Pencina KM, Wilson KE, Kelly TL, Massaro JM, Fielding RA, Magaziner J, Correia-de-Araujo R, Kwok TCY, Hirani V, Karlsson MK, D’Agostino RB Sr, Mellström D, Ohlsson C, Ribom E, Jordan JM, Bhasin S, Cawthon PM.**

*Identification of Sarcopenia Components That Discriminate Slow Walking Speed: A Pooled Data Analysis. J Am Geriatr Soc. 2020 Jul;68(7):1419-1428. doi: 10.1111/jgs.16524. Epub 2020.*



## Health research participation

Health research participation of racial and ethnic minorities is significantly lower than their white counterparts, impeding the testing and development of evidence-based clinical and public health interventions. The purpose of our study was to determine African-Americans' perceptions of and willingness to participate in health research studies compared with white adults from a large socioeconomically disadvantaged population. A major finding of our study involving 7,809 African-American and white participants was that a majority was willing to take part in health research, although African-Americans were significantly less inclined to do so. African-Americans also were significantly less likely to have previously taken part in research and less inclined to trust researchers.

*Webb FJ, Khubchandani J, Striley CW, Cottler LB.*

*Black-White Differences in Willingness to Participate and Perceptions About Health Research: Results from the Population-Based HealthStreet Study. J Immigr Minor Health. 2019 Apr;21(2):299-305. doi: 10.1007/s10903-018-0729-2. Erratum in: J Immigr Minor Health. 2018 May 9.*

## Sepsis and the elderly

Sepsis has long been recognized as the “quintessential disease of the elderly.” The incidence of sepsis and in-hospital mortality increases exponentially beyond age 65. While older adults compose one-fifth of the U.S. population, they account for nearly two-thirds of the patients admitted to hospitals with sepsis. We examined previously undescribed epidemiological aspects of sepsis across age groups in 328 adult surgical intensive care sepsis patients. We found that, compared with young and middle-aged patients, older patients have significantly more comorbidities at presentation, higher 30-day and 12-month mortality, fewer ICU-free days and more progression into chronic critical illness, among other measures. To our knowledge, this is the first prospective comprehensive

characterization of the in-hospital and post-discharge long-term outcomes in sepsis survivors across age groups.

*Mankowski RT, Anton SD, Ghita GL, Brumback B, Cox MC, Mohr AM, Leeuwenburgh C, Moldawer LL, Efron PA, Brakenridge SC, Brakenridge SC, Moore FA.*

*Older Sepsis Survivors Suffer Persistent Disability Burden and Poor Long-Term Survival. J Am Geriatr Soc. 2020 Sep;68(9):1962-1969. doi: 10.1111/jgs.16435. Epub 2020.*

## Exercise and wearable technology

Exercise is associated with decreased cardiovascular disease, or CVD, risk. But recent trials suggest that exercise alone is insufficient to reduce CVD events in older adults. Our pilot study included 40 participants age 60 and above with moderate-to-high risk of coronary heart disease events who were separated into two groups. Both groups received a twice-weekly, eight-week exercise intervention. The second group also received a wearable activity tracking device with behavioral monitoring and feedback throughout the study. We found the wearable-device group took more steps per day, were modestly less sedentary and had lower blood pressure. The addition of wearable technology appeared to positively influence daily activity patterns and changes in blood pressure, potentially improving risk factors for CVD. A full randomized trial is needed to test this hypothesis.

*Roberts LM, Jaeger BC, Baptista LC, Harper SA, Gardner AK, Jackson EA, Pekmezi D, Sandesara B, Manini TM, Anton SD, Buford TW.*

*Wearable Technology To Reduce Sedentary Behavior And CVD Risk In Older Adults: A Pilot Randomized Clinical Trial. Clin Interv Aging. 2019 Oct 23;14:1817-1828. doi: 10.2147/CIA.S222655. PMID: 31695350; PMCID: PMC6815758.*

## Fatigue and exercise

A key indicator of successful aging is the ability to maintain physical function. Our study's aim was to examine the impact of baseline fatigue on the effectiveness of a physical activity intervention to prevent major mobility disability and persistent

major mobility disability in participants in the Lifestyle Interventions and Independence for Elders, or LIFE, study. Results show that exercise prevented major mobility disability by 29% and persistent major mobility disability by 40% in those who self-reported higher levels of baseline fatigue. Findings suggest long-term, moderate intensity physical activity might be particularly effective at preserving mobility in fatigued older adults at risk of major mobility disability.

*Glynn NW, Gmelin T, Santanasto AJ, Lovato LC, Lange-Maia BS, Nicklas BJ, Fielding RA, Manini TM, Myers VH, de Rekeneire N, Spring BJ, Pahor M, King AC, Rejeski WJ, Newman AB.*

*Lifestyle Interventions and Independence for Elders Study Group. Impact of Baseline Fatigue on a Physical Activity Intervention to Prevent Mobility Disability. J Am Geriatr Soc. 2020 Mar;68(3):619-624. doi: 10.1111/jgs.16274. Epub 2019 Dec 22. PMID: 31867713; PMCID: PMC8061638.*

## Resveratrol and the heart

Studies have shown that resveratrol, a micronutrient in grapes and red wine, might help prevent cardiovascular disease, or CVD. We hypothesized resveratrol would reduce biomarkers of CVD risk in overweight, but otherwise healthy, older adults. Our pilot study involved 29 participants over age 65 divided into three groups, one receiving a 300 mg treatment of resveratrol, the next 1,000 mg and the third a placebo, all in a 90-day trial. We then measured CVD biomarkers. Our study suggests that a higher dose of resveratrol may increase the levels of CVD risk biomarkers in this population, although not the lower dosage. Future studies should test the effects of higher doses of resveratrol to evaluate potential detrimental effects.

*Mankowski RT, You L, Buford TW, Leeuwenburgh C, Manini TM, Schneider S, Qiu P, Anton SD.*

*Exp Gerontol. 2020 Mar;131:110821. doi: 10.1016/j.exger.2019.110821. Epub 2019.*

## Walking ability

A six-minute walk test is a common outcome measure in clinical trials involving those with lower extremity peripheral artery disease, or PAD. But what constitutes meaningful change in

this test has not been well-defined. We analyzed data from 777 participants with PAD in three studies. All were quizzed about their perceived difficulty walking distances of different lengths. Those reporting no change in perceived walking difficulty declined in their walking ability by 7 meters annually. An 8-meter improvement, however, was seen in those reporting a small improvement in walking ability, which climbed to 20 meters for those reporting a large change. Results should inform future trials involving six-minute walking tests of people with PAD.

*McDermott MM, Tian L, Criqui MH, Ferrucci L, Conte MS, Zhao L, Li L, Sufti R, Polonsky TS, Kibbe MR, Greenland P, Leeuwenburgh C, Guralnik JM.*

*Meaningful change in 6-minute walk in people with peripheral artery disease. J Vasc Surg. 2021 Jan;73(1):267-276.e1. doi: 10.1016/j.jvs.2020.03.052. Epub 2020 Apr 23. PMID: 32335305.*

## Smartwatch and mobility

Smartphone and smartwatch technology enables the transmission and monitoring of patient and research participant health care information in real time. Flexible, bidirectional and real-time control of communication allows development of a rich set of health care applications that can provide interactivity with study subjects and adapt dynamically to a changing environment. Given their popularity, smartwatches are ideal for monitoring activities for extended periods to investigate the physical activity patterns in free-living conditions. Our paper provides a smartwatch-based framework, including app and computer server, for real-time online assessment and mobility monitoring, or ROAMM. We developed ROAMM to help report geriatric conditions that don't typically find their way into the medical system, such as falls that don't result in medical care.

*Kheirkhahan M, Nair S, Davoudi A, Rashidi P, Wanigatunga AA, Corbett DB, Mendoza T, Manini TM, Ranka S.*

*A smartwatch-based framework for real-time and online assessment and mobility monitoring. J Biomed Inform. 2019 Jan;89:29-40. doi: 10.1016/j.jbi.2018.11.003. Epub 2018.*

# FLORIDA'S SUPERAGERS

University of Florida Health scientists knew the retirement-friendly Sunshine State has its share of residents age 90 and older. But their hunch was that relatively few are largely unscathed by the infirmities of long life.

What they discovered surprised them.

A pilot study of the factors associated with successful aging in a population of those 90 and older found about 45,000 “superagers” in Florida. These are people free of Alzheimer’s, dementia or stroke, living independently, with few hospitalizations or emergency room visits and generally free of disease.

The finding by researchers at the UF Institute on Aging and elsewhere confirmed that scientists are working in one of the largest laboratories on the planet as they seek to understand the underpinnings of successful aging.

“We have been able to identify nearly 2,000 people right in UF Health’s records that fit our medical records criteria for successful aging,” said Glenn Smith, Ph.D., a professor in the UF College of Public Health and Health Professions’ department of clinical and health psychology.

**These are people free of Alzheimer's, dementia or stroke, living independently, with few hospitalizations or emergency room visits and generally free of disease.**

Stephen Anton, Ph.D., a professor at the UF Institute on Aging, and Smith are co-principal investigators of the Understanding Resistance, Resilience and Repair in the Health Span study.

The Over 90s study seeks to identify people of diverse ethnic and racial backgrounds and geographic locations who are resistant to the effects of aging, as well as those who are resilient and recovered from past illnesses. Investigators

hope to examine their biological, genetic, environmental and lifestyle for clues about how they aged successfully. The work might one day provide lessons on living longer and healthier lives.

“Everybody wants to learn the secret of living longer and healthier,” said Anton. “And we’re on the verge of getting closer to those answers.”



# STOPPING VIRUS TRANSMISSION

Many Americans touched their faces too often during the coronavirus pandemic, public health officials have observed, potentially increasing their exposure to the pathogen. But just try to stop.

Face touching is like breathing. We do it without really thinking about it. One pre-pandemic study found that people touch their face an average of 23 times an hour. Even though a finger or hand can pick up the virus on a surface and infect someone while they rub their eyes, mouth or nose, it can seem nearly impossible to avoid the instinctive act.

But what if a smartwatch beeped or vibrated every time your hand touched your face?

Two University of Florida researchers have launched an effort to build a smartwatch application, or app, that will do just that, essentially training wearers to avoid touching their faces and thus reduce the spread of COVID-19, the disease caused by the coronavirus.

“One way to break the cycle and restrict the spread of the coronavirus or any other respiratory illness is by simply alerting individuals when they try to touch their faces,” said Mamoun Mardini, Ph.D., a faculty member with the UF Institute on Aging and the project’s co-principal investigator.

The hope is that, after being warned repeatedly, users begin conditioning themselves to avoid the behavior altogether.

Mardini, a data scientist who is an assistant professor in the UF College of Medicine’s department of aging and geriatric research, worked with co-principal investigator Lisa Anthony, Ph.D., an associate professor in the Herbert Wertheim College of Engineering’s department of computer & information science & engineering.

“Even with all the increased scrutiny in people touching their faces during the pandemic, I think we’re all still doing it plenty of times,” said Anthony. “The work is really exciting. It feels nice that we might actually be able to contribute something to a real pressing problem.”

Anthony and Mardini emphasized such an app will prove useful not just in future pandemics, but also during a normal flu season. “It can be used to avoid any respiratory illness,” Mardini said.





# UNDERSTANDING EXERCISE

It's so obvious that exercise is a healthy habit that it almost goes without saying. Scientists have known for years that physical activity lowers the risk of cancer, heart disease, stroke and diabetes, among other benefits.

What might come as a surprise is that researchers still don't know why being physically fit is beneficial, especially on a molecular level.

A massive, first-of-its-kind study to map out these molecular changes reached a key milestone in 2020 as a group of 25 universities and research centers, including the University of Florida, published its first major paper. After several years of work, the Molecular Transducers of Physical Activity Consortium, or MoTrPAC, published a paper in the journal *Cell* that outlines the investigation's

organization and clinical study protocols.

Protocols describe study objectives, design, methods and steps used to protect participants, among other considerations.

It's a major step for the \$170 million study, funded by the National Institutes of Health, that combines both preclinical and clinical studies, with an expected enrollment of up to 2,600 participants.

"This is a very complex project," said Marco Pahor, M.D., director of the UF Institute on Aging. "It's never been attempted to try to put together



**We've been working for three years to get together a common protocol on which everyone agrees. It's a landmark paper."**

— Marco Pahor, M.D.

such a broad range and array of competencies. We all speak different scientific languages. We've been working for three years to get together a common protocol on which everyone agrees. It's a landmark paper."

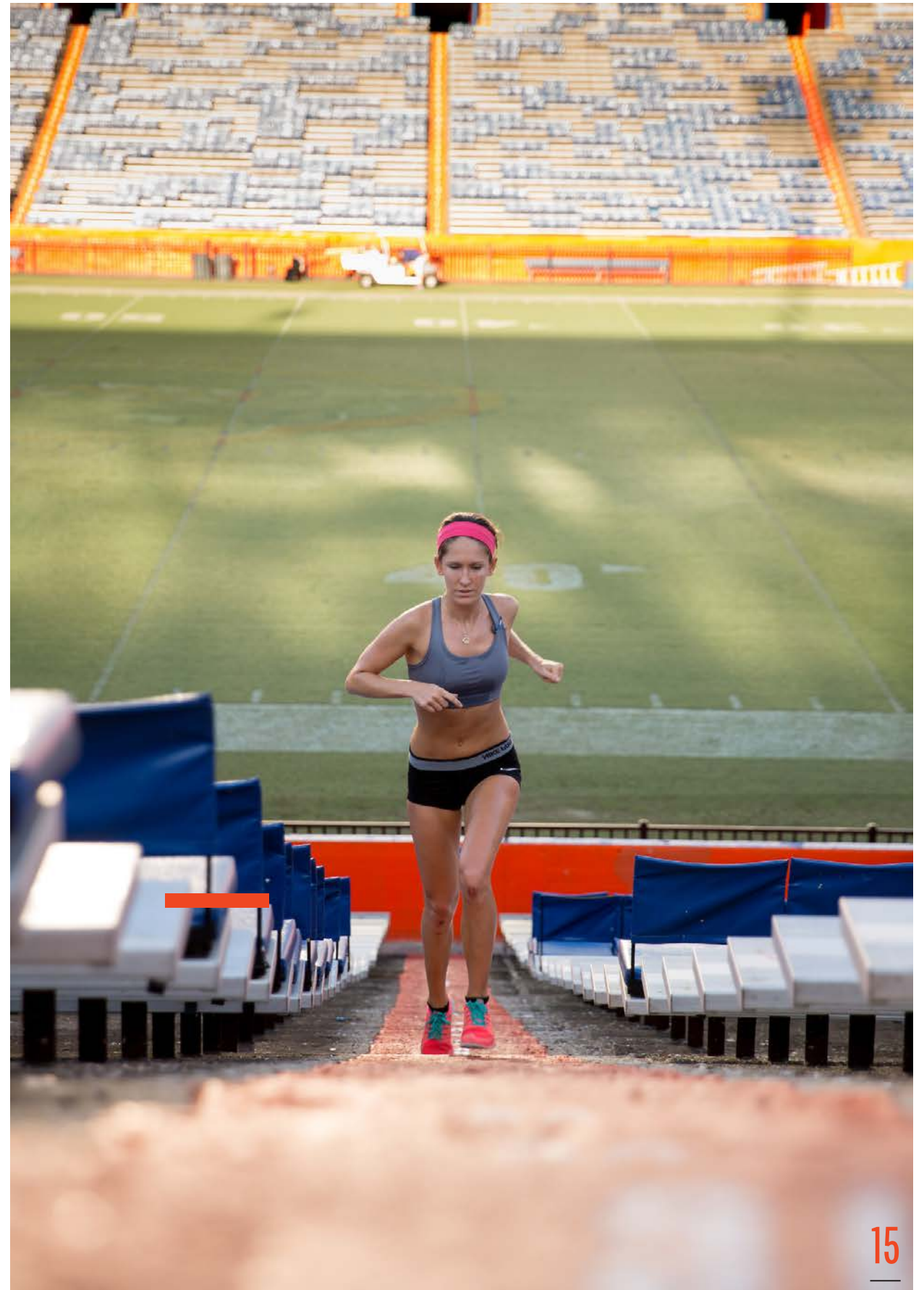
In conjunction with scientists at Wake Forest University and the University of Vermont, Pahor leads the consortium's coordinating center under a grant totaling \$9.4 million. Karyn Esser, Ph.D., associate program director of the UF Institute of Myology, leads one of MoTrPAC's preclinical animal study sites.

In ongoing animal studies, scientists are examining the impact of exercise on more than 17 organs, including the heart, brain, kidneys and other tissues.

"The idea is that exercise is resulting in a systemic effect," said Esser. "And these things don't work in isolation. These cells and tissues are all talking to each other. This study has the potential to uncover these systemwide beneficial effects."

*Sanford JA, Nogiec CD, Lindholm ME, Adkins JN, Amar D, Dasari S, Drugan JK, Fernández FM, Radom-Aizik S, Schenk S, Snyder MP, Tracy RP, Vanderboom P, Trappe S, Walsh MJ.*

*Molecular Transducers of Physical Activity Consortium (MoTrPAC): Mapping the Dynamic Responses to Exercise. Cell. 2020 Jun 25;181(7):1464-1474. doi: 10.1016/j.cell.2020.06.004. PMID: 32589957.*







## THE AGING BRAIN

Scientists have long recognized the human brain appears to keep time to its own internal clock, its biological age speeding or slowing depending on a host of factors.

Someone with a higher education might have a younger-looking brain than someone without one, research has suggested. Surprisingly, dancing appears to keep the brain young. And stress has been associated with an older-appearing brain.

A study led by a UF Institute on Aging researcher has found the brain age of older adults with chronic pain had accelerated by an average of two years.

“The greater the pain intensity they were experiencing, the older looking their brain,” said UF Health researcher Yenisel Cruz-Almeida, Ph.D., MSPH, an institute faculty member and the study’s lead author.

Cruz-Almeida found that people who received treatments for their pain, from medication to even home remedies like a cold compress on an aching knee, had younger-appearing brains, suggesting that pain relief might slow that internal clock.

Meanwhile, individuals without chronic pain had, on average, a brain that appeared four years younger than their actual age.

“Our findings highlight the need to address chronic pain, not just in older individuals but in potentially everyone, as pain may have unintended consequences in the brain that we don’t yet fully understand,” said Cruz-Almeida.

The study, published in the journal *Pain*, showed that people with a positive affect — those who have a happier outlook on life and were generally more upbeat, even when they have chronic pain — had younger-appearing brains.

“Not everybody ages the same way,” said Cruz-Almeida. “I don’t want people to think, ‘Oh, I have chronic pain. I’m doomed.’ There is more nuance than that.”

*Cruz-Almeida Y, Fillingim RB, Riley JL 3rd, Woods AJ, Porges E, Cohen R, Cole J.*

*Chronic pain is associated with a brain aging biomarker in community-dwelling older adults*  
*Pain. 2019 May;160(5):1119-1130. doi: 10.1097/j.pain.0000000000001491.*

“

**Our findings highlight the need to address chronic pain, not just in older individuals ...”**

— Yenisel Cruz-Almeida, Ph.D., MSPH





## WHITE HOUSE AWARD

David J. Clark, Sc.D, has been awarded the Presidential Early Career Award for scientists or engineers, or PECASE, the highest honor bestowed by the U.S. government for outstanding scientists completing the early phase of their career.

PECASE is granted to those researchers who show exceptional promise for leadership in science and technology. The award was announced by the White House in the summer of 2019.

Clark was honored for his work to improve neural control of walking in older people who experience impairment from aging, disease or nervous system injury. The goal is to develop therapies that can help older adults maintain their well-being as they age.

Clark, an associate professor in the UF College of Medicine's department of aging and geriatric research, was nominated for the award by the U.S. Department of Veterans Affairs. In addition to his position at UF Health, Clark is an investigator at the Brain Rehabilitation Research Center at the Malcom Randall VA Medical Center in Gainesville.



David J. Clark, Sc.D

## PROMOTIONS

Congratulations to Todd Manini, Ph.D., and Steve Anton, Ph.D., who have been promoted to the rank of professor with tenure in the UF College of Medicine's department of aging and geriatric research. Both are faculty members in the UF Institute on Aging. Manini is the co-leader of the data science and applied technology core in the UF Claude D. Pepper Older American's Independence Center. He also is a fellow of the American College of Sports Medicine and the Gerontological Society of America. Anton is chief of the department's division of clinical research and co-principal investigator of the Jacksonville Aging Studies Center, or JAX-ASCENT. They have both been recognized as master mentors in the UF Mentor Academy and awarded a UF Term Professorship, a distinction given to top faculty members.



Todd Manini, Ph.D.



Steve Anton, Ph.D.

## NEW FACULTY

**Mariam Mufti, M.D.**, is an assistant professor in the UF College of Medicine's division of general internal medicine. She graduated cum laude from the Ross University School of Medicine in Barbados and completed a family medicine residency at Rutgers Robert Wood Johnson Medical School. She later completed a geriatric medicine fellowship at UF Health. Mufti earned an undergraduate degree from Virginia Commonwealth University, majoring in forensic science, with a concentration in biology. Mufti is part of the UF Health Shands Hospital interdisciplinary delirium task force and is active in medical student, resident and fellow education.



Mariam Mufti, M.D.

**Yasmin Mohiuddin, D.O.**, is an assistant professor in the UF College of Medicine's division of general internal medicine and was a 2019 UF Health geriatric fellow. She received her doctor of osteopathic medicine from the University of Pikeville — Kentucky College of Osteopathic Medicine, in addition to a master's in medical science-research microbiology, and a bachelor's in microbiology and cell science, both from UF. Mohiuddin also served a family medicine internship and residency at AdventHealth East Orlando, formerly known as Florida Hospital East Orlando.



Yasmin Mohiuddin, D.O.

**Candace Anne Worsham, M.D.** is an assistant professor in the UF College of Medicine's division of general internal medicine and sees patients in the outpatient practice and at the skilled nursing facility at Oak Hammock. She earned a bachelor of science in biology and minor in English from the University of Florida, before earning her medical degree from Ross University School of Medicine, then in Dominica. Worsham completed her residency in internal medicine at Grand Strand Medical Center in Myrtle Beach, South Carolina, and a geriatric fellowship at UF Health.



Candace Anne Worsham, M.D.





## INTERMITTENT FASTING

Biological changes in cognitive and physical function appear to accelerate in those people who are overweight. Might a popular dietary approach called intermittent fasting benefit older adults, helping them successfully age?

Stephen D. Anton, Ph.D., a faculty member at the UF Institute on Aging, led a team of UF Health researchers in a small pilot study and found encouraging evidence that such an eating pattern might produce positive results.

Anton's group looked at a type of intermittent fasting called time-restricted feeding, during which volunteers fasted for 16 hours of the day and then ate as they normally would for the remaining eight hours. This intervention lasted four weeks.

Of the nine overweight study participants with an average age of 77, eight lost weight, with a mean loss of 5.7 pounds. Researchers noted small increases in walking speed but no other significant changes in cognitive or physical function. The majority of participants also reported improvements in health-related quality of life.

Anton said the next step is a larger study to help determine if these encouraging results can be confirmed.

"These results are exciting because time-restricted feeding appears to have the potential to impact a person's health span, or the time period in which we live without disease or disability," he added.

Anton noted it is important that people consult with a medical professional before they undertake intermittent fasting.

*SAnton SD, Lee SA, Donahoo WT, McLaren C, Manini T, Leeuwenburgh C, Pahor M.*

*The Effects of Time Restricted Feeding on Overweight, Older Adults: A Pilot Study. Nutrients. 2019 Jun 30;11(7):1500. doi: 10.3390/nu11071500. PMID: 31262054; PMCID: PMC6682944.*



## EVERY DOLLAR COUNTS

Unlocking life's mysteries — particularly the secrets of how long and how well we live — is the distinct focus of the UF Institute on Aging.

Our scientists and physicians are dedicated to achieving a better understanding of the biological mechanisms of aging and of how we can enhance our physical independence and cognitive abilities.

Your gift can make the critical difference in funding new scientific endeavors. Imagine discoveries that fuel positive cellular changes or lead to new therapies to help rehabilitate aging bones and joints ... private philanthropy makes all this and much more possible.



### YOU CAN HELP

**To learn about ways you can invest in a healthier and more independent tomorrow for us all, please contact Joseph Mandernach at [jmandern@ufl.edu](mailto:jmandern@ufl.edu) or 352.273.9620.**



# PROGRESS

2018  
2019  
2020-2021 ◀ Annual Report  
2022

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