

Save the Date

Tues., May 16 ■ 9:30 to 11:00 AM ■ The Retreat, Lonestar Room

RSVP Required. [RSVP Link Opens May 1](#)



**How Computers
and Technology are
Changing
Healthcare**
Examples from Austin and
Georgetown

To View this Presentation
With an audio recording
And Closed Captions
Click on the blue link below

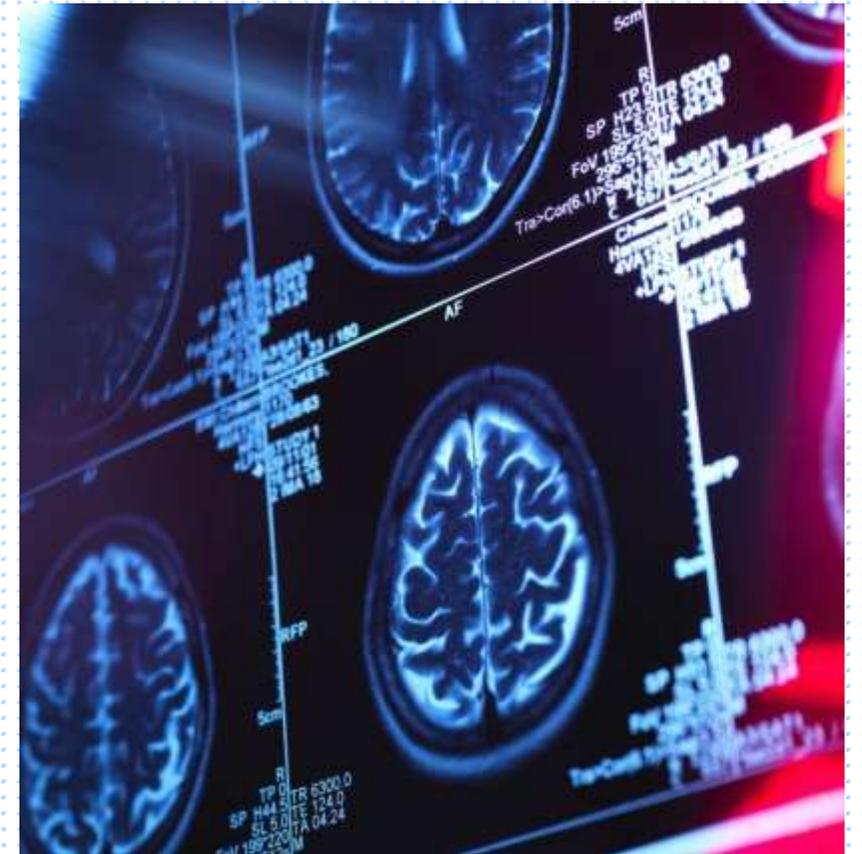
<https://vimeo.com/830591118?share=copy>

Computers in Medical Research and Discovery

Sun City Computer Club

March 16, 2023

- How are medical discoveries commercialized (from discovery to market)?
- What are the steps in this journey
 - Therapeutics, Diagnostics and Medical Devices
 - Basic Research and Clinical Research
- Community participation in clinical research
 - Georgetown Brain Study
 - Research partnerships with UT Medical Schools
- Digital biomarkers: using computers, smart devices, technology and medical devices to access cognition, mood, etc. and its use in research discovery.



FDA - is it safe and effective?

- Drugs, diagnostics and medical devices must be approved by the FDA
- Preclinical Studies
 - Cell and animals
 - Toxicity
- Clinical Studies in Man – three phases
 - Phase 1 study - toxicity in healthy volunteers
 - Phase 2 study – efficacy in small study in subjects with disease
 - Phase 3 study - large version of Phase 2

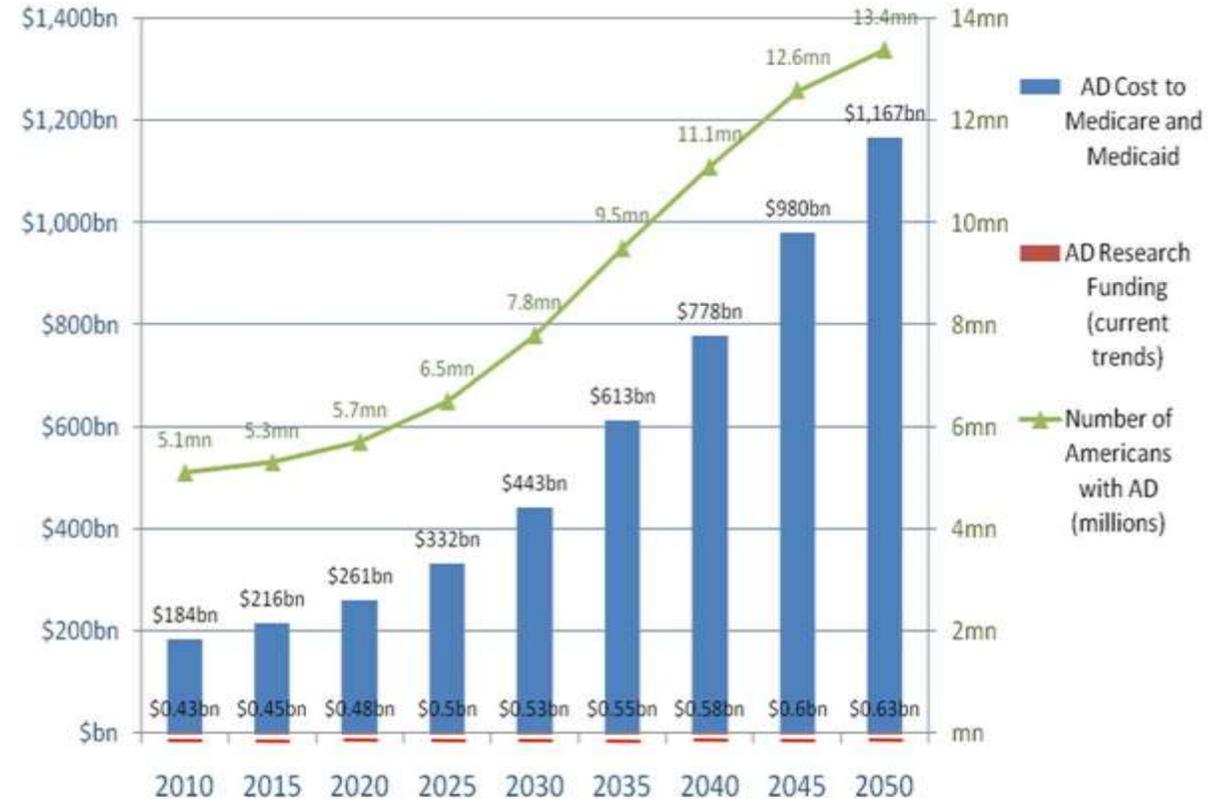


Alzheimer's Dementia is a Problem which lacks effective therapeutic intervention

- The Tsunami is here
- Need is economic as well as social
- Therapeutics are not here yet
- Early diagnosis
- Prevention is primary for now
 - Lifestyle
 - Diet
 - Exercise
 - Social engagement

Federal Gov't Expenditures

People in US with Alzheimer's



Sources: Alzheimer's Study Group, *A National Alzheimer's Strategic Plan: The Report of the Alzheimer's Study Group* (March 2009); Alzheimer's Association, *2009 Alzheimer's Disease Facts and Figures* (March 2009); National Institutes of Health Office of the Budget

Georgetown Neuroscience Foundation

Georgetown Brain Study

www.georgetownneurosciencefoundation.org

- Retirement destination with a growing senior and young family populations
- Active retired professionals with priority in health and wellness
- Priorities of the Georgetown in community health and emergency medicine
- Established active collaborations with medical institutions focus on medical research and education
- Volunteer/study group (>850 members) who can choose to:
 - participate in clinical studies
 - Bring diversity and the underserved into the program
 - inform and educate the membership in current research and prevention
 - financially support the programs



Digital biomarkers will accelerate discovery



Digital biomarkers are data that people/consumers/researchers directly collect about health/disease through digital health technologies to explain, influence and/or predict health-related outcomes



Digital health – examples mobile health, mental health, health information technology (IT), wearable devices, telehealth and telemedicine, and personalized medicine.



Smart devices, computers ,wearables, computer software applications etc. can capture data **passively**



voice recordings are becoming a part of our digital biomarker medical health record

Brain Studies with UT Dell Medical School

Use of digital
technologies as tools
for data collection
and assessment

- Smart devices, technology, computers, phones, user profiles
- First Pilot study – a survey to engage GNF study subjects
- Older adults completed the **Digital and Analog Daily Activities Survey**, using a newly developed measure of how an individual performs financial, navigation, medication, and other iADLs (instrumental Activities of Daily Living)
- Conclusion: By capitalizing on and enriching environments with new technologies, there are opportunities to **promote technological reserve in older adults** in a manner that sustains daily functioning.

Technological Reserve Hypothesis

- We hypothesize that mobile devices may allow for more ubiquitous engagement and in turn cognitive stimulation
- Older adults who routinely use mobile devices would have had to acquire these skills in the last several years, versus personal computer use, which would have been available for several decades.
- It may be that the ability and/or desire to learn new devices over time may be driving portions both of improved subjective cognitive status and frequency of use.
- Studies suggest that executive function declines are associated with less digital technology use
- Training older adults to use digital devices may benefit cognitive functioning
- The current results are another in a series of findings that suggest the potential for positive/productive associations between device use and cognitive outcomes, supporting the technological reserve hypothesis.



Invitation to Research Study

Cognitive Health Assessment Digital Biomarkers

Researchers at The University of Texas at Austin would like to invite you to participate in a research study. We are exploring a new way to assess cognitive health based on data that is collected from sensors in smartphones and smartwatches. Our goal is to assess and characterize cognitive functioning in a more naturalistic, unobtrusive, efficient, and continuous manner.

Qualified participants must:

- Be 65 or older
- Own and use a smartphone daily
- Have Internet access at home (e.g., Wifi)



Qualified participants will be asked to:

- Install an application on their smartphone
- Share their contact information and health records with the research team
- Perform their everyday activities as they normally do
- Take brief cognitive assessments in person, and/or over the phone or video

If you are interested in participating, please visit:

<https://redcap.link/techsans>

If you have questions, contact ethomaz@austin.utexas.edu

Current and Upcoming Studies

Passive activity detection via smart phone sensors to **assess cognitive decline** in older adults.

- 1 year duration, virtual testing 0, 6' and 12 mo.
- To distinguish digital activity between people showing cognitive decline and those who do not.

Enrolling currently, NIH funded

Passive activity detection via smart phone sensors/fitness tracker to **assess cognitive factors that detect apathy**

- 1 year duration, one-time cognitive assessment battery and collaborative reporter (know subject well)
- virtual testing, several study visits needed

Enrollment beginning, Alzheimer's Assoc. Funded

One more this year



The GNF will aggregate its data with others to accelerate answers: the power of Big Data

- Digital Biomarkers and other data are deidentified and shared
- The GNF data is aggregated with that of other communities globally
- Our data is part of the Alzheimer's Disease Data Initiative (ADDI) a worldwide data resource funded by Gates Ventures. <https://www.alzheimersdata.org>

Mike Douglas

mdouglas@georgetownneurosciencefoundation.org

512-831-8271



Publications and In Press

- Benge, J. F., Aguirre, A., Scullin, M. K., Kiselica, A. M., Hilsabeck, R. C., Paydarfar, D., & Douglas, M. (In press). Internet-enabled behaviors in older adults during the pandemic: Patterns of use, psychosocial impacts, and plans for continued utilization. *Work, Aging and Retirement*
- Benge, J.F., Kiselica, A.M., Aguirre, A., Hilsabeck, R.C, Douglas, M., Paydarfar, D., & Scullin, M.K. (In press). Technology use and subjective cognitive concerns in older adults. *Archives of Gerontology and Geriatrics*.
- Benge, J.F., Aguirre, A., Scullin, M.K., Kiselica, A.K., Hilsabeck, R.C., Paydarfar, D., Thomaz, E., & Douglas, M. (2023) Digital methods for performing daily tasks among older adults: An initial report of frequency of use and perceived utility. *Experimental Aging Research* <https://doi.org/10.1080/0361073X.2023.2172950>

Q&A

QUESTIONS & ANSWERS SESSION

