

# Innovations in Aging Well: Introduction

**Jehni Robinson, MD, FAAFP**  
*Professor and Chair*  
*Department of Family Medicine*  
*Associate Dean for Primary Care*  
*President, USC Care Medical Group*  
*Keck Medicine of USC*

January 25, 2022

# Keck Medicine of USC

**3** Hospitals

**619** Beds

**80+** Clinics

**7,000+** Employees

**2,100** Faculty

**1,100** Residents

**245,000** Unique Patients

Served Annually

**\$2.1B** Net Revenue

Born in **2009**



# Keck Medicine of USC

**USC** Norris Comprehensive  
Cancer Center  
Keck Medicine of **USC**



Keck Hospital  
of **USC**  
Keck Medicine of **USC**



**USC** Verdugo  
Hills Hospital  
Keck Medicine of **USC**



Keck School of  
Medicine of **USC**



# National Recognition



**Top 3 Metro Los Angeles**  
**Top 5 California**  
**Top 25 Nationally**

- #20 in Cancer
- #14 in Cardiology & Heart Surgery
- #48 in Diabetes & Endocrinology
- #35 in ENT
- #12 in Gastroenterology & GI Surgery
- #11 in Geriatrics
- #25 in Gynecology
- #36 in Neurology & Neurosurgery
- #13 in Ophthalmology
- #34 in Orthopedics
- #21 in Pulmonology & Lung Surgery
- #10 in Urology

**High Performing:**

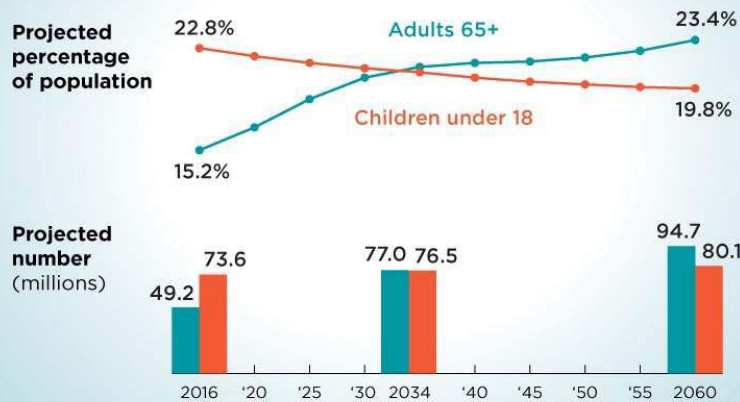
Aortic Valve Surgery, Colon Cancer Surgery, Heart Bypass Surgery, Heart Failure, Hip Replacement, Knee Replacement, Lung Cancer Surgery, TAVR, Back Surgery (spinal fusion), Heart Attack, Kidney Failure, Pneumonia, Stroke



# An Aging Nation

Projected Number of Children and Older Adults

For the First Time in U.S. History Older Adults Are Projected to Outnumber Children by 2034



Note: 2016 data are estimates not projections.

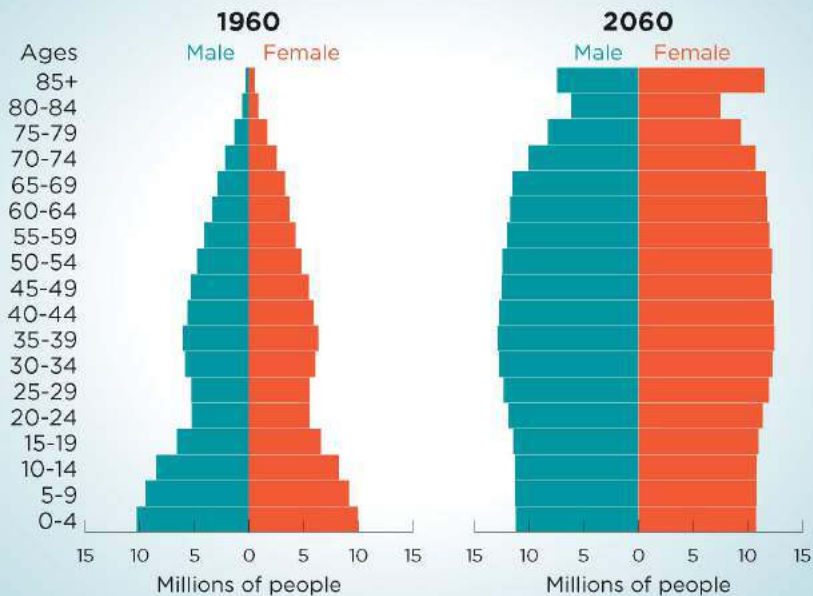
United States<sup>®</sup>  
**Census**  
Bureau

U.S. Department of Commerce  
U.S. CENSUS BUREAU  
[census.gov](http://census.gov)

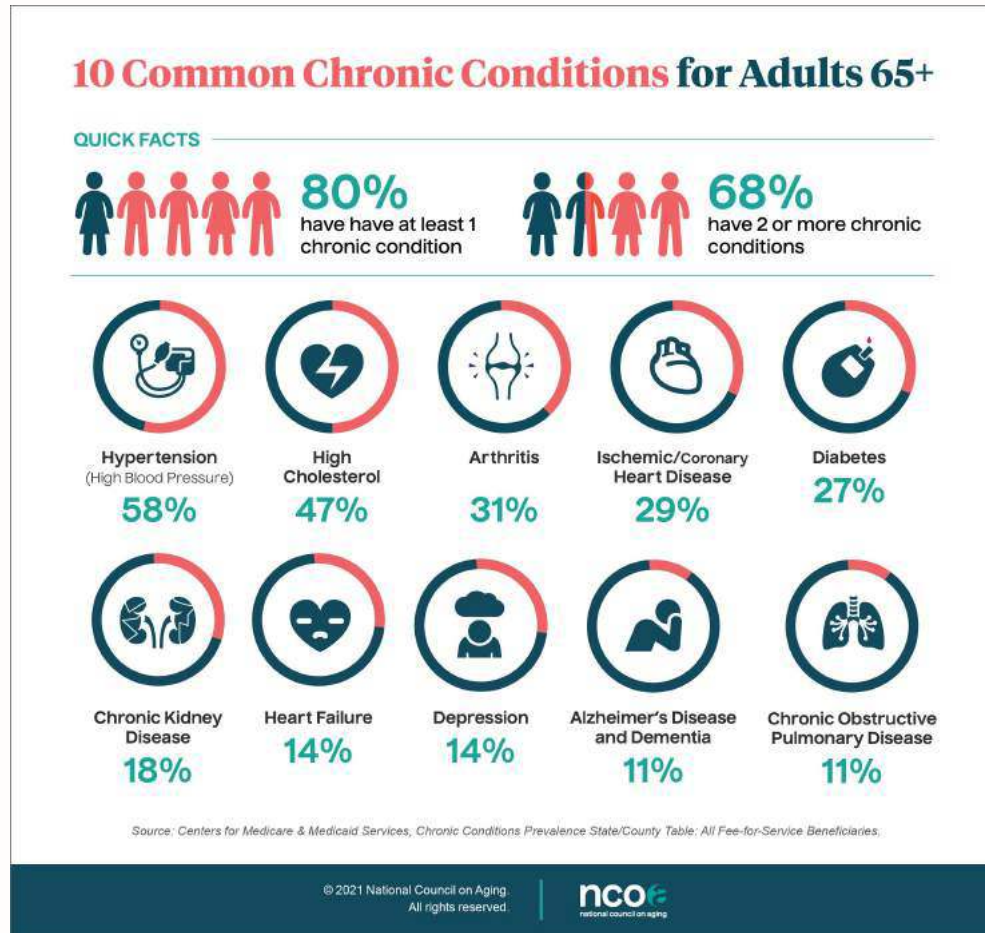
Source: National Population Projections, 2017  
[www.census.gov/programs-surveys/popproj.html](http://www.census.gov/programs-surveys/popproj.html)

# From Pyramid to Pillar: A Century of Change

Population of the United States



# Older adults have more health needs



# Traditional Thinking

How should we approach aging?

Battle



What can be done to ensure wellbeing in older aging?

Nothing much



# New Lens

How should we approach aging?

Embrace



What can be done to ensure wellbeing in older aging?

Plenty





# Innovations in Aging Well: Can we protect the aging brain from Alzheimer's ?

**Hussein Yassine, MD**

*Associate Professor*

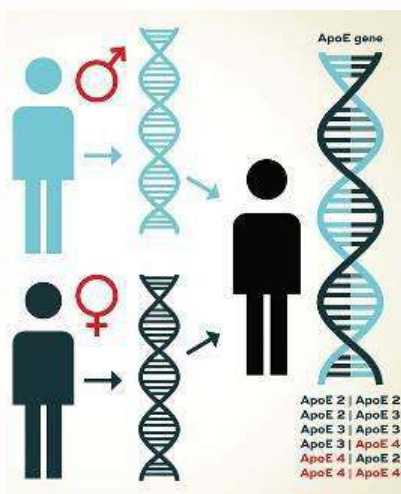
*Departments of Medicine and Neurology*

*Keck School of Medicine of USC*

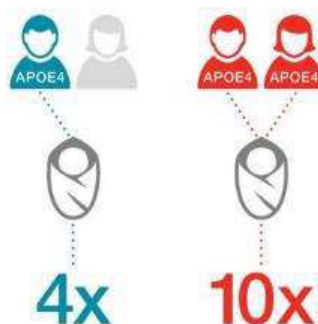
January 25, 2022



# Strongest genetic risk factors for late onset Alzheimer's: APOE4



Increased Risk of Developing Alzheimer's Disease Based On Inheriting APOE4 Gene Variant From One Parent Vs. Both



- Risk can be passed down in families
- One out of four people carry the APOE4 Allele
- 50% of patients with Alzheimer's carry at least one copy of E4

**We lack information on what diet, lifestyle factors, or drugs that can protect the aging brain in APOE4 carriers**

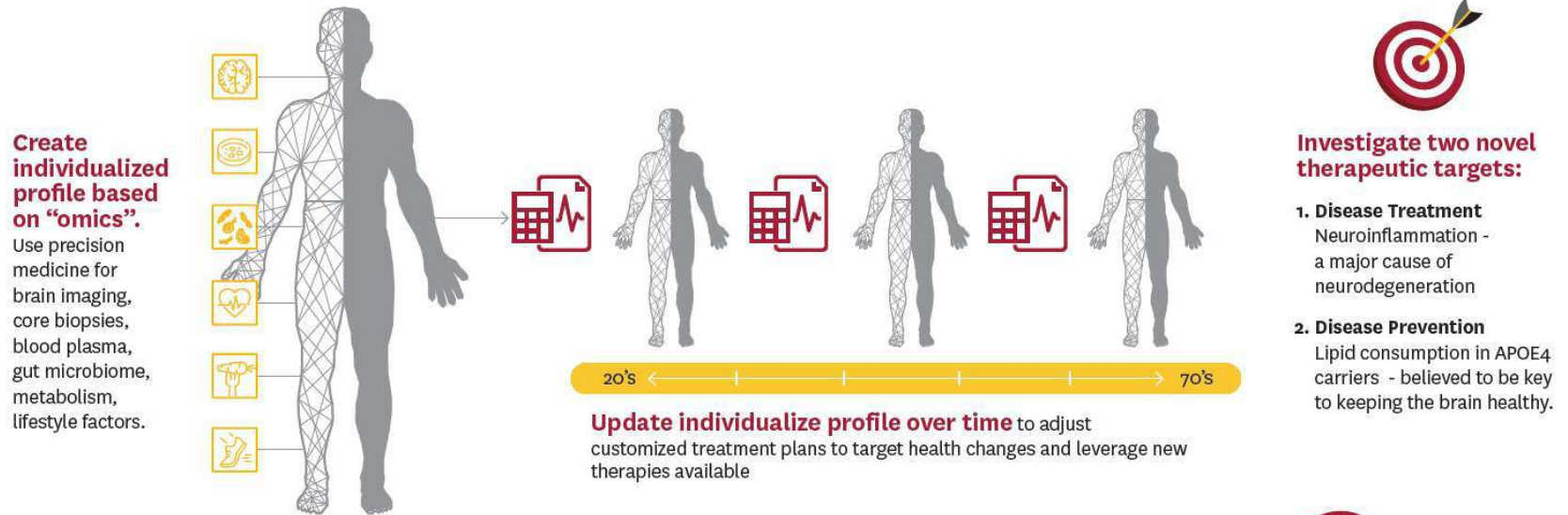
# Yassine Lab Research

1. Lower blood omega-3 are associated with lower cognitive function & hippocampal volumes, and more amyloid plaque accumulation in older adults without Alzheimer's
2. Older APOE4 carriers with dementia have reduced omega-3 brain delivery that makes them unresponsive to omega-3 supplementation
3. We identified that the enzyme cPLA2 is activated in APOE4 carriers with dementia, breaking down brain omega3s : *could cPLA2 be drug target?*
4. Younger APOE4 carriers have an increase in brain omega-3 uptake using PET scans, suggesting a greater brain demand for omega3s
5. Cognitively normal APOE4 carriers have lower delivery of omega-3s to the brain before the onset of cognitive decline
6. We are conducting the **PREVENT4 trial** to test the role of high dose omega-3 supplementation on the brain in APOE4 carriers before the onset of Alzheimer's



# Building a resource for APOE4 carriers

## Developing an Individual Model of Care for APOE4 Gene Carriers that is



Build a resource for APOE4 carriers with data collected from research and clinical findings — 200,000 subscribers to date.



# Acknowledgements

- Yassine Lab

Isabella Cordova Arellanes  
Victoria Solomon  
Ashley Martinez  
Shaowei Wang  
Carla Canas  
Jazmin Martinez  
Xulei He  
Cristiana Meuret  
Boyang Li

Seva Katrich  
Stan Louie  
Isaac Assante  
Brandon Ebright

**RUSH ADRC**  
Zoe Arvanitakis  
David Bennet

- Michael Harrington and Alfred Fonteh (HMRI)
- Wendy Mack (USC Biostatistics)
- Naoko Kono (USC Biostatistics)

DSM for providing DHA supplements

- Helena Chui
- Lon Schneider
- Meredith Braskie
- Lina D'orazio
- Carol McCleary



*Vranos Foundation*



Funding

R01AG055770  
R01AG054434  
R01AG067063  
ADDF GC-201711-2014197  
AA: NIRG-15-361854

# Innovations in Aging Well: Treating the Aging Eye

**Mark Humayun, MD, PhD**

*Professor of Ophthalmology, Biomedical Engineering  
Director USC Ginsburg Institute for Biomedical Therapeutics  
Co-Director USC Roski Eye Institute  
Keck School of Medicine  
University of Southern California*

January 25, 2022



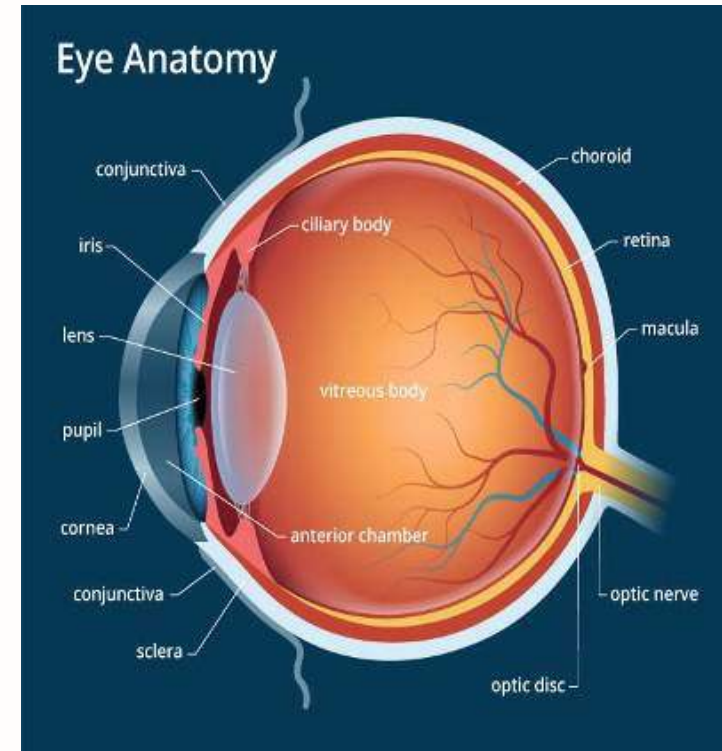
# Aging Eye

## Cataract

- 24.4M in US
- Cloudy area in the lens of the eye
- Half of Americans aged 80 or older have cataracts or have had surgery for cataracts (reference – National Eye Institute)

## Glaucoma

- 2<sup>nd</sup> leading cause of blindness (3M in US; risk increases with age & increasing eye pressure)
- Group of eye diseases that can cause vision loss (peripheral, then central reading vision) and blindness by damaging the optic nerve
- No Cure. Early treatment (eye drops, laser, surgery) can preserve vision



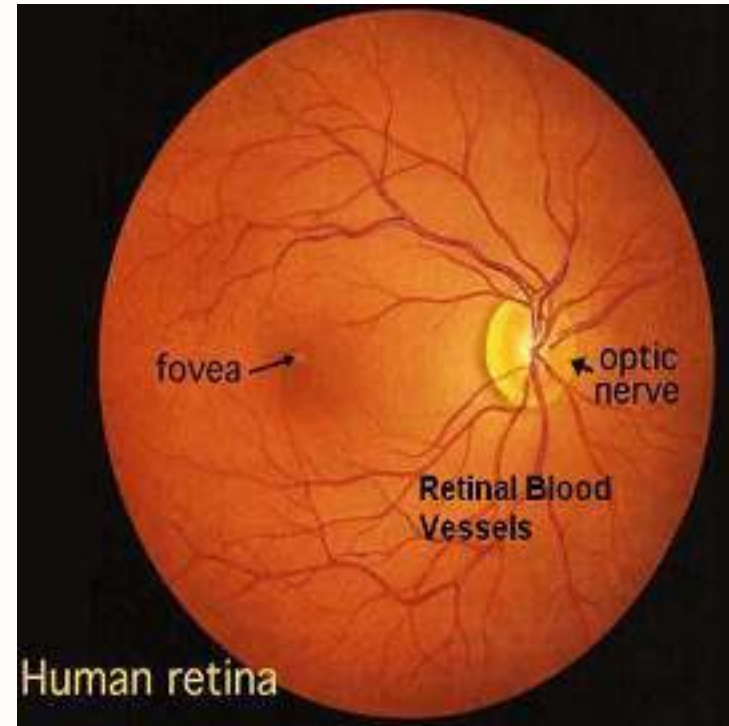
# Aging Eye Cont.

## Age-Related Macular Degeneration (AMD)

- 15M in US; 1.7M blind
- AMD can blur central vision
- 2 types of AMD: Dry and Wet (Bleeding)
- Eye injections of medications can slow Wet AMD progression
- Proven eye vitamins can slow Dry AMD progression

## Diabetic Retinopathy

- 10M in US
- Can cause vision loss and blindness in diabetic patients (majority older patients with type 2 diabetes)
- Affects retinal blood vessels
- Eye injections of medications can slow vision loss
- Laser and Eye Surgery required for more advanced forms





# Uniquely Positioned to Treat Aging Eye Diseases

- **Patient Care** – Among the top 15 programs in the US (US News & World Report)
- **Research** - #1 in Research in the US (National Eye Institute)
- **Education** – educate the workforce and leaders of the future
- **Community** – Primary provider of underprivileged through LA County Hospital

USC DEPARTMENT OF OPHTHALMOLOGY

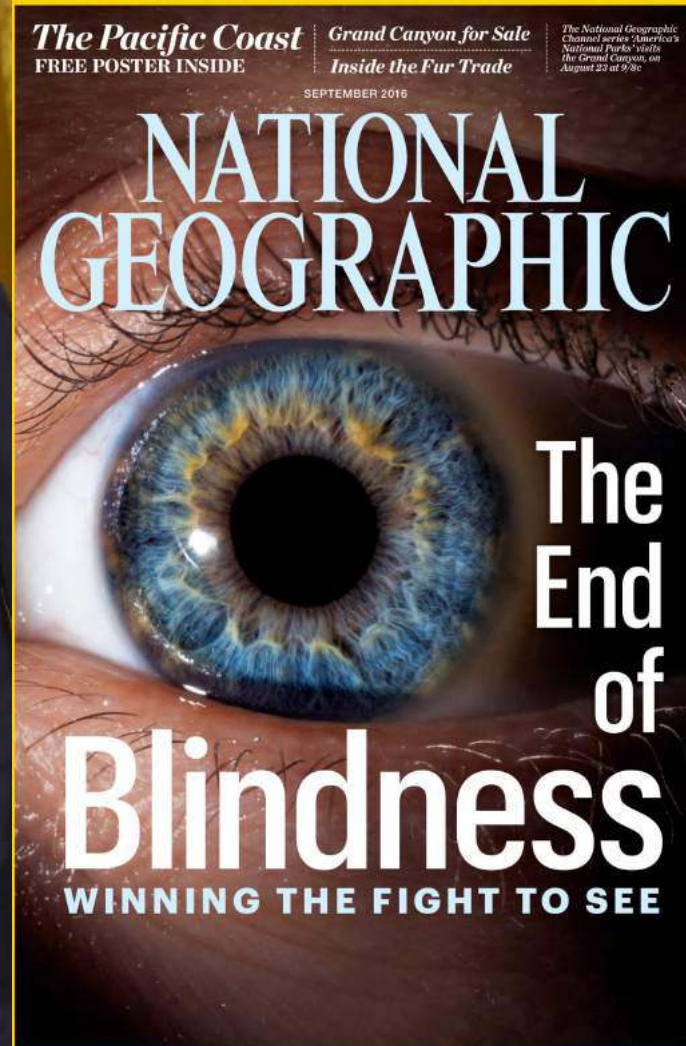
# #1

IN NIH RESEARCH FUNDING  
AMONG OPHTHALMOLOGY DEPARTMENTS

**FY 2019**

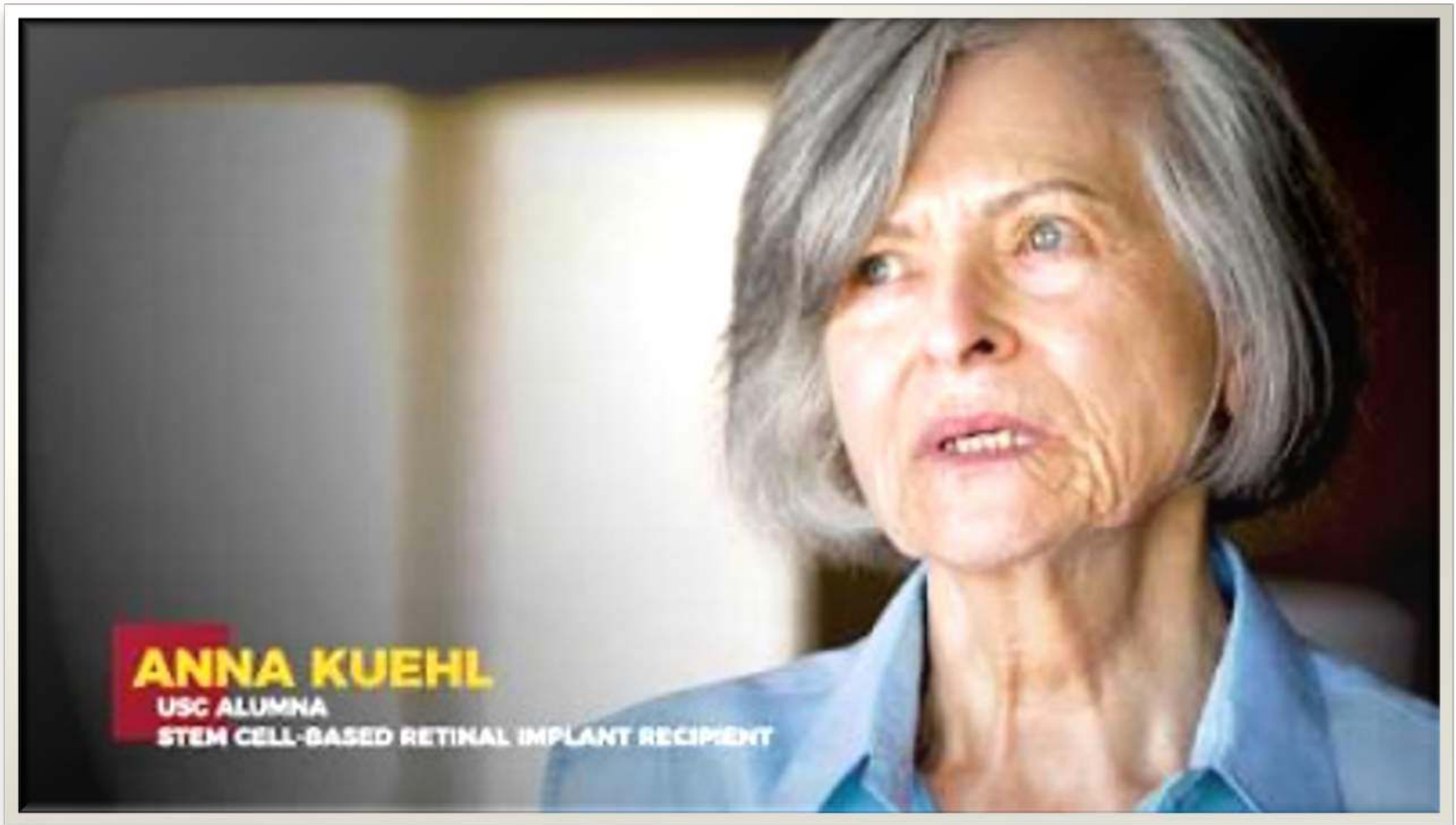


Research  
Programs –  
Award  
Winning



Keck Medicine of **USC**

# Stem Cell Implant for Macular Degeneration



# Conclusions

## **Vision impairment and eye disease**

- Growing larger due to aging population
- Disproportionate incidence in minority populations
- Significant co-morbid condition from the epidemic of diabetes (diabetic retinopathy)

**Many great ideas require philanthropic seed funding to show proof of principle** in order to obtain federal, state, or corporate funding and ultimately benefit patients

**At USC, with the help philanthropic funding,** we have been successful in launching new breakthrough ideas for the treatment of the aging eye

**We are very grateful for the support to date from**

National Eye Institute (NEI)

Dr. Allen and Charlotte Ginsburg

National Science Foundation (NSF)

Michele and Dennis Slivinski

California Institute of Regenerative Medicine  
(CIRM)

Perkins Foundation

L. K. Whittier Foundation

# Innovations in Aging Well: Preventing Cardiovascular Disease

**Vivian Y. Mo, MD, MHA**

*Clinical Associate Professor of Medicine*

*Chief Medical Officer, USC Care Medical Group*

*Interim Chief, Division of Cardiovascular Medicine*

*Keck School of Medicine of USC*

January 25, 2022

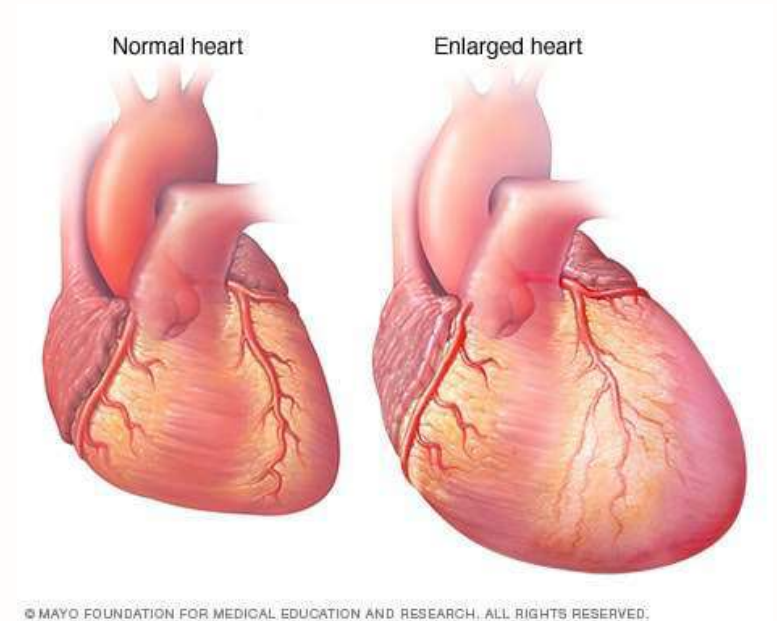
# Cardiac Disease

- Coronary artery disease (CAD) remains the leading cause of morbidity and mortality worldwide despite advances in diagnosis and treatment
- Development of CAD commonly begins early in life and the process continues over years and decades
- Most patients who have had a heart attack or myocardial infarction (MI) have had unfavorable levels of at least one cardiovascular risk factor before their cardiac event



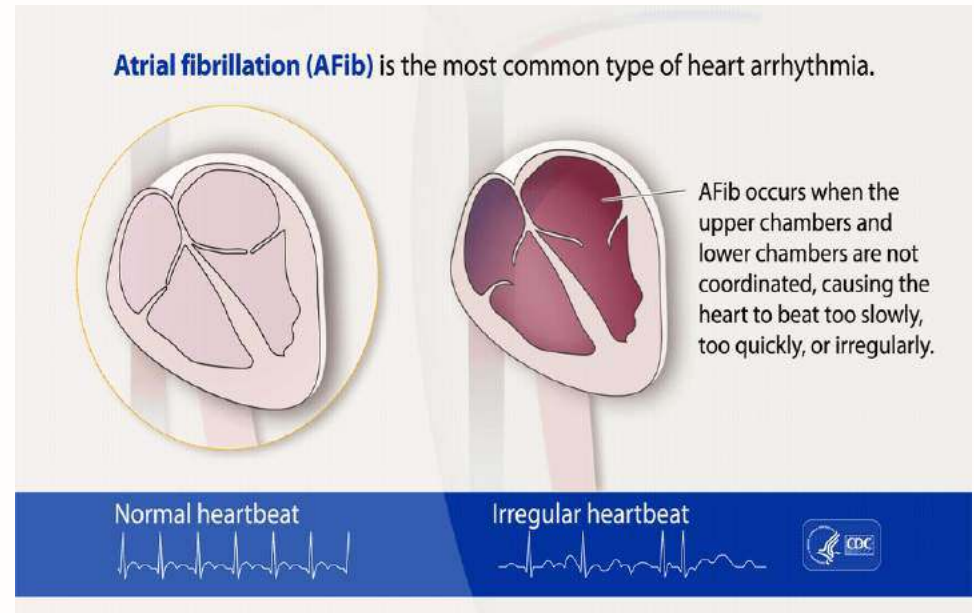
# Heart Failure

- Approximately 6.5 million American have heart failure (HF)
- Lifetime risk of developing HF is estimated to be 1 in 5 at 40 years of age
- HF incidence increases with age and is the #1 reason for hospitalizations in the elderly



# Arrhythmic Disease

- Atrial fibrillation (AF) is the most common arrhythmia worldwide
- Most common etiology for AF in industrialized countries is hypertension
- AF carries a 4-5 fold increased risk of stroke
- AF is associated with high risk of cardiovascular events and hospitalization





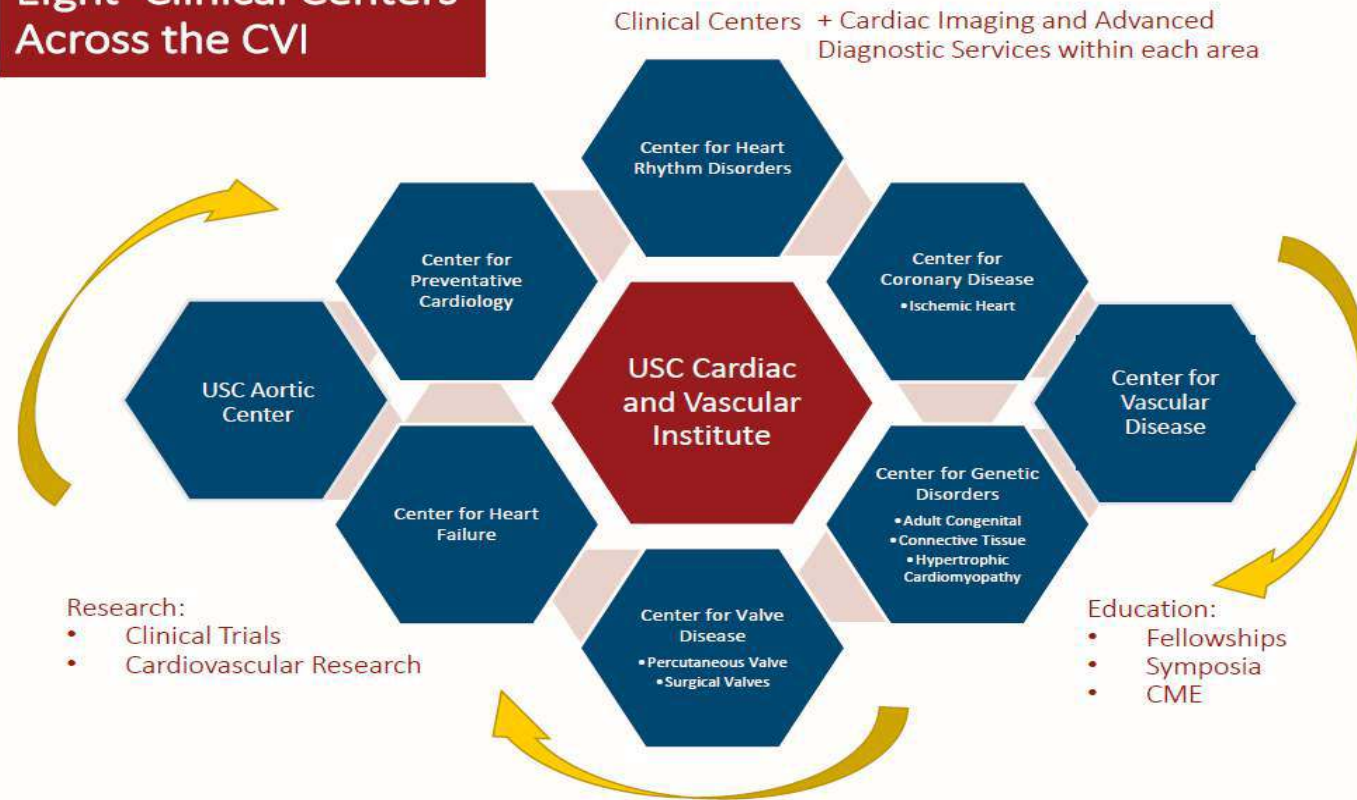
# Promoting Cardiac Health

- Improving cardiovascular risk factors can lower the incidence of coronary artery disease, heart failure, atrial fibrillation, cancer, depression, and cognitive decline
- Most important way to promote cardiac health is ***to promote a healthy lifestyle with focus on lifestyle optimization through diet, physical activity, avoiding tobacco use***



# Cardiac and Vascular Institute at USC

## Eight Clinical Centers Across the CVI



# Thank You!

Please contact Keck Advancement for more information  
on the innovative work showcased in this webinar:

Thanh Hoang  
Assistant Vice President, Clinical and Research Initiatives  
Keck Advancement  
Keck Medicine of **USC**  
University of Southern California  
1149 South Hill Street, Suite 360  
Los Angeles, CA 90015  
Cell: (310) 804-7508  
[Thanh.Hoang@med.usc.edu](mailto:Thanh.Hoang@med.usc.edu)