AMA
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The Impact of Vision and Hearing Loss in the Senior Population – Why Seeing and Hearing are Believing

Noon–1:30 p.m. | Saturday, November 16

Room: Grand Hall C| Manchester Grand Hyatt San Diego

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Moderator

James F. Burdick, MD

Chair-Elect, AMA-SPS Governing Council

Objectives

Upon completion of this activity, the physician will be able to:

- Explain the importance of testing for hearing and vision loss as one ages.
- Review current screening tests available for hearing impairment.
- Identify how hearing loss is associated with significant adverse effects on a person's social, psychological and physical well-being.

Speakers' Disclosure

The content of this activity does not relate to any product of a commercial interest as defined by the ACCME; therefore, there are no relevant financial relationships to disclose at this time.

Speaker

Mihir (Max) Y. Parikh, MD

Board-certified ophthalmologist

Former president of the San Diego County Medical Society

Chief surgeon for NVision San Diego

JAMA Ophthalmology | Brief Report

Evaluating Whether Sight Is the Most Valued Sense

Jamie Enoch, MSc; Leanne McDonald, MSc; Lee Jones, PhD; Pete R. Jones, PhD; David P. Crabb, PhD

IMPORTANCE Sight is often considered to be the sense most valued by the general public, but there are limited empirical data to support this. This study provides empirical evidence for frequent assertions made by practitioners, researchers, and funding agencies that sight is the most valued sense.

OBJECTIVE To determine which senses are rated most valuable by the general public and quantify attitudes toward sight and hearing loss in particular.

DESIGN, SETTING, AND PARTICIPANTS This cross-sectional web-based survey was conducted from March to April 2016 through a market research platform and captured a heterogeneous sample of 250 UK adults ages 22 to 80 years recruited in March 2016. The data were analyzed from October to December 2018.

MAIN OUTCOMES AND MEASURES Participants were first asked to rank the 5 traditional senses (sight, hearing, touch, smell, and taste) plus 3 other senses (balance, temperature, and pain) in order of most valuable (8) to least valuable (1). Next, the fear of losing sight and hearing was investigated using a time tradeoff exercise. Participants chose between 10 years without sight/hearing vs varying amounts of perfect health (from 0-10 years).

RESULTS Of 250 participants, 141 (56.4%) were women and the mean (SD) age was 49.5 (14.6) years. Two hundred twenty participants (88%) ranked sight as their most valuable sense (mean [SD] rating, 7.8 [0.9]; 95% CI, 7.6-7.9). Hearing was ranked second (mean [SD] rating, 6.2 [1.3]; 95% CI 6.1-6.4) and balance third (mean [SD] rating, 4.9 [1.7]; 95% CI, 4.7-5.1). All 3 were ranked above the traditional senses of touch, taste, and smell (F_7 = 928.4; P < .001). The time tradeoff exercise indicated that, on average, participants preferred 4.6 years (95% CI, 4.2-5.0) of perfect health over 10 years without sight and 6.8 years (95% CI, 6.5-7.2) of perfect health over 10 years without hearing (mean difference between sight and hearing, 2.2 years; P < .001).

CONCLUSIONS AND RELEVANCE In a cross-sectional survey of UK adults from the general public, sight was the most valued sense, followed by hearing. These results suggest that people would on average choose 4.6 years of perfect health over 10 years of life with complete sight loss, although how this generalizes to other parts of the world is unknown.

JAMA Ophthalmol. doi:10.1001/jamaophthalmol.2019.3537
Published online October 3, 2019.

Supplemental content

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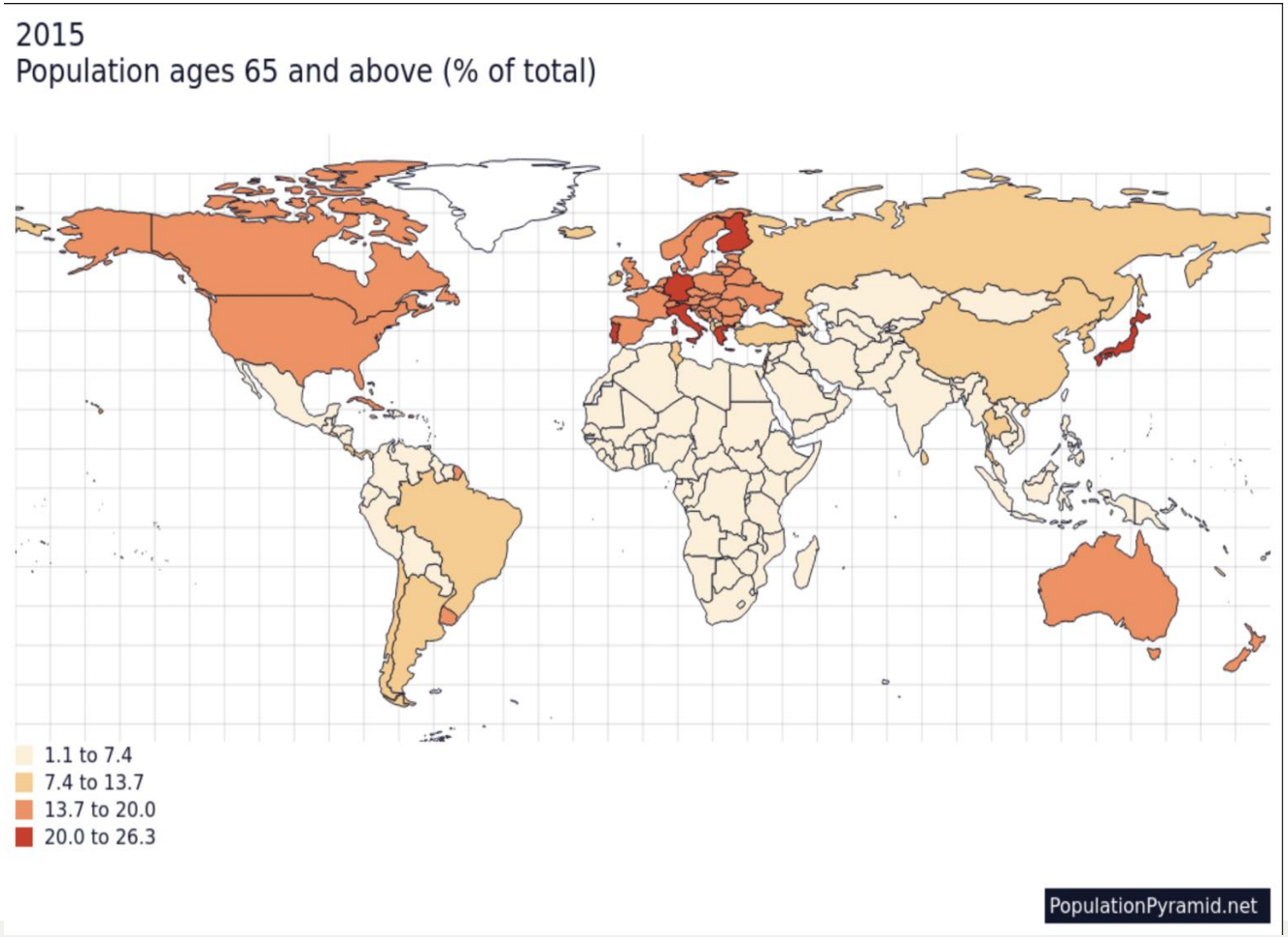
Study Conclusions

- 88% of 220 participants ranked SIGHT as most valuable sense
- Hearing was SECOND
- Participants preferred 4.6 years of perfect health over 10 years without sight

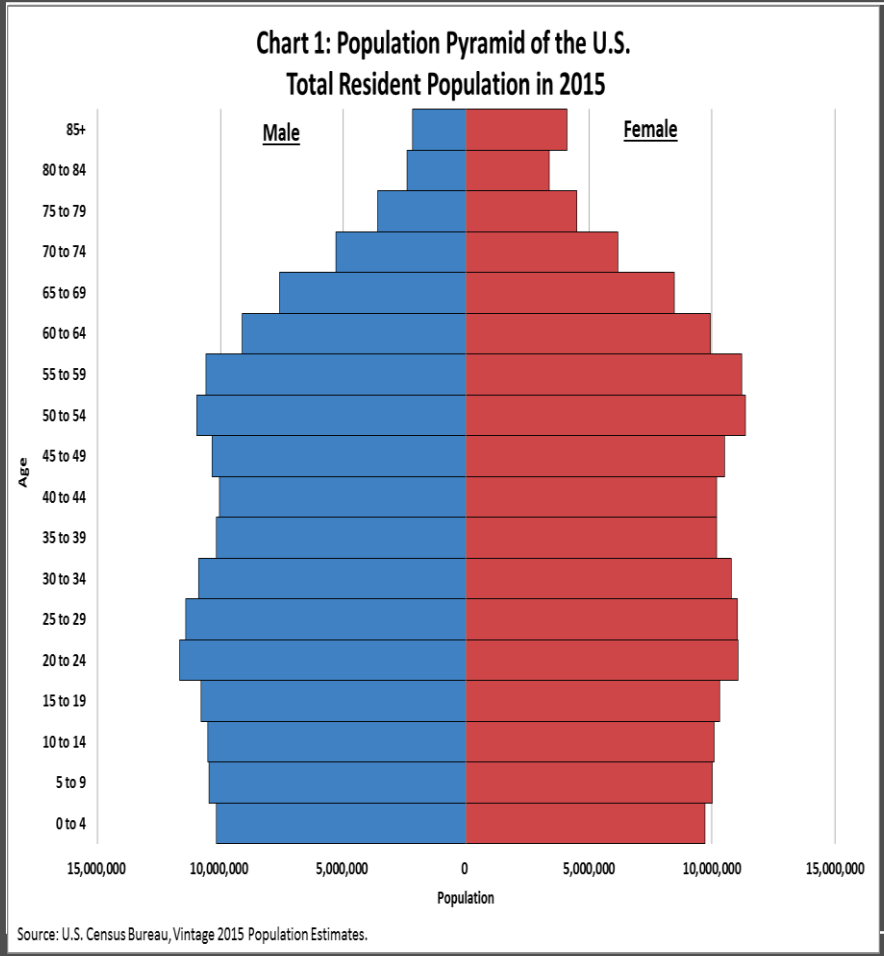
  vs. 6.8 years of perfect health over 10 years without hearing

- Mean difference of 2.2 more years of life

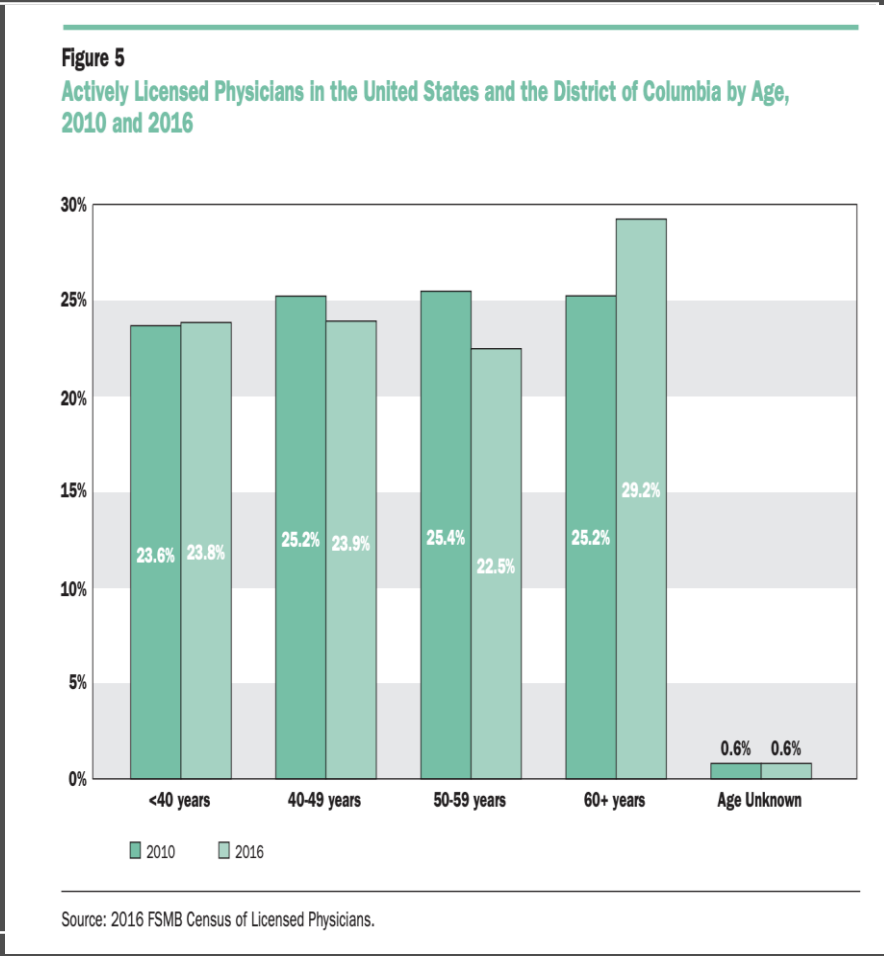


22.8% of US population over 60

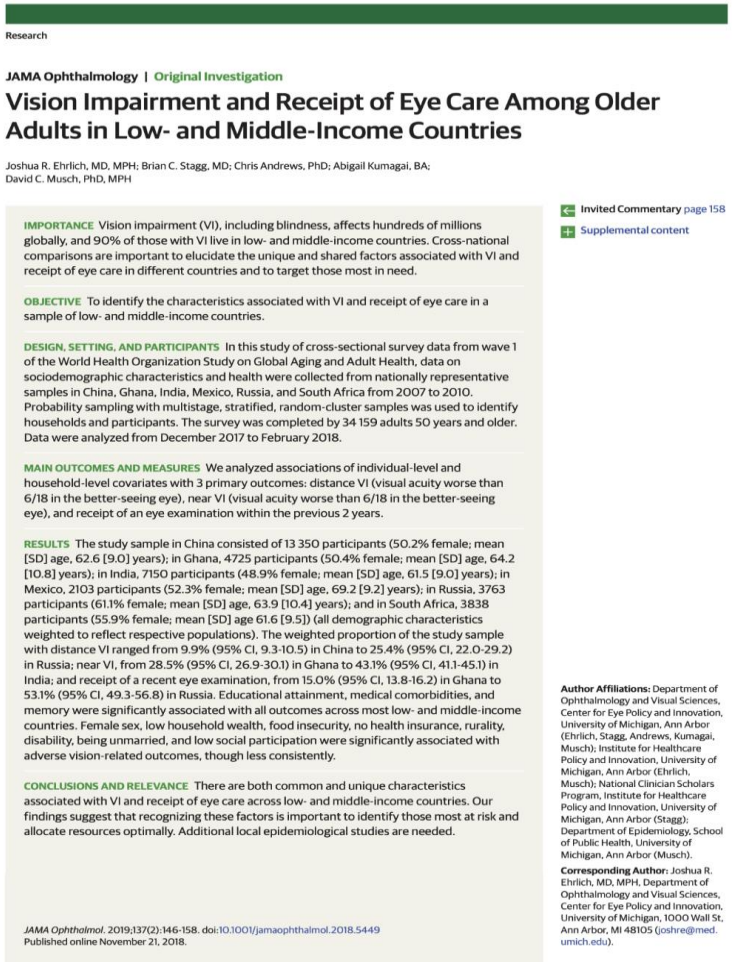
29% of the MD population in US over 60



Source: U.S. Census Bureau, Vintage 2015 Population Estimates.



Source: 2016 FSMB Census of Licensed Physicians.



Research

JAMA Ophthalmology | Original Investigation

Vision Impairment and Receipt of Eye Care Among Older Adults in Low- and Middle-Income Countries

Joshua R. Ehrlich, MD, MPH; Brian C. Stagg, MD; Chris Andrews, PhD; Abigail Kumagai, BA; David C. Musch, PhD, MPH

Invited Commentary page 158
Supplemental content

IMPORTANCE Vision impairment (VI), including blindness, affects hundreds of millions globally, and 90% of those with VI live in low- and middle-income countries. Cross-national comparisons are important to elucidate the unique and shared factors associated with VI and receipt of eye care in different countries and to target those most in need.

OBJECTIVE To identify the characteristics associated with VI and receipt of eye care in a sample of low- and middle-income countries.

DESIGN, SETTING, AND PARTICIPANTS In this study of cross-sectional survey data from wave 1 of the World Health Organization Study on Global Aging and Adult Health, data on sociodemographic characteristics and health were collected from nationally representative samples in China, Ghana, India, Mexico, Russia, and South Africa from 2007 to 2010. Probability sampling with multistage, stratified, random-cluster samples was used to identify households and participants. The survey was completed by 34 159 adults 50 years and older. Data were analyzed from December 2017 to February 2018.

MAIN OUTCOMES AND MEASURES We analyzed associations of individual-level and household-level covariates with 3 primary outcomes: distance VI (visual acuity worse than 6/18 in the better-seeing eye), near VI (visual acuity worse than 6/18 in the better-seeing eye), and receipt of an eye examination within the previous 2 years.

RESULTS The study sample in China consisted of 13 350 participants (50.2% female; mean [SD] age, 62.6 [9.0] years); in Ghana, 4725 participants (50.4% female; mean [SD] age, 64.2 [10.8] years); in India, 7150 participants (48.9% female; mean [SD] age, 61.5 [9.0] years); in Mexico, 2103 participants (52.3% female; mean [SD] age, 69.2 [9.2] years); in Russia, 3763 participants (61.1% female; mean [SD] age, 63.9 [10.4] years); and in South Africa, 3838 participants (55.9% female; mean [SD] age 61.6 [9.5]) (all demographic characteristics weighted to reflect respective populations). The weighted proportion of the study sample with distance VI ranged from 9.9% (95% CI, 9.3-10.5) in China to 25.4% (95% CI, 22.0-29.2) in Russia; near VI, from 28.5% (95% CI, 26.9-30.1) in Ghana to 43.1% (95% CI, 41.1-45.1) in India; and receipt of a recent eye examination, from 15.0% (95% CI, 13.8-16.2) in Ghana to 53.1% (95% CI, 49.3-56.8) in Russia. Educational attainment, medical comorbidities, and memory were significantly associated with all outcomes across most low- and middle-income countries. Female sex, low household wealth, food insecurity, no health insurance, rurality, disability, being unmarried, and low social participation were significantly associated with adverse vision-related outcomes, though less consistently.

CONCLUSIONS AND RELEVANCE There are both common and unique characteristics associated with VI and receipt of eye care across low- and middle-income countries. Our findings suggest that recognizing these factors is important to identify those most at risk and allocate resources optimally. Additional local epidemiological studies are needed.

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JAMA Ophthalmol. 2019;137(2):146-158. doi:10.1001/jamaophthalmol.2018.5449
Published online November 21, 2018.

- Older Age
- Lower Educational attainment
- Greater Disability
- More medical co morbidity
- Poorer Memory

Associated with significant VI in most L/MI countries

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Review | EVIDENCE REPORT FOR THE USPSTF

Screening for Impaired Visual Acuity in Older Adults
Updated Evidence Report and Systematic Review for the US Preventive Services Task Force

Roger Chou, MD; Tracy Dana, MLS; Christina Bougatsos, MPH; Sara Grusing, BS; Ian Blazina, MPH

CONCLUSIONS AND RELEVANCE Screening can identify persons with impaired visual acuity, and effective treatments are available for common causes of impaired visual acuity, such as uncorrected refractive error, cataracts, and dry or wet AMD. However, direct evidence found no significant difference between vision screening in older adults in primary care settings vs no screening for improving visual acuity or other clinical outcomes.

JAMA. 2016;315(9):915-933. doi:10.1001/jama.2016.0783

I Statement	The USPSTF concludes that the current evidence is insufficient to assess the balance of benefits and harms of the service. Evidence is lacking, of poor quality, or conflicting, and the balance of benefits and harms cannot be determined.

Editorial

Vision screening

Jennifer Evans,[1] Liam Smeeth,[2] Astrid Fletcher[2]

Visual problems are frequently unrecognised or untreated in older people in high-income countries. Population-based surveys in the UK suggest that approximately 12–15% of people aged 75 years and above have a presenting binocular visual acuity worse than 6/18 (corresponding to WHO definitions of visual impairment), and 20–30% have a visual acuity worse than 6/12 (equivalent to the visual standard required for driving).[1–3]

Given the availability of free sight tests for the older population, it is of concern that over 50% of vision impairment is due to easily correctable conditions such as refractive error and cataract.[4] A systematic approach to detection of vision problems in the community might therefore be of benefit. The assumption behind screening for visual impairment in this age group is that, if avoidable visual impairment could be detected and, most importantly, treated effectively, then the prevalence of visual impairment could be reduced. As visual impairment is associated with reduced functioning,[5] decreased quality of life,[6] an increased risk of falls[7] and possibly depression,[8] reducing the prevalence of visual impairment in older people would be an important public health benefit. (There is a large literature on this subject: selected references only cited.)

Early enthusiasm for population screening for visual impairment in older people, particularly in the primary care setting[9–11] has not been supported by subsequent evidence. Trials to date have failed to demonstrate any substantial benefit of vision screening in older people.[12] In a large pragmatic trial of multidimensional screening of older people in the UK, participants were given a visual acuity test by a practice nurse (with a clear protocol for intervention) as part of an in-depth health examination or completed a brief health questionnaire including a question on self-reported vision problems.[13] A nested trial examining participants in a random selection of general practices from the trial found that 3–5 years after screening, the prevalence of visual impairment in the two groups was similar,[14] although the study demonstrated that a small number of people had benefited from screening. The study found that a high proportion (86%) of people with vision impairment had previously seen an ophthalmologist (mainly due to age-related macular degeneration or diabetic retinopathy). Only half the recommendations for referral to an ophthalmologist resulted in an actual referral being made by the general practitioners, although this could have been due to patient refusal as much as to reluctance by the general practitioner. Non-referral was higher in cognitively impaired people and those who had previously been seen by ophthalmologists. Of those who were referred, a large majority attended (88%), with cataract being the most common intervention. From this trial, we can conclude that there were benefits, but these were not large enough to justify the introduction of population screening. One possibility is that vision testing by a nurse as part of a multidimensional assessment in primary care is not an effective vision-screening strategy. Would screening by a trained eye-healthcare professional be better?

In this issue of the BJO, a randomised trial of vision screening in frail older people in Australia is reported ***(see page 736)*** that evaluates such a screening model.[15] The trial randomised over 600 people aged 70 years and above to either a comprehensive eye examination by an optometrist or no vision assessment. The study found no beneficial effect of screening for visual impairment in older people (indeed a previous report by the same group suggests that the screening intervention was harmful in that it increased the risk of falls and fractures[16]). A comprehensive vision assessment, conducted by an optometrist, did not reduce the prevalence of visual impairment; nor did it improve vision-related functioning in this group of older people. At the end of the study, 35% of the participants in both intervention and control groups were visually impaired with a binocular visual acuity less than 6/12.

One possible explanation for the lack of effect in this study was contamination of the control group. Over 70% of the control group visited an eye-healthcare professional during the 12 months of the study. This is a high proportion and may have been influenced by participation in the trial. However, at baseline, 82% of people reported having seen an eye-healthcare professional within the last 2 years, so it may also reflect high levels of eye-healthcare use in this population.

At the beginning of the study, 63% of the study sample reported they had cataract, 39% reported they had had cataract surgery, and almost everyone (97%) had glasses. Thus, it may be that in spite of the relatively high levels of visual impairment, levels of unmet need in terms of eye-health services were not high. In the 509 people randomised to screening, 92 received a new pair of glasses, and 15 were referred for cataract surgery as a result of the examination—seven people in total had cataract surgery as a result of the screening programme. There were no data on interventions among the group randomised to not having a vision assessment, and we do not know what the cause of visual impairment was at the end of the study. However, it would appear that, even though a large proportion of the study population were seen by an eye-healthcare professional during the course of the study, the prevalence of visual impairment less than 6/12 at the end of the study remained as high as that observed in other population-based studies of visual impairment in this age group.

Future research needs to focus on the reasons why such high levels of visual impairment in community-dwelling older adults persist even in the presence of apparently good access to a trained eye-healthcare professional. Research in nursing homes suggests that screening and identifying cataracts in the absence of additional support systems does not lead to improved uptake of cataract services.[17]

This and the other studies we have discussed highlight the importance of thorough testing of potential programmes to reduce the prevalence of visual impairment in the population. Vision screening is often advocated with little evidence of effectiveness simply because its benefits seem too obvious to question. Among school-age children, for example, there are no completed randomised trials of vision screening programmes.[18] For older people, among whom randomised trials have been undertaken, vision screening appears not to be an effective intervention.

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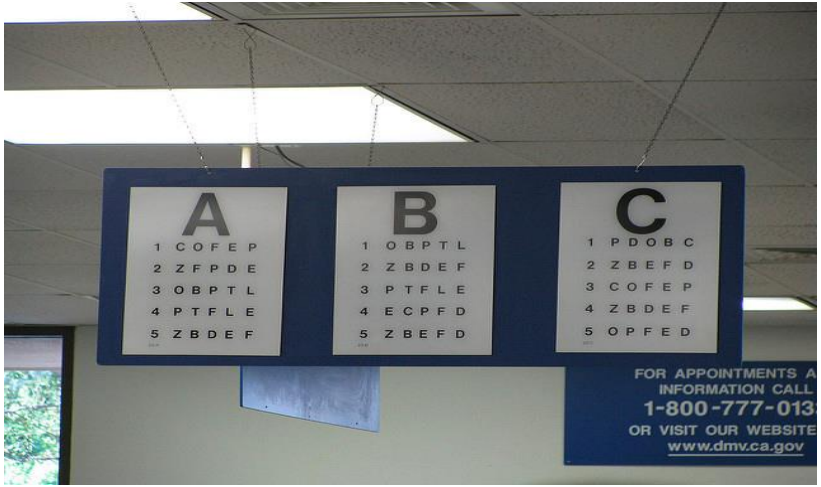
- Reduced functioning
- Decreased quality of life
- Increased risk of falls
- Possibly increased risk of depression
- Reducing VI would be an important public health benefit
- BUT vision screening alone is not an effective tool. Does not lower VI

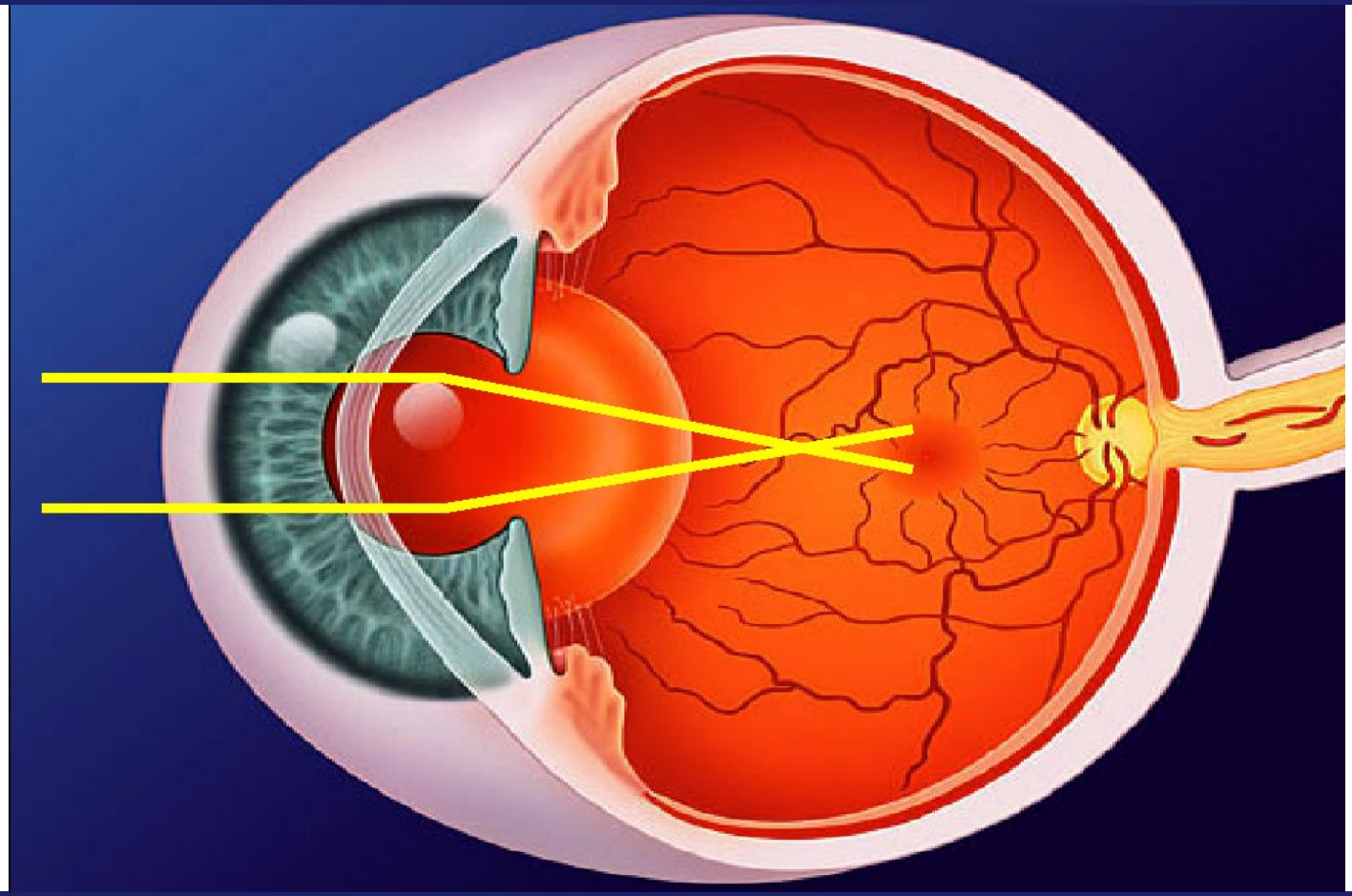
What is Visual Impairment?

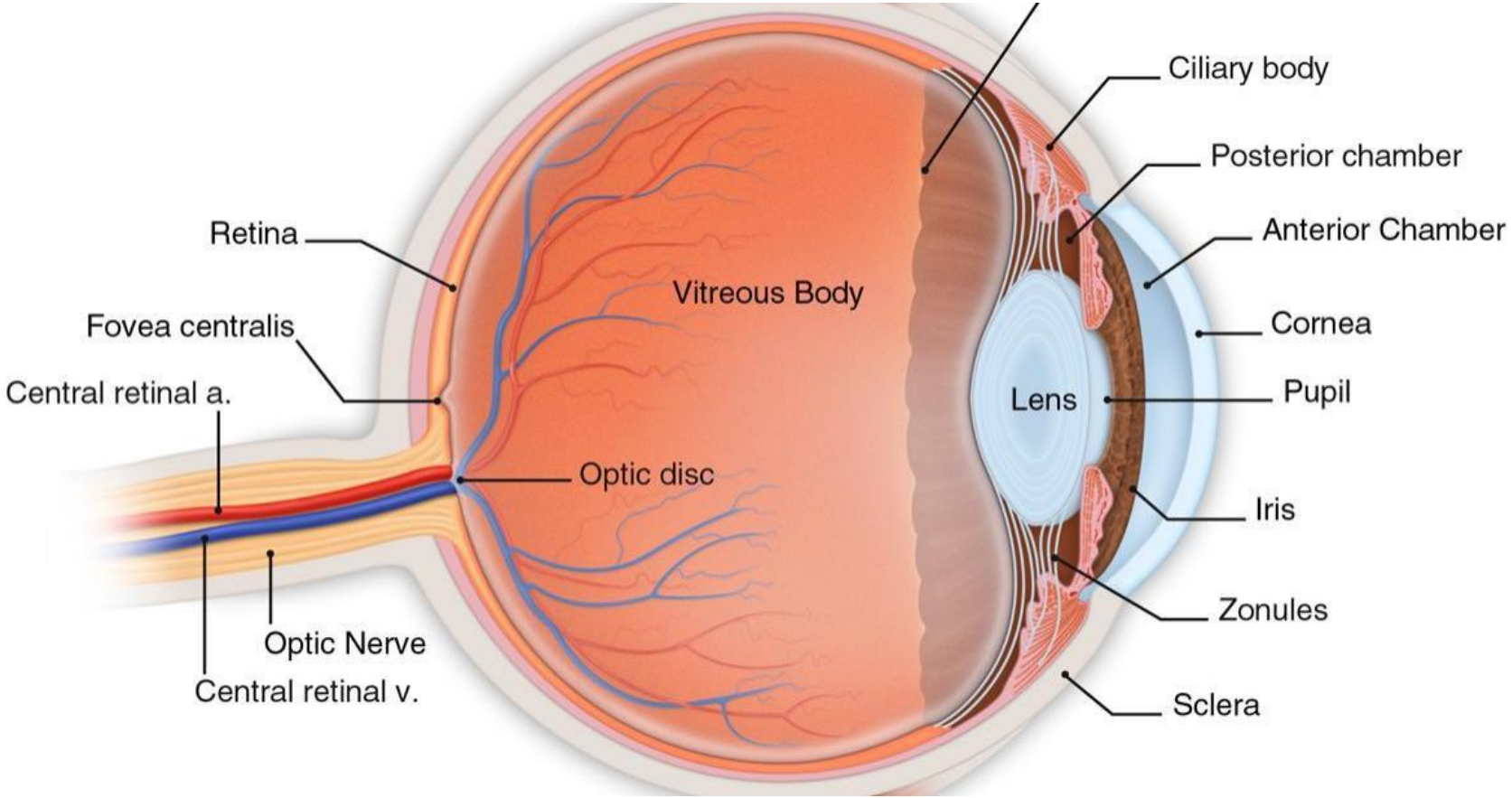
- Vision Impairment: worse than 20/40 in the better seeing eye

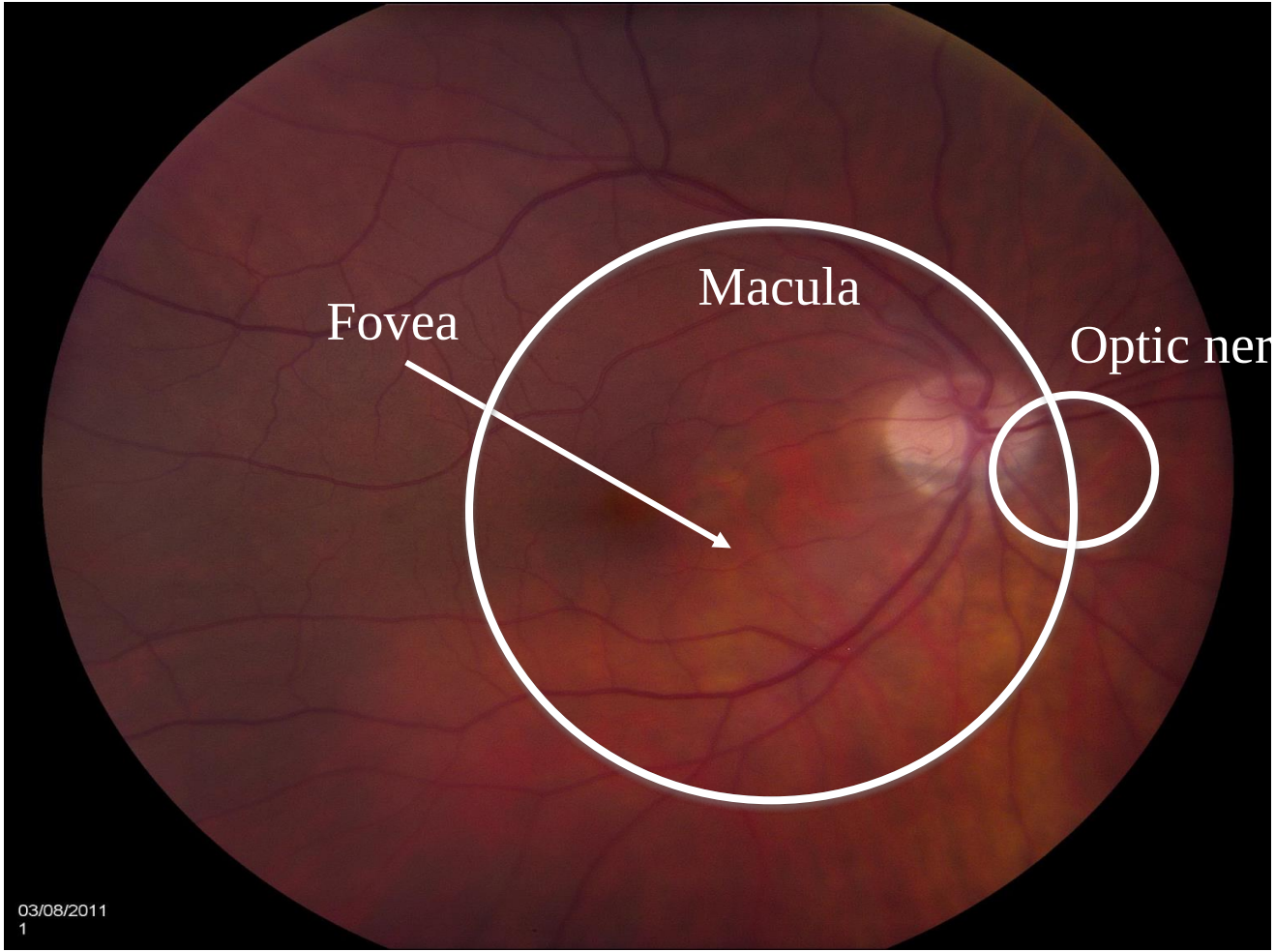


- Legal Blindness: vision worse than 20/200 or Visual Field less than 20 degrees

Entire Visual Field in One Eye







Most Common Cause of Visual Impairment in USA, 2015

- Non-Hispanic White Population

  Cataracts (42%) (141/1000 people)

  Age-Related Macular Degeneration (28%) (15.6/1000 people)

  Others (22%)

  Diabetic Retinopathy (5%) (39.8/1000 people)

  Glaucoma (2%) (23.2/1000 people)

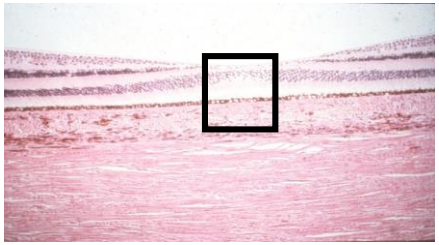
Data from the University of Chicago (UIC)
https://www.aao.org/clinical-statement/eye-disease-statistics-2#CausesofVisualImpairment
https://www.healthypeople.gov/2020/topics-objectives/topic/vision/objectives

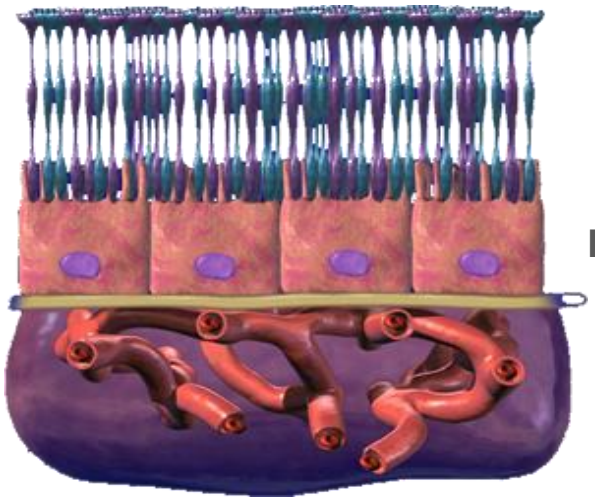
MACULAR DEGENERATION

Vision with Macular Degeneration

Normal Anatomy of the Retina

Cross section of normal retina

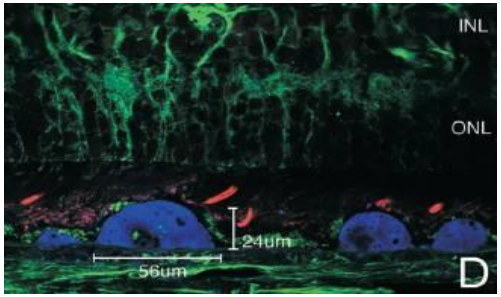


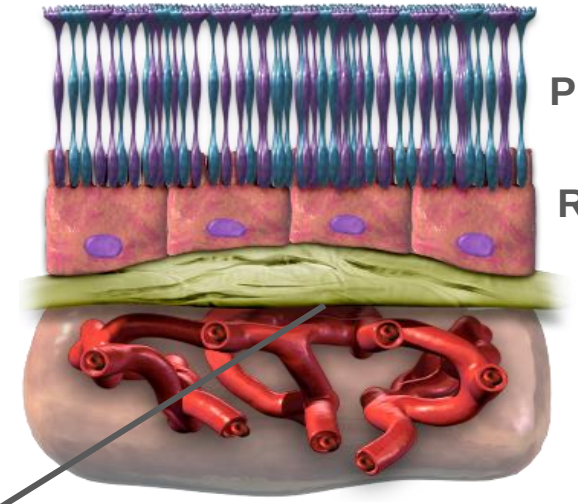


Campochiaro. *J Cell Physiol*. 2000;184:301.

Drusen Formation

Cross section of retina with drusen





Photoreceptors

RPE

Bruch's membrane

Choriocapillaris

Drusen

Campochiaro. *J Cell Physiol*. 2000;184:301.
Johnson et al. *Invest Ophthalmol Vis Sci*. 2003;44:4481; Reproduced with permission.

Normal

Drusen

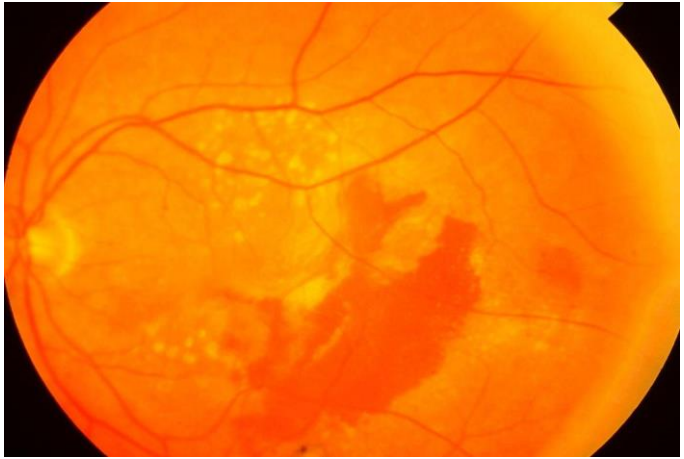
Normal

Drusen

Geographic atrophy

Causes of severe vision loss

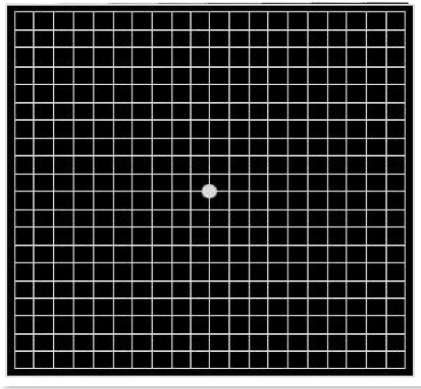
Dry
10%



Wet
90%

Strategies for Preventing Progression to Advanced AMD

- Early detection, diagnosis, and treatment important to maximize visual outcomes
- Lifestyle modifications may slow progression
  - Smoking cessation
  - Exercise
  - Maintain healthy weight
  - Maintain normal blood pressure
  - Proper nutrition

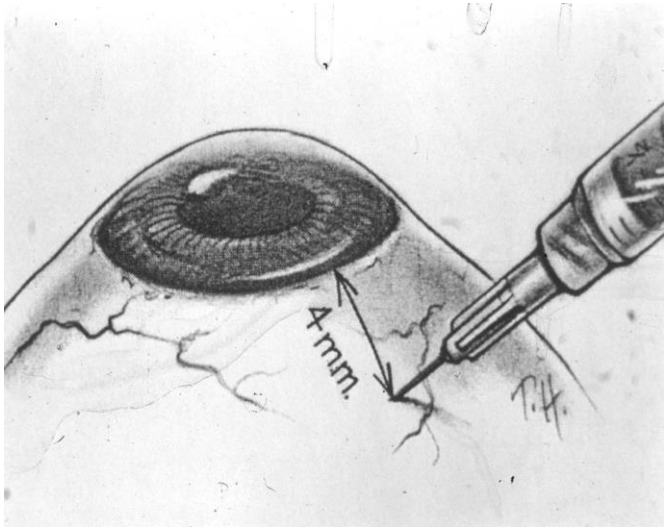


Strategies for Preventing Progression to Advanced AMD (cont'd)

- Nutritional considerations
  - Evidence supports the role of nutrition in decreasing the risk of progression
  - Fruits and vegetables high in vitamins C and E, selenium, and carotenoids (beta carotene, lutein, and zeaxanthin) are recommended
    - Dark green, leafy vegetables (e.g. spinach)
    - Other colorful fruits and vegetables (e.g. carrots, peas,)

Neovascular AMD
State of the Art 2012

- Intravitreal pan-VEGF blockers:
  - Ranibizumab (Lucentis)-FDA approved
  - Bevacizumab (Avastin)-Off label
  - Aflibercept (Eylea)-FDA approved
- Frequent intravitreal injections
- Frequent follow-up and testing
- Limitations:
  - Not all patients have improved visual acuity
  - Duration of therapy unknown: Disease control-*not* cure
  - Inconvenient
  - Costly

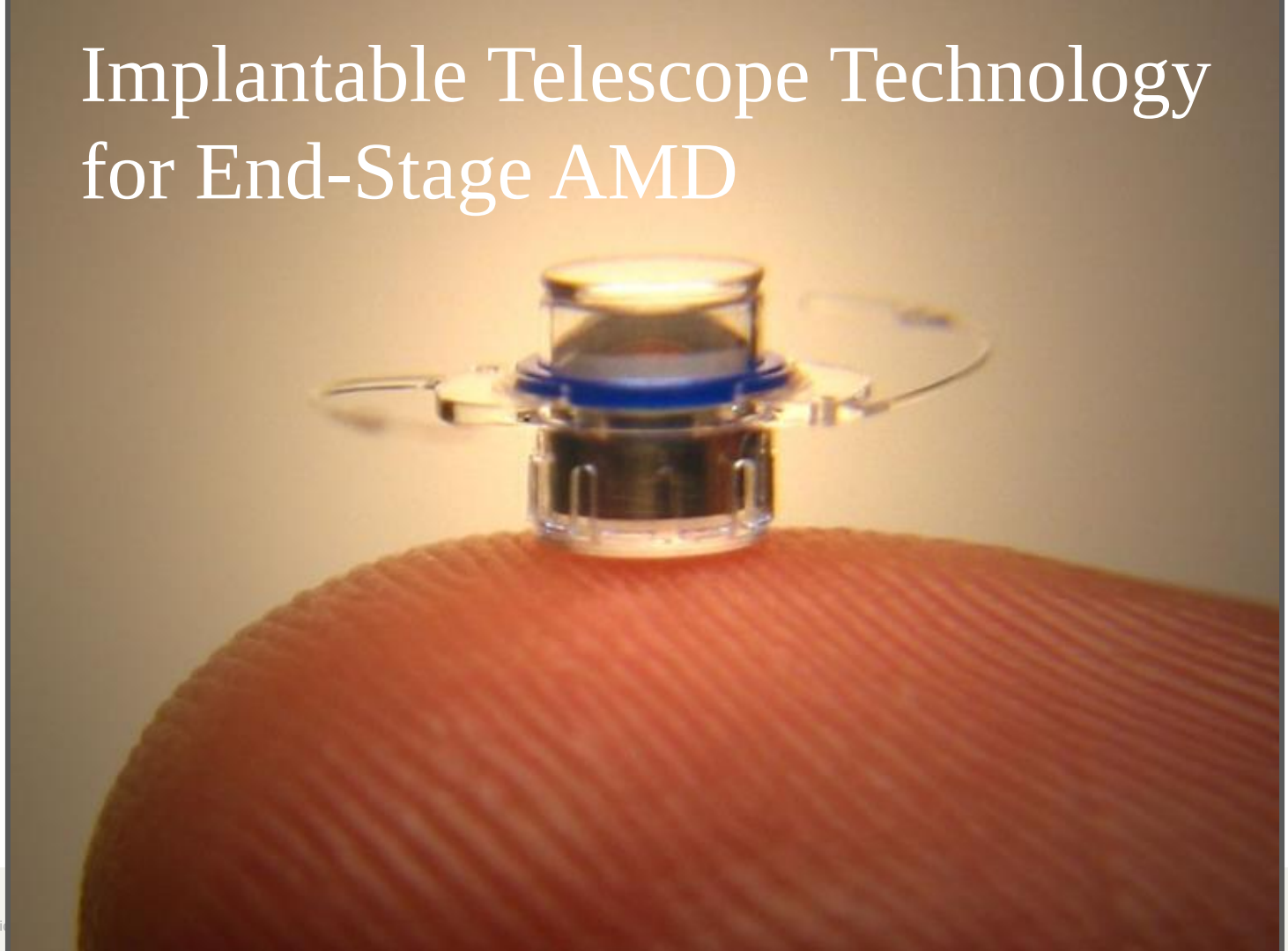


AMD

The Future

- Genetic testing
- Treatment options for dry AMD
- Stem cell therapy
- New medications for wet AMD
- Sustained release devices
- Combination treatment
- Intraocular telescope

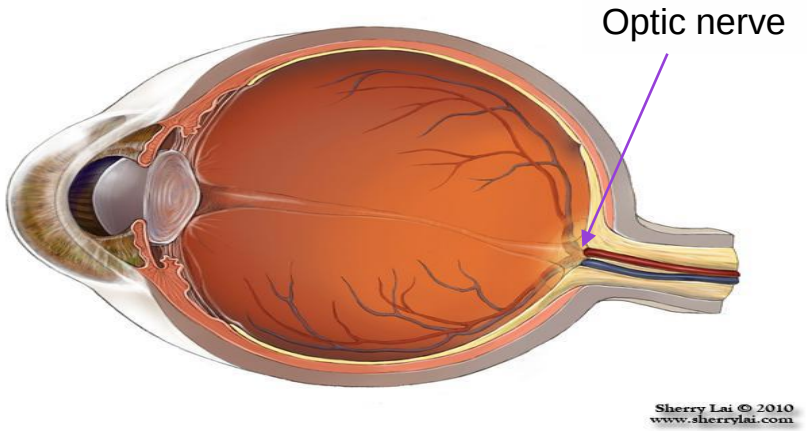
Implantable Telescope Technology for End-Stage AMD

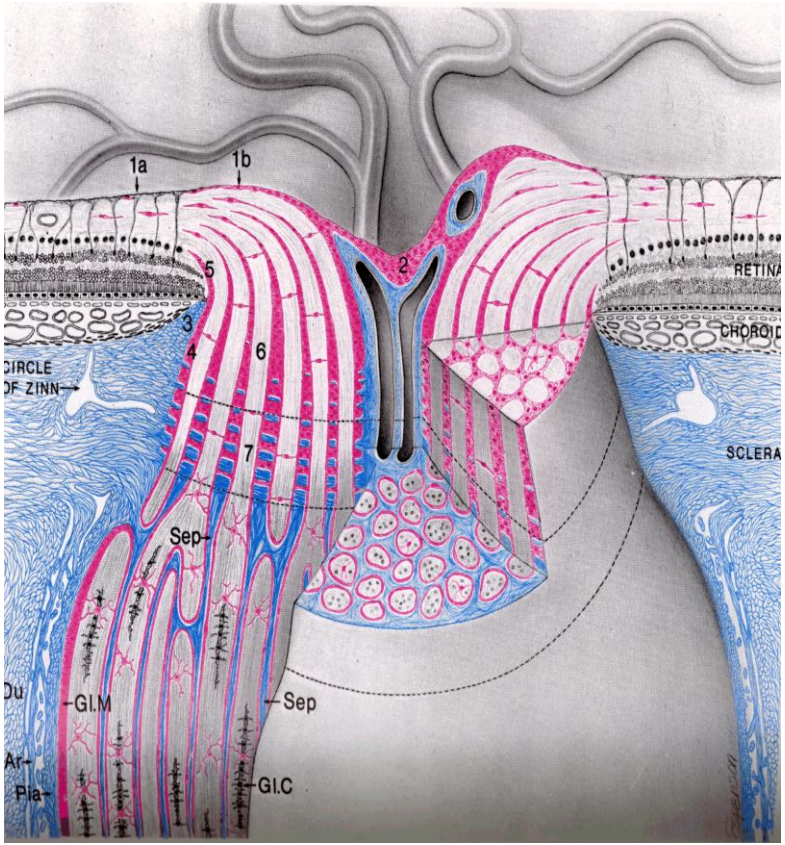


GLAUCOMA

Optic nerve

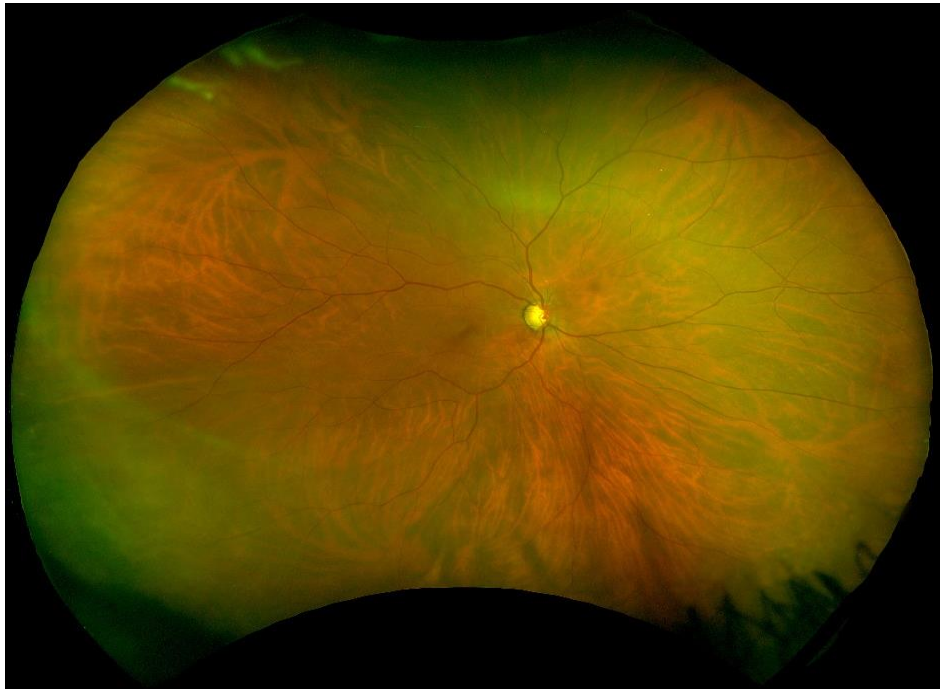
Contains up to 1.7 Million Nerve Fibers

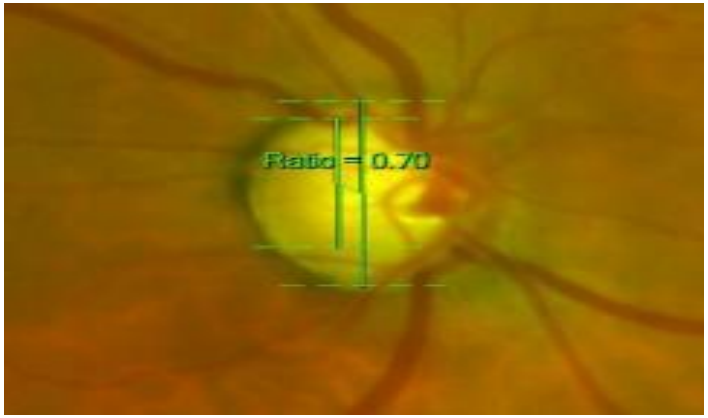


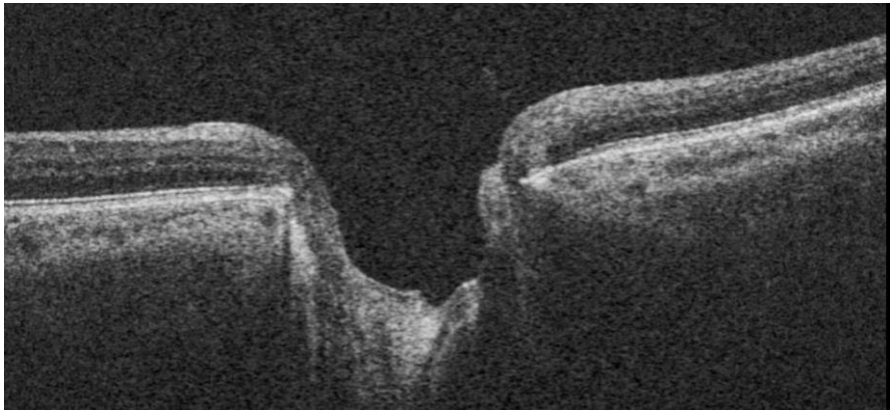


Glaucoma

- Groups of diseases typically associated with high eye pressure
- Defined by damage to the optic nerve
- Loss of peripheral vision

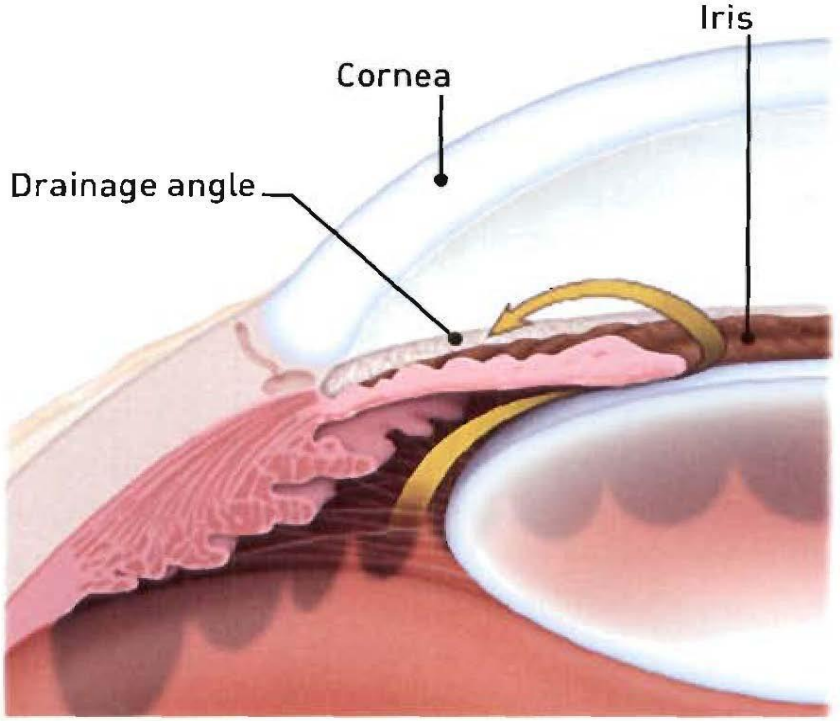






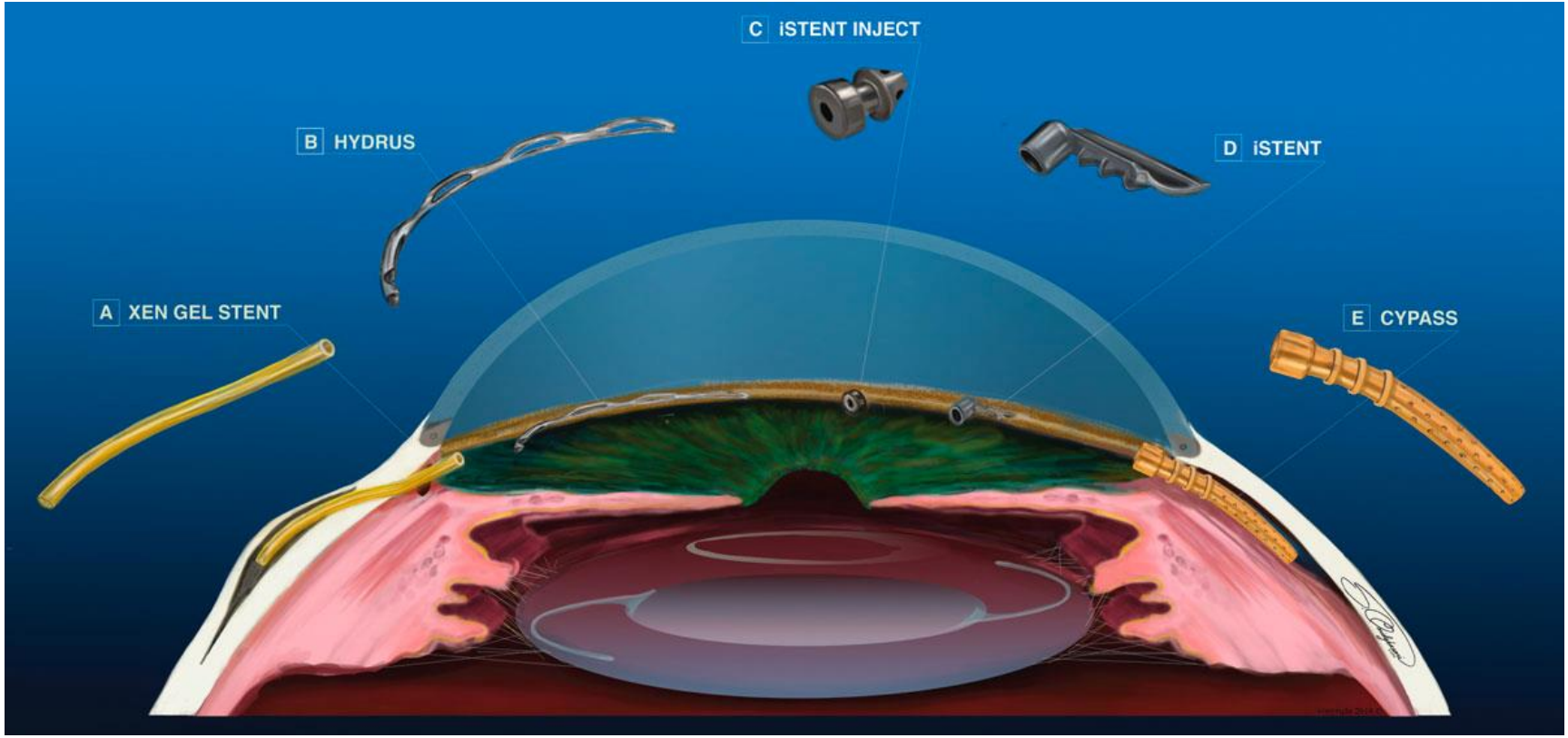
Aqueous Humor

- Secreted by the ciliary body
- Provides nutrients and oxygen to the front of the eye
- Maintains intraocular pressure
- Drains out via the anterior chamber angle
- Balance between production and drainage is key
- Sustained high pressure can damage the retina and optic nerve



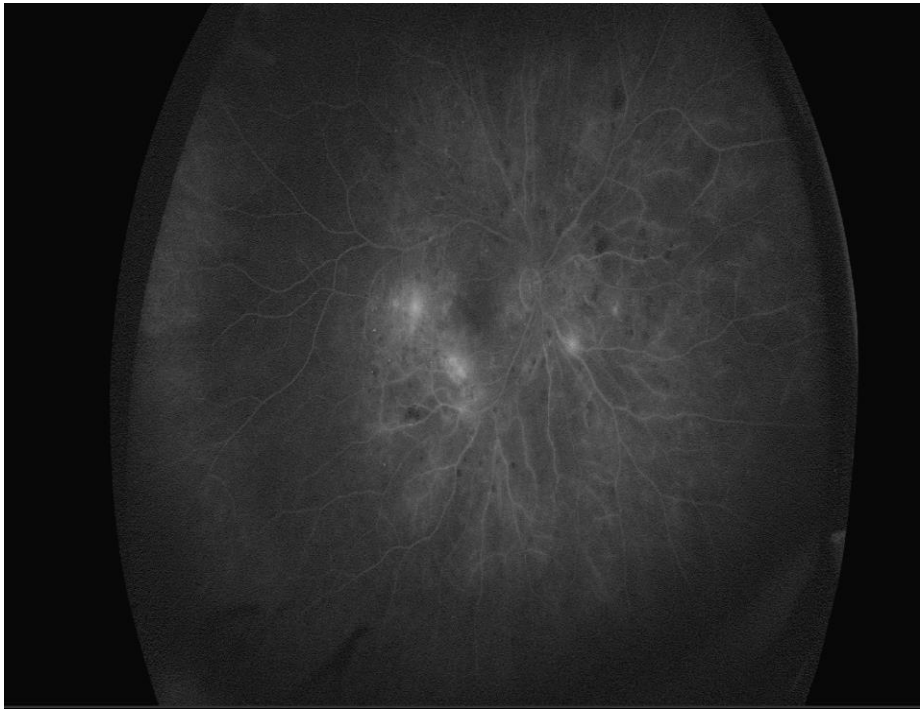
If the drainage angle is blocked, excess fluid cannot flow out of the eye, causing the fluid pressure to increase.

MIGS: Minimally Invasive Glaucoma Surgery



DIABETIC RETINOPATHY

Proliferative Diabetic Retinopathy

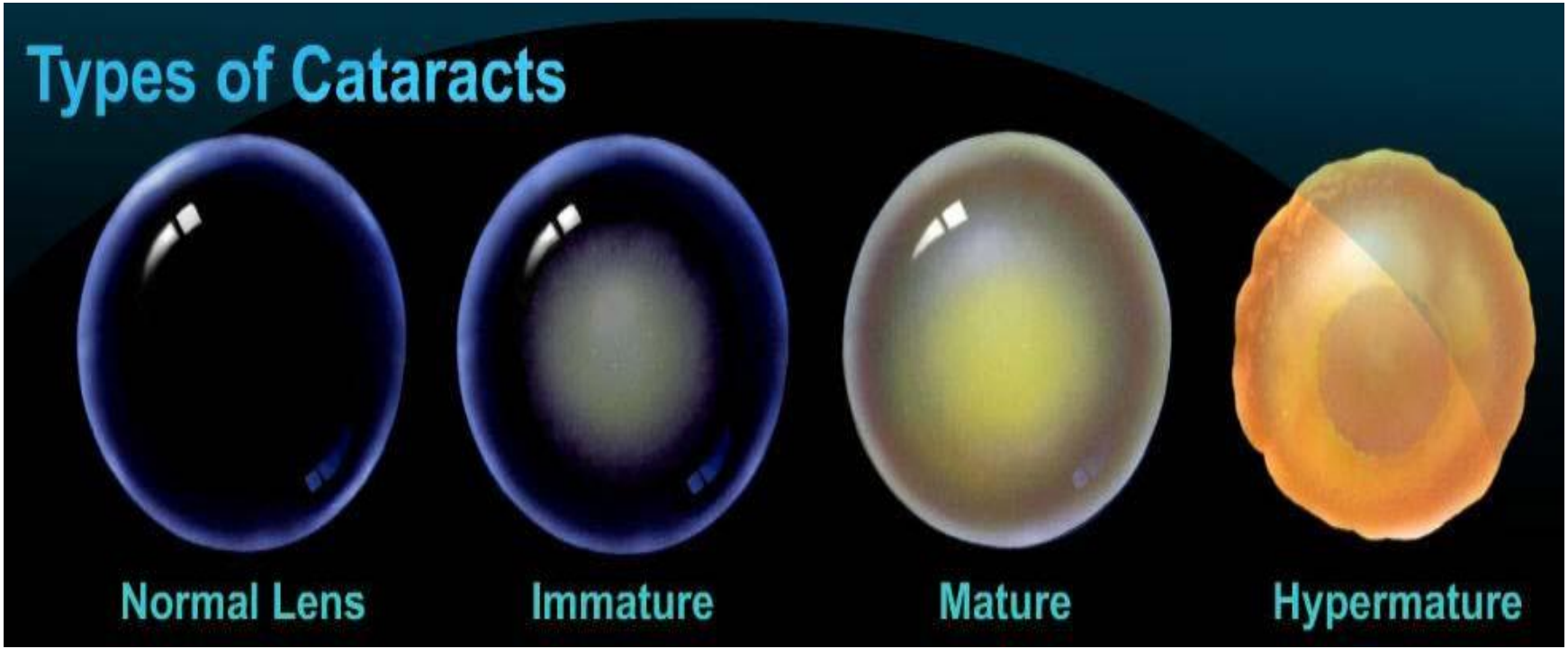


CATARACTS

Cataracts

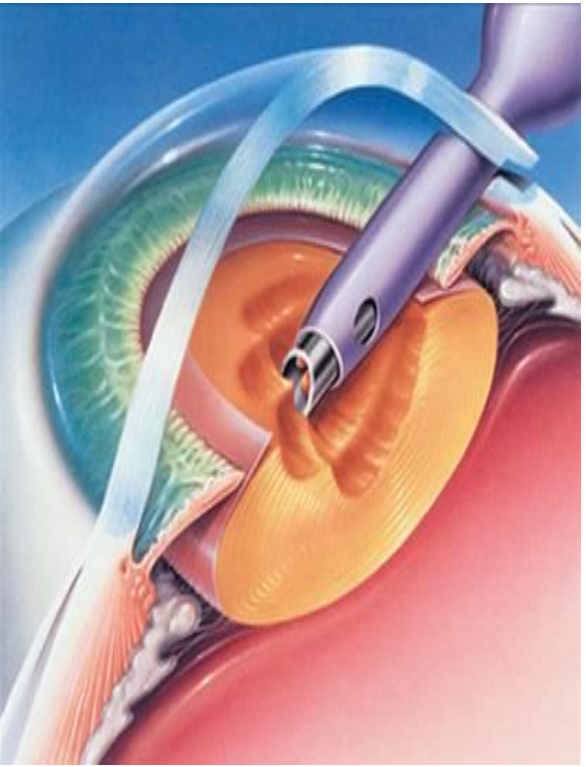
- Over 40% of people over 70 have significant cataracts
- Leading cause of blindness
- Symptoms:
  - Cloudy vision
  - Difficulty at night
  - Glare
  - Fading of color

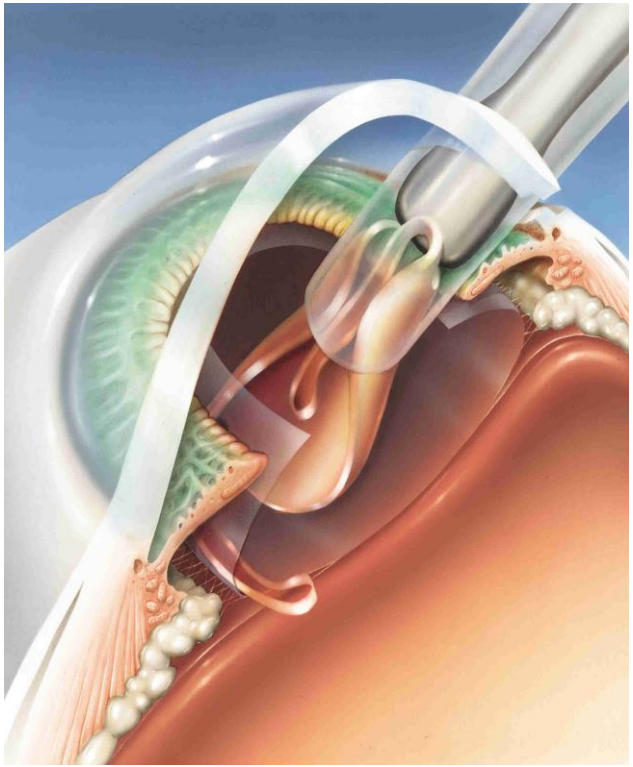
Cataracts

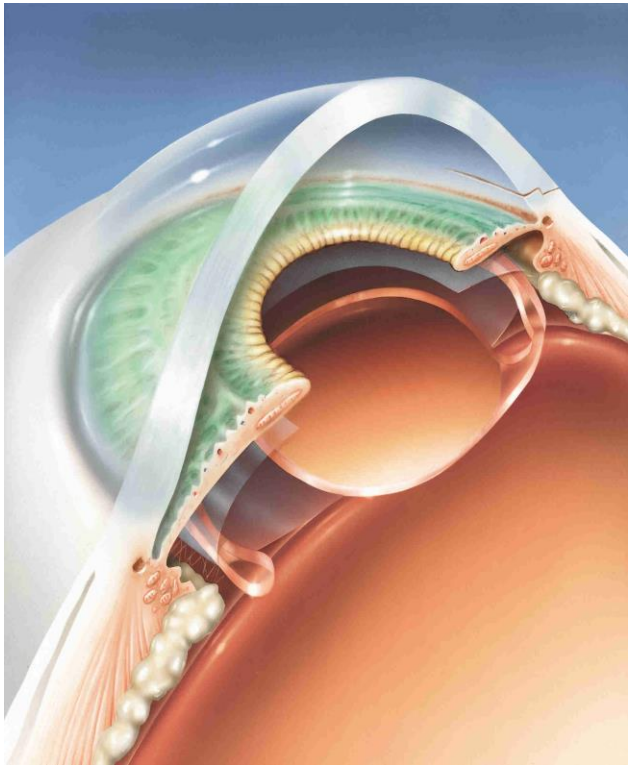


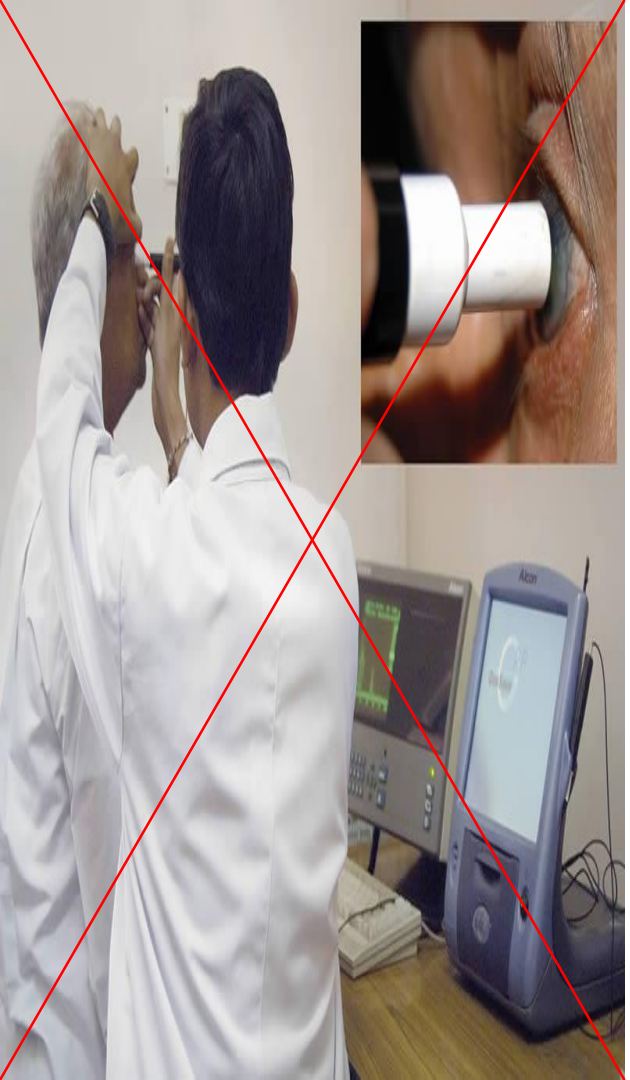
Cataracts

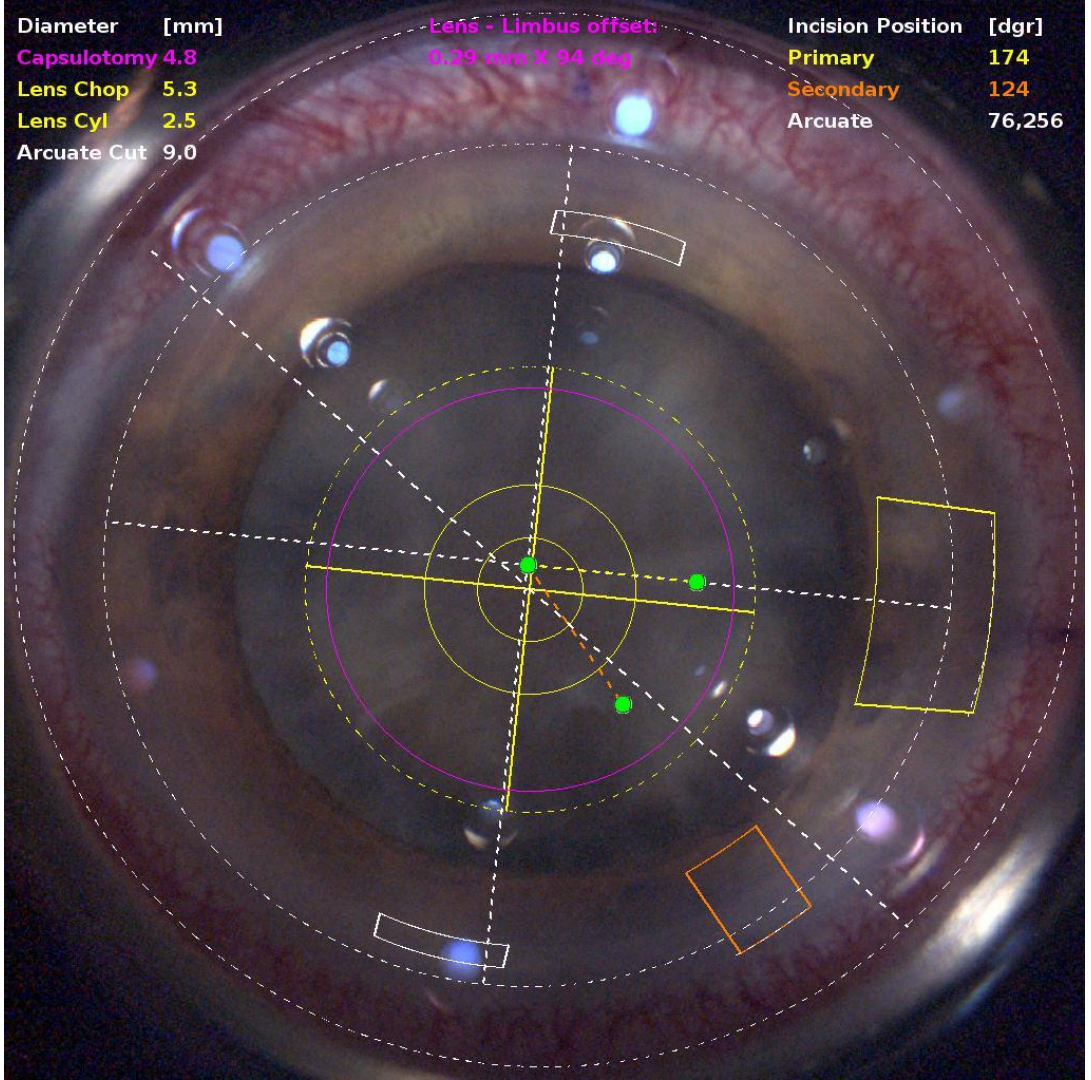
Cataract Surgery

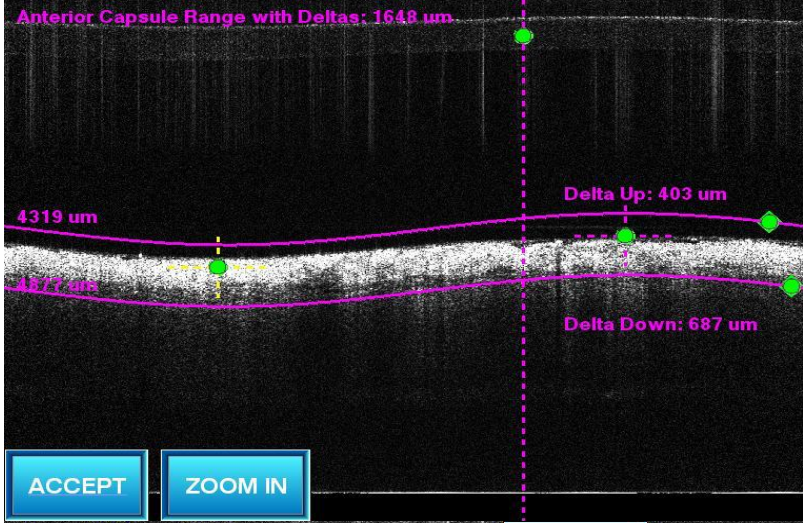


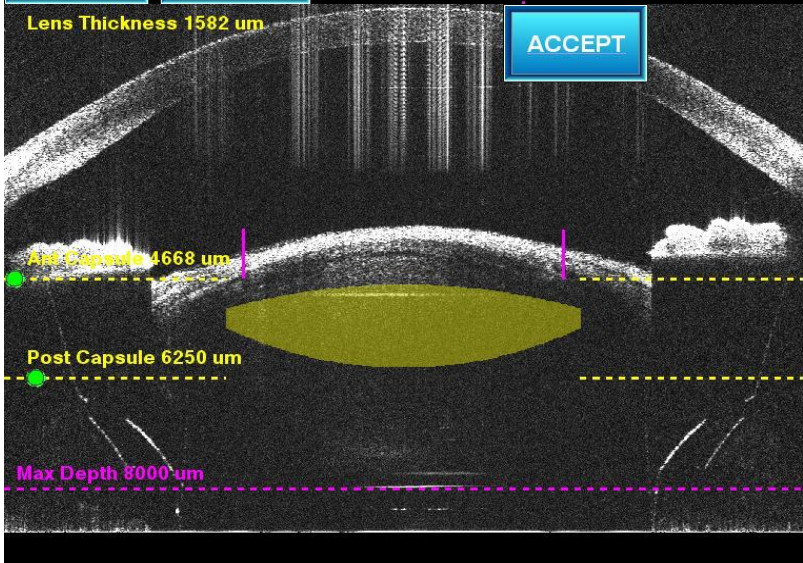




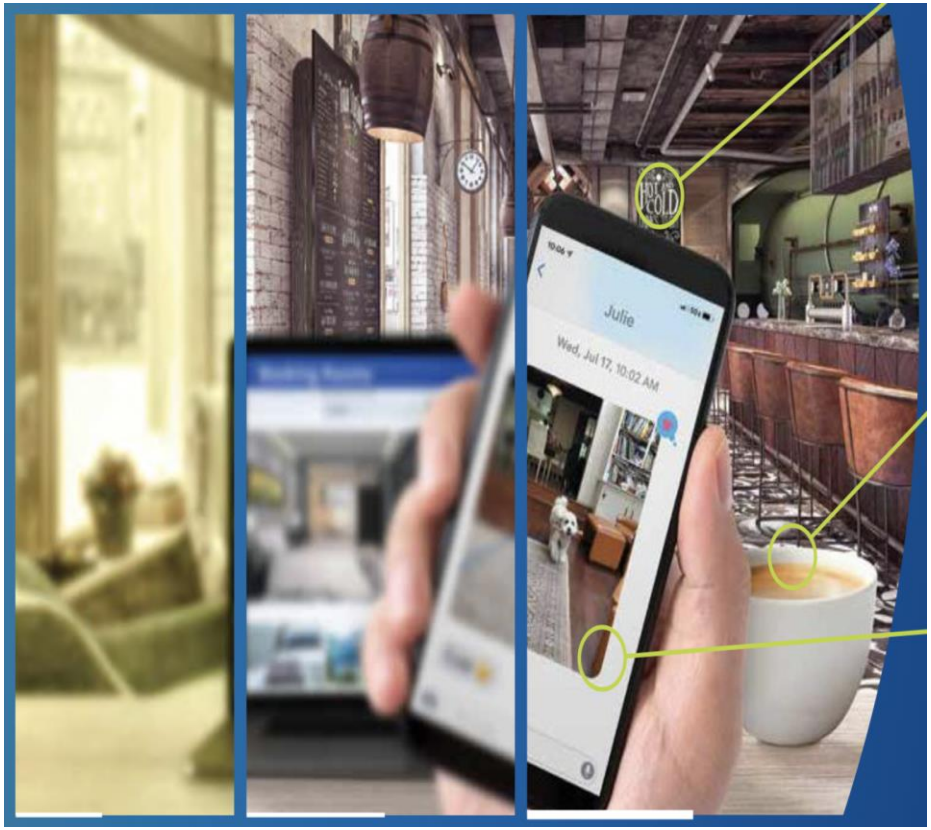



Diameter [mm]
Capsulotomy 4.8
Lens Chop 5.3
Lens Cyl 2.5
Arcuate Cut 9.0
Lens - Limbus offset:
0.29 mm X 94 deg
Incision Position [dgr]
Primary 174
Secondary 124
Arcuate 76,256


Anterior Capsule Range with Deltas: 1648 um
Delta Up: 403 um
4319 um
4877 um
Delta Down: 687 um
ACCEPT
ZOOM IN


Lens Thickness 1582 um
ACCEPT
Ant Capsule 4668 um
Post Capsule 6250 um
Max Depth 8000 um


AMO - ZCT225
No Post-Refractive
Power:16.50
Aphakic
Sphere: -5.71D
Cylinder: 4.75D
Axis: 85°
SE: -3.33D
RR-CW
Pre-OP Data
Select Power
End Surgery
16.50
17.00 -2.13
17.50 -2.45
18.00
1.08 X 111°
1.08 X 103°
Logout
Take Measurement



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Preventing eye problems

- See your family physician regularly
- Visit your ophthalmologist yearly for routine screening
- See an eye doctor immediately for any loss of vision, blurred vision, eye pain, double vision, redness, swelling, or discharge
- Eat well, exercise, and control any other medical problems well

Healthy People 2020 VISION: Healthypeople.gov

V-5 Reduce visual impairment

- **V-5.1** Reduce visual impairment due to uncorrected refractive error
- **V-5.2** Reduce visual impairment due to diabetic retinopathy Revised
- **V-5.3** Reduce visual impairment due to glaucoma Revised
- **V-5.4** Reduce visual impairment due to cataract Revised
- **V-5.5** Reduce visual impairment due to age-related macular degeneration (AMD) Revised

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Have you seen your ophthalmologist recently??

Thank you,
Mihir Parikh MD
DrParikh@max.vision

Speaker

S. Bobby Mukkamala, MD

Board-certified otolaryngologist—head and neck surgeon

Elected to the American Medical Association Board of Trustees in June 2017

Hearing Loss in the Senior Population

aka…

"Pardon me?”

Discussion today will include:

Reviewing types of hearing loss, evaluation of hearing loss, treatment options and other related issues.

Hearing loss in the Elderly - Why are we talking about it?

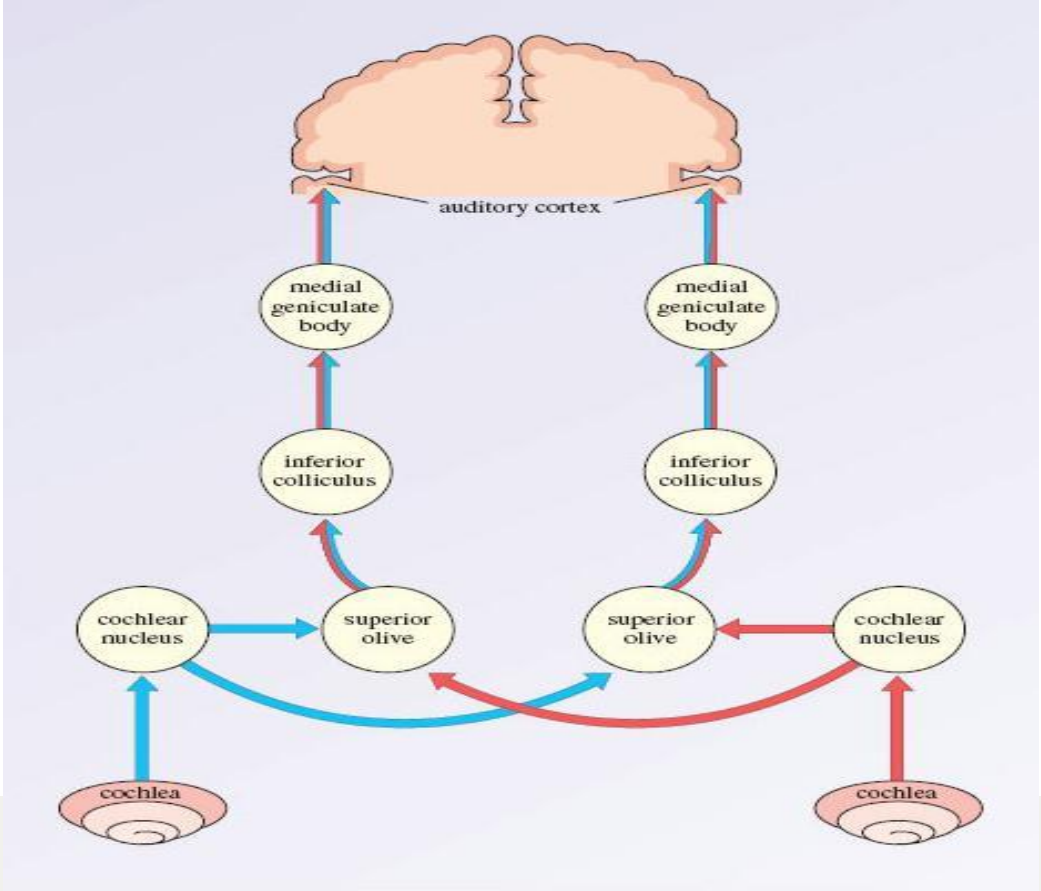
Prevalence:

- Adults 70 years of age and older have a 65% incidence of significant hearing loss

Consequences:

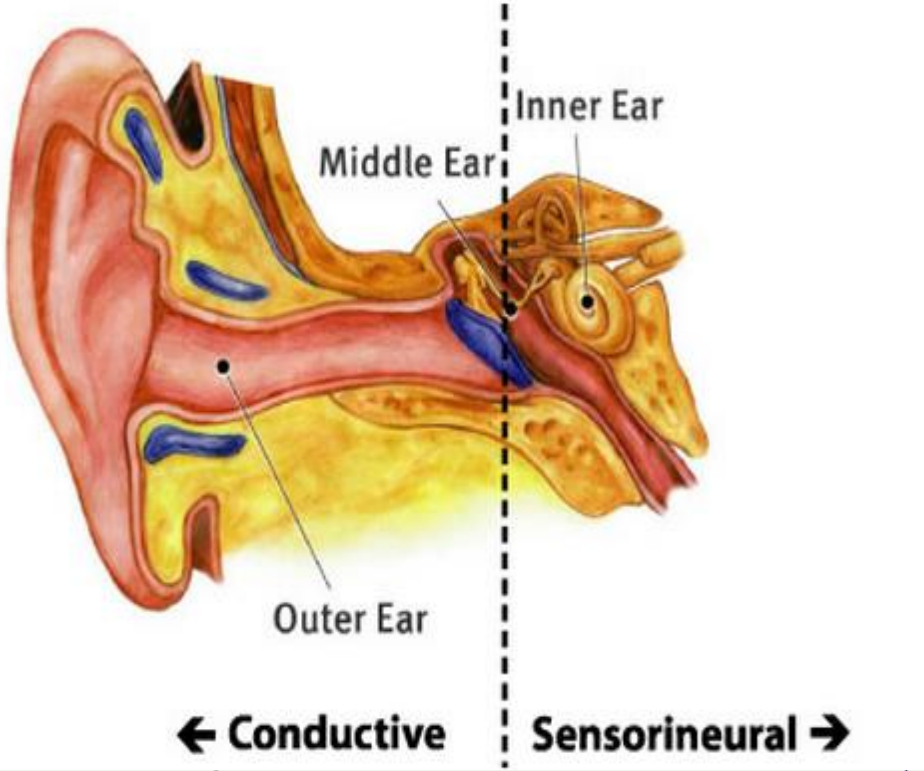
- Hearing loss has significant association with chronic conditions: Dementia, Falls

Ear - Brain Connection



Types of Hearing Loss

- Conductive
- Sensorineural
- Central



Evaluation of Hearing Loss

History

- Acute or Chronic
- Unilateral or Bilateral
- Noise Exposure

Family History

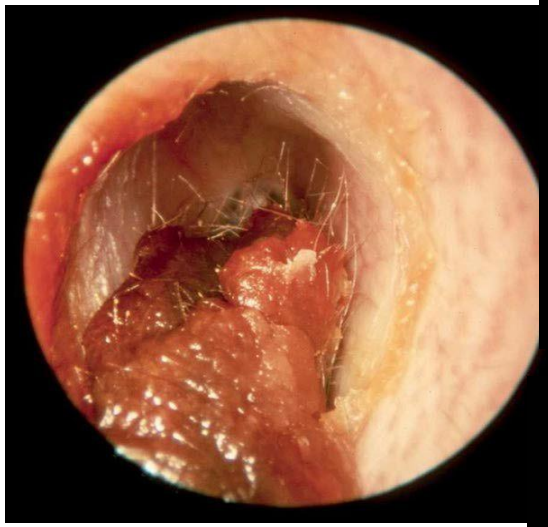
- Bothering the patient or those around them (severity)
- Other symptoms: Drainage, Pain

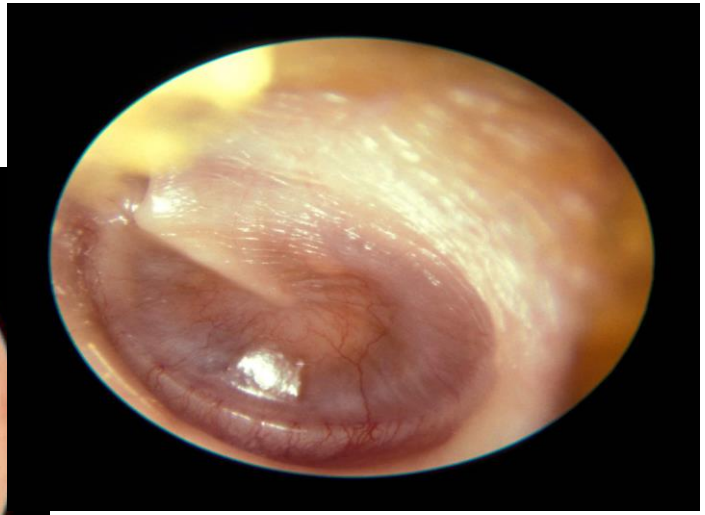
Evaluation of Hearing Loss

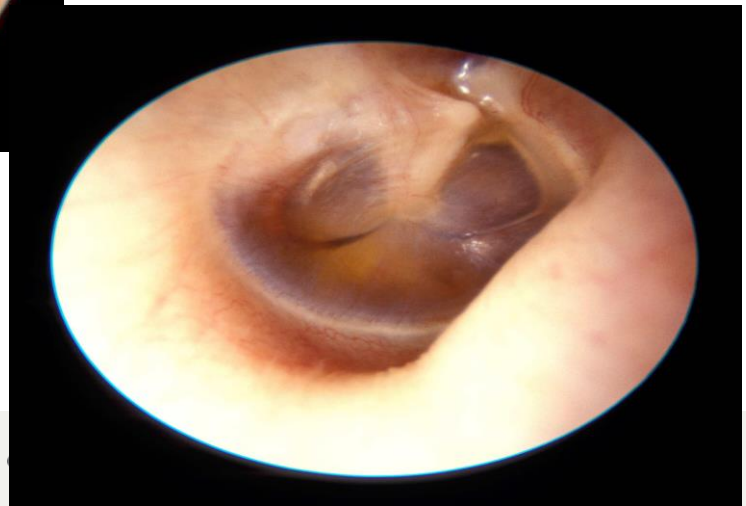
Exam:

External Ear Findings

- Cerumen
- Fluid

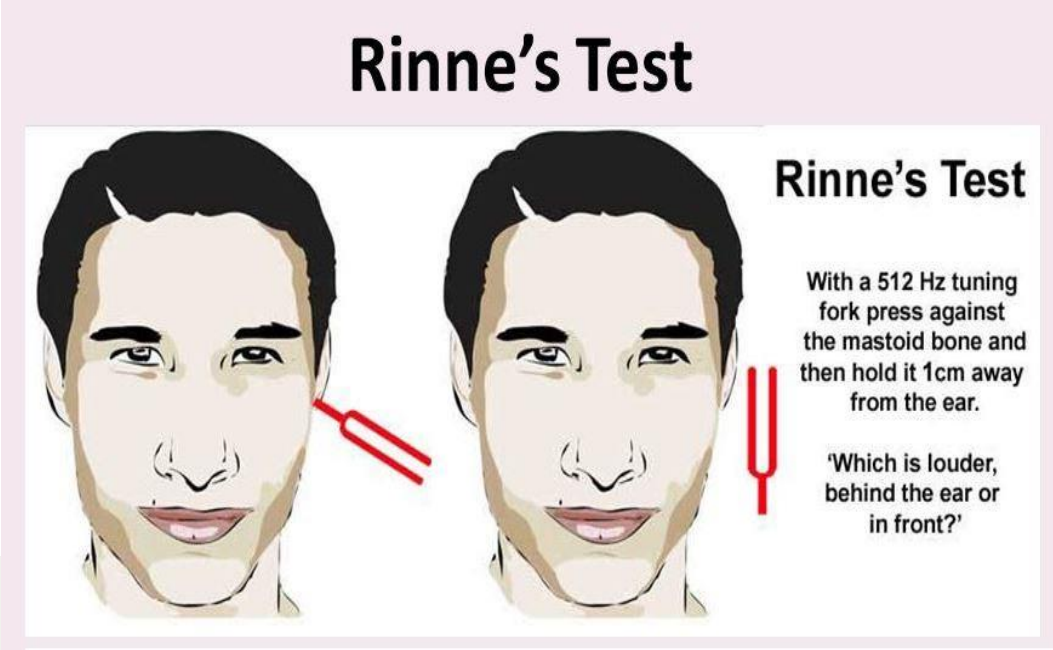






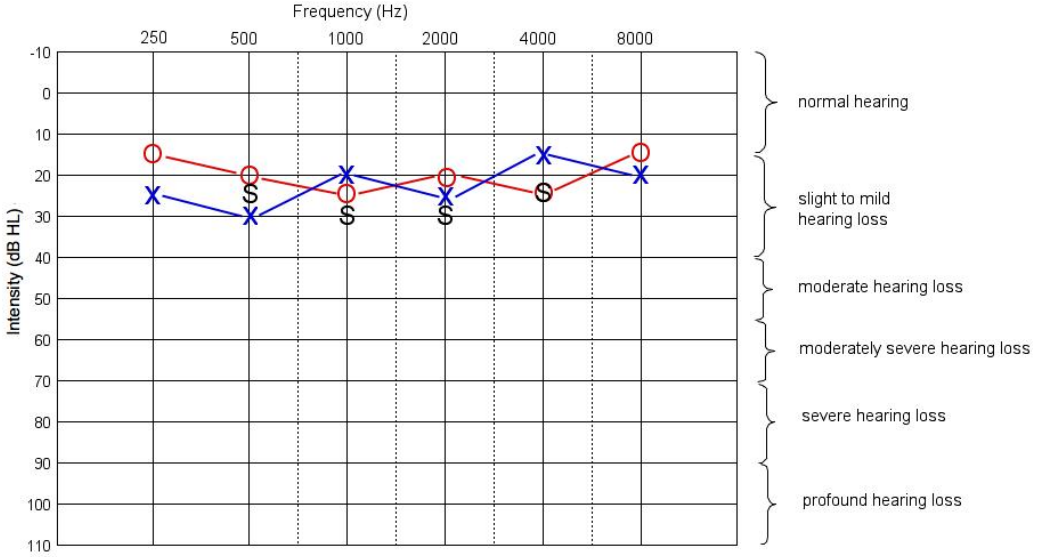
Evaluation of Hearing Loss

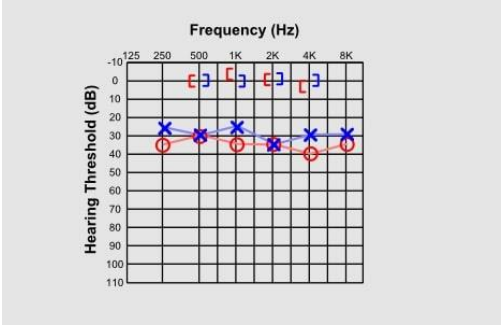
- Tuning Forks
- 512Hz
- Rinne
- Louder in back = Conductive Loss

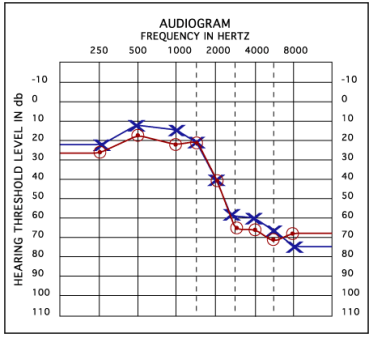


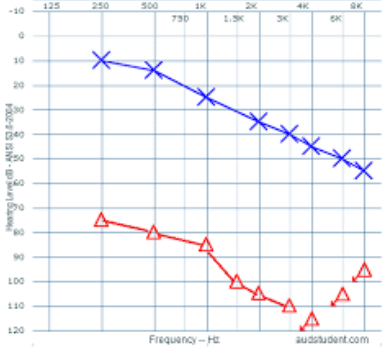
Audiogram

- Frequencies
- Severity
- Type (Conductive vs Sensorineu
- Asymmetry









Most Common Scenario in Seniors

- Chronic
- Gradual Onset
- Bilateral
- Progressive
- Trouble in Social Settings more than one-on-one
- Possible Hx of Noise Exposure
- Possible Family Hx
- Family / Spouse more bothered than patient

Options

- Turn up Television
- Assisted Listening Telephon
- Hearing Aids
- Surgery

Hearing Aids

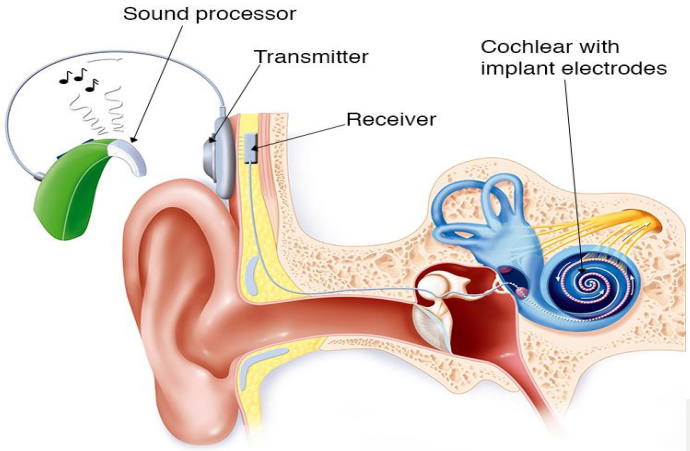
Satisfaction varies

Issues to consider:

- Vision
- Dexterity
- Cerumen
- Features

Cochlear Implantation

- Surgical procedure that taps directly into the auditory nerve and bypasses the hair cells within the cochlea (which aren't working)
- Indications have evolved
- Severe to profound hearing loss in both ears (now cleared for single sided deafness)



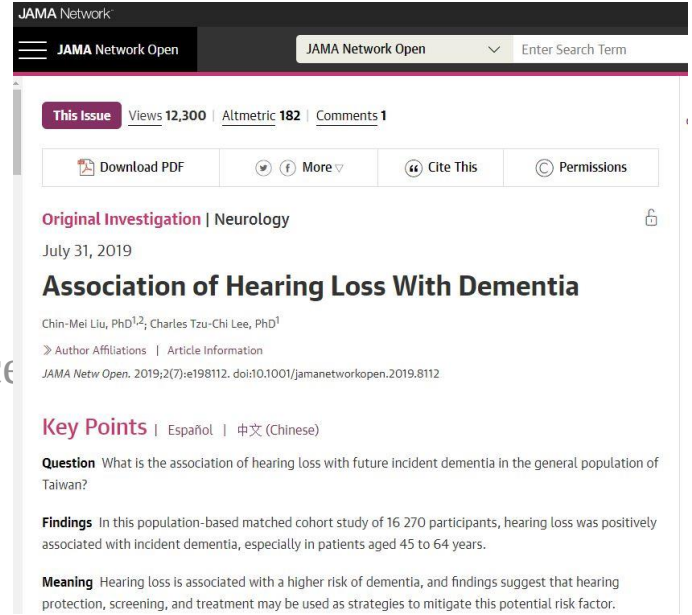
Recent Data on “Collateral Damage”

Dementia

Alzheimer's

Theories:

- Both HL and Dementia caused by a common proce
- HL may cause Dementia (cognitive exhaustion)



Recent Data on “Collateral Damage”

If indeed there is a causal relationship…

(if you don’t use it …you lose it theory)...

then it makes sense to amplify early to keep that part of the brain working

Tinnitus

- The perception of noise in the ears
    - Ringing, Buzzing, Humming, Electronic Hum, Crickets / Cicadas
- Most often due to Sensorineural Hearing Loss
- Can be due to Conductive Hearing Loss (the lucky ones)
- Can be Non-Ear Related
    - Central
    - Salt, Caffeine, Nicotine, Aspirin
- Options include masking devices, nutritional supplements (nothing great out there)

Vertigo

- Sensation of movement
- Central or Peripheral (Ear) Related
- Senior Population has many reasons to have it
    - Ear causes (infection, BPPV)
    - Non ear causes (cerebrovascular, tumor, migraine)
- Treatment
    - Supportive
    - Physical Therapy

Facilitator

Louis Weinstein, MD

Chair, AMA-SPS Governing Council

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Questions from Audience Members

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bit.ly/amainterimsurvey

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