NORTHEAST
BUSINESS GROUP ON HEALTH

MONDAYS WITH DR MARK & DR MICHAEL

Monday, March 24, 2025 | 1:00 – 2:00PM

TOPIC #41
Focus on Eye Health

HP2030 HEALTHY PEOPLE 2030 CHAMPION

Guest speaker:

Brenton Finklea, MD

Cornea Attending Surgeon and Director

Wills Eye Center for Academic Global Ophthalmology

MONDAYS WITH DR MARK & DR MICHAEL

NORTHEAST BUSINESS GROUP ON HEALTH

EYE HEALTH
in the
Working Age Population

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Cornea Service

OPHTHALMIC PARTNERS
VISION•VISIONARY
WILLS EYE SURGEONS

DISCLOSURES

I consult for Alcon Surgical, an ophthalmic device and intraocular lens company.

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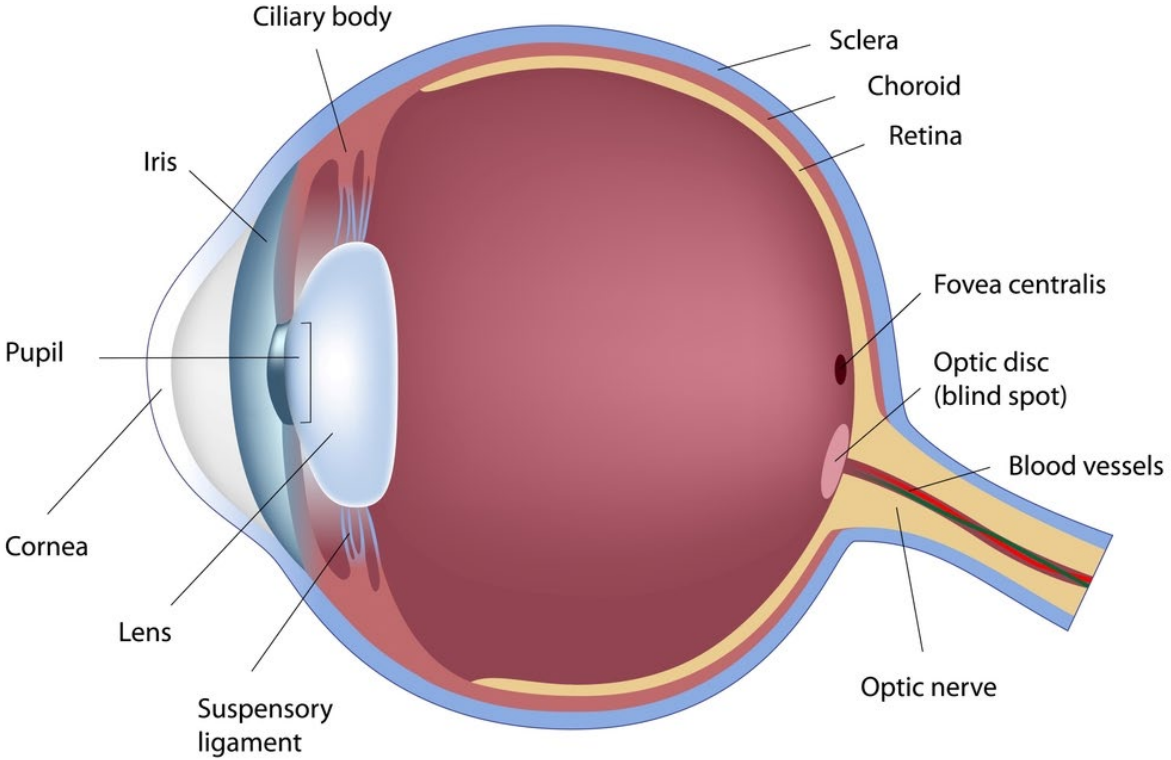
Wills Eye Hospital

Review of Ocular Anatomv



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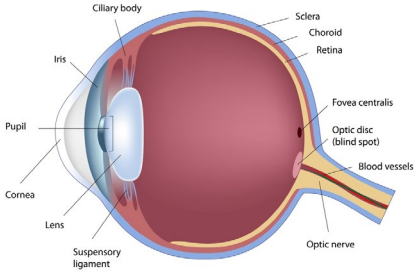
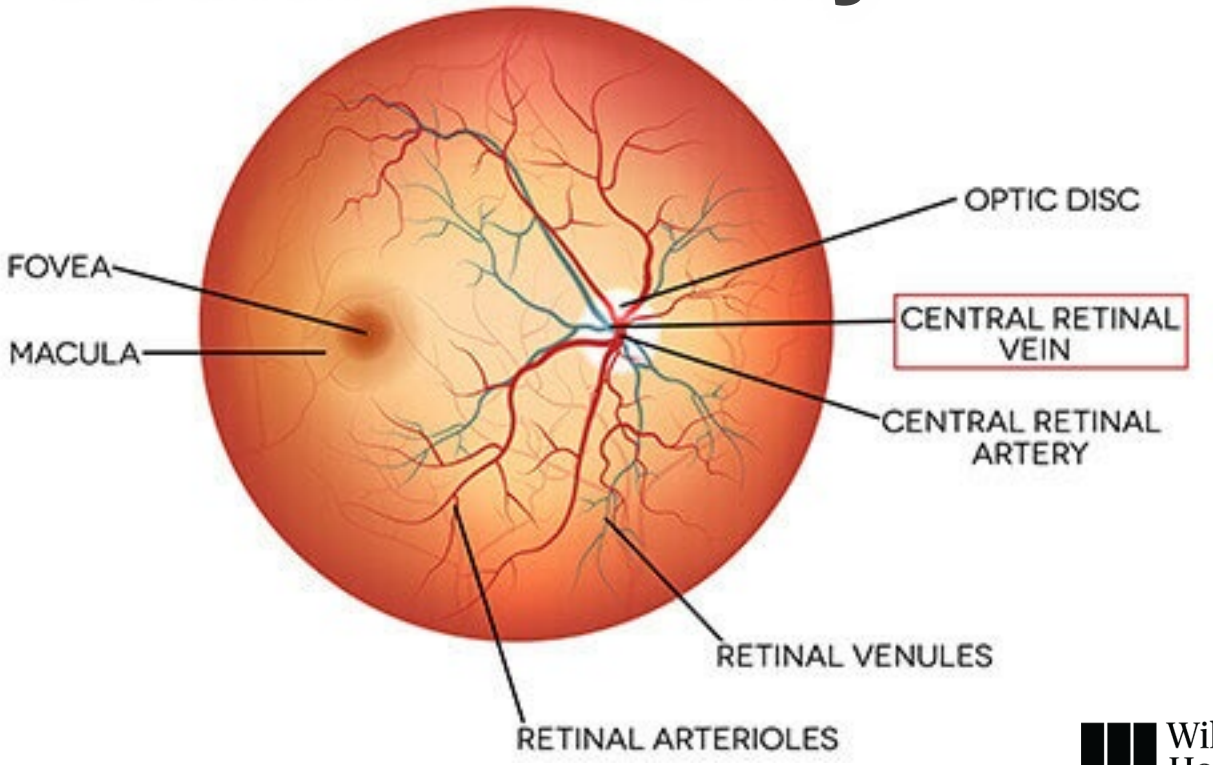
Review of Ocular Anatomy





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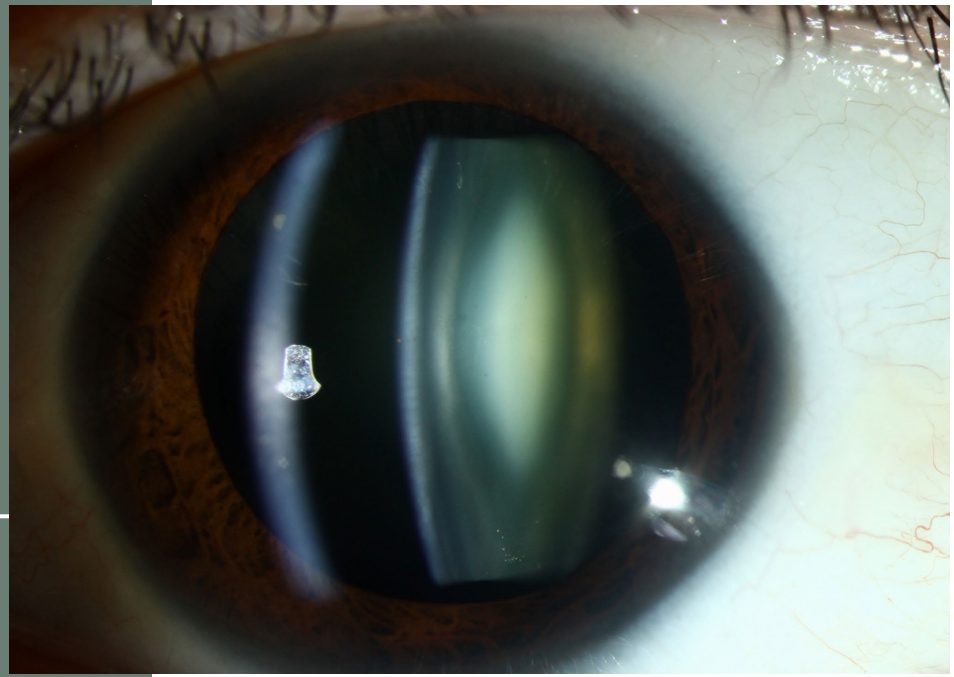
Common Conditions



Refractive Error

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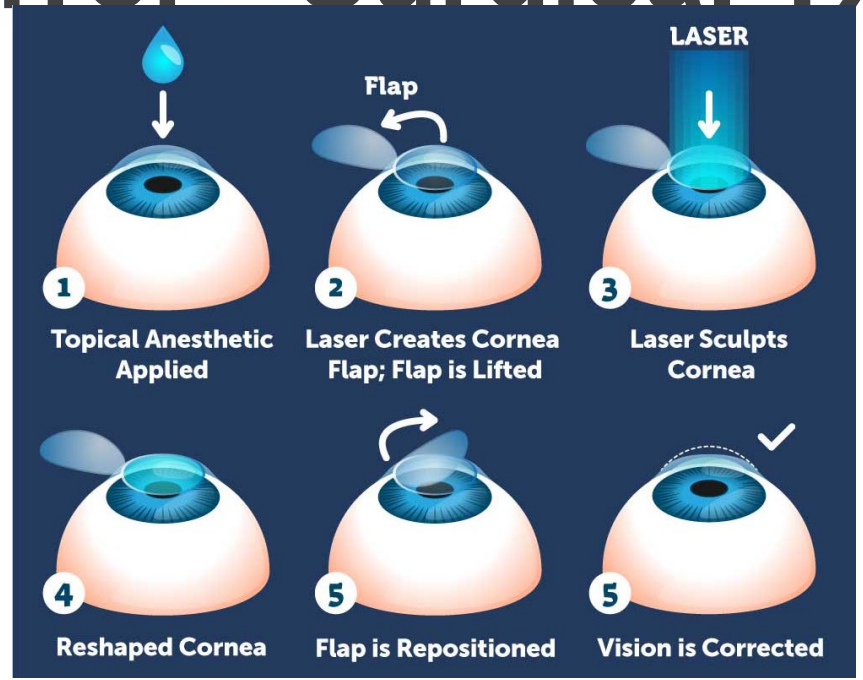
Refractive Error - Surgical Tx

- LASIK
- PRK
- SMILE
- ICL
- RLE



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Cataracts

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Warning: Surgical Video

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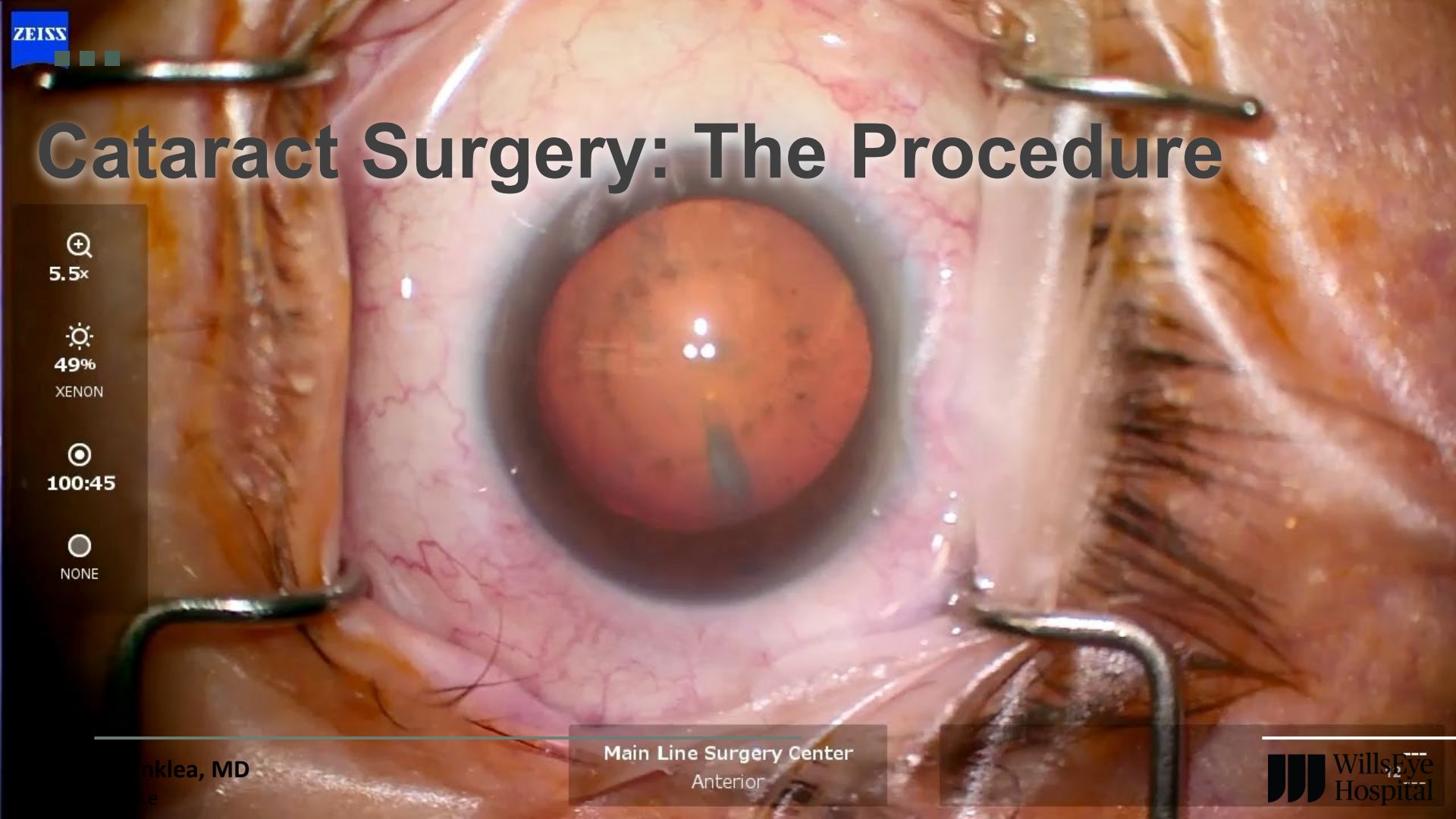
Cataract Surgery: The Procedure



Cataract Surgery: IOLs

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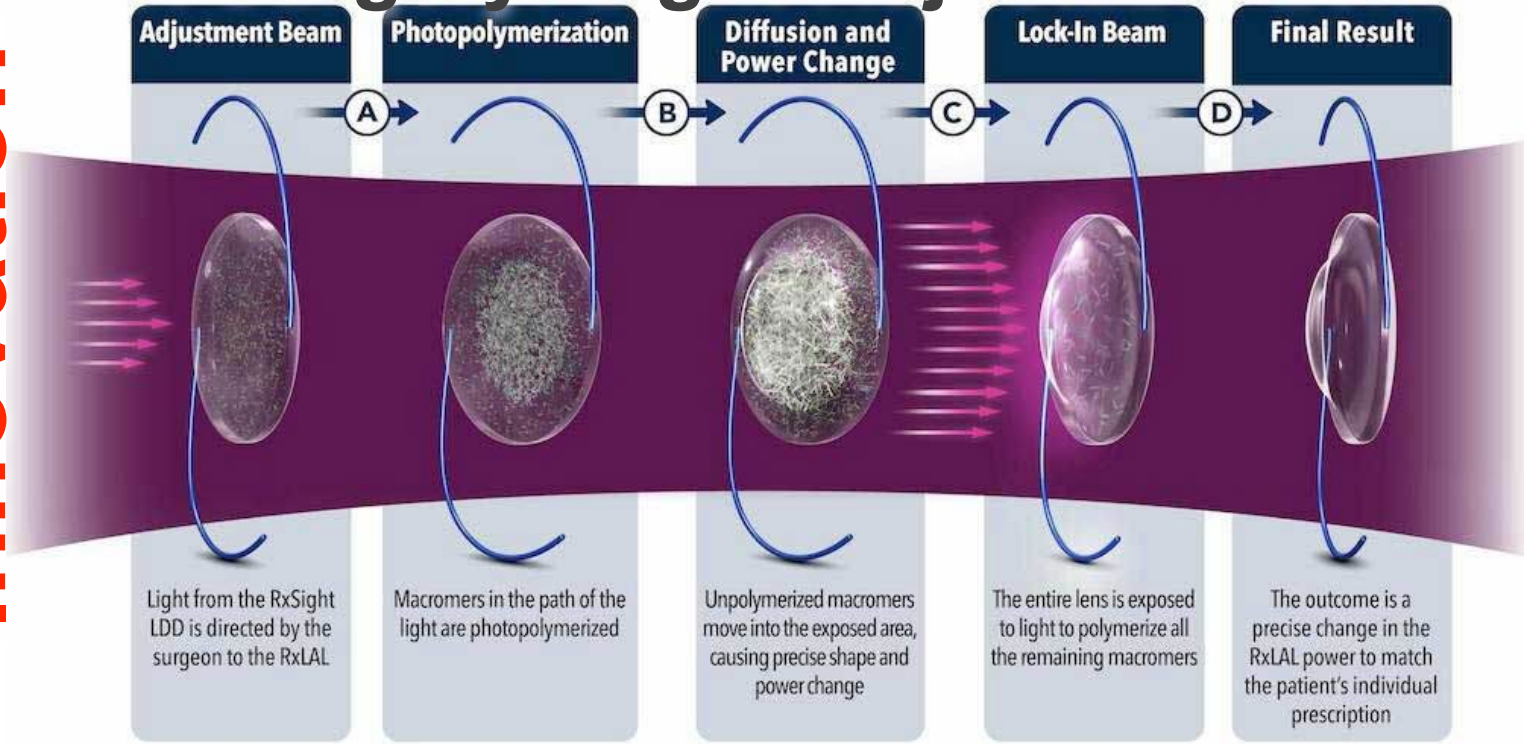
Cataract Surgery: Light-Adjustable Lenses

Innovation



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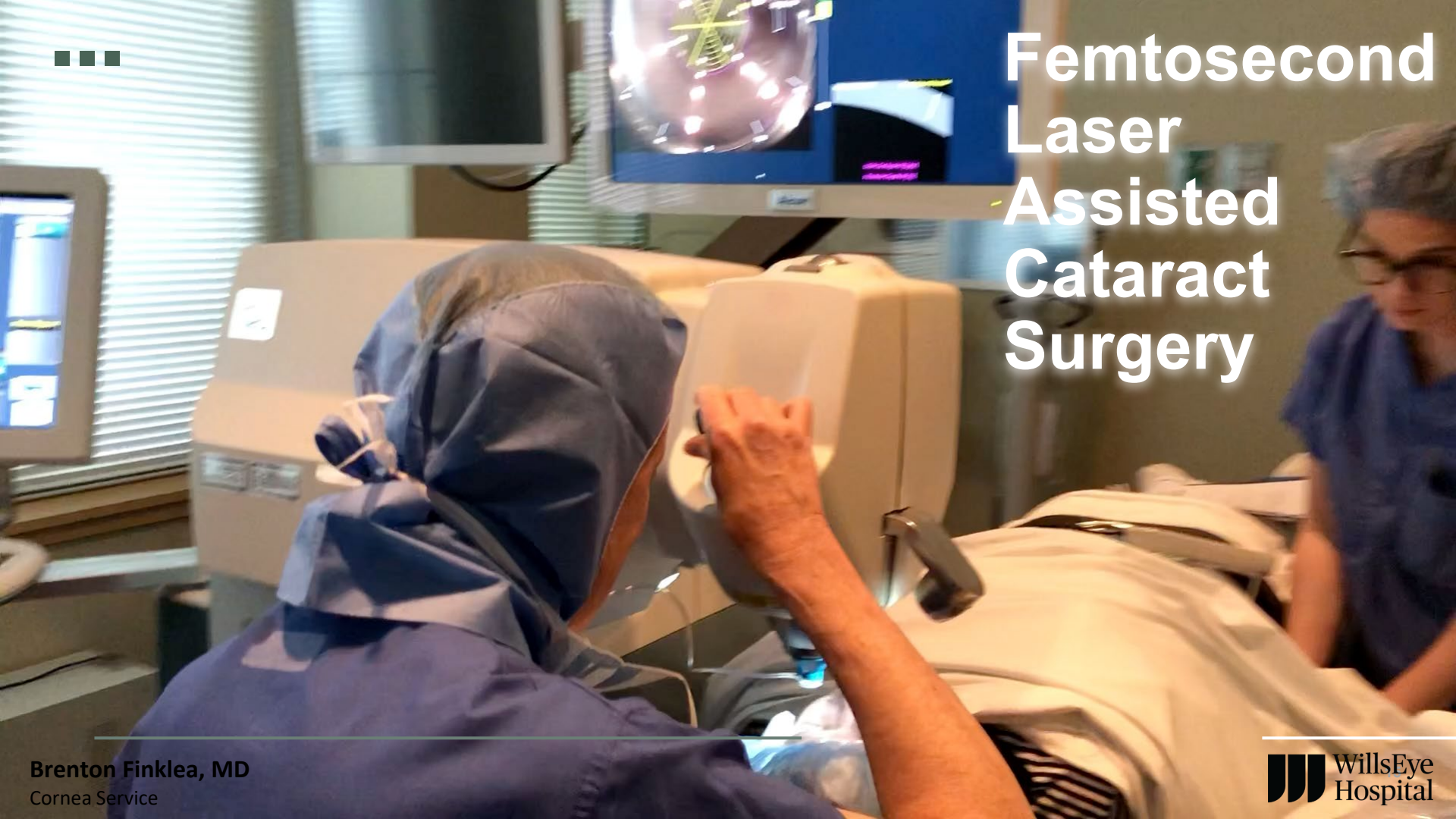

Femtosecond Laser Assisted Cataract Surgery

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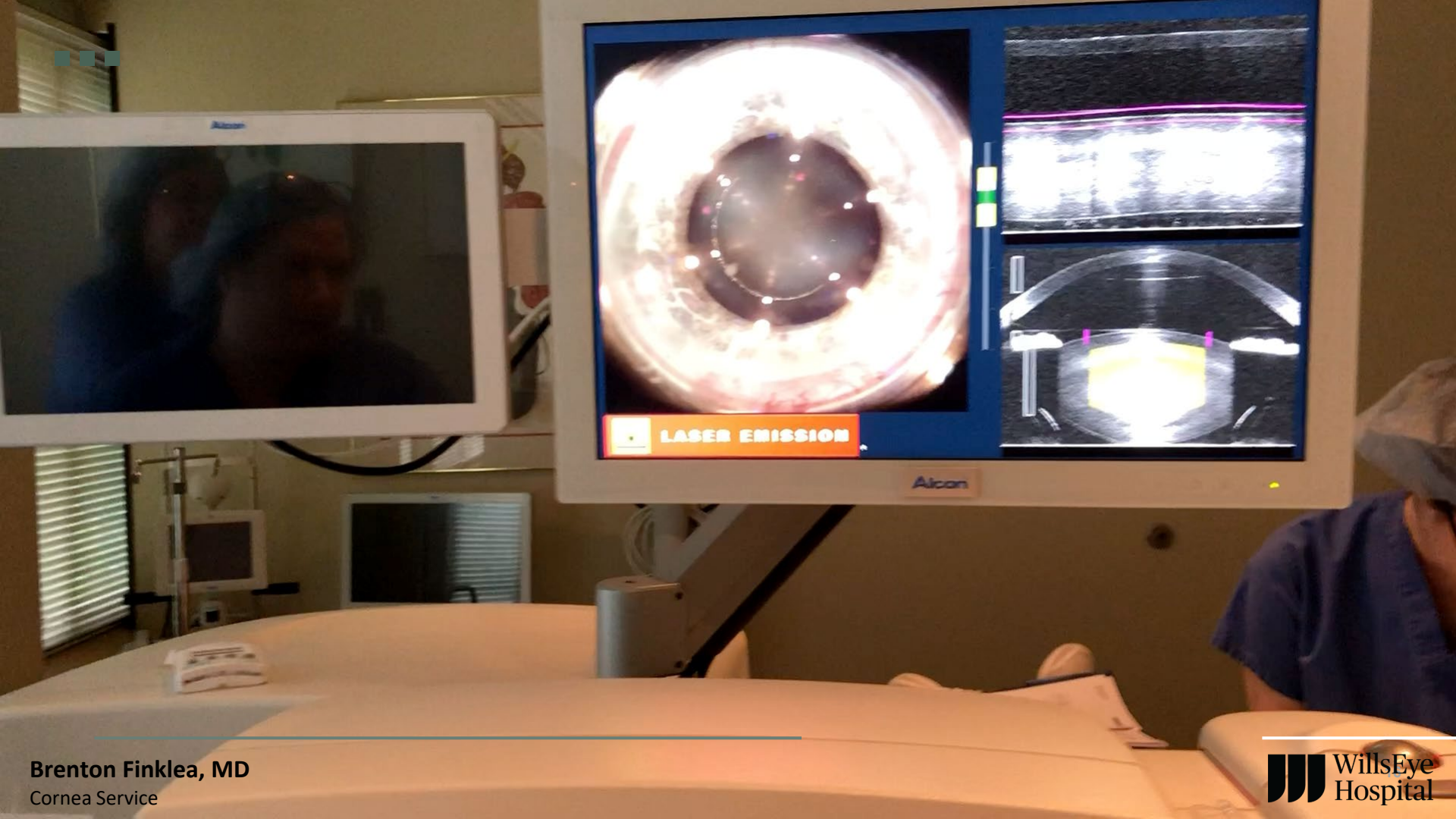

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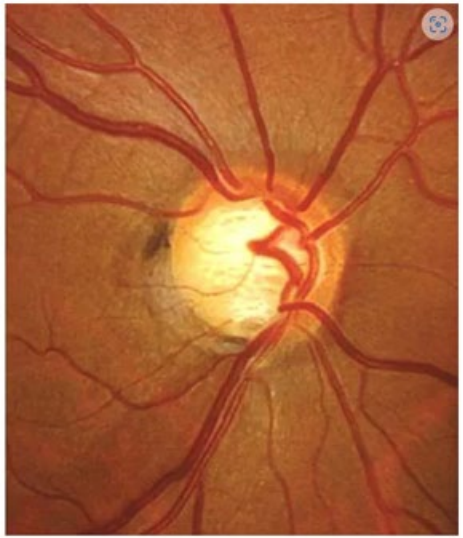
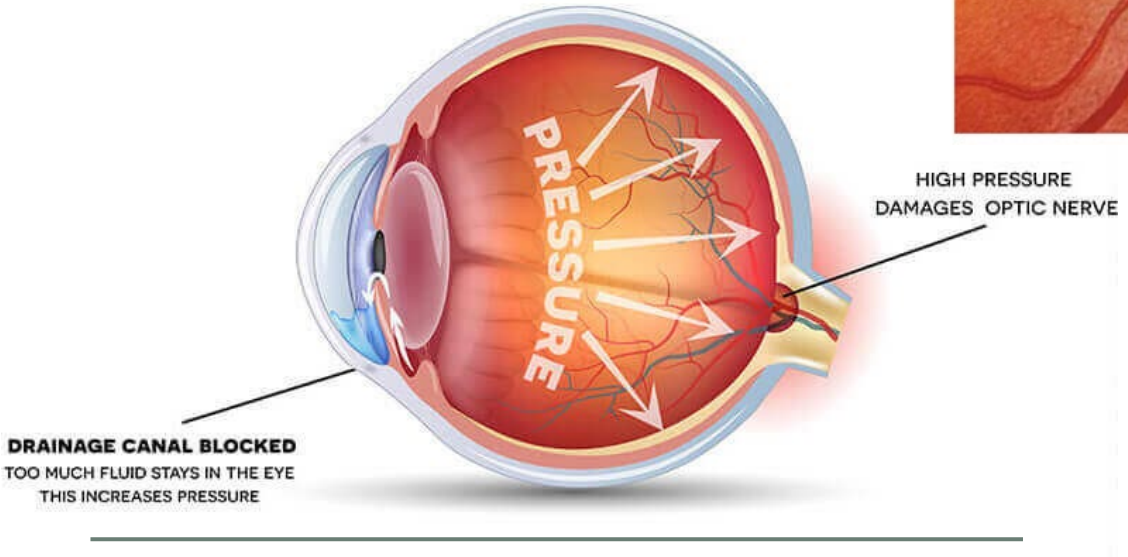
Glaucoma





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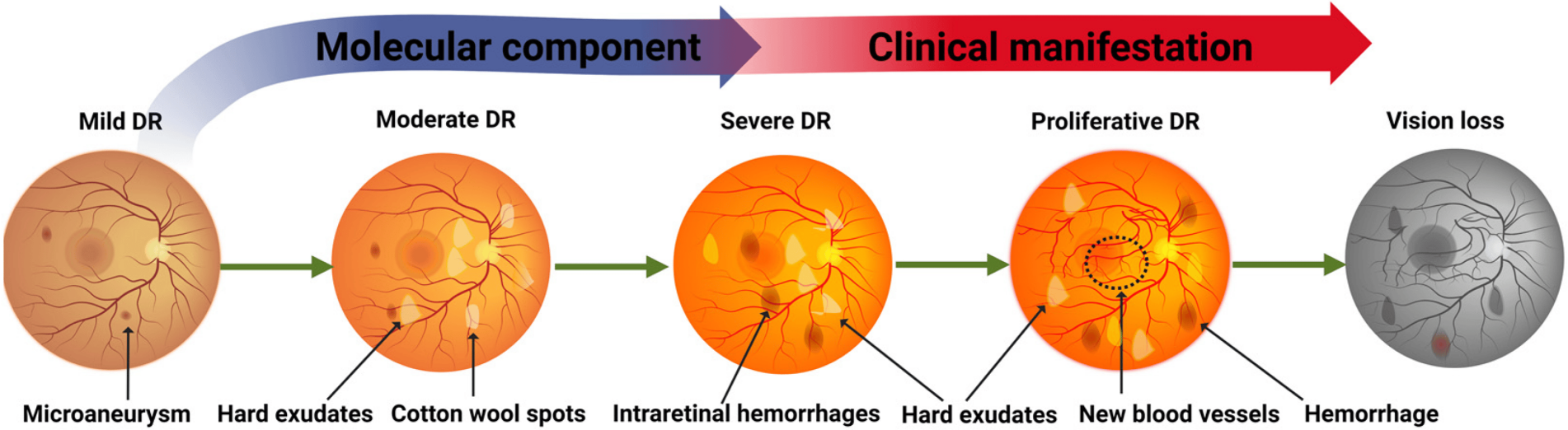
Diabetic Retinopathy



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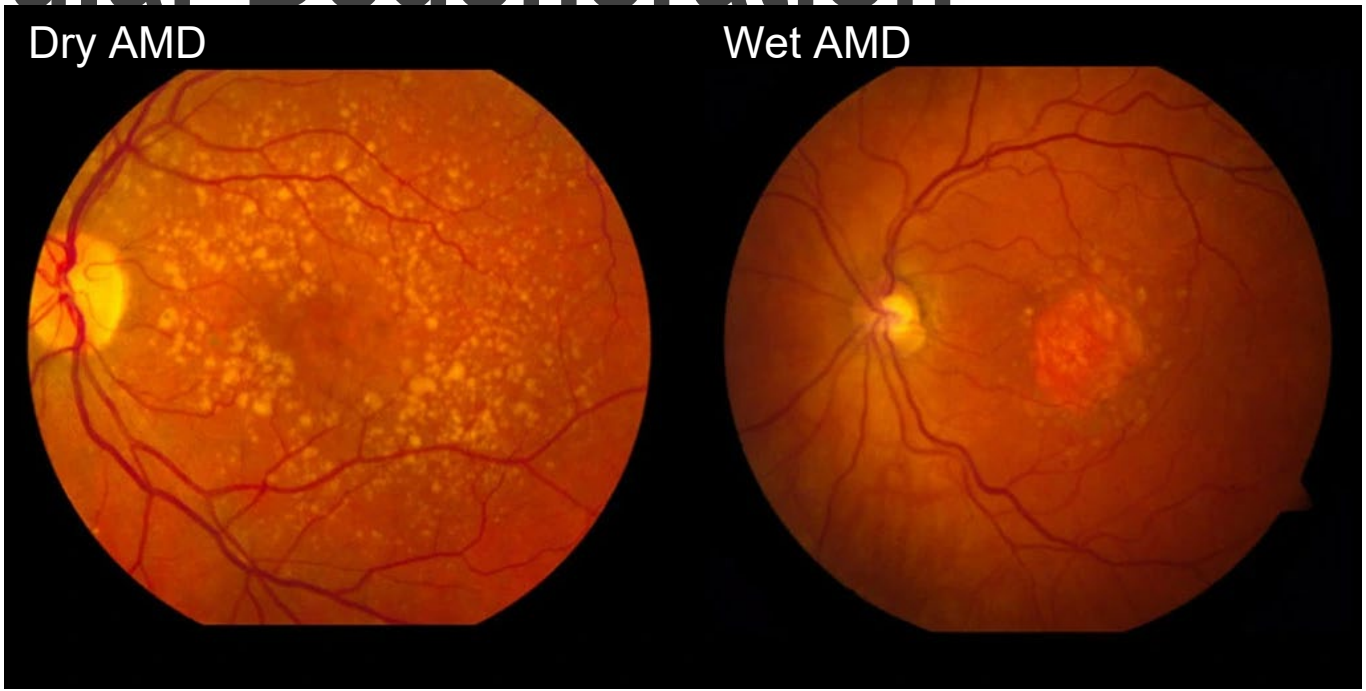
Macular Degeneration



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Macular Degeneration

Anti-VEGF Injections

Vascular
Endothelial-Derived
Growth
Factor

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Macular Degeneration

Medication	Dosage	Maximum Approved Interval	Mechanism of Action
Pegaptanib*	0.3 mg/ 90mcl	Q6weeks	Pegylated aptamer that binds to VEGF165
Bevacizumab**	1.25 mg /0.05 mL	Q4weeks	Monoclonal antibody that binds to VEGF-A
Ranibizumab	0.5 mg/ 0.05 mL	Q4weeks	Monoclonal antibody fragment that binds to VEGF-A
Aflibercept	2 mg/ 0.05 mL	Q8weeks	Fusion protein that that binds to VEGF-A, VEGF-B, and placental growth factor
Brolucizumab	6 mg/ 0.05 mL	Q12weeks	Humanized, single-chain variable fragment that three major isoforms of VEGF-A (VEGF 110, VEGF 121, and VEGF 165)
Faricimab	6 mg/ 0.05 mL	Q16weeks	Bispecific monoclonal antibody that inhibits both VEGF-A and angiopoietin 2 (Ang-2)

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Macular Degeneration

Innovation

Glance

Apellis

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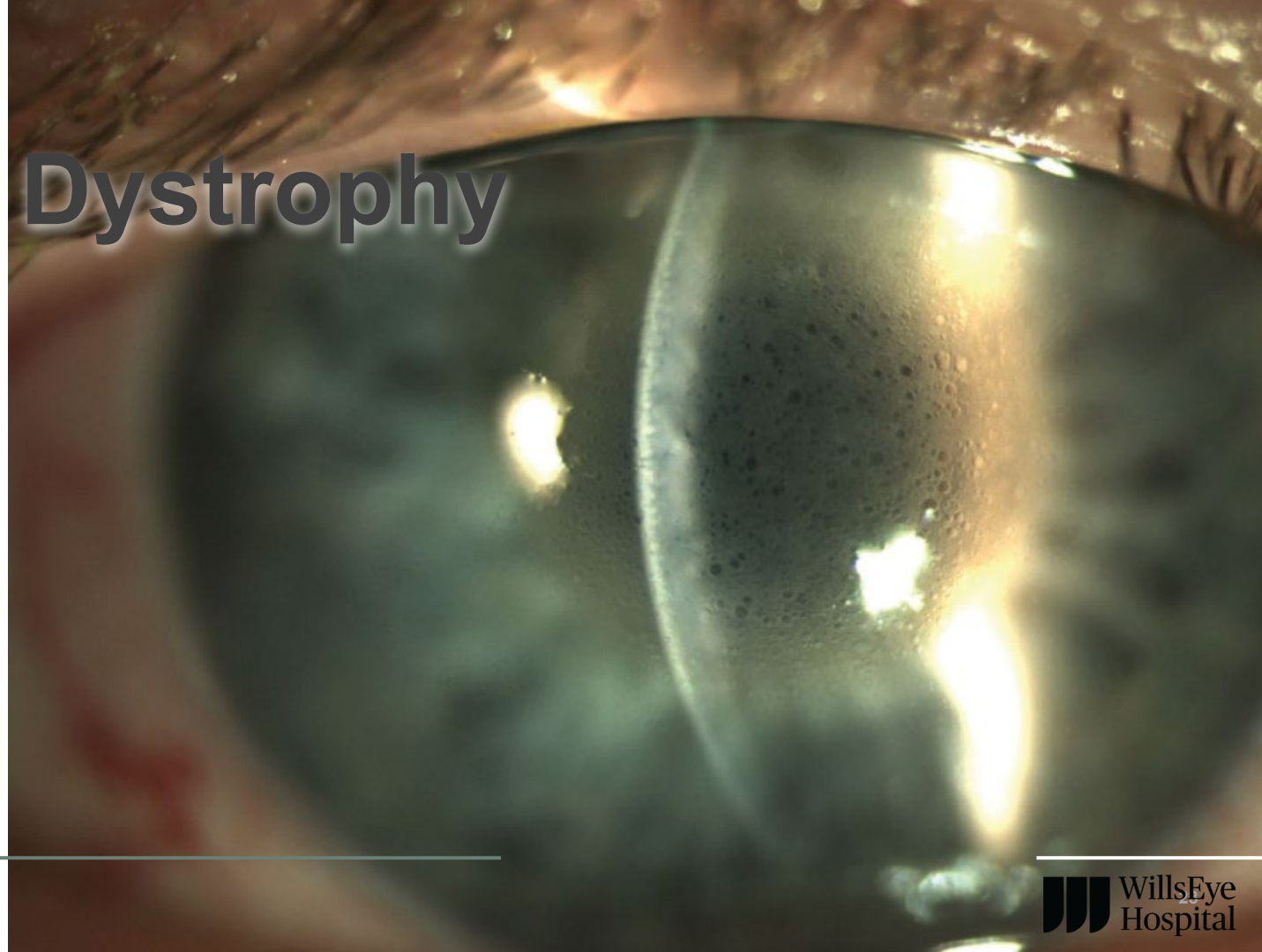
Corneal Dystrophy



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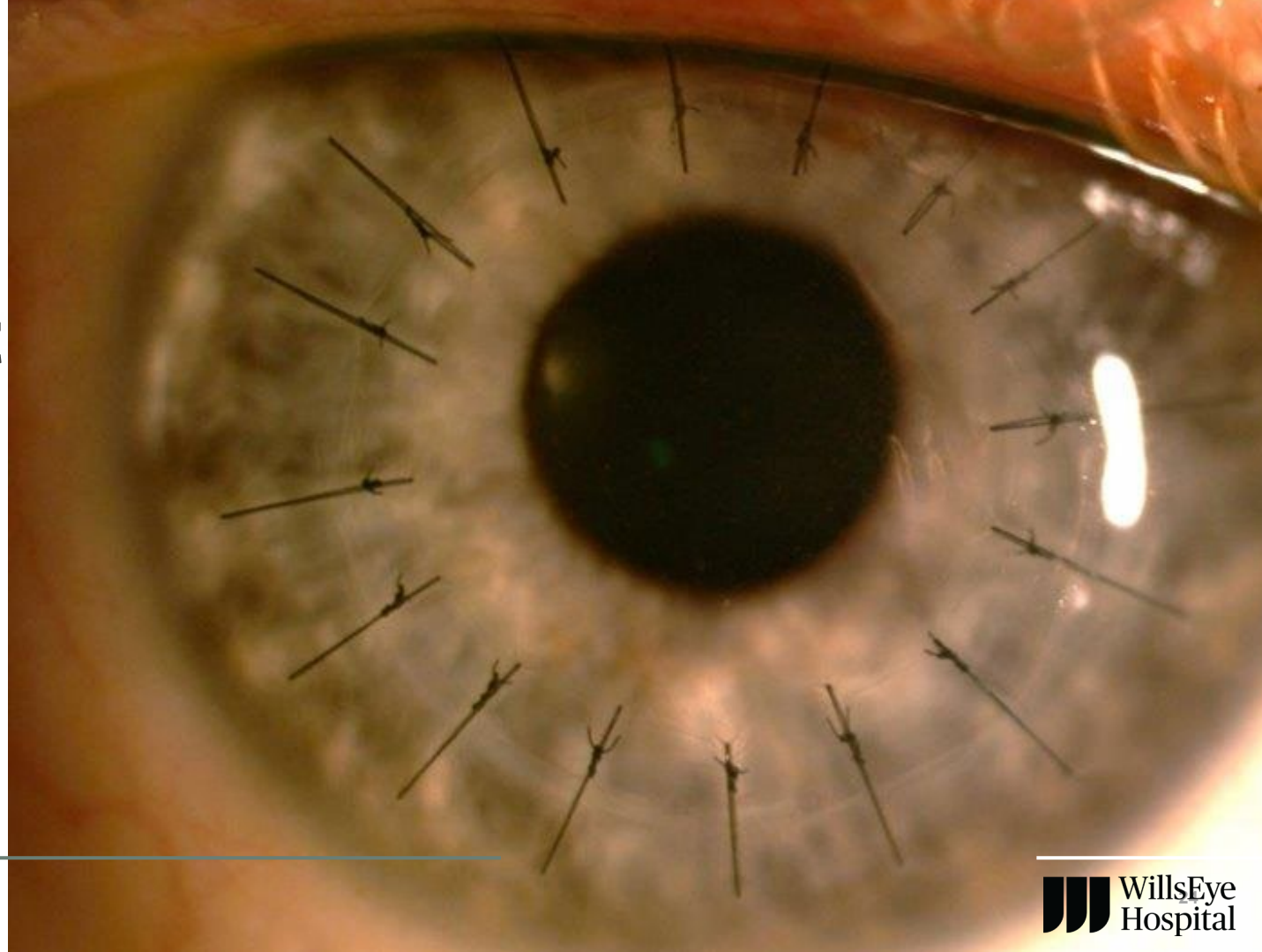
Corneal Transplant



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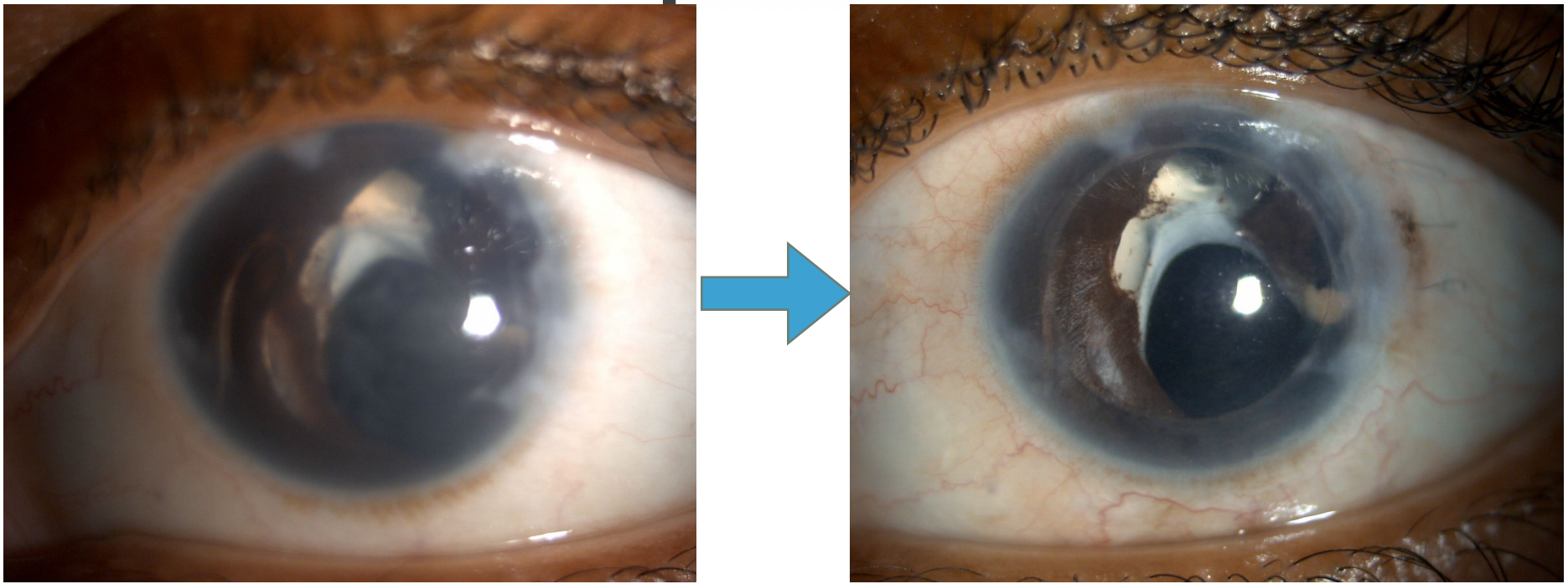
Corneal Transplantation



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Warning: Surgical Video

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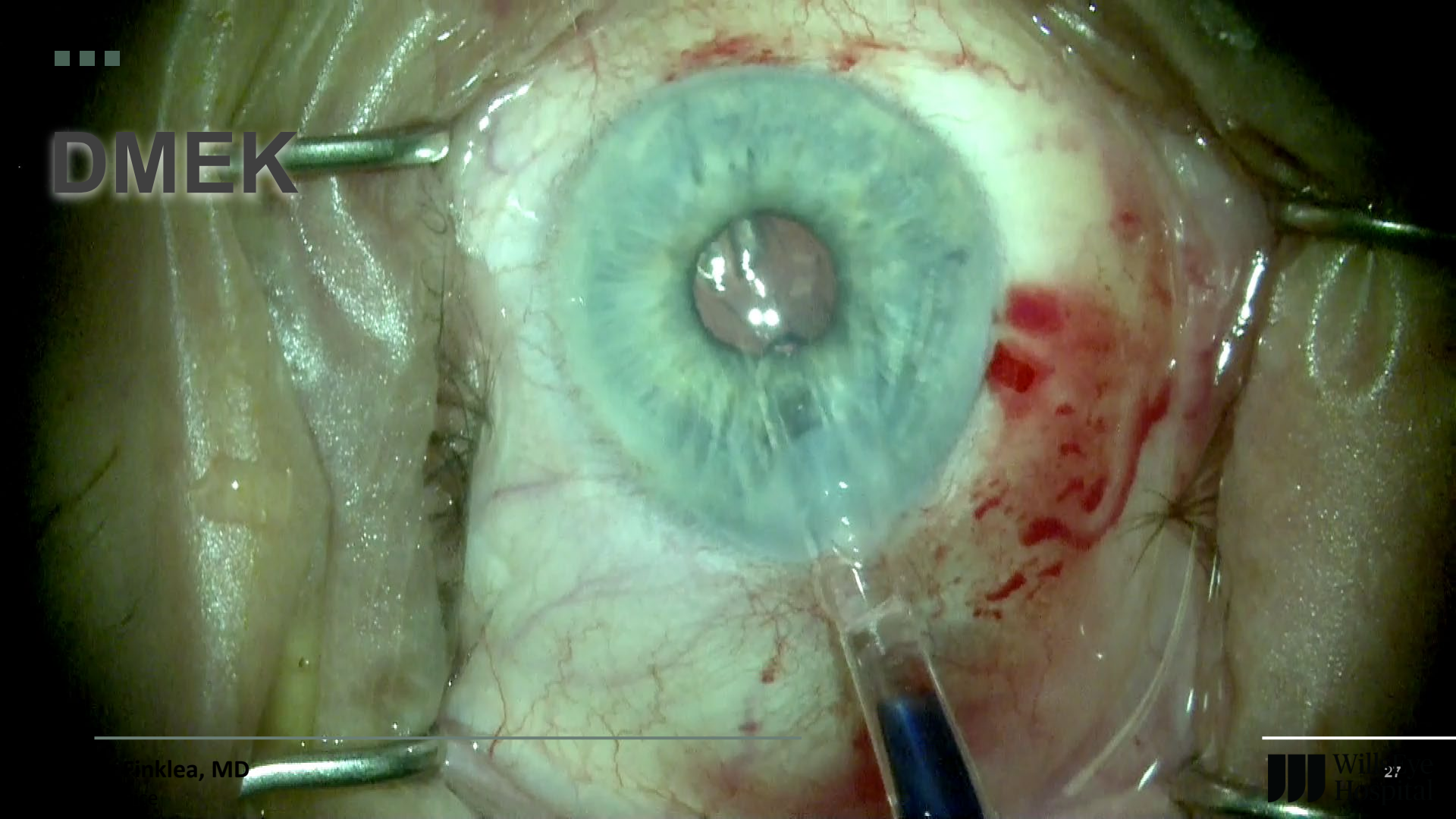
DMEK



Innovation

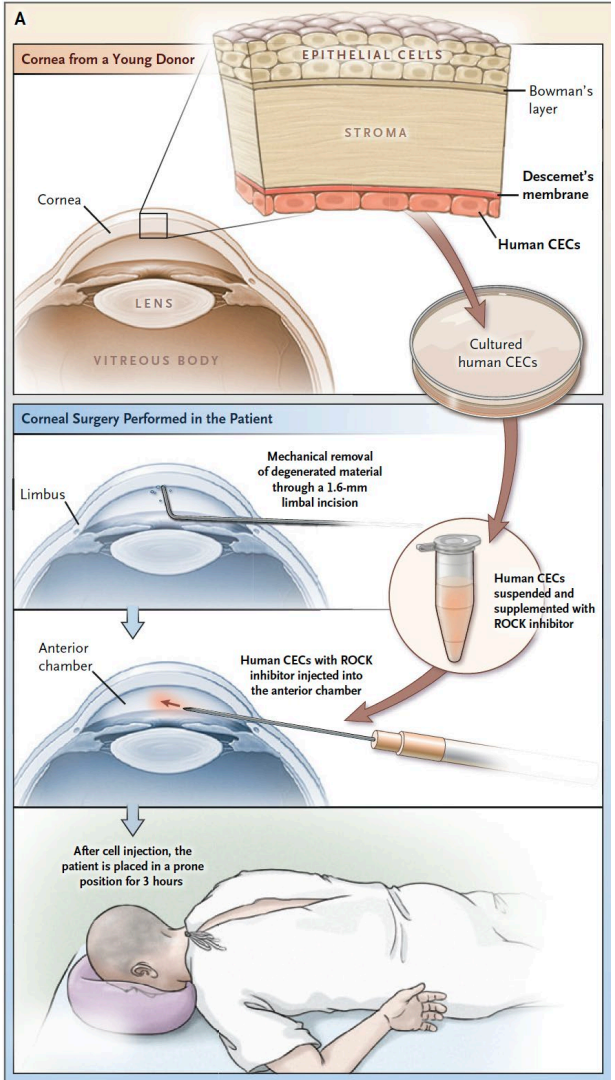
The NEW ENGLAND JOURNAL of MEDICINE

ORIGINAL ARTICLE

Injection of Cultured Cells with a ROCK Inhibitor for Bullous Keratopathy

Shigeru Kinoshita, M.D., Ph.D., Noriko Koizumi, M.D., Ph.D., Morio Ueno, M.D., Ph.D., Naoki Okumura, M.D., Ph.D., Kojiro Imai, M.D., Ph.D., Hiroshi Tanaka, M.D., Ph.D., Yuji Yamamoto, M.D., Takahiro Nakamura, M.D., Ph.D., Tsutomu Inatomi, M.D., Ph.D., John Bush, B.A., Munetoyo Toda, Ph.D., Michio Hagiya, Ph.D., Isao Yokota, Ph.D., Satoshi Teramukai, Ph.D., Chie Sotozono, M.D., Ph.D., and Junji Hamuro, Ph.D.

N Engl J Med 2018;378:995-1003.
DOI: 10.1056/NEJMoa1712770



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Innovation

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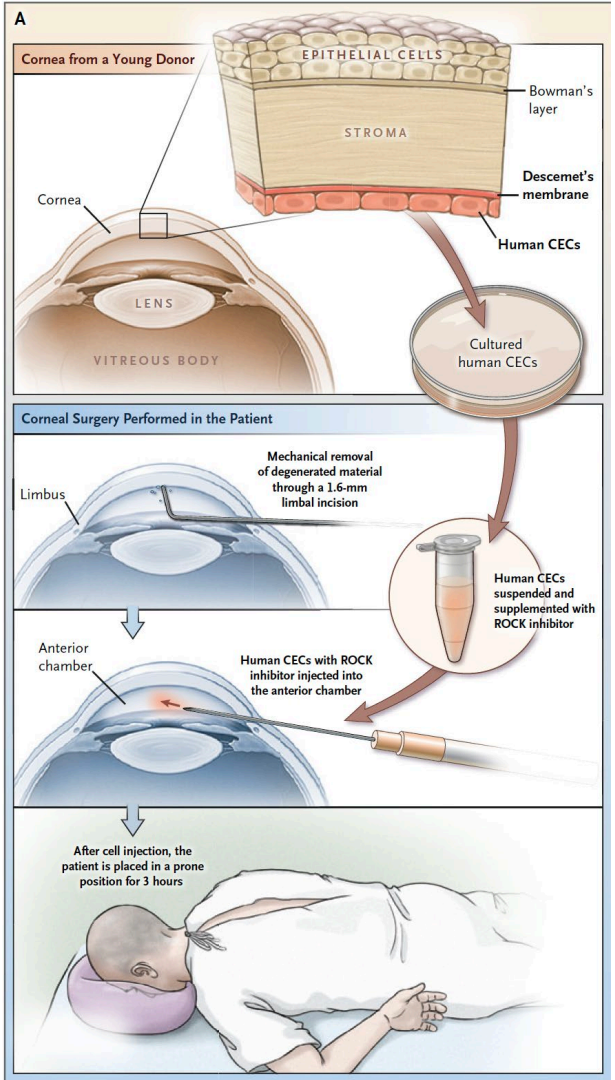

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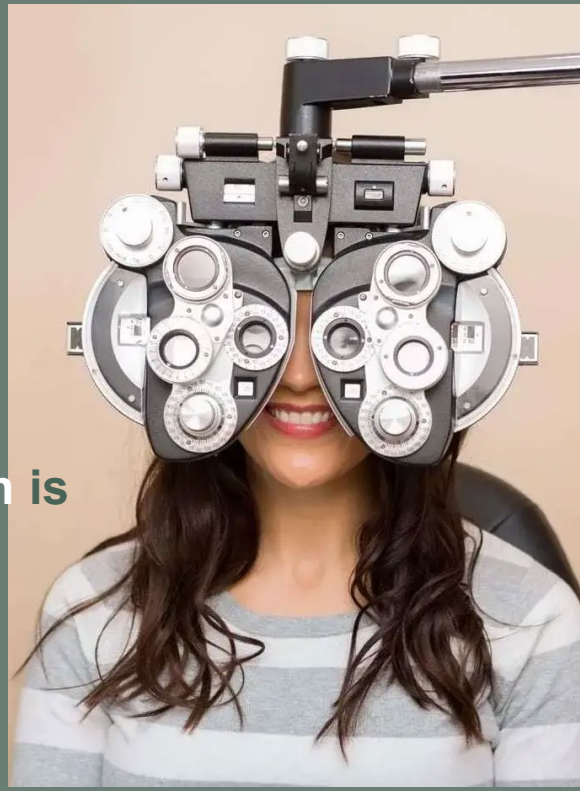
Prevention is the most important medicine



Screening & Monitoring

Annual examinations are the best way to prevent early asymptomatic diseases from becoming a functionality-limiting problem.

Frequency of Eye Exams

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I. Childhood

Screenings during childhood with pediatrician
School screenings

II. Adulthood (< 40)

Exams every 2-4 years unless risk factors exist

III. Adulthood (> 40)

Exams every 1-2 years for screening
Exams 1-2 times / year for higher risk conditions (glaucoma, diabetes macular degeneration)

Vision Loss and Blindness

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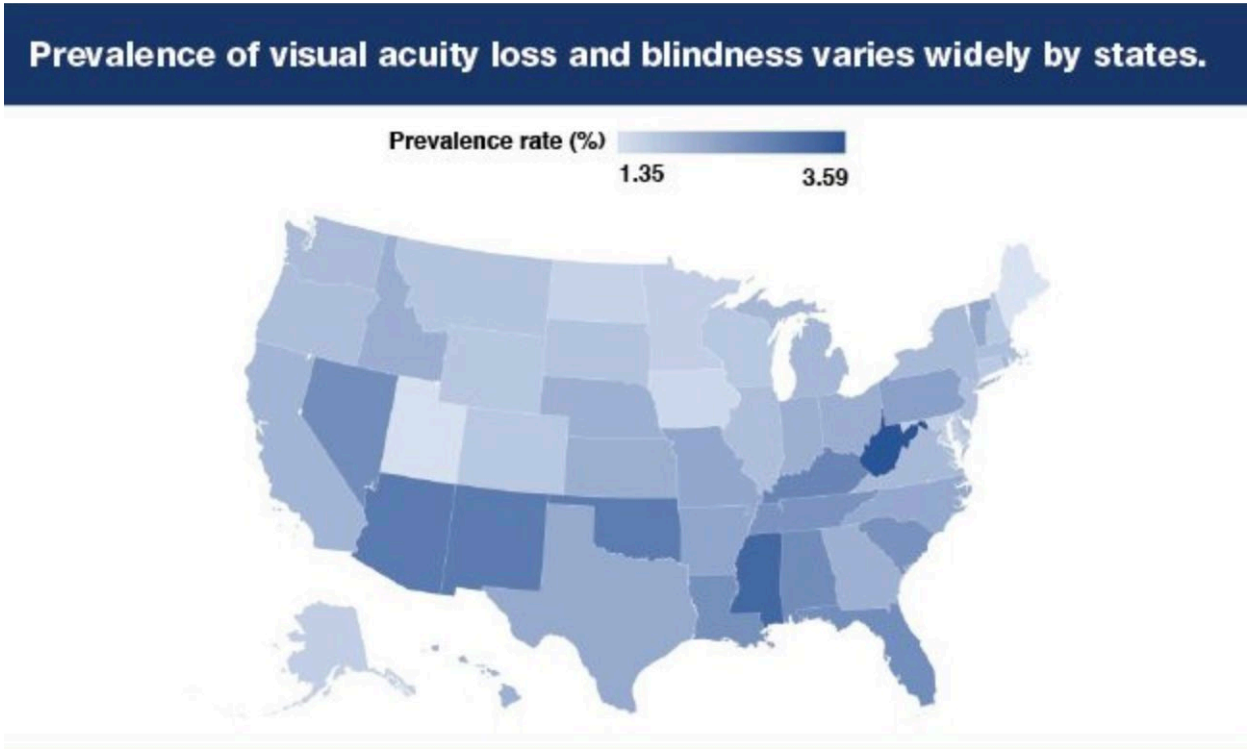
Eye Care in America



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Eye Disease Statistics

Eye Disease Prevalence

Age-related Macular Degeneration
2.1 Million

Glaucoma
2.7 Million

Diabetic Retinopathy
7.7 Million

Cataract
24 Million

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Eye Disease Statistics. National Eye Institute. www.nei.nih.gov; March 2014

Economics of Eye Care

Economic Burden[1]

$139 billion = estimated annual economic burden of vision loss and eye diseases and vision disorders in the U.S.

Burden of Blindness and Low Vision[2]

- 1.3 million Americans are blind (≤20/200); an estimated 2.2 million Americans will be blind by 2030.
- 2.9 million Americans have low vision (<20/40); an estimated 5 million Americans will have low vision by 2030.

1 NORC and Prevent Blindness America. Cost of Vision Problems: The Economic Burden of Vision Loss and Eye Disorders in the United States. June 11, 2013.

2 Prevent Blindness America and National Eye Institute. Vision Problems in the U.S. 2012.

Eye Disease Statistics

Age-related Macular Degeneration (AMD)

- 2.1 million Americans have advanced AMD; an estimated 3.7 million will have advanced AMD by 2030.

Glaucoma

- 2.7 million Americans have glaucoma; an estimated 4.3 million will have glaucoma by 2030.

Diabetic Retinopathy

- 7.7 million Americans have diabetic retinopathy; an estimated 11.3 million will have diabetic retinopathy by 2030.

Cataract

- 24 million Americans are affected by cataract; an estimated 38.7 million will be affected by cataract by 2030.

Refractive Error

- 34.1 million Americans are nearsighted; an estimated 39 million will be nearsighted by 2030.
- 14.1 million Americans are farsighted; an estimated 20 million will be farsighted by 2030.

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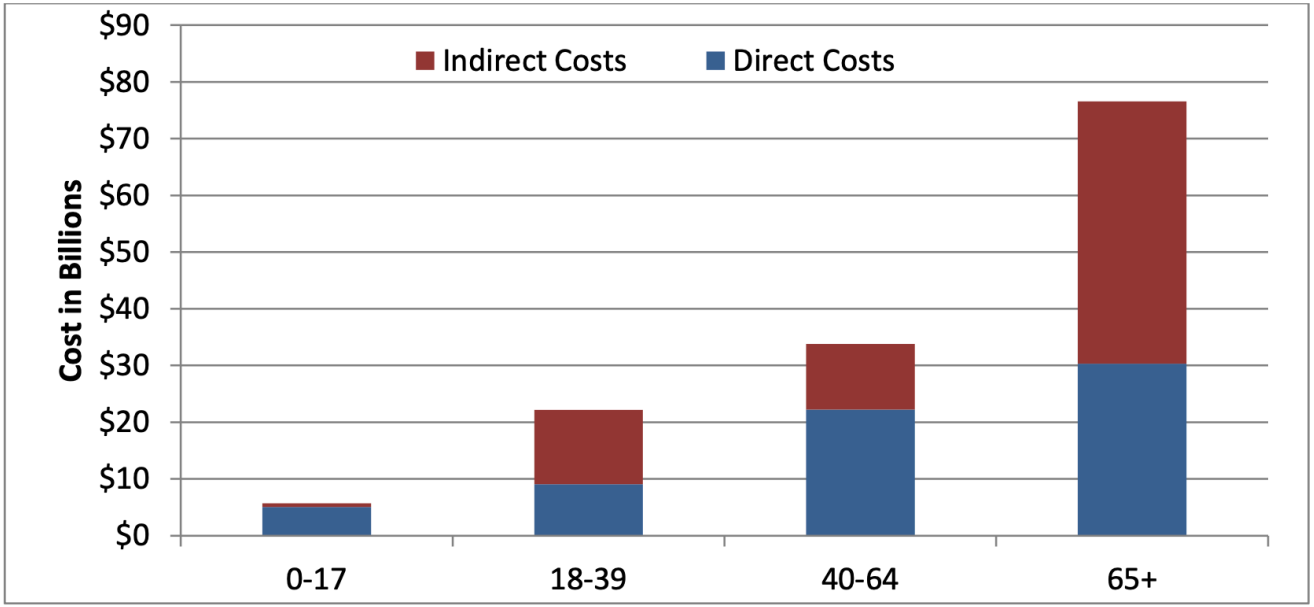
Economic Burden National

Figure 1. Direct and indirect costs by age group



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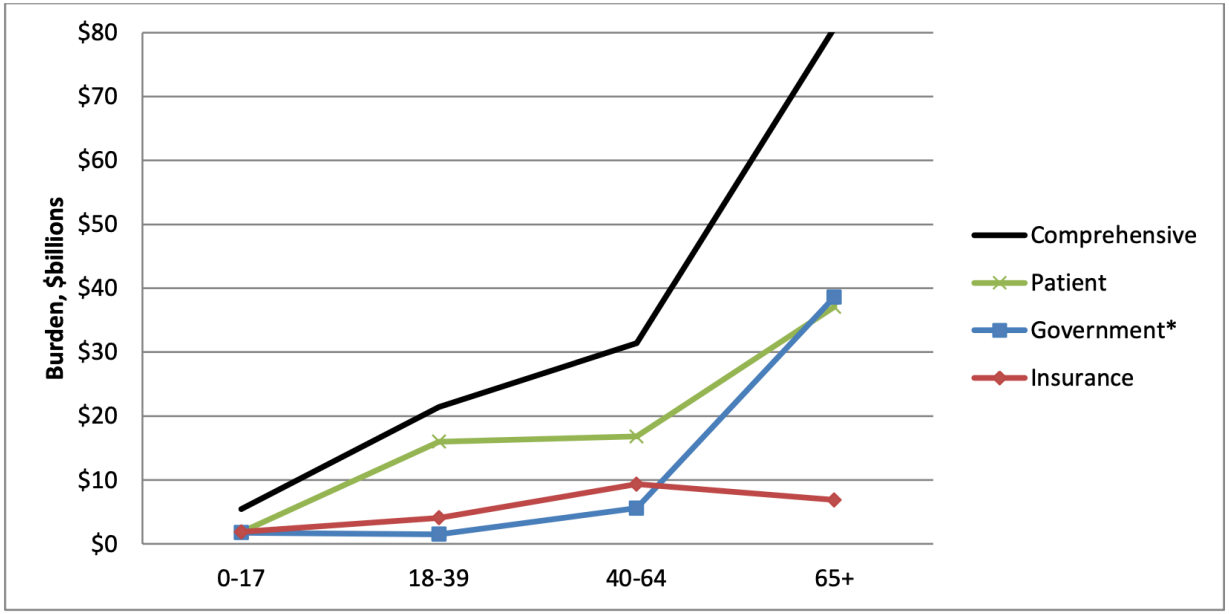
Cost of Vision Problems: The economic burden of vision loss and eye disorders In the United States. Prevent Blindness America. July 2013

Economic Burden National

Figure 4. Costs by payer by age group



*Government total includes transfer payment costs that are not included in Comprehensive

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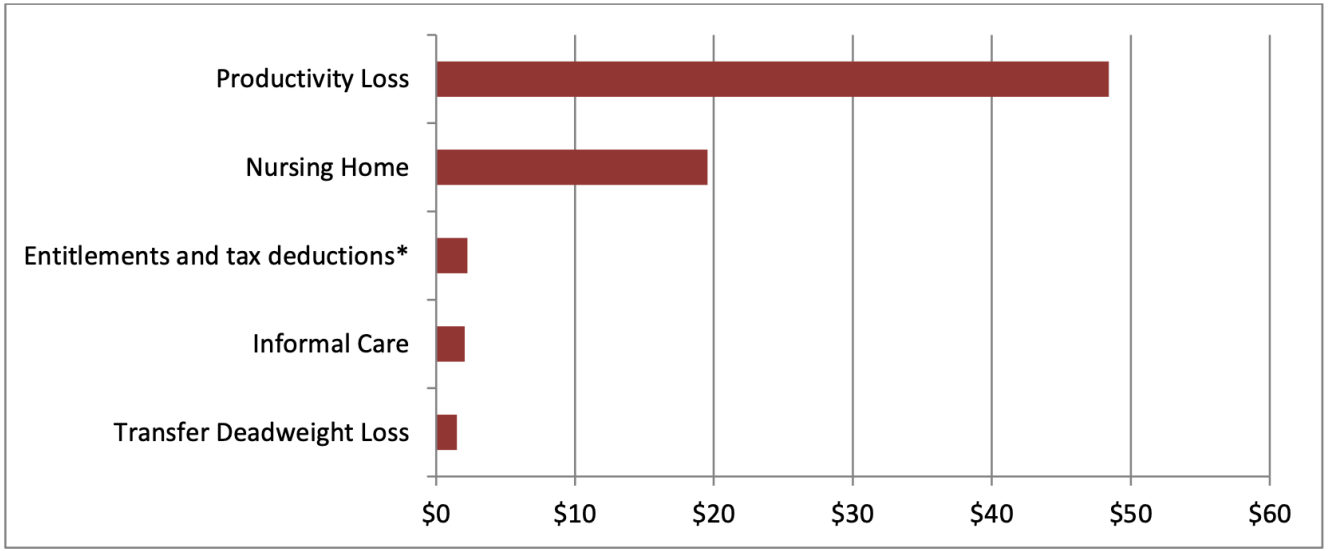
Cost of Vision Problems: The economic burden of vision loss and eye disorders In the United States. Prevent Blindness America. July 2013

Economic Burden National

Figure 3. Indirect costs by cost category



*Transfer payment costs are not included in total costs

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Cost of Vision Problems: The economic burden of vision loss and eye disorders In the United States. Prevent Blindness America. July 2013

Economic Burden National

Table R1. Economic Burden Results, in $ millions

Age Group	Comprehensive Costs				
Perspective	**0-17**	**18-39**	**40-64**	**65+**	**All Ages**
Direct Costs					
Diagnosed Disorders	$2,844	$5,067	$14,218	$26,640	$48,769
Medical Vision Aids	$1,480	$3,335	$6,222	$2,199	$13,236
Undiagnosed Vision Loss	$48	$474	$1,702	$798	$3,022
Aids/Devices	$38	$77	$81	$553	$749
Education/School Screening	$651	$119	-	-	$769
Assistance Programs	$25	$13	$23	$145	$207
Total Direct Costs	**$5,086**	**$9,086**	**$22,246**	**$30,335**	**$66,752**
Indirect Costs					
Productivity Loss	-	$12,978	$10,828	$24,622	$48,427
Informal Care	$601	-	$187	$1,264	$2,052
Nursing Home	-	-	-	$20,248	$20,248
Entitlement Programs*	$0.5	$165	$279	$1,782	$2,226
Tax Deduction*	-	$6	$11	$10	$28
Transfer Deadweight Loss	$47	$98	$538	$808	$1,490
Total Indirect Costs	**$648**	**$13,075**	**$11,553**	**$46,941**	**$72,217**
Total Economic Burden	**$5,734**	**$22,161**	**$33,799**	**$77,276**	**$138,970**

Cost of Vision Problems: The economic burden of vision loss and eye disorders In the United States. Prevent Blindness America. July 2013

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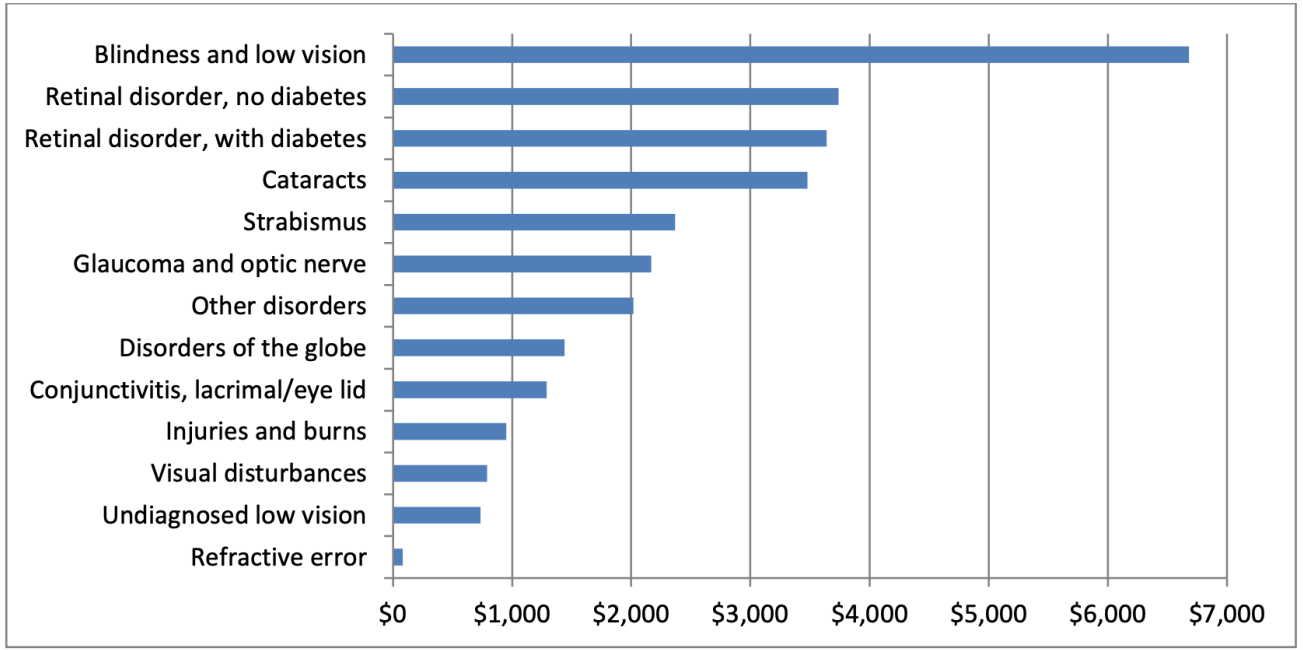
Economic Burden Individual

Figure 7. Per-person annual medical costs by disorder



Cost of Vision Problems: The economic burden of vision loss and eye disorders In the United States. Prevent Blindness America. July 2013

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The Economic Burden of Vision Loss and Blindness in the United States

David B. Rein, PhD,[1] John S. Wittenborn, BS,[1] Ping Zhang, PhD,[2] Farah Sublett, MPH,[1] Phoebe A. Lamuda, SM,[1] Elizabeth A. Lundeen, PhD, MPH,[2] Jinan Saaddine, MD, MPH[2]

Purpose: To estimate the economic burden of vision loss (VL) in the United States and by state.

Design: Analysis of secondary data sources (American Community Survey [ACS], American Time Use Survey, Bureau of Labor Statistics, Medical Expenditure Panel Survey [MEPS], National and State Health Expenditure Accounts, and National Health Interview Survey [NHIS]) using attributable fraction, regression, and other methods to estimate the incremental direct and indirect 2017 costs of VL.

Participants: People with a yes response to a question asking if they are blind or have serious difficulty seeing even when wearing glasses in the ACS, MEPS, or NHIS.

Main Outcome Measures: We estimated the direct costs of medical, nursing home (NH), and supportive services and the indirect costs of absenteeism, lost household production, reduced labor force participation, and informal care by age group, sex, and state in aggregate and per person with VL.

Results: We estimated an economic burden of VL of $134.2 billion: $98.7 billion in direct costs and $35.5 billion in indirect costs. The largest burden components were NH ($41.8 billion), other medical care services ($30.9 billion), and reduced labor force participation ($16.2 billion), all of which accounted for 66% of the total. Those with VL incurred $16 838 per year in incremental burden. Informal care was the largest burden component for people 0 to 18 years of age, reduced labor force participation was the largest burden component for people 19 to 64 years of age, and NH costs were the largest burden component for people 65 years of age or older. New York, Connecticut, Massachusetts, Rhode Island, and Vermont experienced the highest costs per person with VL. Sensitivity analyses indicate total burden may range between $76 and $218 billion depending on the assumptions used in the model.

Conclusions: Self-reported VL imposes a substantial economic burden on the United States. Burden accrues in different ways at different ages, leading to state differences in the composition of per-person costs based on the age composition of the population with VL. Information on state variation can help local decision makers target resources better to address the burden of VL. *Ophthalmology 2022;129:369-378 © 2021 by the American Academy of Ophthalmology*

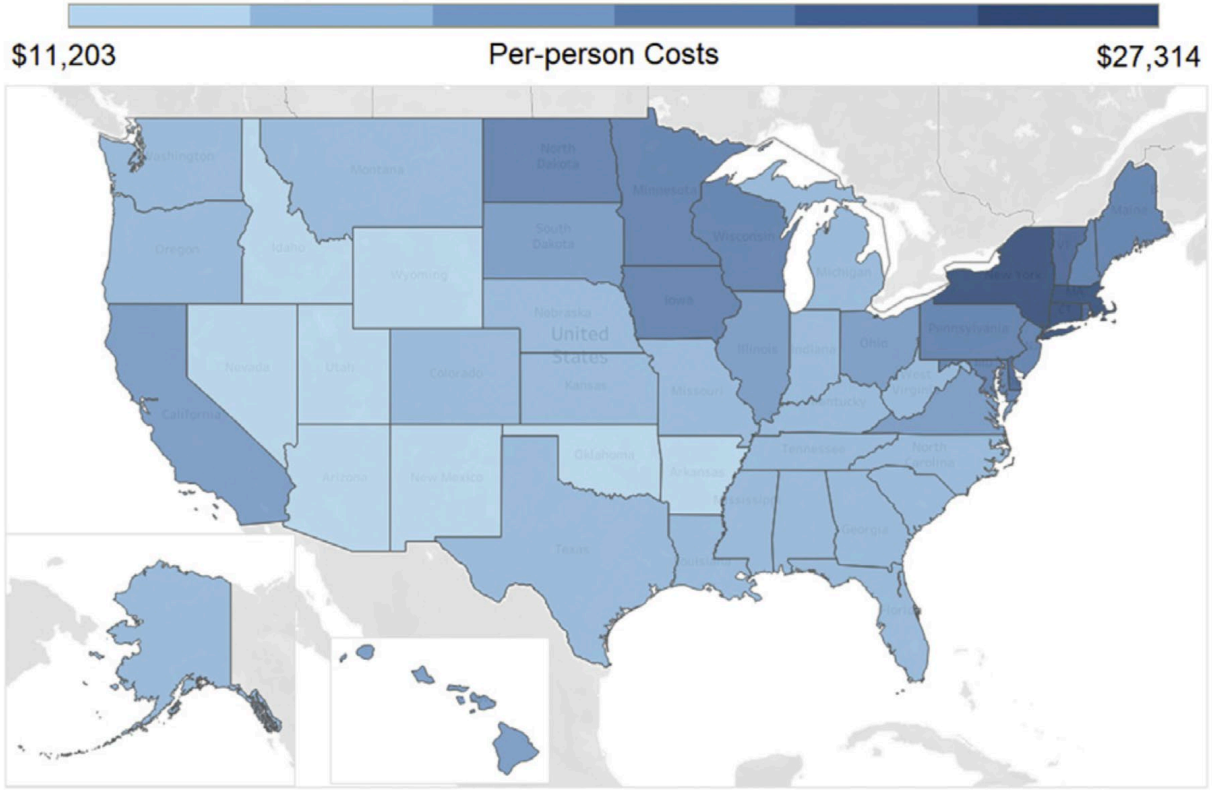

Figure 1. Map showing the state burden of vision loss or blindness per person with vision loss or blindness.

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Rein et al. The Economic Burden of Vision Loss and Blindness in the United States.
Ophthalmology 2022; 129:369-378

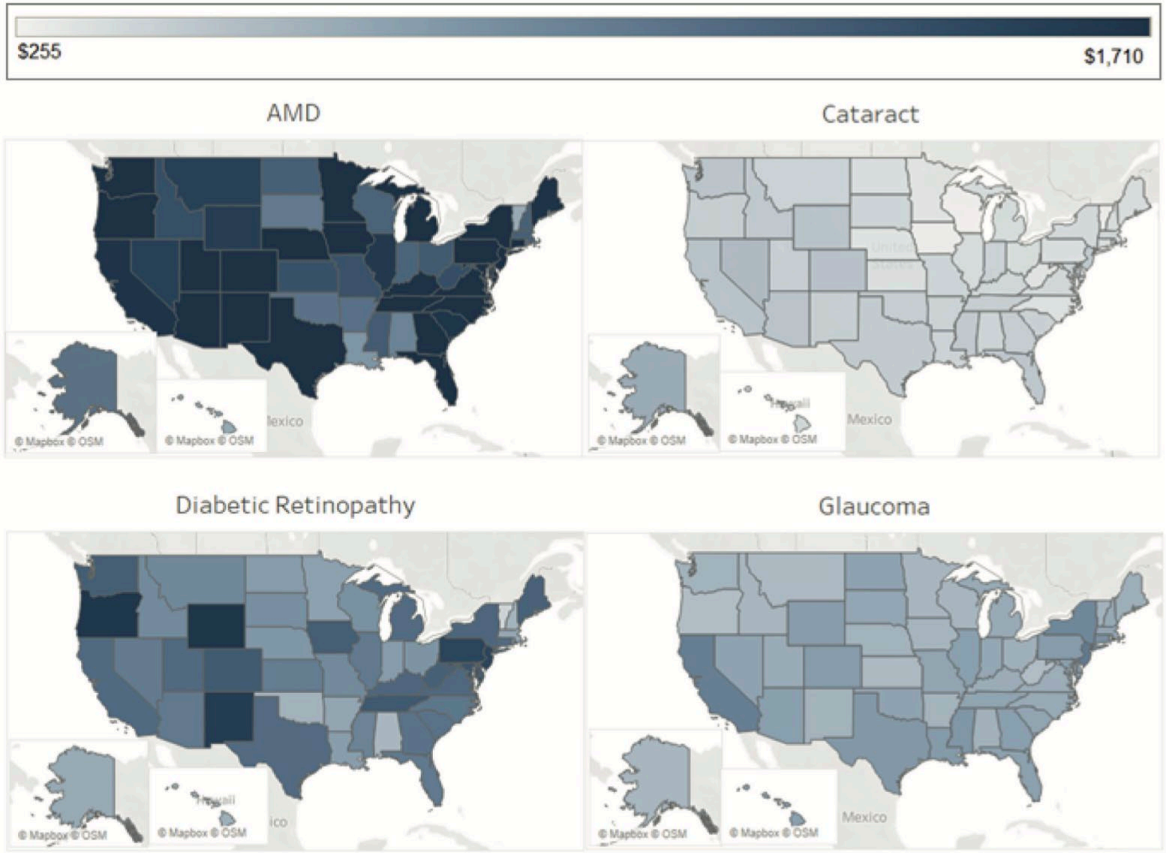

Figure 1. Medicare FFS payments for services for AMD, cataract, DR and glaucoma, per person diagnosed with each disease in 2018.

A Cost-benefit Analysis of 2018 Cataract Surgery in the United States

Gary C. Brown[1,2,3,4], Melissa M. Brown[1,2,3,4], Brandon G. Busbee[5], Sara B. Rapuano[1,3]

[1]Center for Value-Based Medicine, Hilton Head, South Carolina, [2]Wills Eye Hospital, Philadelphia, PA, [3]Department of Ophthalmology, Jefferson Medical University, Philadelphia, PA, [4]Emory University School of Medicine, Atlanta, GA, [5]Tennessee Retina, Nashville, TN

ABSTRACT

Background: Cost-utility analysis was performed by our group on conventional Medicare beneficiaries in the U.S. in 2012, 2000, and 1985. We are unaware, however, of a formal cost-benefit analysis, performed for U.S. cataract surgery. The authors, therefore, undertook a cost-benefit analysis to ascertain the financial monetary benefits returned to society from the surgery versus the direct medical costs expended on it from both the individual and macroeconomic perspectives. **Methods:** The 14-year, cost-benefit model utilized a societal cost perspective and employed 2018 U.S. real dollars and Patient Outcomes Research Team study vision outcomes. Expenses included average national Medicare Fee Schedule costs, while financial benefits or costs returned to society by surgery included ophthalmic and non-ophthalmic direct medical costs, caregiver costs, and productivity costs. Other outcomes included (1) average national Medicare Fee Schedule costs, (2) overall Medicare costs, (3) Medicaid costs, (4) commercial insurer costs, (5) patient costs, and (6) macroeconomic costs and return-on-investment (ROI) for each. Net present value analysis discounted outcomes and costs at 3%/year. The number of cataract operations in the conventional Medicare population 2018 were assumed to be similar to those in 2017. **Results:** Individual patient costs: The direct medical cost of each cataract surgery was $2,526, with a 14-year, societal financial gain of $372,543 for first-eye surgery. This yielded a 14-year ROI of 14,648% (42.9% annual interest rate) and a societal ROI of $147.48 for $1 expended on first-eye surgery. Direct ophthalmic medical costs: First-eye, 2018, cataract surgery/surgeon costs were $2,526/$656, 14.4%/25.0% less than in 2012, 43.3%/51.9% less than in 2000, and 87.9%/92.5% less than in 1985. The 2018 surgeon fee was 7.5% of the 1985 fee. Macroeconomic costs: A 2018 conventional Medicare patient cohort model had 1,907,318 patients undergoing 3,337,807 cataract operations with a direct medical cost of $8.43 billion. The 14-year societal, monetary ROI was $710.6 billion, an 8,428% ROI per patient. The 14-year gross domestic product contribution was $170 billion. **Conclusions:** 2018 cataract surgery delivers great financial value. The total Medicare-approved reimbursement is 12.1% of that in 1985, while the surgeon reimbursement is 7.5% of that in 1985. Cataract surgery returns considerable financial resources to patients and health insurers and increases the U.S. national wealth.

Key words: Cataract surgery, cost-benefit analysis, financial return-on-investment

Brown, *et al*. Cataract surgery cost-benefit analysis

Table 4: All cataract surgery costs and Medicare Fee Schedule surgeon's fees (adjusted using the Medical Care CPI[17] to 2018 real U.S. dollars)

Year	All cataract surgery costs	Percentage of 1985 cost (%)	Reduction from 1985 cost (%)	Surgeon fee	Percentage of 1985 cost (%)	Reduction from 1985 cost (%)
1985[5]	$20,910	100.0	0.0	$8,745	100.0	0.0
2000[4]	$4,131	19.8	80.2	$1,224	14.0	86.0
2012[5]	$3,128	15.0	85.0	$897	10.3	89.7
2018[6]	$2,526	12.1	87.9	$656	7.5	92.5

Cataract surgery yielded 4,567% financial return-on-investment to society over the 13-year period analyzed

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The ROI for cataract surgery has been estimated to be $4 - $6 for every $1 spent

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Self-Reported Vision Impairment and Psychological Distress in U.S. Adults

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ABSTRACT

Purpose: Examine the relationship between vision impairment and psychological distress in adults ≥18 years.

Methods: Using the 2016–2017 cross-sectional, U.S. National Health Interview Survey, we analyzed self-reported data (n = 57,644) on: Kessler psychological distress scores; general vision impairment (GVI), defined as difficulty seeing even when wearing glasses or contacts; and visual function impairment (VFI), measured using six visual function questions. Multinomial logistic regression was used to estimate adjusted odds ratios (aOR) for mild/moderate and serious psychological distress, by GVI and VFI status, and identify predictors of psychological distress among those with GVI or VFI.

Results: Among adults, 10.6% (95% CI: 10.2, 11.0) had GVI; 11.6% (CI: 11.1, 12.0) had VFI. One in four adults with GVI had psychological distress (14.9% [CI: 13.8, 16.0] reported mild/moderate and 11.2% [CI: 10.2, 12.3] reported serious). Individuals with GVI, versus those without, had higher odds of mild/moderate (aOR = 2.24; CI: 2.00, 2.52) and serious (aOR = 3.41; CI: 2.96, 3.93) psychological distress; VFI had similar findings. Among adults with GVI, odds of serious psychological distress were higher for those aged 18–39 (aOR = 4.46; CI: 2.89, 6.90) or 40–64 (aOR = 6.09; CI: 4.33, 8.57) versus ≥65 years; smokers (aOR = 2.45; CI: 1.88, 3.18) versus non-smokers; physically inactive (aOR = 1.61; CI: 1.22, 2.11) versus active; and with arthritis (aOR = 2.18; CI: 1.66, 2.87) or chronic obstructive pulmonary disease (aOR = 1.65; CI: 1.15, 2.37) versus without.

Conclusion: Adults with self-reported vision impairment had higher odds of psychological distress. These findings may inform screening interventions to address psychological distress, particularly among younger working-age adults vision impairment.

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KEYWORDS
Vision impairment; blindness; psychological distress; depression; anxiety

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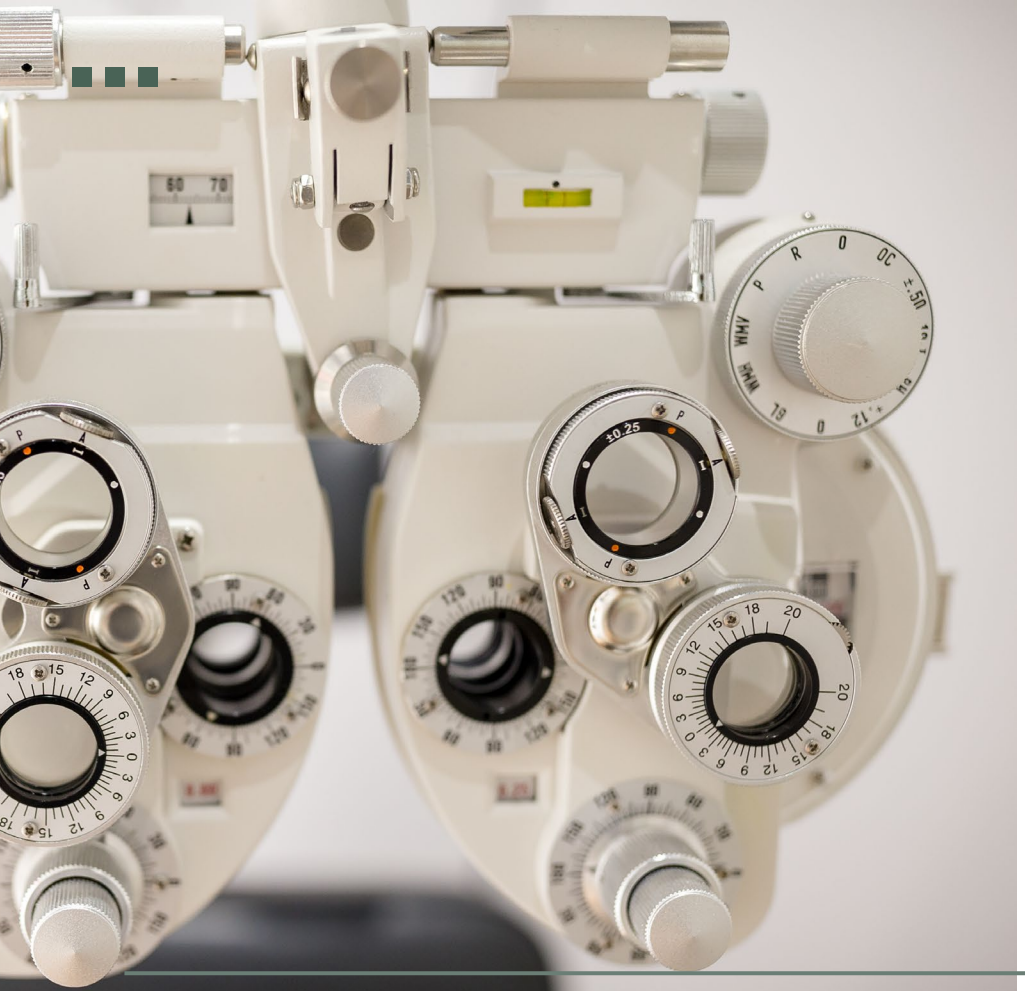
"1 in 4 adults with vision loss reported anxiety or depression"

"Younger adults with vision loss had almost 5 times the risk of serious anxiety or depression compared to older adults"

Lundeen, E. A., Saydah, S., Ehrlich, J. R., & Saaddine, J. (2021). Self-Reported Vision Impairment and Psychological Distress in U.S. Adults. Ophthalmic Epidemiology, 29(2), 171–181.



Summary

- Eye care is a vast field with wide ranging diagnoses and treatments
- Education and awareness for patients can delay care and worsen outcomes
- Annual exams and screenings are key to lowered morbidity and costs
- Cataract surgery is one of the highest yield surgeries in terms of ROI

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Thank
You

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Questions

Upcoming NEBGH events:

- **March 27**– Women's Health Conference
- **April 2** – Future Impact of GLP-1s: Employer Educational Dinner
- **April 7 –** Mondays with Dr. Mark & Dr. Michael
- **May 8 -** First 100 Days of the Trump Administration: Implications for Employers.
- **June 5** – 14th Annual Health & Wellness Benefits Conference
- **September 18** – 2025 Pharmacy Benefits Conference