



Eye Care and Vision Research Workgroup

August 18, 2026



Mission

- The purpose of the Eye Care and Vision Research Workgroup is to advance the development and implementation of **data standards** in ophthalmology, optometry, and the vision sciences, and to support studies using **observational ophthalmic data** for generating insights to improve health and vision outcomes.

Current Co-Leads



Cindy Cai
Hopkins



Kerry Ashby
Topcon



Michelle Hribar
UIC

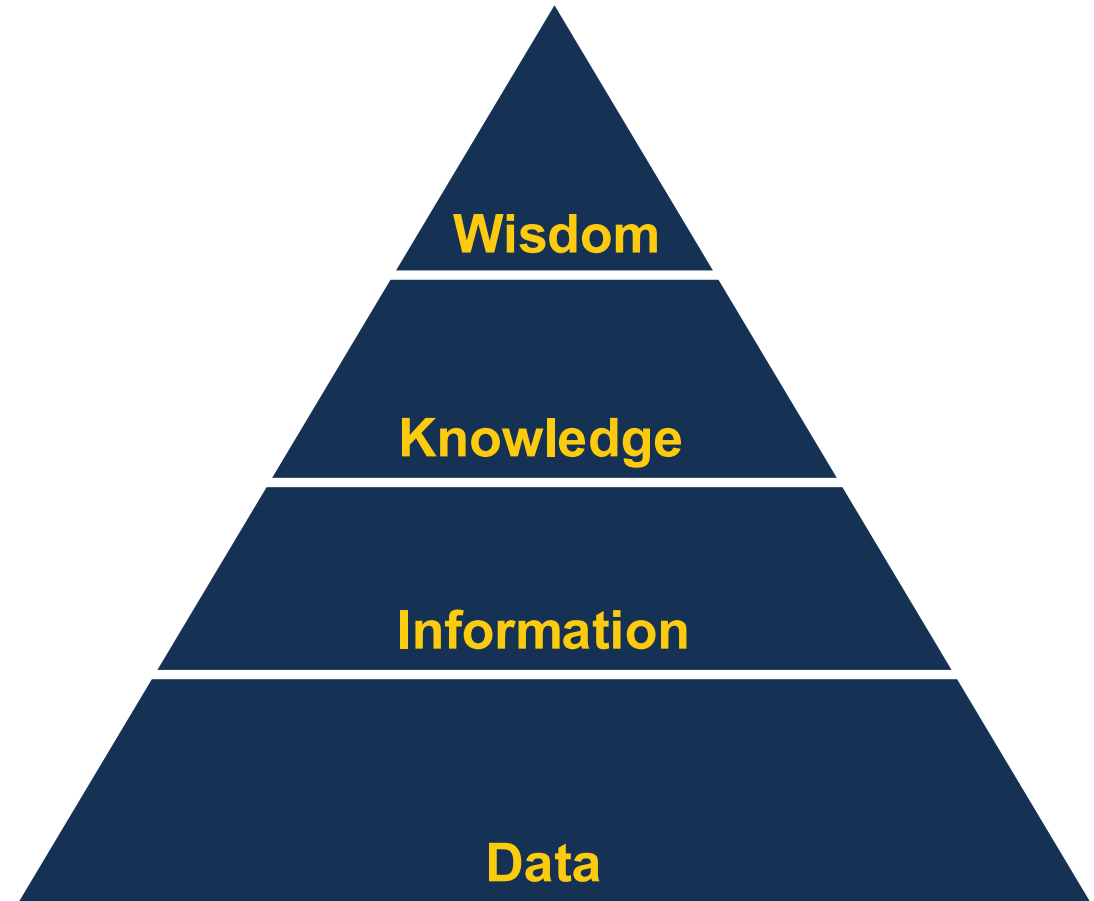


Sally Baxter
UCSD
2022 to
12/2025



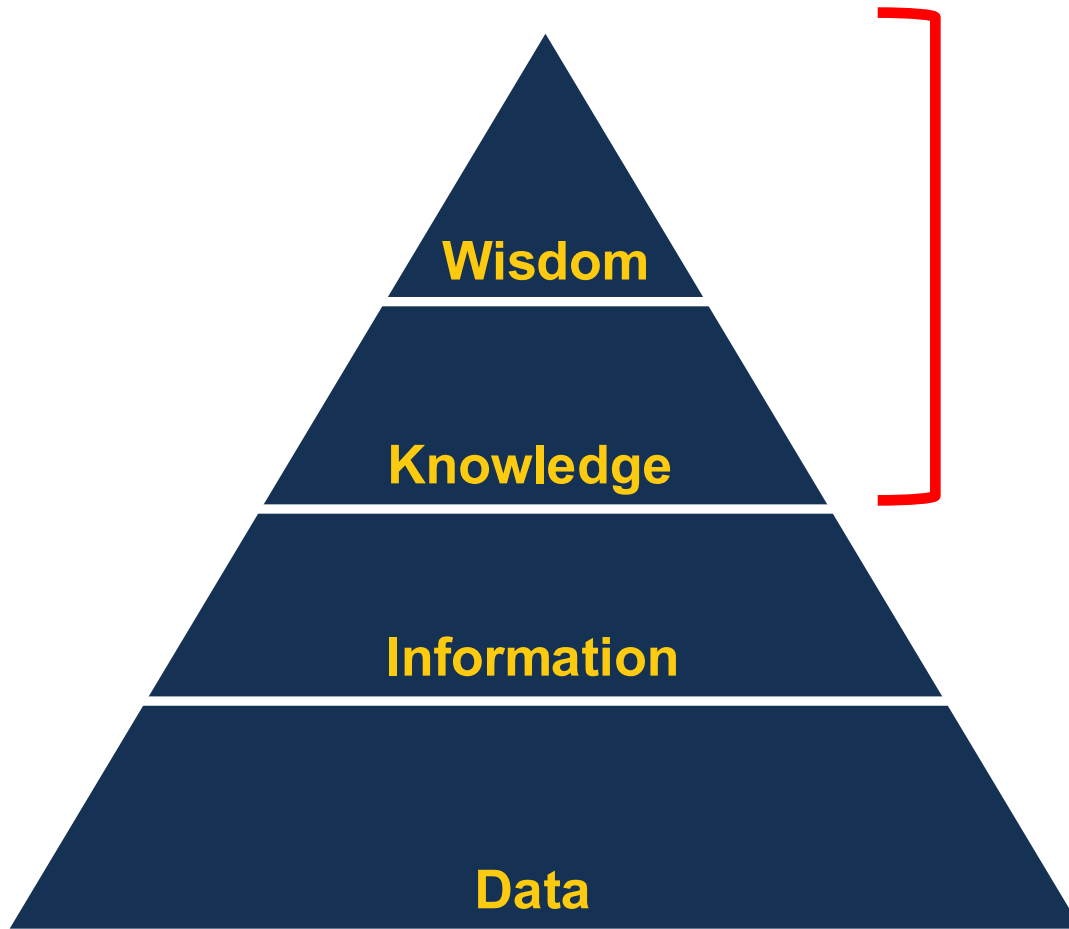
Outline

- Recent achievements
- Current research
- Longer-term goals





Evidence Generation



- Published*
 - SOS Challenge: anti-VEGF and kidney failure
 - Semaglutide/NAION
 - Semaglutide/DR complications
 - Semaglutide/Neovascular Age Related Macular Degeneration
- In Progress*
 - GDE2025: Diabetic Retinopathy Screening
 - Semaglutide/Uveitis
 - Glaucoma Prescreening Prediction
 - How Often—Ophthalmology

Evidence Generation (*Published*)



Similar Risk of Kidney Failure among Patients with Blinding Diseases Who Receive Ranibizumab, Aflibercept, and Bevacizumab

An Observational Health Data Sciences and Informatics Network Study

August
2024

Cindy X. Cai, MD, MS,¹ Akihiko Nishimura, PhD,² Mary G. Bowring, MPH,³ Erik Westlund, PhD,² Diep Tran, MSc,¹ Jia H. Ng, MD, MSCE,⁴ Paul Nagy, PhD,⁵ Michael Cook, BS,⁶ Jody-Ann McLeggion, MPH,⁷ Scott L. DuVall, PhD,⁸ Michael E. Matheny, MD, MPH,^{10,11} Asieh Goloogar, PhD,^{12,13} Anna Ostropolets, MD, PhD,¹² Evan Minty, MD, MSc,¹⁴ Priya Desai, MS,¹⁵ Fan Bu, PhD,¹⁶ Brian Toy, MD,¹⁷ Michelle Hribar, PhD,^{18,19} Thomas Falconer, MS,²⁰ Linying Zhang, PhD,²¹ Laurence Lawrence-Archer, MSc,^{12,13} Michael V. Boland, MD, PhD,²⁰ Kerry Goetz, MS,¹⁶ Nathan Hall, MS,²¹ Azza Shoaibi, PhD,²¹ Jenna Reys, PhD,²¹ Anthony G. Sena, BA,^{21,22} Clair Blacketer, MPH,²¹ Joel Swerdel, PhD, MPH,²¹ Kenar D. Jhaveri, MD,²³ Edward Lee, BS,¹⁷ Zachary Gilbert, BS,¹⁷ Scott L. Zeger, PhD,²⁴ Deidra C. Crews, MD, ScM,²⁴ Marc A. Suchard, MD, PhD,^{8,16} George Hripisak, MD, MS,²⁵ Patrick B. Ryan, PhD²¹



Semaglutide and diabetic retinopathy: an OHDSI network study

Cindy Xinji Cai^{1,2}, Akihiko Nishimura,³ Sally Baxter,^{4,5} Kerry Goetz,⁶ Michelle Hribar,^{6,7,8} Brian Toy,⁹ Andrew Barkmeier,¹⁰ Sophia Wang,¹¹ Swarup Swaminathan,¹² Alexis Flowers,¹³ Eric Brown,¹³ Benjamin Xu,⁹ John Chen,¹⁰ Aiyn Chen,^{7,8} Theodore Leng,¹¹ Michael Boland,¹⁴ Thamir Alshammari,^{15,16} Fan Bu,¹⁷ Thomas Falconer,¹⁸ Benjamin Martin,² Erik Westlund,³ Nestoras Mathioudakis,¹⁹ Linying Zhang,²⁰ Ruochong Fan,²⁰ Adam Wilcox,²⁰ Albert Lai,²⁰ Jacqueline C Stocking²¹, Yangyiran Xie,¹³ Lok Hin Lee,¹³ David Dorr,⁸ Isabelle Humes,²² David McCoy,²² Mohammad Adibuzzaman,²² Raymond Areaux Jr.,²³ James Brash,²⁴ Nicole Weiskopf,⁸ Hannah Morgan-Cooper,²⁵ Priya Desai,²⁵ Diep Tran,¹ Zainab Rustam,¹ Gina Zhu,¹ Joel Swerdel,²⁶ Anthony Sena,^{26,27} Paul Nagy,² Marc Suchard,^{28,29} Martijn Schuemie,^{28,30} George Hripisak,¹⁸ Patrick Ryan^{18,30}

June
2025



Semaglutide and Neovascular Age-Related Macular Degeneration among Adults with Type 2 Diabetes

An Observational Health Data Sciences and Informatics Network Study

June
2026

Cindy X. Cai, MD, MS,^{1,2} Brian Toy, MD,³ Benjamin Martin, PhD,² Ruochong Fan, MA,⁴ Erik Westlund, PhD,⁵ Diep Tran, MS,¹ Akihiko Nishimura, PhD,⁵ Haen Lee, MS,² Theodore Leng, MD, MS,⁶ Paul Nagy, PhD,² Nestoras Mathioudakis, MD, MHS,⁷ Linying Zhang, PhD,⁴ Michelle Hribar, PhD,⁸ Aiyn Chen, MD,^{9,10} Karen Armbrust, MD, PhD,^{11,12} Kerry Goetz, MS,¹⁴ Sally Baxter, MD, MSc,^{14,15} Michael V. Boland, MD, PhD,¹⁶ Eric N. Brown, MD, PhD,¹⁷ Edmund Tsui, MD, MS,¹⁸ Andrew J. Barkmeier, MD,¹⁹ Sophia Wang, MD, MS,⁶ Nitish Mehta, MD,²⁰ Jacqueline C. Stocking, PhD, RN,²¹ Ghazala O'Keefe, MD,²² Cecilia S. Lee, MD, MS,²³ Philip R.O. Payne, PhD,²⁴ William J. O'Brien, MS,²⁵ Scott DuVall, PhD,²⁶ Thamir Alshammari, PhD,^{27,28} Thomas Falconer, MS,²⁹ David A. Dorr, MD, MS,³⁰ Isabelle Humes, DPT, MS,³¹ David McCoy, BA,³¹ Mohammed Adibuzzaman, PhD,³¹ Ruamel Mahmood, PhD,³¹ Hannah Morgan-Cooper, MSc,³² Priya Desai, MSc,³² Shikha Yashwant Kothari, MBBS, MSc,³² Anthony Sena, MS,^{33,34} Clair Blacketer, MPH,^{33,34} Anna Ostropolets, MD, PhD,^{29,33} Azza Shoaibi, PhD,³³ Gowtham Rao, MD, PhD,³⁵ George Hripisak, MD, MS,²⁹ Patrick Ryan, PhD,^{16,37} Marc A. Suchard, MD, PhD^{16,37}

JAMA Ophthalmology | Original Investigation

Semaglutide and Nonarteritic Anterior Ischemic Optic Neuropathy

Cindy X. Cai, MD, MS; Michelle Hribar, PhD; Sally Baxter, MD, MSc; Kerry Goetz, MS; Swarup S. Swaminathan, MD; Alexis Flowers, MD; Eric N. Brown, MD, PhD; Brian Toy, MD; Benjamin Xu, MD, PhD; John Chen, MD, PhD; Aiyn Chen, MD; Sophia Wang, MD, MS; Cecilia Lee, MD, MS; Theodore Leng, MD, MS; Joshua R. Ehrlich, MD, MPH; Andrew Barkmeier, MD; Karen R. Armbrust, MD, PhD; Michael V. Boland, MD, PhD; David Dorr, MD, MS; Danielle Boyce, MPH, DPA; Thamir Alshammari, PhD; Joel Swerdel, PhD, MS, MPH; Marc A. Suchard, MD, PhD; Martijn Schuemie, PhD; Fan Bu, PhD; Anthony G. Sena, BA; George Hripisak, MD, MS; Akihiko Nishimura, PhD; Paul Nagy, PhD; Thomas Falconer, MS; Scott L. DuVall, PhD; Michael Matheny, MD; Benjamin Vliernes, PhD; William O'Brien, MS; Linying Zhang, PhD; Benjamin Martin, PhD; Erik Westlund, PhD; Nestoras Mathioudakis, MD, MHS; Ruochong Fan, MA; Adam Wilcox, PhD; Albert Lai, PhD; Jacqueline C. Stocking, PhD, RN; Sahar Talkkouchie, MD, MBA; Lok Hin Lee, DPhil; Yangyiran Xie, BS; Isabelle Humes, PT, DPT; David B. McCoy, BA; Mohammad Adibuzzaman, PhD; Raymond G. Areaux Jr, MD; William Rojas-Carabali, MD; James Brash, PhD; David A. Lee, MD, MS; Nicole G. Weiskopf, PhD; Louise Mawin, MD; Rupesh Agrawal, MD; Hannah Morgan-Cooper, MSc; Priya Desai, MSc; Patrick B. Ryan, PhD

February
2025



Most Recent Publication



Semaglutide and Neovascular Age-Related Macular Degeneration among Adults with Type 2 Diabetes

An Observational Health Data Sciences and Informatics Network Study

June 2026

Cindy X. Cai, MD, MS,^{1,2} Brian Toy, MD,³ Benjamin Martin, PhD,² Ruochong Fan, MA,⁴ Erik Westlund, PhD,⁵ Diep Tran, MS,¹ Akihiko Nishimura, PhD,⁵ Haeun Lee, MS,² Theodore Leng, MD, MS,⁶ Paul Nagy, PhD,² Nestoras Mathioudakis, MD, MHS,⁷ Linying Zhang, PhD,⁸ Michelle Hribar, PhD,⁸ Aiyin Chen, MD,^{9,10} Karen Armbrust, MD, PhD,^{11,12} Kerry Goetz, MS,¹³ Sally Baxter, MD, MSc,^{14,15} Michael V. Boland, MD, PhD,¹⁶ Eric N. Brown, MD, PhD,¹⁷ Edmund Tsui, MD, MS,¹⁸ Andrew J. Barkmeier, MD,¹⁹ Sophia Wang, MD, MS,⁶ Nitish Mehta, MD,²⁰ Jacqueline C. Stocking, PhD, RN,²¹ Ghazala O'Keefe, MD,²² Cecilia S. Lee, MD, MS,²³ Philip R.O. Payne, PhD,²⁴ William J. O'Brien, MS,²⁵ Scott DuVall, PhD,²⁶ Tamir Alshammari, PhD,^{27,28} Thomas Falconer, MS,²⁹ David A. Dorr, MD, MS,³⁰ Isabelle Humes, DPT, MS,³¹ David McCoy, BA,³¹ Mohammed Adibuzzaman, PhD,³¹ Rumel Mahmood, PhD,³¹ Hannah Morgan-Cooper, MSc,³² Priya Desai, MSc,³² Shikha Yashwant Kothari, MBBS, MSc,³² Anthony Sena, MS,^{33,34} Clair Blacketer, MPH,^{33,34} Anna Ostroplets, MD, PhD,^{29,33} Azza Shoaibi, PhD,³³ Gowtham Rao, MD, PhD,³⁵ George Hripsak, MD, MS,²⁹ Patrick Ryan, PhD,^{29,33} Marc A. Suchard, MD, PhD,^{16,37}



AMERICAN ACADEMY
OF OPHTHALMOLOGY®

Commentary

Glucagon-Like Peptide-1 Receptor Agonist and Age-related Macular Degeneration: Adding to the Story

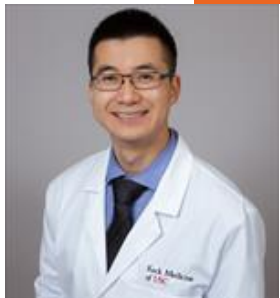
Maureen G. Maguire, PhD - Philadelphia, Pennsylvania

“Negative” study: did not find differences in risk of NVAMD comparing new users of semaglutide other GLP-1RAs (dulaglutide, exenatide), or non-GLP-1RAs (empagliflozin, sitagliptin, glipizide)

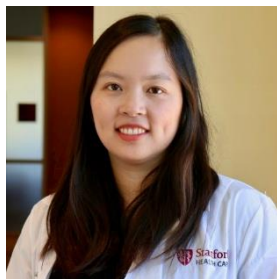
“The methodology of this investigation was quite strong.”



Evidence Generation (*In Progress*)



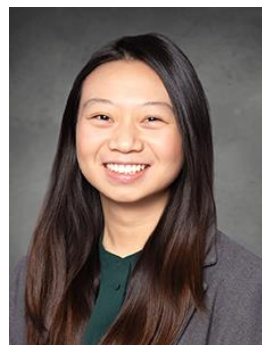
Brian Toy
USC



Sophia Wang
Stanford



Jenna Reps
J&J

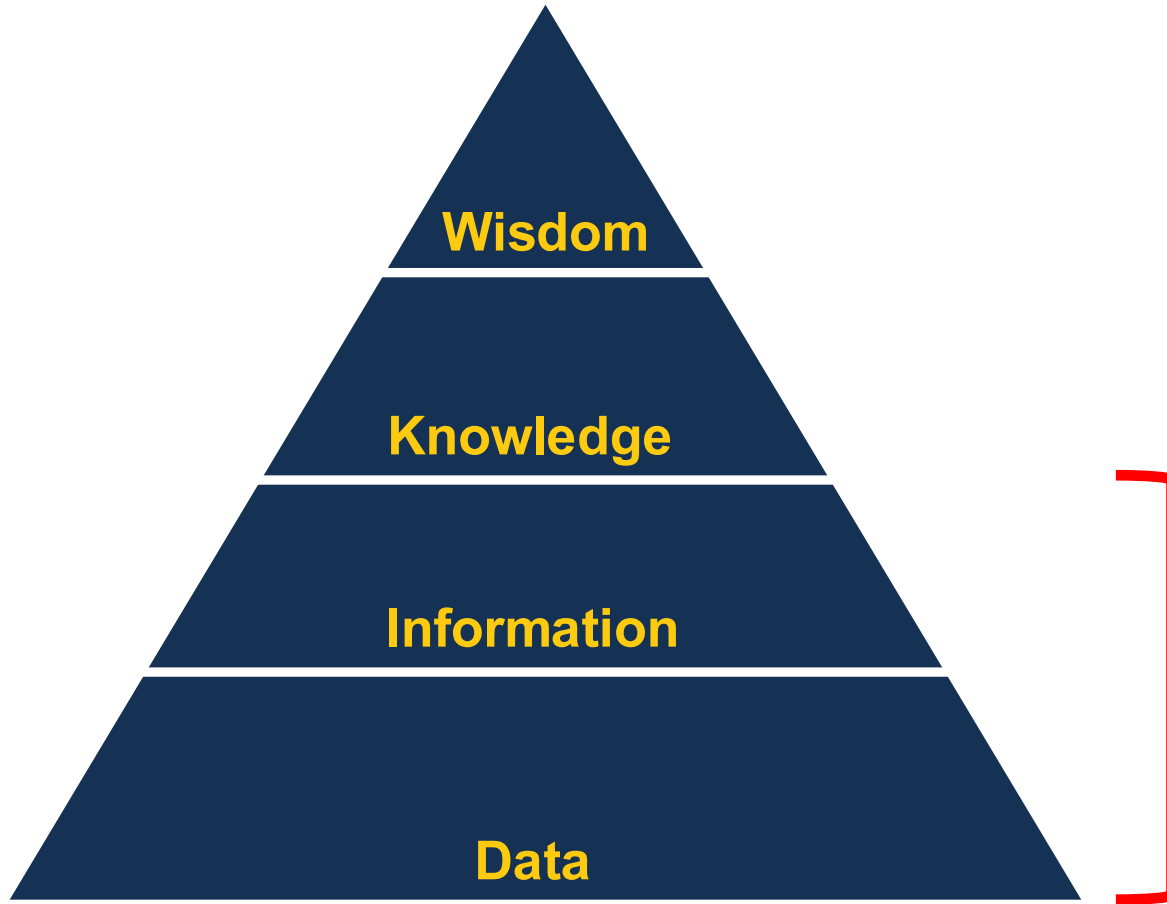


Hsin Yi "Cindy" Chen
Columbia

- GDE2025: Diabetic Retinopathy Screening
- Semaglutide/Uveitis
- Glaucoma Prescreening Prediction
- How Often—Ophthalmology



Data Standardization

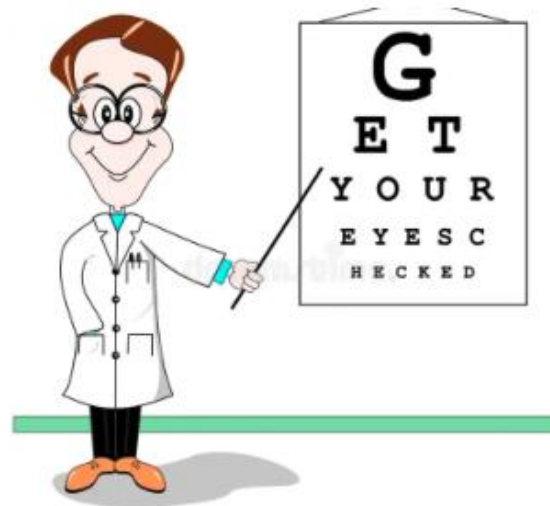


- If we want to push the field of observational research in vision sciences forward



Unique Data Types in Vision Research

...Think about the last time you went to the eye doctor's office...

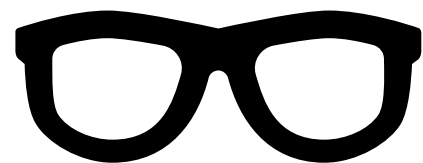




Unique Data Types in Vision Research

E	1	20/200
F P	2	20/100
T O Z	3	20/70
L P E D	4	20/50
P E C F D	5	20/40
E D F C Z P	6	20/30
FELOPZD	7	20/25
DEFFOTEC	8	20/20
LEFODFOY	9	
YDFLTCEO	10	
YDEOLOFFD	11	

Visual acuity



With glasses
Without glasses

20/40
20/100



With pinhole
Without pinhole

20/40
20/50



At distance
At near

20/20
20/30



The Eight-Point Eye Examination

The core elements captured in a comprehensive ophthalmic exam

1

Visual acuity

5

Confrontation visual fields

2

Pupils

6

External examination

3

Extraocular motility and alignment

7

Slit-lamp examination

4

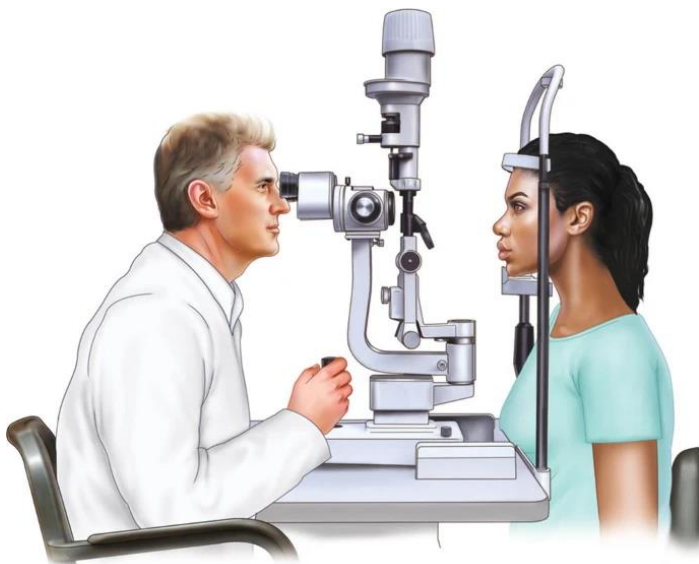
Intraocular pressure

8

Funduscopy examination



Unique Data Types in Vision Research

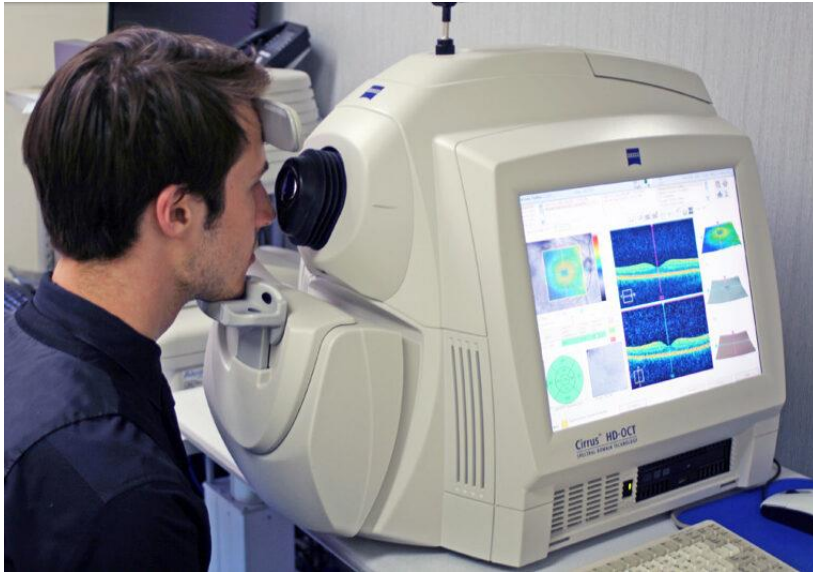


Slit lamp
biomicroscopy
($\pm$ fundoscopy)

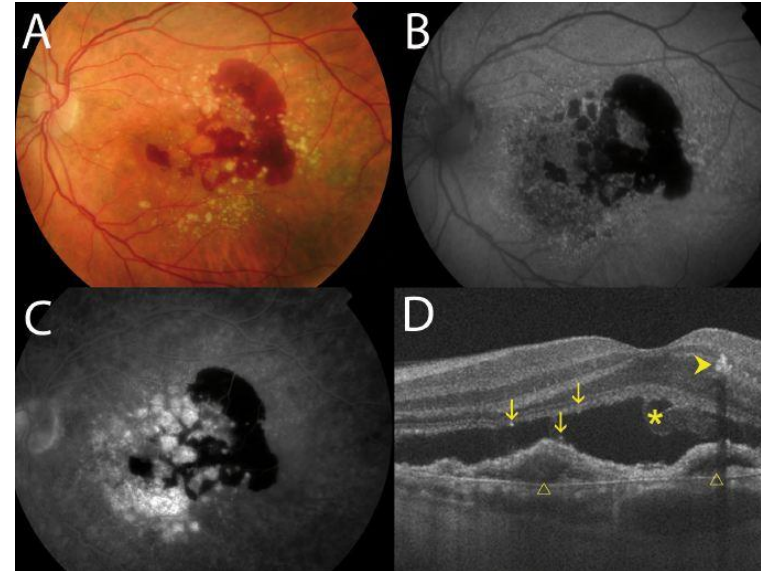
		Right Eye	Left Eye
Anterior	Lids/Lashes	Free text	Free text
	Conjunctiva /Sclera		
	Cornea	Scar	
	Anterior Chamber		
	Iris		
	Lens	Cataract	
Posterior	Vitreous		
	Optic Nerve		
	Macula	Drusen	
	Vessels		
	Periphery		



Unique Data Types in Vision Research

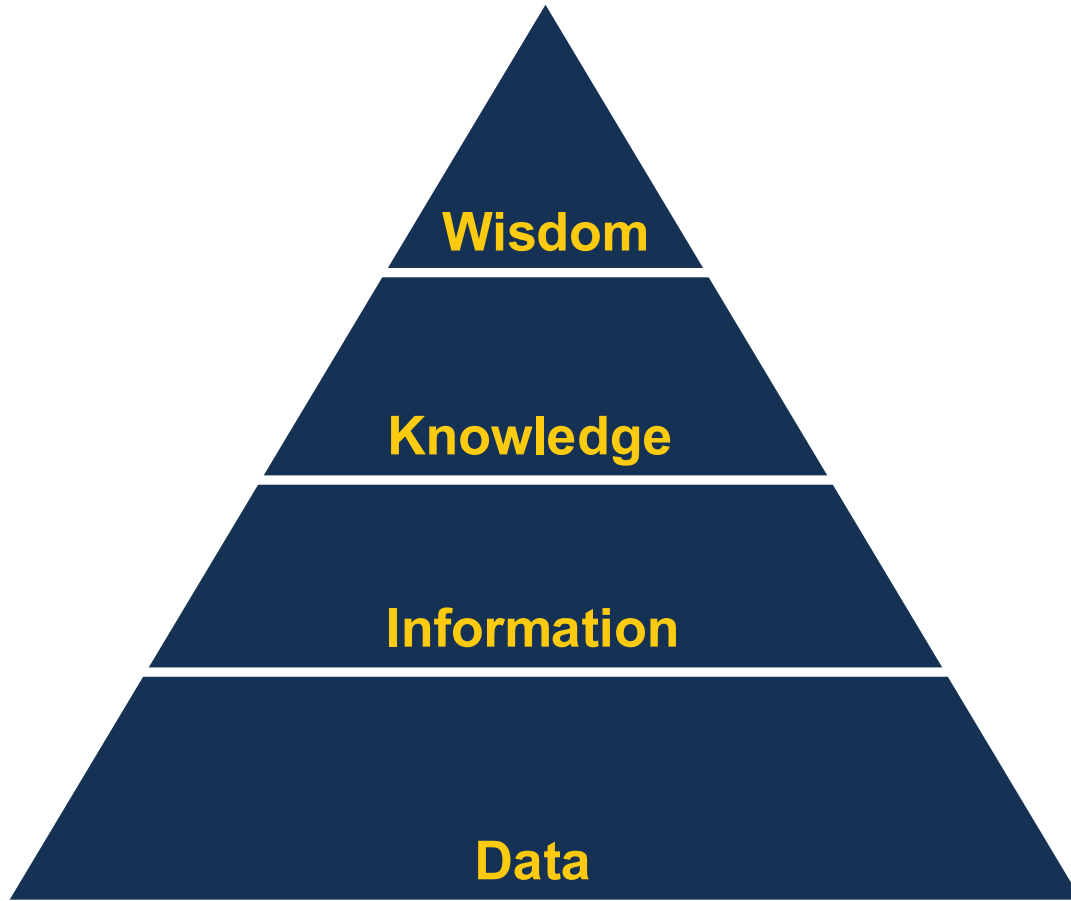


Ophthalmic
imaging





Data Standardization

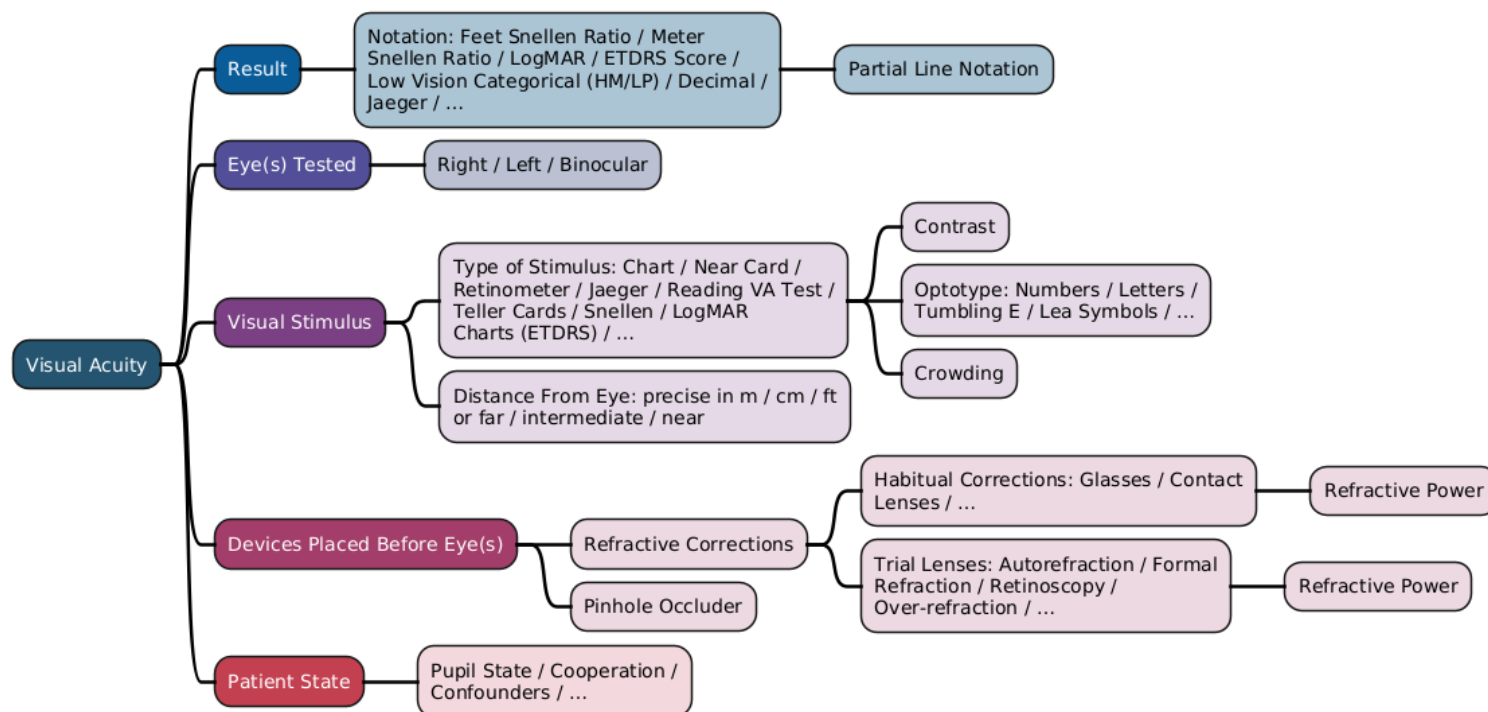


- Visual acuity
- Slit lamp biomicroscopy ($\pm$ fundoscopy)
- Ophthalmic imaging



Data Type: Visual Acuity

- Measurement of visual clarity or sharpness of vision: endpoint of clinical trial



Source Data

Right eye, distance VA, measured with ETDRS chart, with glasses, with pinhole, before dilation



SNOMED

Right eye visual acuity – corrected (concept ID 4160316)

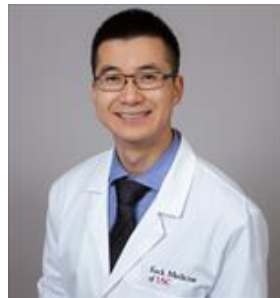


Data Type: Visual Acuity

- Work with what we have:
 - Define a Best Recorded Visual Acuity (BRVA)
 - Themis conventions
 - Epic Clarity ETL scripts being tested
 - Cerner ETL scripts ongoing
- Expand existing standards:
 - LOINC VA panel submission
 - Discussions with SNOMED (Ophthalmology Clinical Reference Group)



Nitin Parikh
Bascom Palmer



Brian Toy
USC



Data Type: Slit Lamp Exam

- Work with what we have:
 - Agreeing upon the conceptual ETL rules: Themis conventions
 - Developing EHR specific scripts (Epic, Cerner, OpenEyes, Medisoft)
- Expand on existing standards:
 - Submissions to LOINC
 - Submission to SNOMED (Ophthalmology Clinical Reference Group)



Data Type: Ophthalmic Imaging

- Crucial piece for diagnosis, monitoring, and treatment of eye disease
 - Challenges with lack of compliance with DICOM, interoperability, and sharing images
- Ongoing work:
 - Demonstration of federated learning predicting Thyroid Eye Disease from external photographs
 - RadLex extension for eye related data (EyeLex)
 - Submitted new concepts to vocabularies
 - LOINC: new terms added for imaging findings (e.g., visual fields)
 - DICOM Supplement 247: Eyecare Measurement Templates

Table A-3. Context Group UID Values

Context Group UID	Context Group Identifier	Context Group Name	Comment
1.2.840.10008.6.1.x1	CID 42x1	Visual Field Measurements	
1.2.840.10008.6.1.x2	CID 42x2	Optic Disc Key Measurements	
1.2.840.10008.6.1.xa	CID 42xa	Retinal Sector Methods	
1.2.840.10008.6.1.x3	CID 42x3	RNFL Sector Measurements	
1.2.840.10008.6.1.xb	CID 42xb	RNFL Clockface Measurements	
1.2.840.10008.6.1.x4	CID 42x4	Macular Thickness Key Measurements	
1.2.840.10008.6.1.x5	CID 42x5	Ganglion Cell Measurement Extent	
1.2.840.10008.6.1.x6	CID 42x6	Ganglion Cell Key Measurements	
1.2.840.10008.6.1.x7	CID 42x7	Ganglion Cell Sector Measurements	
1.2.840.10008.6.1.x8	CID 42x8	Ganglion Cell Sector Methods	
1.2.840.10008.6.1.y0	CID 42y0	Endothelial Cell Count Measurements	
1.2.840.10008.6.1.y1	CID 42y1	Ophthalmic Image ROI Measurements	



Subspecialty Specific Standardization Efforts

- Uveitis
 - Implemented existing SUN classifications as phenotypes
- Glaucoma
 - Standardize disease definition
 - Expanded SNOMED terms
- Pediatric
 - Mapped data elements
 - Testing adult definition for visual acuity



Engagement with Broader Standards Community

- **Implementation:** HL7 FHIR Connectathon: IOP exchange
- **Education:** Publishing standards paper in *Translational Vision Science & Technology*
- **Engagement:**
 - Collaborative Community on Ophthalmic Innovation (CCOI)
 - American Academy of Ophthalmology (AAO)
 - USCDI+Eye



Call to Action

- Cross-collaboration with other workgroups
 - Patient-level Prediction
 - Medical Imaging
 - Natural Language Processing (NLP)

Get to Know the OHDSI Workgroups

[Africa Chapter](#)

[APAC](#)

[ATLAS/WebAPI](#)

[Clinical Trials](#)

[Common Data Model](#)

[CDM Survey Subgroup](#)

[CDM Vocabulary Subgroup](#)

[Dentistry](#)

[Early-Stage Researchers](#)

[Electronic Animal Health Records](#)

[Eye Care & Vision Research](#)

[FHIR and OMOP](#)

[Generative AI & Analytics in Healthcare \(GAIA\)](#)

[GIS – Geographic Information System](#)

[HADES](#)

[Health Equity](#)

[Healthcare Systems](#)

[Industry](#)

[Latin America](#)

[Medical Devices](#)

[Medical Imaging](#)

[Methods Research](#)

[Natural Language Processing](#)

[Network Data Quality](#)

[Oncology](#)

[Open-Source Community](#)

[Patient-Level Prediction](#)

[Perinatal and Reproductive Health](#)

[Phenotype Development & Evaluation](#)

[Psychiatry](#)

[Rehabilitation](#)

[Registry](#)

[Steering Group](#)

[Surgery and Perioperative Medicine](#)

[Themis](#)

[Vaccine Vocabulary](#)



How to Join

- Eye Care Vision Research Workgroup: second Wednesday of each month at 7PM ET
 - Next meeting moved to Wednesday September 16, 2026 at 7PM
- Global OHDSI Symposium
 - 8AM to 10AM Thursday 10/22/2026
 - New network study ideas, roadmap for the future

...if you can read this slide...