

## Statistical methods for correlated eye data

### Course organizers

Maureen G Maguire, PhD, FARVO, University of Pennsylvania and Gui-shuang Ying, PhD, University of Pennsylvania

### Presentations

Presenters and presentations may change.

Time	Presentation title	Presenter
8-8:05am	Welcome and Introductions	Maureen G Maguire, PhD, FARVO, University of Pennsylvania
8:05-8:30am	Current approaches to the statistical analysis of correlated eye data and Discussion/Questions	Maureen G Maguire, PhD, FARVO, University of Pennsylvania
8:30-9:10am	Analyses for continuous, correlated outcomes in cross-sectional studies and Discussion/Questions	Gui-shuang Ying, PhD, University of Pennsylvania
9:10-9:45am	Statistical analysis of binary, correlated outcomes in cross-sectional studies and Discussion/Questions	Robert Glynn, PhD, T.C. Channing School of Public Health, Harvard University
9:45-10am	Morning Break	
10-10:40am	Analyses for continuous, correlated outcomes in longitudinal studies and Discussion/Questions	Bernard Rosner, PhD, T.C. Channing School of Public Health Harvard University
10:40-11:15am	Analyses for correlated categorical outcomes in longitudinal studies and Discussion/Questions	Michele Melia, ScM, JAEB Center for Health Research
11:15-11:50am	Survival analyses for time to event outcomes in longitudinal studies and Discussion/Questions	Xiangrong Kong, PhD, Wilmer Eye Institute, Johns Hopkins School of Medicine
11:50 – 12pm	Final questions and answers	All speakers

### Continuing Medical Education Program Information

#### Statement of need

Despite the availability of statistical methods that appropriately handle the correlation in outcome measures between the two eyes of an individual person or animal, many clinician-scientists either ignore the correlation and provide incorrect data analyses or limit their analyses to only one eye and “waste” the data from the second eye or design relatively inefficient experiments. Many clinician-scientists are not familiar with the specialized

methods appropriate for correlated eye data and therefore do not know how to apply them in to practice. Further, many statistical software packages provide procedures to perform appropriate analyses, but researchers are not aware of them or are uncertain about how to apply them.

### **Target audience**

The target audience includes clinicians and basic scientists in the vision and ophthalmology field, who need to analyze data from both eyes of study subjects or animals. The course content is for those familiar with statistical analysis, including linear and logistic regression analysis.

### **Educational objectives**

After participating in this CME activity, participants should be able to:

- Recognize research study designs that require statistical methods for correlated eye data.
- Evaluate comparisons of groups when the two eyes of an individual are in different or the same groups using simple methods that do not accommodate covariates and more complex model-based methods that do accommodate covariates.
- Explain the results of statistical analyses for correlated eye data.

### **Physician accreditation statement**

The Association for Research in Vision and Ophthalmology (ARVO) is accredited by the Accreditation Council for Continuing Medical Education (ACCME) to provide continuing medical education for physicians.

### **Physician credit designation**

ARVO designates this live activity for a maximum of 3.75 *AMA PRA Category 1 Credits™*. Physicians should claim only the credit commensurate with the extent of their participation in the activity.

International Attendees: The American Medical Association (AMA) has determined that physicians not licensed in the U.S. who participate in CME activities are eligible for *AMA PRA Category 1 Credit™*.

The following Annual Meeting session types are not certified as Continuing Medical Education (CME) and are not eligible for *AMA PRA Category 1 Credit™*: ALCON/Keynote series, Award lectures, Posters, SiGs, and Special sessions.

### **American Board of Ophthalmology (ABO) diplomates**

Successful completion of this CME activity, which includes participation in the evaluation component, enables the learner to satisfy the Lifelong Learning, Self-Assessment, Improvement in Medical Practice and/or Patient Safety requirements for the American Board of Ophthalmology's Maintenance of Certification program. It is the CME activity provider's responsibility to submit learner completion information to ACCME for the purpose of granting MOC credit.

The Annual Meeting qualifies for Lifelong Learning (Part II). Credits will be reported to the ABO via the ACCME in September each year.

ARVO does not solicit commercial support so learner data will not be shared with any entity other than the ACCME for the purpose of granting MOC credit. Attendees will be able to provide the required information for MOC credit tracking on the Overall Meeting Evaluating Form. By providing the required information, attendees will be giving ARVO permission to share their learner data with the ACCME.

### **Royal College of Physicians and Surgeons of Canada**

Fellows and Health Care Professionals participating in the Maintenance of Certification Program can record credits earned at the Annual Meeting toward Section 1: Group Learning Credits.

## European Union of Medical Specialists (UEMS) CME/CPD requirements

European physicians can convert CME credit from the Annual Meeting to meet European Union of Medical Specialists (UEMS) CME/CPD requirements.

The American Medical Association has an agreement of mutual recognition of CME credits with the UEMS, the accreditation body for European countries. Physicians interested in *converting AMA PRA Category 1 Credit™* to UEMS-European Accreditation Council for Continuing Medical Education CME credits (ECMECs) should contact the UEMS at [mutualrecognition@uems.eu](mailto:mutualrecognition@uems.eu).

## Certificate of participation

ARVO is accredited to offer *AMA PRA Category 1 Credits™* to physicians. All other participants in the CME program may receive a Certificate of Participation that documents the number of CME hours attended\* by following the same instructions listed above and paying the CME credits and certificates fee.

\*Some accrediting agencies may award equivalent Continuing Education (CE) credit when presented with a Certificate of Participation from an activity that offered *AMA PRA Category 1 Credit™*. Check with your accrediting agency for information.

## Instructions to receive credit and/or certificates

Attendees interested in claiming *AMA PRA Category 1 Credits™* for attendance at this Education Course must pay the CME credits and certificates fee. Payment is collected during the Annual Meeting registration process by adding “CME credits and certificates” as a session. **Attendees who do not register for CME before the conclusion of the course will not be able to claim and request credit.** Attendees registered as guests are not eligible to receive CME credit.

CME registrants will receive an email from “ARVO 2019 CME” with credit claiming instructions prior to the start of the Education Course. All requests for credit must be submitted no later than 11:59pm U.S. Eastern Time on Friday, Aug. 30, 2019.

## Contact us

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## Certificate of attendance

Certificates of attendance are available free to all attendees. These certificates state that one has attended the Education Course; but does not offer credit tracking. Contact [education@arvo.org](mailto:education@arvo.org) to request a certificate of attendance.

CME credits and certificate fee (paid in conjunction with Annual Meeting registration)	Advance	Onsite
MIT, Student Non-Member	\$59	\$59
Member, Non-Member, Exhibitor (paid full-meeting access badge)	\$79	\$99
Exhibitor (complimentary full-meeting access badge only)	\$89	\$89

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The *planners and managers* reported the following financial relationships or relationships to products or devices that they or their spouse/life partners have with commercial interests related to the content of this CME activity:

### **Professional Development and Education Committee (PDEC)**

Chair: Shlomit Schaal, MD PhD; Nothing to disclose.

*The following individuals on the AMPC reported financial relationships.*

Name	Commercial interest (nature of the relationship)
Bennie H Jeng, MD	Aquinox: (C); Aerie: (C); EyeGate: (I, C); Kedrion: (C); TissueTech: (C)

*The following individuals on the PDEC committee reported no financial relationships.*

Nizar Saleh Abdelfattah, MD, David Cordeiro Sousa, MD, MSc, Thomas Armin Fuchsluger, MD PhD FEBO MSc, Meredith Giblin, Bo Lei, MD PhD, Yureeda Qazi, M.D, Andrew T C Tsing, PhD FARVO, Fuensanta A Vera-Diaz, PhD, OD, Siamak Yousefi, PhD, Jie J Zheng, PhD

## Continuing Medical Education Committee (CME)

Chair: William J Foster, MD PhD FRCSC, Altasciences Clinical Research: (C); US Patent 9,050,171, Small diameter fragmatome for minimally traumatic retained lens fragments removal: (P)

*The following individuals on the CME Committee reported financial relationships.*

Name	Commercial interest (nature of the relationship)
Anton B. Hommer, MD	Santen: (R); Allergan: (R); Alcon: (R); Thea: (R)
Christina Y Weng, MD, MBA	Allergan, Inc.: (C); Alimera Sciences, Inc.: (C)

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