



THE UNIVERSITY OF ARIZONA COLLEGE OF PHARMACY

Center for Health Outcomes
& PharmacoEconomic Research

Training Program in Meta-Analysis

June 20-22, 2017

The University of Arizona
College of Pharmacy
Tucson, Arizona

*A 3-day, hands-on training
program for personnel
in healthcare decision-
making, industry and
academic research,
or graduate training
programs wanting to
evaluate results across
multiple studies*

Sponsored by
The University of Arizona
College of Pharmacy



An Overview of the Meta-Analysis Program

In an era of information overload and increasing accountability, the goal of many aspects of research in healthcare has moved from understanding treatment effects within a single study to synthesizing effectiveness across multiple studies. To help those working in healthcare policy, pharmaceutical and biomedical industries, and academic research perform and interpret results from multiple studies, the Center for Health Outcomes and PharmacoEconomic Research is offering a training program in meta-analysis.

A 3-day practical training program has been developed and is aimed at professionals and trainees with an entry to intermediate knowledge level. The curriculum integrates in-depth instruction and hands-on workshops and is designed to facilitate interactive sessions and personalized attention.

Participants will develop skills in developing protocols and performing effective literature searches, screening studies and extracting data, and in performing and interpreting meta-analysis and meta-regression. Participants in this training program will have the opportunity to confer with program faculty and other participants.



Training Program Faculty

Ivo Abraham, PhD, RN

*Professor of Pharmacy and Medicine
The University of Arizona College of Pharmacy*

Sandipan Bhattacharjee, PhD, MS

*Assistant Professor, Department of Pharmacy Practice & Science
The University of Arizona College of Pharmacy*

Jason Hurwitz, PhD

*Research Scientist
Center for Health Outcomes and PharmacoEconomic Research*

Christopher S. Lee, PhD, RN

*Associate Professor of Nursing and Cardiovascular Medicine
Oregon Health & Science University School of Nursing
OHSU Knight Cardiovascular Institute*

Jennifer Martin, MA

*Associate Librarian, Arizona Health Sciences Library
Clinical Instructor, Department of Pharmacy Practice & Science*

Marion Slack, PhD

*Professor, Department of Pharmacy Practice & Science
The University of Arizona College of Pharmacy*

Continuing Education



PHARMACY

The University of Arizona College of Pharmacy is accredited by the Accreditation Council for Pharmacy Education as a provider of continuing pharmacy education. Pharmacists attending all sessions and completing the associated activities will be awarded 20 hours.



THE UNIVERSITY OF ARIZONA
College of Pharmacy

WORKSHOP REQUIREMENTS

Participants need to bring a laptop computer or tablet to participate in workshops. We will primarily use Excel for exercises.

Tuesday, June 20, 2017

Training Program in Meta-Analysis Agenda

- 8:00-8:30 am** **Breakfast, registration, Pre-test and Welcome**
- 8:30-9:00** **Value of Meta-Analysis: Why do it?**
Ivo Abraham, Ph.D., R.N.
- Discuss the use and importance of meta-analysis
 - Identify advantages and disadvantages of meta-analysis
- ACPE Program Number: 0003-0000-17-022-L01-P • .5 hour, knowledge-based activity
- 9:00-10:00** **Meta-Analysis Review**
Marion Slack, Ph.D.
- Using a published meta-analysis, identify techniques, terminology, and core concepts
 - Discuss effect size and use of PRISMA criteria
- ACPE Program Number: 0003-0000-17-023-L01-P • 1 hour, knowledge-based activity
- 10:00-10:15** **Break**
- 10:15-12:15 pm** **Within- and Between-Study Estimates of Effect and Variability**
Christopher S. Lee, Ph.D., R.N.
- Describe estimates of effect and precision using means, binary data, correlations, and point estimates
 - Calculate variance, standard error, confidence intervals, and effect sizes
- ACPE Program Number: 0003-0000-17-024-L01-P • 2 hours, application-based activity
- 12:15-1:15** **Lunch**
- 1:15-2:45** **Protocols for Meta-Analysis**
Marion Slack, Ph.D.
- Identify the components of a protocol for conducting a meta-analysis
 - Discuss use of PICOS + E (population, intervention, comparator, outcome(s) of interest, study design, and exclusion criteria)
 - Develop items for a screening and data extraction tool
- ACPE Program Number: 0003-0000-17-025-L01-P • 1.5 hours, application-based activity
- 2:45-3:00** **Break**
- 3:00-5:00** **Fixed and Random Effects Models**
Christopher S. Lee, Ph.D., R.N.
- Discuss the assumptions that underlie fixed and random effects models
 - Compare procedures and products associated with fixed and random effects models
 - Calculate weights for each study using fixed and random models, and calculate a summary effect
 - Compare and contrast fixed and random effects model results
- ACPE Program Number: 0003-0000-17-026-L01-P • 2 hours, application-based activity



8:00-8:30 am

Breakfast

8:30-10:00

Literature Search Techniques for Meta-Analysis

Jennifer Martin, M.A.

- Identify appropriate databases
- Develop database search strategies
- Describe methods to document strategies
- Conduct a series of database searches; evaluate the strategies and results

ACPE Program Number: 0003-0000-17-027-L01-P • 2.25 hours, application-based activity

10:00-10:15

Break

10:15-11:00

Literature Search Techniques for Meta-Analysis (continued)

11:00-12:00 pm

Screening Studies and Data Extraction

Marion Slack, Ph.D. and Jason Hurwitz, Ph.D.

- Identify candidate studies from literature utilizing a screening tool
- Obtain data for a meta-analysis using the data extraction tool
- Create a small data set for use in meta-analysis
- Conduct a meta-analysis; obtain a forest plot, a print out, and identify estimates of effect

ACPE Program Number: 0003-0000-17-028-L01-P • 1.5 hours, application-based activity

12:00-1:00

Lunch

1:00-1:30

Screening Studies and Data Extraction (continued)

1:30-3:00

Quantifying and Interpreting Heterogeneity

Christopher S. Lee, Ph.D., R.N.

- Compare and contrast metrics of total dispersion (Q), total to excess dispersion ($Q-df$), between-study variance (τ^2), and signal-to-noise ratio (I^2)
- Conduct a random effects meta-analysis
- Interpret the summary effect and the metrics of heterogeneity

ACPE Program Number: 0003-0000-17-029-L01-P • 1.5 hours, application-based activity

3:00-3:15

Break

3:15-4:15

Special Topics: Network Meta-Analysis

Ivo Abraham, Ph.D., R.N.

- Compare and contrast approaches of direct and indirect treatment comparisons using meta-analytic approaches
- Discuss the benefits of network meta-analysis
- List potential criticisms of network meta-analysis

ACPE Program Number: 0003-0000-17-030-L01-P • 1 hour, knowledge-based activity



8:00-8:30 am

Breakfast

8:30-10:00

Evaluating Published Meta-Analyses

Sandipan Bhattacharjee, Ph.D., M.S.

- Discuss the process to critique and evaluate meta-analyses
- Review and critique a well done and a flawed meta-analysis
- Apply AMSTAR criteria for the evaluation

ACPE Program Number: 0003-0000-17-031-Lo1-P • 1.5 hours, application-based activity

10:00-10:15

Break

10:15-11:00

Special Topics: Meta-Analysis of Separate Data Sets and of Single Case Research

Jason Hurwitz, Ph.D.

- Compare and contrast issues in analyzing data from publications vs from original data sets for separate studies
- Describe why multilevel modeling is needed to analyze nested data
- Recognize techniques for pooling a series of n-of-1 trials conducted by the same or different clinicians
- Discuss how clinicians use single case research to generate practice-based evidence

ACPE Program Number: 0003-0000-17-032-Lo1-P • 0.75 hour, knowledge-based activity

11:00-11:15

Group photo

11:15-12:00

Special Topics: Meta-Analysis - Special Considerations

Christopher S. Lee, Ph.D., R.N.

- Describe the hierarchical summary receiver operating characteristic (HSROC)
- Discuss the use of diagnostic odds ratios to evaluate sensitivity and specificity
- List special considerations for meta-analyses involving cross-over trials or cluster-randomized trials

ACPE Program Number: 0003-0000-17-033-Lo1-P • .75 hour, knowledge-based activity

12:00-1:00 pm

Lunch

1:00-3:15

Examining Bias in Meta-Analysis

Christopher S. Lee, Ph.D., R.N.

- Explain publication bias using funnel plots, contour-enhanced plots, and non-parametric trim and fill
- Discuss tests for small study effects
- Describe classic and Orwin's fail-safe N
- Interpret the results of tests of publication bias
- Describe the results of Egger's test of small study effects
- Analyze published meta-analyses that use trim and fill and fail-safe N

ACPE Program Number: 0003-0000-17-034-Lo1-P • 2.25 hours, application-based activity



(continues)

Thursday, June 22, 2017

3:15-3:30

Break

3:30-4:30

Sub-group Analysis and Meta-Regression

Christopher S. Lee, Ph.D., R.N.

- Describe situations when subgroup analyses are appropriate
- Identify procedures and products associated with sub-group analysis
- Describe incorporation of covariates using meta-regression
- Discuss interpreting data output from multivariate meta-regression

ACPE Program Number: 0003-0000-17-035-Lo1-P • 1 hour, knowledge-based activity

4:30-5:00

Post-Test and Review

- Complete post-test to identify knowledge change
- Identify and discuss results of pre and post test questions to determine change in knowledge
- Discuss final questions or clarification of content presented during the program

ACPE Program Number: 0003-0000-17-036-Lo1-P • .5 hours, knowledge-based activity

5:00

Close of program





Registration

Venue

UA College of Pharmacy
Drachman Hall
Pulido Center
1295 N. Martin Ave.
Tucson, AZ

Lodging

Area hotels offer lodging at reasonable rates and close proximity to the college

Tucson University Park

520-792-4100

Arizona Inn

800-933-1098

Aloft Tucson University

520-908-6800

Please use the online registration process at <https://events.pharmacy.arizona.edu/metaanalysis> OR complete the registration form and return it with your payment. The registration fee for the Training Program in Meta-Analysis includes all sessions, training materials, daily breakfast, lunch, breaks, continuing education credit for pharmacy and a certificate of completion.

REFUND POLICY: A refund (less \$375 cancellation fee) will be available for cancellations received in writing by June 2, 2017.

Registration fees paid to The University of Arizona Foundation are not considered a tax-deductible gift contribution.

Persons with a disability may request a reasonable accommodation, such as sign language interpreter, by contacting the Office of Continuing Education, 520-626-3020, email: continuinged@pharmacy.arizona.edu. Requests should be made as early as possible to allow time to arrange the accommodation.

For further information:

Office of Continuing Education
The University of Arizona
College of Pharmacy
PO Box 210202
Tucson, Arizona 85721-0202

Phone: (520) 626-3020

Email: continuinged@pharmacy.arizona.edu

Web address: www.pharmacy.arizona.edu



Online Registration

<https://events.pharmacy.arizona.edu/metaanalysis>

If not using the online system,
please return registration form below:

Registration Form

Training Program in Meta-Analysis • June 20-22, 2017

NAME _____

DEGREE _____ POSITION _____

AFFILIATION _____

ADDRESS _____

CITY _____ STATE _____ ZIP CODE _____

TELEPHONE _____ FAX _____

EMAIL ADDRESS _____

- Registration fee:** Professional: \$2,000
 Trainee (Fellows/Residents/Graduate students): \$750
 University of Arizona Faculty/Staff

Please indicate method of payment:

Check made payable to the **The University of Arizona Foundation**

Visa Mastercard American Express

Card Number _____ Expiration Date _____

Cardholder's name as it appears on card _____

Card Billing Address _____

Please return completed registration form and payment to: Office of Continuing Education
The University of Arizona College of Pharmacy
PO Box 210202
Tucson, Arizona 85721-0202
Email: continuinged@pharmacy.arizona.edu