

“Annie” Kai I. Cheang, PharmD, MS, BCPS

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Professional Qualifications

Medical writer and researcher with 18 years of experience in medical writing and clinical and HEOR research (including strategic analysis, grant proposals, clinical research design, clinical protocol, biostatistics and data interpretation, and epidemiology). Functioned in interdisciplinary research teams either as team leader / principal investigator, or collaborative consultant. Board-certified clinical pharmacist and up to date in a broad range of therapeutic areas.

Extensive experience in writing and editing scientific manuscripts for peer-reviewed journals

- First author, corresponding author, or co-author for 34 peer-reviewed journal articles
- Freelance medical writer for manuscripts (original manuscripts and review articles)
- Primary author for 3 book chapters
- Journal reviewer for 14 journals
- Editor and faculty panel chair for a book used for Board of Pharmacy Specialties recertification

Continuing education and training programs

- Designed, authored and delivered in-person CEs
- Writer for CME articles
- Writer for CME needs assessments
- Slide decks for CME programs (cardiovascular disease prevention, stroke, REMS-compliant opioid education, atopic dermatitis, new opioid mechanism of action, women’s health topics)
- Authored and delivered 20 symposia presentations for national and international meetings
- Course design, instruction and coordination for numerous PharmD professional degree courses (women’s health, endocrinology, cardiology, literature evaluation, pharmacoepidemiology and research methods)

Substantial experience in all components of clinical research

- As Principal Investigator or Co-Investigator, created complete proposal packages and received 30 grant awards from the National Institutes of Health, American Heart Association, and other foundations
- Grant reviewer for Veterans Affairs Merit Review Clinical Trials Panel, and national and local research institutes
- Performed gap analyses, study design, wrote clinical study protocols, designed data analysis plans, performed data interpretation for 30 funded projects
- Responsible for all internal regulatory documents (including IRB approvals, informed consent documents, submitting IND for investigator-initiated studies)

Extensive experience in biostatistics, epidemiology and HEOR

- Study design for epidemiological research using large administrative or prospective observational datasets
- Original HEOR research manuscripts
- Study design for meta-analyses
- Sole biostatistician for 18 clinical, health outcomes and epidemiological research projects. Skilled in SAS®, R, and JMP® statistical packages
- Graduate-level coursework in data science
- Skilled in large dataset manipulations, including linking datasets, data extraction, creating study data files from administrative databases, electronic health records, and population-based data sources (e.g. Cerner, Medical Expenditure Panel Survey, NHLBI Cardiovascular Health Study, etc)
- Appointed by the Commonwealth of Virginia Chief Medical Examiner as member of the Commonwealth Maternal Mortality Team. Conducted surveillance and risk factor assessments for maternal deaths

Broad experience in creating abstracts and posters

- Authored 44 abstracts and 44 posters

White papers and clinical guidelines

- Experienced in performing comprehensive medical literature reviews and synthesis of major findings
- Primary author for a white paper on special populations in research studies
- Co-author for a position statement paper for Endocrine Society and Androgen Excess Society

Online learning

- Faculty consultant for CMR Institute "Focus on Women's Health and Reproductive Systems," 2016
- Faculty and co-author for American Heart Association "Healthy Lifestyle" Continued Medical Education Program, 2016
- Designed and created online and blended learning courses in PharmD curriculum

Pharmaceutical Sales Representative Training Materials

- Wrote comprehensive pathophysiology and pharmacology modules for plaque psoriasis, psoriatic arthritis and ankylosing spondylitis
- Course consultant, CMR Institute

Patient education and engagement

- Designed patient education and recruitment materials, and informed consent documents for clinical trials

Professional Affiliations

- American Heart Association (Clinical Cardiology Council member)
- American Diabetes Association
- American Society for Reproductive Medicine
- Endocrine Society
- American College of Clinical Pharmacy (Elected Fellow 2009)
- American Medical Writers Association
- International Society for Pharmacoeconomics and Outcomes Research

Professional Experience

Scientific Value, Mechanicsville, VA, 2017 – present

Principal medical writer and Scientist

Clinical and Epidemiological research

- Literature gap analyses
- Research design (including prospective and retrospective designs)
- Feasibility analyses
- Statistical plans, data analyses and interpretation

Medical writing

- Abstracts and posters
- Case studies
- Clinical study protocols
- Clinical guidelines, position, and consensus statements
- ClinicalTrials.Gov results postings
- Consumer health education
- Continuing medical education (CME)
- Journal articles (original research articles, review articles or other secondary manuscripts), reporting data from:
 - Clinical trials and post-marketing studies
 - Epidemiological / observational studies
 - Health economic studies

- Literature summaries and updates
- Needs assessments
- Newsletters
- Product monographs
- Proposals and grants
- Slide kits, speaker training, and lecture notes
- Systematic literature reviews
- White Papers

Therapeutic areas

I have published and created deliverables on the following areas:

- Affordable Care Act (ACA)
- Cardiovascular disease (CVD), including hypertension, heart failure, peripheral arterial disease (PAD), dyslipidemia, stroke, peripheral vascular disease [PAD], acute coronary syndrome [ACS], cardiac arrhythmia
- Dermatology (atopic dermatitis, psoriasis, acne)
- Diabetes (T1DM, T2DM, glucose monitoring)
- Diabetes in pregnancy and gestational diabetes (GDM)
- Endocrine disorders (androgen excess, polycystic ovary syndrome, hirsutism)
- Erectile dysfunction
- Gastroenterology (fatty liver disease, incretins pharmacology, cirrhosis)
- Immunology (atopic dermatitis, psoriasis, psoriatic arthritis, ankylosing spondylitis)
- Nutrition
- Neurology (Parkinson's disease, with and without motor fluctuations)
- Obesity, metabolic syndrome
- Oncology (Breast cancer prevention, triple negative breast cancer)
- Pain management (new opioids, drug-like, brain uptake, pharmacokinetics and pharmacodynamics, REMS-compliant ER/LA opioid CME)
- Pharmacogenomics
- Rheumatology (psoriatic arthritis, ankylosing spondylitis)
- Thromboembolic disorders (venous thromboembolism [VTE], including deep vein thrombosis [DVT], and pulmonary embolism [PE])
- Women's Health (including contraception, emergency contraception, infertility, ovulatory disorders, pregnancy, postmenopausal hormone therapy, abnormal uterine bleeding)
- Psychiatry (menstrual-related mood disorders, mood disorders in pregnancy)

In addition to the above, as a board-certified pharmacotherapy specialist (BCPS) and clinical pharmacist with advanced clinical experience, I have up-to-date and clinically applicable knowledge, and a firm grasp of the nuances of a broad variety of disease states, including but not limited to:

- Attention deficit hyperactivity disorder (ADHD)
- Diabetes & Endocrinology (thyroid disorders, Cushing's disease)
- Gastrointestinal disorders (Irritable bowel disease [IBD], fatty liver disease, cirrhosis)
- Infectious disease (Clostridium Difficile Colitis [C. diff], Hepatitis C [HCV], HIV, pneumonia, line infection, osteomyelitis, MRSA)
- Oncology / Hematology (renal cell carcinoma, lung cancer, melanoma, multiple myeloma, non-Hodgkin's lymphoma, Hodgkin's lymphoma)
- Nephrology (chronic kidney disease [CKD], urinary tract infection, overactive bladder)

- Neurology (migraine, multiple sclerosis, epilepsy)
- Osteoarthritis
- Osteoporosis
- Psychiatry (depression, bipolar disorder, schizophrenia / antipsychotics)
- Pulmonary / Respiratory diseases (allergic rhinitis, COPD, asthma)
- Rheumatologic disorders (fibromyalgia, rheumatoid arthritis)
- Vaccines

Virginia Commonwealth University, Richmond, VA, 2001-present

- Assistant Professor (2001-2009), and Associate Professor with tenure (2009-2017), Affiliate Associate Professor (2018), Department of Pharmacotherapy and Outcomes Science
- Conducted clinical and epidemiology research: idea conception, study design, securing funding, directing and mentoring study personnel, functioning in cross-disciplinary teams, data collection, data analyses, dissemination (abstracts/posters/study reports/published manuscripts)
- Curriculum and course design, instructor and coordinator for PharmD courses
- Practicing clinical pharmacist (VA License 0202205605) and Board Certified Pharmacotherapy Specialist (BCPS), 2001-present.

University of Utah, Salt Lake City, UT, 1999-2001

- Cardiovascular Experimental Pharmacotherapy Fellowship. Conducted clinical research from idea conception, study design, securing funding, data collection, data analyses, to dissemination (abstracts/posters/study reports/published manuscripts). Led industry-funded research protocols.

Barnes-Jewish Hospital, Washington University Medical Center, St. Louis, MO, 1998-1999

- Pharmacy Practice Resident. Provided inpatient and outpatient clinical services to internal medicine and other sub-specialty units
- Served on Pharmacy and Therapeutics Committee

Other Professional Experiences (most recent)

- Author for *Menstruation-related Disorders* in *Pharmacotherapy: A Pathophysiological Approach 11th ed*, McGraw Hill (textbook used by almost all U.S. schools of pharmacy)
- Member, University Research Conflict of Interest Committee, and University Institutional Conflict of Interest Committee, 2011-2017
- Grant reviewer, Veterans Affairs Merit Review Clinical Trials Panel, 2013-2016
- Grant reviewer, Virginia Commonwealth University Center for Clinical and Translational Research, 2012
- Member, Commonwealth of Virginia Maternal Mortality Review Board (appointed by the Commonwealth Chief Medical Examiner), 2016-2017
- Faculty, "Healthy Lifestyle" Professional Education Program, American Heart Association, 2016
- Faculty chair and Editor, Pharmacotherapy & Self-Assessment Program, "Women's and Men's Health", 2015-2016
- Abstract reviewer, American College of Clinical Pharmacy Annual Meetings 2002-present

Education

- Master of Science in Biostatistics, Virginia Commonwealth University, Richmond, VA, 2009
- Doctor of Pharmacy, University of Texas, Austin, TX, 1998

Selected publications

1. Pakyz AL, Cheang KI, Stultz JS, Moczygemba LR. Building population health management skills for pharmacy students: implementation of needs assessment and program evaluation activities. *Am J Pharm*

Educ [epub ahead of print]

2. Cheang KI, Sistrun SN, Morel KS, Nestler JE. Effect of insulin-stimulated release of D-chiro-inositol-containing inositolphosphoglycan mediator during weight loss in obese women with and without polycystic ovary syndrome. *Int J Endocrinol* 2016;2016:7631804.
3. Cheang KI, Nguyen TT, Karjane NW, Salley KES. Raspberry leaf and hypoglycemia in gestational diabetes mellitus. *Obstet Gynecol* 2016;128(6)1421-1424
4. Pau CT, Cheang KI, Modi BP, Kasippilai T, Keefe CC, Shullea M, Evans WS, Pal L, Strauss 3rd JF, Nestler JE, Welt CK. The role of variants regulating metformin transport and action in women with polycystic ovary syndrome. *Pharmacogenomics*. [epub ahead of print]
5. Adeniji AA, Essah PA, Nestler JE, Cheang KI. Metabolic effects of a commonly used combined hormonal contraceptive in women with and without polycystic ovary syndrome. *J Womens Health* 2016; 25(6): 638-645. PMID: PMC4900190
6. Siddiqui MS, Cheang KI, Luketic VA, Boyett S, Idowu MO, Patidar K, Puri OP, Matherly S, Stravitz RT, Sterling RK, Sanya AJ. Nonalcoholic steatohepatitis (NASH) is associated with a decline in pancreatic beta cell (B-cell) function. *Dig Dis Sci* 2015; 60: 2529-.2537. PMID: PMC4900167
7. Brady MA, Carroll AW, Cheang KI, Straight C, Chelmow D. Sequential compression device compliance in postoperative obstetrics and gynecology patients. *Obstet Gynecol* 2015;125(1):19-25
8. Zreikat HH, Harpe, SE, Slattum PW, Mays DP, Essah PA, Cheang KI. Effect of renin-angiotensin system inhibition on cardiovascular events in older hypertensive patients with metabolic syndrome. *Metabolism* 2014; 63(3): 392-399. PMID: PMC3957480
9. Nestler JE, Reilly ER, Cheang KI, Bachmann LM, Downs RW. A pilot study: effects of decreasing serum insulin with diazoxide on Vitamin D levels in obese women with polycystic ovary syndrome. *Trans Am Clin Climatol Assoc* 2012; 123:209-220. PMID: PMC3540606
10. Witchel SF, Recabarren SE, Gonzalez F, Diamanti-Kandarakis E, Cheang KI, Duleba AJ, et al. Emerging concepts about prenatal genesis, aberrant metabolism and treatment paradigms in polycystic ovary syndrome. *Endocrine* 2012;42:526-34. PMID: PMC3485440
11. Karjane NW, Cheang KI, Mandolesi GA, Stovall DW. Persistence with oral contraceptive pills vs. metformin in women with polycystic ovary syndrome. *J Womens Health* 2012; 21:690-4
12. Vinluan CM, Zreikat HH, Levy JR, Cheang KI. Comparison of different metabolic syndrome definitions in prediction of future cardiovascular events in the elderly. *Metabolism* 2012;61:302-309. PMID: PMC3218249
13. Essah PA, Arrowood JA, Cheang KI, Adawadkar SS, Stovall DW, Nestler JE. Effect of combined metformin and oral contraceptive on metabolic factors and endothelial function in overweight and obese women with polycystic ovary syndrome. *Fertility & Sterility* 2011;96:501-504
14. Cheang, KI, Essah PA, Sharma S, Wickham EP, Nestler JE. Divergent Effect of a combined hormonal oral contraceptive on metabolic factors in lean versus obese women. *Fertility & Sterility* 2011;96:353-359. PMID: PMC3143285
15. Wickham EP, Cheang KI, Clore JN, Billargeon JP, Nestler, JE. Total and High-Molecular Weight Adiponectin in Women with the Polycystic Ovary Syndrome. *Metabolism: Clinical and Experimental* 2011;60:366-72. PMID: PMC2946975
16. Cheang KI, Huszar JM, Best AM, Sharma S, Essah PA, Nestler JE. Long-term effect of metformin on metabolic parameters in the polycystic ovary syndrome. *Diab Vasc Dis Res* 2009;6:110-9. PMID: PMC2907923
17. Cheang KI. Effect of Learner-Centered Teaching on Motivation and Learning Strategies in a Third-Year Pharmacotherapy Course. *Am J Pharm Educ* 2009 73(3); Article 42; pg 1-8. PMID: PMC2703280

18. Carter O, Zebrack J, Gilbert ME, Cheang KI. Effect of beta-blockers on glucose homeostasis in heart failure. *J Pharm Technol* 2009;25:71-78. PMID: PMC2724721.
19. Cheang KI, Baillargeon JP, Essah PA, Ostlund RE, Apridonize T, Islam L, Nestler JE. Insulin-stimulated release of D-*Chiro*-inositol-containing inositolphosphoglycan mediator correlates with insulin sensitivity in women with polycystic ovary syndrome. *Metabolism: Clinical and Experimental* 2008;57; 1390–1397. PMID: PMC2574418
20. Cheang KI, Futterweit W, Nestler JE. Risk of cardiovascular events in mothers of women with the polycystic ovary syndrome. *Endocrine Practice* 2008; 14: 1084-1094. PMID: PMC2639650
21. Cheang KI, Ott C, Garner S, Campbell H, Hansen L, Ma Q, Nazeri E, Gunning K, Wermeling D. ACCP White Paper: Research in Women and Special Populations. *Pharmacotherapy* 2008;28(9):93e–113e
22. Salley KES, Wickham EP, Cheang KI, Essah PA, Karjane NW, Nestler JE. Position Statement: Glucose Intolerance in Polycystic Ovary Syndrome—A Position Statement of the Androgen Excess Society. *J Clin Endocrinol Metab* 2007; 92:4546-4556.
23. Cheang KI. Cardiovascular risk reduction. *Consultant Pharmacist* 2006; 21:493-499.
24. Fagan SC, Touchette D, Smith JA, Sowinski LM, Dolovich L, Olson KL, Cheang KI, Kolesar JM, Crismon ML. The state of science and research in clinical pharmacy. *Pharmacotherapy* 2006;26: 1027-1040.
25. Cheang KI, Sharma ST, Nestler JE. Is metformin a primary ovulatory agent in patients with polycystic ovary syndrome? *Gynecol Endocrinol* 2006;22(11):595-604.
26. Cheang KI. Multiple cardiovascular considerations in a 76-year-old man. *Consultant Pharmacist* 2005; 20: 519-524.
27. Cheang KI, Nestler JE. Should insulin-sensitizers be used in Polycystic Ovary Syndrome? *Reprod BioMed Online* 2004;8:440-447
28. Essah PA, Cheang KI, Nestler JE. The pathophysiology of miscarriage in women with polycystic ovary syndrome. Review and proposed hypothesis of mechanisms involved. *Hormones* 2004;3:221-227
29. Cheang KI, Essah PA, Nestler JE. A paradox: the roles of inositolphosphoglycans in mediating insulin sensitivity and hyperandrogenism in the polycystic ovary syndrome. *Hormones* 2004;3:244-251
30. Terry CM, Kling SJ, Cheang KI, Hoidal JR, Rodgers GM. Polymorphisms in the 5'-UTR of the tissue factor gene are associated with altered expression in human endothelial cells. *J Thromb Haemost* 2004; 2:1351-1358
31. Monien, BH, Cheang KI, Desai UR. Mechanism of poly(acrylic acid) acceleration of antithrombin inhibition of thrombin: implications for the design of novel heparin mimics. *J Med Chem* 2005;48(16):5360-8
32. Crouch MA, Nappi J, Cheang KI. Glycoprotein IIb/IIIa receptor inhibitors in percutaneous coronary intervention and acute coronary syndrome. *Ann Pharmacother* 2003 Jun;37(6):860-75
33. Ng TMH, Cheang KI, Munger MA, Callahan KS. Neurohormonal activation does not explain elevated monocyte tissue factor expression in heart failure. *Thromb Haemost* 2002;87:176-7
34. Munger MA, Cheang KI. β -blocker therapy: A standard of care for heart failure. *Pharmacotherapy* 2000;20(11 Pt 2):359S-367S

Book Chapters

1. Borgelt LM, Cheang KI. Polycystic ovary syndrome. In: Women's Health Across the Lifespan: A Pharmacotherapeutic Approach (Hansen LB, O'Connell MB, Smith J, Calis K, eds.), American Association of Health-System Pharmacist, Bethesda, MD. Chapter 16, pp 235-248.
2. Cheang KI. Pharmacogenetics in the Clinic. In: Biopharmaceutical Drug Design and Development. (Wu-Pong S, Rojanasakal Y, eds.), 2nd Edition, Humana Press, Totowa, New Jersey. Chapter 12, pp 253-266

3. Cheang KI, Nestler JE. Use of insulin sensitizers in the polycystic ovary syndrome. In: Androgen Excess Disorders in Women: Polycystic Ovary Syndrome and Other Disorders (Azziz R, Nestler JE, Dewailly D, eds.), 2nd Edition, Humana Press, Totowa, New Jersey, Chapter 38 pp 421-434, 2006.