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Dr. Duh is a pharmacoepidemiologist specializing in the outcomes, economics, utilizations and safety of pharmaceuticals. In addition to health economics and outcomes research, she also conducts pharmacoepidemiology and pharmacovigilance studies for pharmaceutical companies to address drug safety issues raised by regulatory agencies, such as the FDA and EMA, and provides strategic advice to address drug safety issues in the context of black box warnings, product withdrawals, limited access programs, and NDA applications. Her extensive research has resulted in over 115 peer-reviewed publications in prominent journals, including: a top 9 most-cited article in *Current Medical Research and Opinion*, an article featured in a *Journal of COPD* editorial, and an article nominated for a 2009 Excellence Award by the *Journal of Managed Care Pharmacy*.

Through these investigations, she has collected and utilized data from clinical trials, medical records review, health insurance claims data, patient and physician surveys, and spontaneous report data. Dr. Duh has also been responsible for special tasks in assisting pharmaceutical, biotech, and medical device companies in preparation for FDA and CMS committee meetings, critical review of the planned study protocols, establishment of liaison with clinical communities, and CMS reimbursement analyses.

Dr. Duh has been appointed to several positions in academia and professional societies. She served as a chairperson of Drug Safety and Epidemiology for Drug Information Association and was an adjunct Assistant Professor of Pharmacoeconomics and Outcomes Research at Massachusetts College of Pharmacy and Allied Health Sciences. She is currently a visiting scholar in the Department of Biostatistics and a guest lecturer in the Department of Epidemiology at the Harvard School of Public Health. She is featured at the Harvard Catalyst Profiles website. Dr. Duh is appointed to an expert panel convened by the Foundation for the National Institutes of Health's Observational Medical Outcomes Partnership (OMOP) to develop methodologies for studying drug-induced liver injuries on a national scale. She is also a journal reviewer for *Chest*, *Pharmacoeconomics*, *American Journal of Managed Care*, *Clinical Therapeutics*, *Managed Care Interface*, *American Journal of Kidney Diseases*, *Pharmacoepidemiology and Drug Safety*, and *American Journal of Hospital System Pharmacists*. Dr. Duh is an elected member of the American Society of Hematology (ASH), and a member of the International Society of Pharmacoepidemiology (ISPE), and the International Society of Pharmacoeconomics and Outcomes Research (ISPOR).

Dr. Duh is a graduate of the Harvard School of Public Health, where she received a Doctor of Science degree with a concentration in Pharmacoepidemiology, and minors in Biostatistics, and Health Policy and Management. She received a Masters' degree in Public Health in the area of chronic disease epidemiology from Yale School of Medicine, and a B.S. in pharmacy from Taiwan.

EDUCATION

Sc.D., Epidemiology, Harvard School of Public Health, Boston, Massachusetts, 1996

M.P.H., Epidemiology and Public Health, Yale School of Medicine, New Haven, Connecticut, 1992

B.S., Pharmacy, Kaohsiung Medical College, Taiwan, 1990

EMPLOYMENT

2009–present Managing Principal, Analysis Group, Inc.

2003–2009 Vice President, Analysis Group, Inc.

2001–2002 Senior Associate, Analysis Group, Inc.

1999–2001 Senior Associate Epidemiologist, Ingenix Pharmaceutical Services

1999 Pharmacoepidemiology Consultant, AstraZeneca R&D

1997–1999 Pharmacoepidemiologist, Astra Pharmaceuticals, L.P.

1996–1997 Clinical Scientist/Project Manager, Astra USA, Inc.

1996–1997 Epidemiology Session Chairperson, Drug Information Association

1992–1996 Research Fellow in Pharmacoepidemiology Program, Harvard School of Public Health

PROFESSIONAL AFFILIATIONS

Visiting Scholar, Department of Biostatistics, Harvard University School of Public Health (2012–present)

Guest lecturer, Department of Epidemiology, Harvard University School of Public Health (2007–2012, 2015)

Adjunct Assistant Professor of Pharmacoepidemiology and Pharmacoeconomics, Massachusetts College of Pharmacy and Allied Health Science (1996–1999)

Journal Peer Reviewer, *Pharmacoepidemiology and Drug Safety*; *Pharmacoeconomics*; *American Journal of Hospital-System Pharmacists*; *Chest*; *Critical Care*; *Therapeutics and Clinical Risk Management*; *American Journal of Kidney Diseases*; *Managed Care Interface*; *American Journal of Managed Care*; *Nephrology Dialysis Transplantation*; *Expert Opinions on Pharmacoeconomics and Outcomes Research*; *CNS Neuroscience & Therapeutics*; *Pediatric Pulmonology*

Member, International Society of Pharmacoepidemiology

Member, International Society of Pharmacoeconomics and Outcomes Research

Elected Member, American Society of Hematology

JOURNAL PUBLICATIONS

Duh M-S, Shepard MJ, Wilberger JE, and Bracken MB. The effectiveness of surgery on the treatment of acute spinal cord injury and its relationship with pharmacological treatment. *Neurosurgery* 35:240-249, 1994.

Duh M-S, Walker AM, Pagano M, Kronlund K. Prediction and cross-validation in modeling incident cases of hepatic disorders using automated medical data. *American Journal of Epidemiology* 1998; 147:407-13.

Duh M-S, Walker AM, Ayanian JZ. Interpretation of the weight matrix in an artificial neural network. *American Journal of Epidemiology* 1998; 147: 1112-22.

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Corwin HL, Gettinger A, Levy MM, Fink MP, Pearl RG, Abraham E, MacInyre NR, Shabot M, Duh MS, Shapiro MJ. Anemia and blood transfusion in the critically ill: current clinical practice in the United States-The CRIT Study. *Critical Care Medicine*, 2004; 32:39-52.

Shorr AF, Duh MS, Kelly KM, Kollef MH. Red blood cell transfusion and ventilator-associated pneumonia: a potential link? *Critical Care Medicine*, 2004; 32 (3): 666-74.

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Sands BE, Duh M-S, Ajene A, Walker AM. Computerized algorithms for the identification of irritable bowel syndrome, colonic ischemia, and complications of constipation: validation through medical records. *Pharmacoepidemiology and Drug Safety*, 2005 May 24

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Michna E, Duh MS, Korves C, Dahl JL. Removal of opioid/acetaminophen combination prescription pain medications: assessing the evidence for hepatotoxicity and consequences of removal of these medications. *Pain Med*, 2010 Mar;11(3):369-78.

Weide R, Koppler H, Antras L, Smith M, Chang MP, Green J, Wintfeld N, Neary MP, Duh MS. Renal toxicity in patients with multiple myeloma receiving zoledronic acid vs. ibandronate: a retrospective medical records review. *J Cancer Res Ther*, 2010 Jan-Mar;6(1):31-5.

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Toy EL, Gallagher KF, Stanley EL, Swensen AR, Duh MS. The economic impact of exacerbations of chronic obstructive pulmonary disease and exacerbation definition: a review. *COPD*, 2010 Jun;7(3):214-28.

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HONORS

- 1992–1996 Harvard University: Pharmacoepidemiology Teaching and Training Award
- 1994 Harvard University: Teaching Fellow (honorary award)
- 1992 Yale University: National Collaborative Spinal Cord Study Training Award
- 1992 Yale University: Scholarship Award for Distinctive Doctoral Applicant

INVITED SPEECHES

- 2003 “Application of pharmacoepidemiology to drug safety litigation”, Pharmacoepidemiology Seminar Series, Harvard School of Public Health, Boston, Massachusetts
- 2006 “A new dimension of disease burden- work absenteeism and presenteeism,” Health Economics and Outcomes Research Seminar Series, Harvard School of Public Health, Boston, Massachusetts
- 2009 “Courtroom pharmacoepidemiology: application of pharmacoepidemiology to drug safety litigation,” Department of Epidemiology Seminar Series, Harvard School of Public Health, Boston, Massachusetts.
- 2011 “Applications of epidemiology to Risk Evaluation and Mitigation Strategies (REMS) and drug safety litigation,” Seminars on Drug Safety and Comparative Effectiveness, Harvard School of Public Health, Boston, Massachusetts
- 2014 “Pharmacovigilance and pharmacoepidemiology in pharmaceutical litigation,” Lunch seminar to Covington & Burling LLP, Washington DC
- 2015 “Pharmacovigilance and social media data”, Department of Epidemiology Seminar Series, Harvard T.H. Chan School of Public Health, Boston, Massachusetts