

BIOGRAPHICAL SKETCH

Provide the following information for the Senior/key personnel and other significant contributors.
 Follow this format for each person. **DO NOT EXCEED FIVE PAGES.**

NAME: Goldstein, Mary K.

eRA COMMONS USER NAME (credential, e.g., agency login): GOLDSTEIN.MARY

POSITION TITLE: Professor of Medicine (Primary Care & Outcomes Res) and of Health Research and Policy

EDUCATION/TRAINING

INSTITUTION AND LOCATION	DEGREE	Completion Date	FIELD OF STUDY
Barnard College, Columbia University, New York	B.A.	May, 1973	Philosophy
College of Phys. & Surgeons, Columbia University	M.D.	May, 1977	Medicine
Stanford University, Stanford, California	M.Sc.	June, 1994	Health Services Research

A. Personal Statement

I am Chief of Medical Service at VA Palo Alto Health Care System (VAPAHCS) and Professor of Medicine in the Center for Health Policy/Center for Primary Care and Outcomes Research (CHP/PCOR) and (by courtesy) Professor of Health Research and Policy at Stanford University. Medical Service at VAPAHCS provides clinical care in all the subspecialties of internal medicine; the Emergency Department physicians; the primary care PACT providers located at our hospital-based site (Palo Alto), at Livermore Division, and at our Community-Based Outpatient Clinics (CBOCs); the Women’s Health Program; the Mobile Outreach Program; and the physicians and nurse practitioners providing medical care for inpatient psychiatric and homeless Veterans programs at VAPAHCS. Medical Service is also a major provider of education to medical students, internal medicine residents, fellows, and interdisciplinary trainees in primary care and multiple specialties. Medical Service investigators conduct cutting-edge research in diverse clinical and basic science areas.

I am clinically certified as a geriatrician and as a clinical informaticist. I am Associate Director and mentor in the VA Advanced Fellowship in Clinical Informatics at VAPAHCS,. My area of research expertise is health services research (HSR) to support medical decision-making, including health information technology for quality improvement and patient safety, and understanding patient complexity as it relates to medical decision support.

My research includes leading projects that develop, implement, and evaluate evidence-based clinical decision support (CDS) for improved clinical care with emphasis on safe management of medication given the patient’s comorbid conditions, current laboratory values, and other medications (ATHENA-CDS project). I also mentor and/or collaborate with other investigators on projects that explore emotional and cultural factors in patient decision-making, in natural language processing from free-text in electronic health records, in comorbidity, and in safe use of cardiology interventions, particularly in older adults. I currently serve as a mentor on an NIH K award for Jonathan Chen MD PhD; as the geriatric mentor on the NIH GEMSSSTAR award for Suzann Pershing MD; and on VA Career Development Awards (CDA) for Christine Gould PhD.

I was awarded the Veterans Health Administration Undersecretary’s award for HSR, the highest award for HSR in VA, for “exceptional leadership and enduring dedication to Health Services Research as a scientist, colleague, teacher, and mentor.”

Example publications from recent mentored/co-mentored work with fellows and career development awardees are listed here:

- Leung TI, **Goldstein MK**, Musen MA, Cronkite R, Chen JH, Gottlieb AG, Leitersdorf E. The New HIT: Human Health Information Technology. *Studies Health Technol Inform.* 245:768-772; 2017.
- Tso GJ, Tu SW, Musen MA, **Goldstein MK**. High-Risk Drug-Drug Interactions Between Clinical Practice Guidelines for Management of Chronic Conditions. *AMIA Jt Summits Transl Sci Proc:* 531-539; 2017
- Gould CE, Zapata AML, Bruce J, Berekyei Merrell S, Wetherell JL, O'Hara R, Kuhn E, **Goldstein M K**, & Beaudreau S A. Development of a video-delivered relaxation treatment of late-life anxiety for Veterans. *Int Psychogeriatr.* Oct 29(10):1633-1645; 2017.
- Chen JH, **Goldstein MK**, Asch SM, Mackey L, Altman RB. Predicting Inpatient Clinical Order Patterns with Probabilistic Topic Models vs Conventional Order Sets. *JAMIA* 24(3):472-480; 2017. PMID: PMC5391730.

B. Positions and Honors

Employment

1980-1984	Assistant Professor of Medicine, Univ. of California San Francisco/Natividad Medical Center
1986–1991	Clinical Asst. Prof. of Med. and Dir of Graduate Medical Edu., Div of Gerontology, Stanford Univ. and Palo Alto VA Geriatrics Research Education and Clinical Center (GRECC)
1991-1994	AHCPR (AHRQ) Fellow in Health Services Res., Div. General Internal Medicine, Stanford Univ.
1994-1996	Chief, Section of General Internal Medicine, VA Palo Alto Health Care System (VAPAHCS)
1996-1999	Assistant Professor of Medicine (General Internal Medicine), Stanford Univ. School of Medicine
1996-2002	Career Development Awardee, HSR&D, VA Palo Alto Health Care System
1999-2004	Associate Professor of Medicine (Ctr. for Primary Care and Outcomes Research), Stanford Univ.
2000-2008	Associate Director for Clinical Services, GRECC, VAPAHCS
2003-2009	Director, Geriatric Medicine Fellowship (ACGME clinical fellowship), Stanford University
2005-present	Professor of Medicine and Dir. of Program on Primary Care Policy and Practice Advancement, Ctr. for Primary Care and Outcomes Research (PCOR), and Professor of Health Research and Policy, Stanford University School of Medicine
2008-2017	Director, Geriatrics Research Education and Clinical Center (GRECC), VAPAHCS
2015-present	Chief, Medical Service, VA Palo Alto Health Care System, and Vice Chair-Veterans Affairs, Department of Medicine, Stanford University School of Medicine

Honors and Other Experience

1992-1993	Chairperson, Test Committee for Amer. Board of Internal Med. (ABIM) and Amer. Board of Family Practice (ABFP) Certification Examination in Geriatric Medicine
1993	Lee Lusted Award, Society for Medical Decision Making (second)
1993-1998	Board of Directors, American Board of Family Practice (Vice-President 97-98)
1996-2002	Board of Directors, American Geriatrics Society
1998-2008	Governing Council, UCSF/Stanford Evidence-Based Practice Center
2007-2010	Chairperson, VA HSR&D Career Development Award Review Committee
2008-2012	Robert Wood Johnson Physician Faculty Scholars Program National Advisory Committee
2010	Undersecretary's Award for Outstanding Achievement in Health Services Research, Department of Veterans Affairs Veterans Health Administration (highest award in VA for HSR)
2014-present	Chairperson, Steering Committee, HSR&D VA Information Resource Center (VIReC)
2015-2017	Chairperson, VA ORD Million Veterans Program Beta and Gamma review committees

C. Contribution to Science

URL for list of published work as found in publicly available digital database:

<http://www.ncbi.nlm.nih.gov/sites/myncbi/mary.goldstein.1/bibliography/44388293/public/?sort=date&direction=descending>

1. *Applying health information technology to improve clinical care.* I have led a series of projects, with collaborators from medical informatics and from relevant clinical domains, to develop, implement, and evaluate automated clinical decision support (CDS) for primary care providers at the point of care

(ATHENA-CDS project). We demonstrated the feasibility of developing systems to provide patient-specific analyses for complex patients and recommendations that went far beyond clinical alerts and reminders, using more advanced technology to compute recommendations that take account of nuanced clinical characteristics of the patients. We started with hypertension. Primary care providers used the system extensively, showing its usability and perceived usefulness, and reported satisfaction with it. I collaborated with others (Trafton et al) who took the work forward in pain management, with emphasis on safe management of opioids. Currently I am leading a project, Medication-Safety CDS, in which we are integrating CDS into a visual dashboard for clinicians, addressing multiple comorbidities. In addition to articles listed above:

- a. **Goldstein MK**, Coleman RW, Tu SW, Shankar RD, O'Connor MJ, Musen MA, Martins SB, Lavori PW, Shlipak MG, Oddone E, Advani AA, Gholami P, Hoffman BB. Translating Research into Practice: Organizational issues in implementing automated decision support for hypertension in three medical centers. *J Am Med Inform Assoc.* 2004 11(5):368-76.
 - b. Shluzas LMA, Cronkite RC, Chambers D, Hoffman BB, Breeling J, Musen MA, Owens DK, **Goldstein MK**. Organizational Factors Affecting Implementation of the ATHENA-Hypertension Clinical Decision Support System during the VA's Nation-Wide Information Technology Restructuring: a case study. *Health Systems*, (2014) 3(3), 214–234.
 - c. Leung TI, Jalal HJ, Zulman DM, Dumontier M, Owens DK, Musen MA, **Goldstein MK**. "Automating Identification of Multiple Chronic Conditions in Clinical Practice Guideline Recommendations." *AMIA Joint Summits on Translational Science Proceedings*, 2015. PMID: PMC4525235.
 - d. Kim Y, Garvin JH, **Goldstein MK**, Hwang TS, Redd A, Bolton D, Heidenreich PA, Meystre SM. *J Biomed Informatics* 67: 42-48, 2017.
2. *Understanding complex chronic conditions and multimorbidity*. Presence of multiple co-morbid conditions (multimorbidity) within an individual has been increasing among adults and has become highly prevalent at older ages. Comorbidities increase the complexity of decision-making and of the types of decision-support that can assist health professionals and patients with decision-making. In collaborations with others, I have explored the impact of age and comorbidity on decision-making and clinical care.
- a. Fried, TR, Niehoff, K, Tjia, J, Redeker, N, **Goldstein, MK**. A Delphi process to address medication appropriateness for older persons with multiple chronic conditions. *BMC Geriatr.* 2016 Mar 15;16(1):67.doi: 10.1186/s12877-016-0240-3. PubMed PMID: 26979576; PubMed Central PMCID: PMC4791884.
 - b. Gould CE, O'Hara R, **Goldstein MK**, Beaudreau SA. Multimorbidity is Associated with Anxiety in Older Adults in the Health and Retirement Study. *International J Geriatric Psychiatry* 31(10):1105-15, 2016. NIHSMDID: VAPA846110.
 - c. Zulman DM, Asch SM, Martins SB, Kerr EA, Hoffman BB, **Goldstein MK**. Quality of care for patients with multiple chronic conditions: the role of comorbidity interrelatedness. *J Gen Intern Med.* 2014;29(3):529-37. PMID: PMC3930789.
 - d. Fried TR, O'Leary J, Towle V, **Goldstein MK**, Trentalange M, Martin DK. The effects of comorbidity on the benefits and harms of treatment for chronic disease: A systematic review. *PLoS One.* 2014; 9(11):e112593. PMID: PMC4234418.
3. *Predicting outcomes for patients with mental illness and chronic health conditions*. Comorbid mental illness is one of the specific factors that contributes to complexity in understanding and managing chronic health conditions. Through collaborative efforts, I have contributed to understanding the role of emotion, comorbidity, and mental illness in medical decision-making.
- a. Mikels J. A., C. E. Lockenhoff, S. J. Maglio, **M. K. Goldstein**, A. Garber and L. L. Carstensen. Following Your Heart or Your Head: Focusing on Emotions Versus Information Differentially Influences the Decisions of Younger and Older Adults. *Journal of Exp Psychology: Applied* 16(1): 87-95, 2010. PMID: PMC3919140.

- b. Turan B, Carstensen L, Garber AM, **Goldstein MK**. Knowing Loved Ones' Wishes: Knowledge and Security Surrounding Relationships Predict Caregivers' Accuracy. *Health Psychology*. 30(6, Nov):814-8; 2011. PMID: PMC3228368.
 - c. Frayne SM, Holmes TH, Berg E, **Goldstein MK**, Berlowitz DR, Miller DR, Pogach LM, Laungani KJ, Lee TT, Moos R. Mental Illness and intensification of diabetes medications: an observational cohort study. *BMC Health Services Research*. 2014;14(1):458. PMID: PMC428515.
 - d. Sims T, Tsai JL, Koopmann-Holm B, Thomas EA, **Goldstein MK**. Choosing a physician depends on how you want to feel: the role of ideal affect in health-related decision making. *Emotion*. 2014 14(1): 187-92. PMID: PMC4035201.
4. *Medical ethics and decision making*. Decisions about health care rest on a foundation of medical ethics. Early in my career, I was struck by what seemed like a mismatch between what patients and families were telling me they wanted during serious illness near the end of life (often, compassionate care) and what the health profession was typically offering (aggressive high-technology care). My early writing and research focused on medical ethics, particularly decision-making. My role in these projects included conducting projects myself and also serving as mentor for fellows and medical students. What I learned from patients and from investigations in this area later guided me into elicitation of patient preference, and incorporation of patient preferences into medical decision making.
- a. **Goldstein MK**. Ethical considerations in pharmacotherapy of the aged. *Drugs Aging*. 1991;1(2):91-7.
 - b. **Goldstein MK**, Vallone RP, Pascoe DC, Winograd CH. Durable power of attorney for health care. Are we ready for it? *West J Med*. 1991;155(3):263-8. PMID: PMC1002981.
 - c. Mebane EW, Oman RF, Kroonen LT, **Goldstein MK**. The Influence of Physician Race, Age, and Gender on Physician Attitudes toward Advance Care Directives and Preferences for End-of-Life Decision-Making. *J Am Geriatr Soc*. 1999 47(5):579-91.
 - d. Ruhnke G, Wilson SR, Akamatsu T, Kinoue T, Takashima Y, **Goldstein MK**, Koenig B, Hornberger JC, Raffin TA. Ethical Decision-Making and Patient Autonomy: A Comparison of Physicians and Patients in Japan and the United States. *Chest*, 118:1172-82, 2000.
5. *Preference Assessment for Application to Medical Decision Making*. Patient preferences are an essential component of clinical decision-making, both individual decision-making and cost-effectiveness analysis. In early work, I explored innovative methods of computer-assisted interviewing to improve participants' understanding of health states and to facilitate elicitation of ratings. Later, I led FLAIR project, in which we interviewed more than 1000 older adults to obtain their preference ratings for health states of dependence in activities of daily living (ADLs). I have also mentored others in gathering patient preferences.
- a. **Goldstein MK**, Clarke AE, Michelson D, Garber AM, Bergen MR, Lenert LA. Developing and testing a multimedia presentation of a health-state description. *Med Decis Making*. 1994;14(4):336-44.
 - b. Sims TL, Garber AM, Miller DE, Mahlow PT, Bravata DM, **Goldstein MK**. Multimedia quality of life assessment: Advances with FLAIR. *Proc AMIA* 2005: 694-698. PMID: PMC1560717.
 - c. Bravata DM, Nelson LM, Garber AM, **Goldstein MK**. Invariance and inconsistency in utility ratings. *Med Decis Making*. 2005 25(2):158-67.
 - d. Seidler AM, Bayoumi AM, **Goldstein MK**, Cruz PD, Chen SC. Willingness to Pay in Dermatology: Assessment of the Burden of Skin Diseases. *J Investigat Dermatology*. Jul; **132**(7):1785-90; 2012.

D. Additional Information: Research Support and/or Scholastic Performance

Ongoing Research Support

IP1 HX002261-01 Heidenreich and Goldstein (multiple PI) 10/1/2016-9/30/2021
 VA Health Services Research and Development Quality Enhancement Research Initiative (QUERI)

Optimizing Appropriate Use of Medications for Veterans

Our primary program goal is to optimize medication management in the VA in general and in Patient Aligned Care Teams (PACTs) in particular using pharmacy networks and clinical decision support (CDS) tools.

Patient Safety Center of Inquiry (PSCI) (Boockvar)
 VHA National Center for Patient Safety
 Center for Medication Safety in Aging, a VA PSCI

10/1/18-9/30/21

The primary purpose of PSCIs is safer care delivery and quality improvement. This Center focuses on improving safety by de-prescribing medications when appropriate.

Role: Co-investigator

VA Office of Academic Affairs
Program Director, Owens

2006 – ongoing

VA Medical Informatics Fellowship Program

This two-year fellowship provides advanced research and leadership training for post-doctoral fellows in medical informatics.

Role: Associate Director and Mentor

K01 K01ES026837 (Chen)

2015 – 2020

NIH/NIEHS

Mentored Career Development Award in Biomedical Data Science

Role: Mentor on mentorship team of 3 for Dr. Jonathan Chen's K award

1 I01 HX002126-01 (Leppert)

10/1/2016-9/30/2019

VA HSR&D

Personalized Life Expectancy to Encourage High Value Prostate Cancer Care

Prostate cancer is the most common cancer diagnosed Veterans Health Administration. Veterans receiving care in the Veterans Health Administration may have higher prostate cancer risk due to a family history, race, or exposure to toxins such as Agent Orange and burn pits. Life expectancy estimates can be used to improve our existing prostate cancer screening practices and treatments.

Role: Co-Investigator

1R03AG056453-01 NIA R03 (PI: Pershing)

7/1/17-6/30/19

As needed

GEMSTAR

\$235,500 (2 years, total costs)

(no salary)

Impact and Outcomes of Cataract Surgery among Patients with Alzheimer's Disease

This project will use Medicare claims data to compare rates of eye exams and cataract surgery among patients with and without Alzheimer's Disease, and compare rates of complications and downstream effects.

Role: Primary Mentor for Geriatrics

CDA 15-257 (Breland)

10/1/2016-9/30/2021

VA Health Services Research and Development

Patient-centered Strategies to Engage Veterans in Behavioral Health Services

This Career Development Award for Jessica Breland PhD funds the development and pilot test of a patient-centered self-help tool to engage Veterans in weight loss treatments, while providing training for the PI in implementation science, eHealth, and mixed-methods research.

Role: Consultant

Completed Research Support (past three years)

CDA 12-173 (Zulman)

7/1/2013-6/30/2018

VA Health Services Research and Development

Optimizing eHealth Technology for Multimorbid Patients

Role: Co-Mentor on Dr. Donna Zulman's career development award

VA HSR&D IIR 11-071-1 (Goldstein)

9/1/2011 – 12/31/2015

Automating Performance Metrics for Quality Improvement in Complex Chronic Disease

The overall objective of this project is to develop new informatics methods to automate quality improvement measures for patients with complex clinical scenarios.

DF-11-303 (site-PI: Goldstein)

1/3/2012 – 12/31/2015

Development and Implementation of Patient-Centered Guidelines (PI at Yale: Fried)

This project seeks to provide a practical, feasible clinical tool to help patients with multiple chronic conditions (MCCs) and their clinicians participate in a process of shared decision making to determine a care plan consistent with patients' goals and capabilities.