BIOGRAPHICAL SKETCH

NAME: Goldstein, Mary K.

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POSITION TITLE: Professor Health 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 a Professor of Health Policy at Stanford University School of Medicine, and, by courtesy, a Professor of Medicine in the Center for Biomedical Informatics Research (BMIR) at Stanford. For the past three years I have served as the National Director of Data Analytics, Quality Improvement (QI), and Research, in the Office of Geriatrics and Extended Care (GEC), Veterans Health Administration of the Department of Veterans Affairs (VA), a role in which I developed a new data analytics program and also oversaw VA programs in Palliative and Hospice Care, the Geriatrics Research Education and Clinical Centers (GRECCs), and the burgeoning Age Friendly Healthcare System in VA. I have previously served for 4 years as Chief of Medical Service at VA Palo Alto Health Care System (VAPAHCS) and Vice Chair-VA at the Stanford Department of Medicine, and as Director of the GRECC at VA Palo Alto. I am clinically certified as a geriatrician and as a clinical informaticist.

I have mentored many trainees – students, residents, and fellows - and junior faculty since 1999. I have had leadership roles as fellowship director or associate director both for a clinical fellowship in geriatrics and for research fellowships in geriatrics, medical informatics, and health services research. In addition to my personal roles with these fellowship programs, my role as Medical Service Chief included academic oversight for the extensive VA components of multiple fellowship training programs in medicine subspecialties, as well as academic oversight of faculty dually-appointed at Stanford and VA with their own research programs. As GRECC Director I was privileged to oversee the GRECC's broad research program including basic science, clinical research and health services research, as well as clinical and educational programs in geriatrics. I served as the Stanford leader in geriatrics for the Association of Geriatrics Academic Programs, and interacted with faculty across Stanford who were conducting aging-related work.

My own area of research is health services research (HSR) to support medical decision-making, including health information technology for quality improvement and patient safety, patient complexity as it relates to medical decision making, and patient preferences. I have been principal investigator on NIH R01s and other NIH funding mechanisms, and on multiple large VA HSR & Development (HSR&D) research projects. I have served as a mentor on both NIH and VA career development awards for junior faculty. In addition to projects I lead, have have been privileged to be an active mentor and/or collaborator with other investigators on projects that explore predictive analytics, emotional and cultural factors in patient decision-making, natural language processing for information extraction from free-text in electronic health records, comorbidity and care fragmentation, and other aging-related projects.

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." It has been my goal and practice to foster an inclusive and supportive scientific

environment for training and mentoring, by individual mentoring and also by mentoring the mentors who work directly with trainees in multiple labs and settings such as in GRECC and Medical Service. I have worked closely with trainee fellows in hands-on projects, teaching rigorous methods for clinical informatics research. I have worked with fellows for their development of training goals for each segment of their program, with advancing levels of sophistication in their goal-setting as they progress through the program. I have been pleased to see trainees move on successfully to positions based on their personal skills, interests and values.

Ongoing and recently completed research projects to highlight:

R01 (PI: Pershing) Using Informatics to Evaluate and Predict Surgery Impact on Alzheimer's Disease and Related Dementias and Mild Cognitive Impairment Outcomes (9/1/22 – 5/31/27)

VA HSR&D QUERI (PI Goldstein and Heidenreich) Optimizing Appropriate Use of Medications for Veterans (10/1/16 – 9/30/22

NIH/NLM R56 (PI: J. Chen) Machine Learning Clinical Order Recommendations for Speciality Consultation Center (9/25/20 – 8/31/21)

VA HSR&D (PI: Leppert) Personalized Life Expectancy to Encourage High-Value Prostate Cancer Care (3/1/27 – 2/28/21)

B. Positions, Scientific Appointment, and Honors

Positions and Scientific Appointments

2021-	Professor of Health Policy, Stanford University School of Medicine and, by courtesy, Professor of Medicine (Biomedical Informatics Research)
2020-	National Director, Data Analytics, Quality Improvement and Research, Office of Geriatrics & Extended Care (GEC), Veterans Health Administration, Department of Veterans Affairs
2020-2023	Joint VA-Department of Energy (DOE) Executive Committee
2016-2020	Chief, Medical Service, VA Palo Alto Health Care System (VAPAHCS), and Vice Chair-Veterans Affairs, Department of Medicine, Stanford University School of Medicine
2015-2017	Chairperson, VA ORD Million Veterans Program Beta and Gamma review committees
2014-2023	Chairperson, Expert & Stakeholder Forum, HSR&D VA Information Resource Center (VIReC)
2008-2017	Director, Palo Alto GRECC, VA Palo Alto Health Care System
2008-2012	Robert Wood Johnson Physician Faculty Scholars Program National Advisory Committee
2007-2010	Chairperson, VA HSR&D Career Development Award Review Committee
2006-2017	Program Director, VA Advanced Fellowship in Geriatrics, VA Palo Alto Health Care System
2005-2021	Professor of Medicine (Ctr. for Primary Care and Outcomes Research), and Professor of Health Research and Policy, Stanford University School of Medicine
2003-2009	Director, Geriatric Medicine Fellowship (ACGME clinical fellowship), Stanford University
2000-2008	Associate Director for Clinical Services, GRECC, VAPAHCS
1999-2013	Advisory Board, Center on the Demography and Economics of Health and Aging (CDEHA)
1999-2004	Associate Professor of Medicine (Ctr. for Primary Care and Outcomes Research), Stanford Univ.
1998-2008	Governing Council, UCSF/Stanford Evidence-Based Practice Center
1996-2002	Board of Directors, American Geriatrics Society
1996-2002	Career Development Awardee, HSR&D, VA Palo Alto Health Care System
1996-1999	Assistant Professor of Medicine (General Internal Medicine), Stanford Univ. School of Medicine
1994-1996	Chief, Section of General Internal Medicine, VAPAHCS
1993-1998	Board of Directors, American Board of Family Practice (Vice-President 97-98)
1992-1993	Chairperson, Test Committee for Amer. Board of Internal Med. (ABIM) and Amer. Board of Family Practice (ABFP) Certification Examination in Geriatric Medicine
1991-1994	AHCPR (AHRQ) Fellow in Health Services Research (HSR) and candidate for masters degree in HSR, Stanford University
1986-1991	Clinical Asst. Prof. of Med. and Dir of Graduate Medical Edu., Div of Gerontology, Stanford Univ. and Palo Alto GRECC, VAPAHCS
1980-1984	Assistant Professor of Medicine, Univ. of California San Francisco/Natividad Medical Center

Clinical Licenses and Board Certifications

1978–91	State of North Carolina License No. 22932
1980-current	State of California License No. G042672
1980–	Diplomate of American Board of Family Practice, certified 7/11/1980; re-certifications 1986, 1992, 1998, 2004; 2014; meeting requirements for current Maintenance of Certification
1988–	Certificate of Added Qualification in Geriatrics; recertification 1998, 2007, and for 2017 -2027
2016–	Board certification in Clinical Informatics, American Board of Preventive Medicine, 1/1/2016 through 1/31/2026; currently meeting requirements for Maintenance of Certification

Honors

2019-	Alpha Omega Alpha (AOA) Stanford Faculty
2019	Fellow, American College of Medical Informatics (ACMI)
2010	Undersecretary's Award for Outstanding Achievement in Health Services Research Department of Veterans Affairs Veterans Health Administration (highest award in VA for HSR) awarded for Exceptional Leadership and Enduring Dedication to Health Services Research as Scientist, Colleague, Teacher, and Mentor
1994-	Fellow, American Geriatrics Society
1993	Lee Lusted Award, Society for Medical Decision Making (second)

C. Contribution to Science

1. *Clinical Decision Support that Takes Account of Patient Complexity***.** Clinical decision making for common chronic conditions, such as hypertension, can rapidly become complex with patients have multiple potentially interacting clinical conditions and medications; yet, most clinical decision support (CDS) is based on a single condition and does not take account of the patient's other relevant diagnoses and medications. Starting in the late 1990s I collaborated with investigators at Stanford Medical Informatics (now Stanford Biomedical Informatics Research, BMIR) to apply powerful knowledge acquisition and knowledge representation software tools to develop computable knowledge bases capable of encoding medical complexity. For more than 20 years, in close collaboration with faculty colleagues, I led a team that developed, implemented, and evaluated CDS with this complexity to generate highly detailed patient-specific recommendations to primary care providers and to provide these in actual clinical settings. In work funded primarily by the Department of VA HSR&D as implementation projects, we deployed and evaluated these systems, known as ATHENA-CDS, in a series of studies, with updates to the clinical knowledge bases to stay aligned with current evidence and updates to the information technology. We displayed recommendations to more than 100 primary care providers for tens of thousands of patients, and received very positive responses from providers in surveys with high response rates. We demonstrated the feasibility of providing detailed clinical recommendations that take account of patient complexity. We monitored the systems for patient safety; we obtained feedback from providers regarding their perceived barriers to following the evidence-based guidelines, and we evaluated the organizational factors in implementation. I have mentored a number of post-doctoral fellows as part of this project; we have published more than 25 papers from the ATHENA-CDS project. Collaborators adapted ATHENA-CDS to provide recommendations for safe management of opioids. I have also led a number of other projects, with publications listed in the MyBibliography, using health information technology for implementing evidence.
    a. **Goldstein M.K**., Coleman R., Tu S.W., Shankar R.D., O'Connor M.J., Musen M.A., Martins S.B., Lavori P.W., Shlipak M.G., Oddone E., Advani A.A., Gholami P., Hoffman B.B. Translating Research Into Practice: Organizational Issues in Implementing Automated Decision Support for Hypertension in Three Medical Centers. *J Am Med Inform Assoc*, 11:368-376, 2004
    b. **Goldstein M.K**., P. Lavori, R. Coleman, A. Advani, and B.B. Hoffman. Improving Adherence to Guidelines for Hypertension Drug Prescribing: Cluster-Randomized Controlled Trial of General Versus Patient-Specific Recommendations. *American Journal of Managed Care*, 11;677-685, 2005
    c. 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

d. Tu SW, Podchiyska T, Oshiro C, Martins S, Ashcraft M, Chambers J, Robinson A, Heidenreich P, **Goldstein MK**. Structural Patters in Chronic Disease Clinical Practice Guidelines Formalized for Clinical Decision Support. AMIA Annual Symposium Proceedings. Apr 29;2022:1081-1090. 2023

2. *Eliciting Patient Preferences for Application to Medical Decision Making***.** Patient preferences are a key aspect of medical decision making; the balance of risk/burdens versus benefits of treatment are weighed differently by different individuals. Diagnostic and therapeutic interventions for older adults often entail greater risks and burdens than for younger or healthier adults, so patient preferences are especially salient. Elicitation of patient preferences can be facilitated by health information technology designed with patient-friendly interfaces. I began work during my own fellowship on designing systems for clear explanation of health states and elicitation of preference weightings and developed it further over time. In an NIA-funded R01 I led a team that developed multimedia software, known as Functional Limitation and Indepence Rating (FLAIR) designed for older adults to elicit preferences for health states related to important functional outcomes of independence in Activities of Daily Living and additional health states. We used FLAIR in interviews with more than one thousand older adults, with average age 72 years. I also mentored fellows and junior colleagues in developing and implementing preference elicitation methods in dermatology, gastrointestinal illness, and pulmonary artery hypertension, and I participated in expert statements regarding best methods. I also collaborated with colleagues in assessments of patient preferences for choice of primary care physician.

a. Stalmeier, P.F.M., **Goldstein, M.K**., Holmes, A.M., Lenert, L., Miyamoto, J.M., Stigglebout, A.M., et al., What Should Be Reported in a Methods Section on Utility Assessment? *Medical Decision Making*, 21(3):200-207, 2001.

b. Bravata, D.M., L.M. Nelson, A.M. Garber, and **M.K. Goldstein**, *Invariance and Inconsistency in Utility Ratings.* Med Decis Making, 2005. **25**(2): p. 158-167

c. Sims, T., T.H. Holmes, D.M. Bravata, A.M. Garber, L.M. Nelson, and **M.K. Goldstein**. Simple counts of ADL dependencies do not adequately reflect older adults' preferences toward states of functional impairment. *J Clin Epidemiol,* 2008. **61**(12): p. 1261-70

d. Sims T, Tsai JL, Koopman-Holm B, Thomas EAC, **Goldstein MK**. Choosing a Physician Depends on How You Want to Feel: The Role of Ideal Affect in Health-Related Decision-Making. advanced online publication 11/4/2103: doi: 10/1037/a0034372. *Emotion* Feb; 14(1): 187-92; 2014

3. *Understanding complex chronic conditions and multimorbidity*. The presence of multiple comorbidities within the same individual, often known as multimorbidity, is very common in older adults; yet, clinical practice guidelines are written for single conditions and rarely address important comorbidities that affect clinical decision making. In one project, I mentored post-doctoral fellows in applying innovative technologies to identify comorbities in the standard clinical practice guidelines for the most common chronic diseases in the Medicare Chronic Conditions Data Warehouse (CCW) and compared these with the rates of co-occurrence of the conditions; we found that many commonly co-occurring conditions are not addressed in guidelines. In collaborative work with a junior faculty member, we developed a model for comorbidity interrelatedness and assessed it in actual patient data, demonstrating extensive interrelatedness.

a. 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; Mar 25;2015: 456-60

b. 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. epub ahead of print 10/1/2013. *Journal of General Internal Medicine* 29(3):529-37; 2014

c. Zulman DM, Martins SB, Liu Y, Tu SW, Hoffman BB, Asch SM, **Goldstein MK**. Using a Clinical Knowledge Base to Assess Comorbidity Interrelatedness Among Patients with Multiple Chronic Conditions. A*MIA Annu Symp Proc* 2015, Nov 5: 1381-9; 2015

4. *Incorporating Geriatric Medicine Perspectives in Research from Other Specialties*. With population aging, health care for adults is increasingly health care for older adults; yet, specialty and sub-specialty research has often not been informed by geriatrics knowledge. I have participated in many collaborative

research projects to which I have brought the perspective of geriatrics medicine, sometimes adding medicine to existing gero-psychology, and sometimes adding geriatrics to other specialties such as cardiovascular medicine, women's health, ophthalmology, and urology. These have been fruitful collaborations with outstanding colleagues who led the work and welcomed inclusion of a perspective from geriatric medicine.

a. Heidenreich PA, Tsai V, Curtis J, Wang Y, Turakhia M, Masoudi FA, Varosy PD, **Goldstein MK**. A Validated Risk Model for One-Year Mortality after Primary Prevention Implantable Cardioverter Defibrillator Placement. *Am Heart J, Aug;170(2):281-289;2015*
b. Padula C, Weitlauf J, Rosen A, Reiber G, Cochrane B, Naughton M, Li W, Rissling M, Yaffe K, Hunt J, Stefanick M, **Goldstein M**K, Espeland M. Longitudinal Cognitive Trajectories of Women Veterans from the Women's Health Initiative Memory Study. *The Gerontologist*. 56(1);115-25; 2016
c. Gould CE, Zapata AML, Shinsky DN, **Goldstein MK**. Testing the Usability of a Portable DVD Player and Tailored Photo Instructions with Older Adult Veterans. *Educational Gerontology* 44(1):64-73, 2018
d. Pershing S, **Goldstein MK**, Henderson VW, Bundorf MK, Lu MY, Rahman M, Stein JD. Receipt of Eye Care Services among Medicare Beneficiaries with and without Dementia. *Ophthalmology*. 2020 Aug;127(8):1000-1011

5. *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. PMCID: PMC3919140.
b. 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. PMCID: PMC428515.
c. 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. PMCID: PMC4035201.
d. Schwartz R, Zulman D, Gray C, **Goldstein MK**, Trivedi R. "It's a disease of families": Neurologists' insights on how to improve communication and quality of life for families of Parkinson's disease patients. *Chronic Illness Sep;16(3):201-211. 2020.*

List of published work as found in publicly available digital database:
https://www.ncbi.nlm.nih.gov/myncbi/mary.goldstein.1/bibliography/public/