

Stanford



Norman Downing

Clinical Assistant Professor, Medicine - Biomedical Informatics Research

CLINICAL OFFICES

- **Stanford Express Care**

211 Quarry Rd Ste 102

MC 5989

Palo Alto, CA 94304

Tel (650) 736-5211

Fax (650) 736-5299

ACADEMIC CONTACT INFORMATION

- **Alternate Contact**

Marta Vitale - Administrative Associate

Email msoto2@stanford.edu

Bio

BIO

I am faculty in Biomedical Informatics Research at Stanford and board-certified internal medicine and clinical informatics. I split my time between clinical practice, hospital medical informatics and applications of artificial intelligence in healthcare. I work with the Clinical Excellence Research Center – a research group dedicated to reducing the cost of high-quality care – directing the Partnership in AI collaboration with the Stanford Artificial Intelligence Lab. Recognizing that the complexity of medicine has grown beyond the abilities of even the most expert clinician, we focus applications of computer vision to address some of the greatest challenges in healthcare: perfecting intended care for frail patients in settings ranging from the intensive care unit to the home. My work has been featured in the New England Journal of Medicine, Health Affairs, Annals of Internal Medicine, and the Journal of the American Medical Informatics Association on applications of artificial intelligence and health IT to lower the cost of high-quality care.

CLINICAL FOCUS

- Internal Medicine
- Clinical Informatics

ACADEMIC APPOINTMENTS

- Clinical Assistant Professor, Medicine - Biomedical Informatics Research

ADMINISTRATIVE APPOINTMENTS

- Medical Informatics Director, Stanford Health Care, (2017- present)
- Program Director, Partnership in AI-assisted Care (PAC, Clinical Effectiveness Research Center (CERC), (2017- present)

PROFESSIONAL EDUCATION

- Residency: Stanford University Internal Medicine Residency (2014) CA
- Board Certification: Clinical Informatics, American Board of Preventive Medicine (2017)
- Medical Education: Case Western Reserve School of Medicine (2011) OH
- Fellowship: Stanford Hospitals and Clinics CA

- Board Certification: Internal Medicine, American Board of Internal Medicine (2014)

Research & Scholarship

CLINICAL TRIALS

- Virtual Hypertension Management Pilot, Recruiting
- Study of an Electronic Health Record-embedded Severe Sepsis Early Warning Alert, Not Recruiting

Teaching

COURSES

2018-19

- AI-Assisted Care: MED 277 (Aut, Win)

Publications

PUBLICATIONS

- **Electronic health record-based clinical decision support alert for severe sepsis: a randomised evaluation.** *BMJ quality & safety*
Downing, N. L., Rolnick, J., Poole, S. F., Hall, E., Wessels, A. J., Heidenreich, P., Shieh, L.
2019
- **Technology-Enabled Consumer Engagement: Promising Practices At Four Health Care Delivery Organizations.** *Health affairs (Project Hope)*
Tai-Seale, M., Downing, N. L., Jones, V. G., Milani, R. V., Zhao, B., Clay, B., Sharp, C. D., Chan, A. S., Longhurst, C. A.
2019; 38 (3): 383–90
- **Improving palliative care with deep learning.** *BMC medical informatics and decision making*
Avati, A., Jung, K., Harman, S., Downing, L., Ng, A., Shah, N. H.
2018; 18 (Suppl 4): 122
- **Physician Burnout in the Electronic Health Record Era: Are We Ignoring the Real Cause?** *ANNALS OF INTERNAL MEDICINE*
Downing, N., Bates, D. W., Longhurst, C. A.
2018; 169 (1): 50–+
- **Bedside Computer Vision - Moving Artificial Intelligence from Driver Assistance to Patient Safety.** *The New England journal of medicine*
Yeung, S., Downing, N. L., Fei-Fei, L., Milstein, A.
2018; 378 (14): 1271–73
- **Towards Vision-Based Smart Hospitals: A System for Tracking and Monitoring Hand Hygiene Compliance** *Proceedings of the 2nd Machine Learning for Healthcare Conference*
Haque, A., Guo, M., Alahi, A., Luo, Z., Rege, A., Jopling, J., Downing, L., Beninati, W., Singh, A., Platchek, T., Milstein, A., Fei-Fei, L.
- **A computer vision system for deep learning-based detection of patient mobilization activities in the ICU** *NPJ DIGITAL MEDICINE*
Yeung, S., Rinaldo, F., Jopling, J., Liu, B., Mehra, R., Downing, N., Guo, M., Bianconi, G. M., Alahi, A., Lee, J., Campbell, B., Deru, K., Beninati, et al
2019; 2
- **Physician Burnout in the Electronic Health Record Era** *RESPONSE ANNALS OF INTERNAL MEDICINE*
Downing, N., Bates, D. W., Longhurst, C. A.
2019; 170 (3): 216–17
- **Occupational exposures and asthma prevalence among US farmworkers: National Agricultural Workers Survey, 2003-2014.** *The journal of allergy and clinical immunology. In practice*
Arroyo, A. J., Robinson, L. B., Downing, N. L., Camargo, C. A.
2018
- **Health information exchange policies of 11 diverse health systems and the associated impact on volume of exchange.** *Journal of the American Medical Informatics Association*

- Downing, N. L., Adler-Milstein, J., Palma, J. P., Lane, S., Eisenberg, M., Sharp, C., Longhurst, C. A.
2017; 24 (1): 113-122
- **Improving palliative care with deep learning.** *IEEE International Conference on Bioinformatics and Biomedicine*
Avati, A., Jung, K., Stephanie, H., Lance, D., Ng, A., Shah, N.
2017
 - **Electronic Health Record-Enabled Research in Children Using the Electronic Health Record for Clinical Discovery.** *Pediatric clinics of North America*
Sutherland, S. M., Kaelber, D. C., Downing, N. L., Goel, V. V., Longhurst, C. A.
2016; 63 (2): 251-268
 - **Validation of Test Performance and Clinical Time Zero for an Electronic Health Record Embedded Severe Sepsis Alert.** *Applied clinical informatics*
Rolnick, J., Downing, N. L., Shepard, J., Chu, W., Tam, J., Wessels, A., Li, R., Dietrich, B., Rudy, M., Castaneda, L., Shieh, L.
2016; 7 (2): 560-572
 - **An Exponential Increase in Regional Health Information Exchange With Collaborative Policies and Technologies.** *Studies in health technology and informatics*
Downing, N. L., Lane, S., Eisenberg, M., Sharp, C., Palma, J., Longhurst, C.
2015; 216: 931-?
 - **An Exponential Increase in Regional Health Information Exchange With Collaborative Policies and Technologies**
Downing, N., Lane, S., Eisenberg, M., Sharp, C., Palma, J., Longhurst, C., Northern Calif HIE Working Grp, Sarkar, I. N., Georgiou, A., Marques, P. M.
IOS PRESS.2015: 931
 - **COMPARISON OF EARLY REPOLARIZATION IN INFERIOR AND LATERAL LEADS** *61st Annual Scientific Session and Expo of the American College-of-Cardiology (ACC)/Conference on ACC-i2 with TCT*
Downing, N. L., Abhimanyu, Uberoi, M., Sallam, K., Sadik, J., Adhikarla, C., Froelicher, V.
ELSEVIER SCIENCE INC.2012: E1940–E1940
 - **In Regards to: Dr. N. Lance Downing et al. (Int J Radiat Oncol Biol Physics 2009;75:1064-1070) IN RESPONSE TO DR. H. CHRISTIANSEN ET AL.** *INTERNATIONAL JOURNAL OF RADIATION ONCOLOGY BIOLOGY PHYSICS*
Downing, L., Wolden, S., Le, Q.
2010; 76 (5): 1601
 - **COMPARISON OF TREATMENT RESULTS BETWEEN ADULT AND JUVENILE NASOPHARYNGEAL CARCINOMA** *INTERNATIONAL JOURNAL OF RADIATION ONCOLOGY BIOLOGY PHYSICS*
Downing, N. L., Wolden, S., Wong, P., Petrik, D. W., Hara, W., Le, Q.
2009; 75 (4): 1064-1070
 - **Framing physical activity as a distinct and uniquely valuable behavior independent of weight management: A pilot randomized controlled trial for overweight and obese sedentary persons** *EATING AND WEIGHT DISORDERS-STUDIES ON ANOREXIA BULIMIA AND OBESITY*
Mascola, A. J., Yiaslas, T. A., Meir, R. L., McGee, S. M., DOWNING, N. L., Beaver, K. M., CRANE, L. B., Agras, S.
2009; 14 (2-3): E148-E152