Primary care providers see many patients per day with short periods of time to complete each clinical visit. Multimorbidity or multiple comorbidities (having more than one chronic health care condition) is very common, so there is typically much to address in each visit. The evidence base of best clinical practice, based on randomized clinical trials and other evidence, is continually evolving. The evidence base is synthesized into clinical practice guidelines; however, physicians do not have time to reference these long documents as they work their way through a series of patients. Health information technology techniques now exist to break out details of clinical knowledge into computable formats so that the knowledge can be matched to individual patients using details of the patients’ clinical characterization from data in electronic health records (EHR). These technologies allow for generating patient-specific recommendations for care management that can be presented to health professionals through various channels available in the clinical workflow. This talk will discuss encoding clinical knowledge, accounting for comorbidity, linking to patient data in EHR, developing user interfaces to present information to health professionals, and choosing among alternative channels for presentation such as the EHR or dashboards for panel management.
Automating Guidelines for Clinical Decision Support: Knowledge Engineering and Implementation.

Tso GJ¹, Tu SW², Oshiro C³, Martins S³, Ashcraft M³, Yuen KW³, Wang D³, Robinson A³, Heidenreich PA¹, Goldstein MK².

Automating Performance Measures and Clinical Practice Guidelines: Differences and Complementarities

Samson W. Tu, MS,¹ Susana Martins, MD MSc,² Connie Oshiro, PhD,² Kaeli Yuen,² Dan Wang, PhD,² Amy Robinson, PharmD,² Michael Ashcraft, MD,² Paul A. Heidenreich, MD MS,¹,² and Mary K. Goldstein, MD MS¹,²

Additional citations for those who would like to read more (all are available in full text in pmc):

Automating Identification of Multiple Chronic Conditions in Clinical Practice Guidelines.

Leung TI¹, Jalal H², Zulman DM¹, Dumontier M⁴, Owens DK², Musen MA⁴, Goldstein MK³.

Using a Clinical Knowledge Base to Assess Comorbidity Interrelatedness Among Patients with Multiple Chronic Conditions.

Zulman DM¹, Martins SB², Liu Y³, Tu SW⁴, Hoffman BB⁵, Asch SM¹, Goldstein MK⁶.

Quality of care for patients with multiple chronic conditions: the role of comorbidity interrelatedness.


Designing an automated clinical decision support system to match clinical practice guidelines for opioid therapy for chronic pain.


Translating research into practice: organizational issues in implementing automated decision support for hypertension in three medical centers.

Goldstein MK¹, 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.