

Incorporating the patient's voice into electronic health records through patient-reported outcomes as the "review of systems"

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ABSTRACT

Owing to lack of standardization for eliciting patient symptoms, the limited time available during clinical encounters, and the often-competing priorities of patients and providers, providers may not appreciate the full spectrum of the patient's symptom experience. Using electronically collected patient-reported outcomes to capture the review of system outside of the clinic visit may not only improve the efficiency, completeness, and accuracy of data collection for the review of system, but also provide the opportunity to operationalize incorporating the patient's voice into the electronic health record. While the necessary technology is already available, multiple stakeholders, including electronic health record vendors, clinicians, researchers, and professional societies, need to align their interests before this can become a widespread reality.

Keywords: patient-reported outcomes, review of systems, electronic health records, patient-centered care, patient engagement

The review of systems (ROS) is an inventory of signs and symptoms elicited from patients by health care providers during conversations at clinical encounters. Currently, there is little standardization for how clinicians elicit the ROS through interviewing the patient or through practice-specific questionnaires. Due to the limited time available for clinical encounters and competing priorities of both patients and providers, an accurate complete ROS is often difficult to obtain even when clinically necessary. As a result, the provider may not appreciate the full spectrum of the patient's symptom experience, which could leave issues important to the patient unaddressed.

In the United States, the level of provider billing for an encounter is also, in part, dictated by the comprehensiveness of ROS documentation in the medical chart. For instance, in Medicare established patients, documenting a "complete" ROS (all 10 organ systems) instead of an "extended" ROS (the organ system related to the presenting problem, plus at least 2 other systems) can increase allowable charges by 34%.¹

Direct provision of patient-reported outcomes (PROs) via standardized electronic questionnaires may improve the efficiency, completeness, and accuracy of data collection for the ROS and overcome the aforementioned issues. PROs are already the gold standard for assessing symptoms in clinical trials² and increasingly in comparative effectiveness research³ and quality assessment.⁴ There is substantial evidence that direct reporting of symptoms by patients more accurately reflects their health status than clinician elicitation.^{5,6}

A PRO approach to the ROS might involve asking patients to report symptoms and severity electronically prior to visits via an online patient portal, which would then be available to auto-populate the ROS section of the provider's note within the electronic health record (EHR). Patients who did not complete their questionnaires prior to a visit or need assistance to do so could report at the encounter via a tablet computer, via

paper questionnaire in the waiting room, or be interviewed verbally and have their data manually entered (similar multitier approaches are already used to collect other types of health information, such as medication use). The provider would have access to the patient's self-reported symptoms not only for chart documentation, but also as a starting point for discussions during the clinical encounter and to support clinical decision making.

The building blocks needed to support an electronic patient-reported ROS already exist. Three of the largest EHR vendors (Epic, Allscripts, and Cerner)⁷ all offer patient portals with the capability to send PRO questionnaires to patients. Each vendor provides options to either modify existing or create new questionnaires, and may also allow providers to schedule and queue PRO questionnaires. The patient-entered information flows back to the EHR either as scanned PDF documents or as structured data to be reviewed and accepted directly into the medical record; the latter, preferred option offers the advantage of integrating the results into the EHR as the ROS for clinical documentation. This approach is also feasible from a billing standpoint: The Centers for Medicare & Medicaid Services already allows the use of paper-based or electronic patient-reported symptoms as the basis for the ROS, as long as a health care provider documents that the patient-reported information has been reviewed.⁸

This overall approach is consistent with a broader movement towards increasing the patient-centeredness of U.S. health care delivery, and particularly the functioning of EHRs. The federal Meaningful Use Stage 3 recommended objectives from the U.S. Office of the National Coordinator for Health Information Technology's Health Information Technology Policy Committee will require provider-requested, patient-generated health data, including PROs, to be accepted electronically, with the goal of having patients contribute information to the EHR. A patient-reported ROS collected and transmitted electronically would satisfy this Meaningful Use criterion.

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Not only would an electronically patient-reported or shared patient-provider ROS likely improve the accuracy of symptom detection and the efficiency of clinical workflow, but it would also facilitate systematic collection of structured, patient-reported data for aggregated analyses for comparative effectiveness research^{3,9,10} and quality assessment.^{2,4} In Minnesota, for example, primary care and psychiatric practices are required to complete a standardized depression questionnaire longitudinally as part of state-wide mental health quality assessment. Whereas this initiative started with paper-based surveys, it now uses EHR-based data collection.¹¹ Similarly, across the province of Ontario, Canada, computer kiosks have been installed in clinics for patients to complete a ROS—these data are used to guide clinical practice and system-level assessments of comparative effectiveness and quality of care delivery.¹² Social networks through websites such as “PatientsLikeMe” demonstrate that patients are willing and able to electronically self-report information about their health status and symptoms. Numerous studies have shown high patient adherence rates for self-reporting symptoms, even among the elderly, infirm, or those with lower health literacy.

A potential obstacle to instituting widespread collection of electronic patient-reported data as the ROS is that different symptoms may be pertinent to different patient populations. As a result, patients with multiple comorbidities could potentially be faced with numerous or extended questionnaires. EHR systems may also be unable to distinguish between various diagnoses warranting the assessment of context-specific symptoms, for example, dyspnea in patients with asthma or sensory neuropathy in patients with diabetes. Ideally, as strategies for systematic PRO collection in routine care mature, a common core set of symptom questions could emerge for administration across all populations, supplemented by customized modules for specific diagnoses or treatments. Core symptoms that have been suggested in oncology but with likely wide applicability include anxiety, constipation, depression, diarrhea, dyspnea, fatigue, nausea, pain, and sleep disturbance, as well as overall functional status.^{13,14} Multiple well-established questionnaires include these symptoms and could be immediately employed for this purpose.

The time is right for the patient’s voice to become systematically integrated into the EHR as a part of routine clinical care through the use of PROs as the ROS. Patients are willing and able to provide this information; PRO data can provide more accurate information about patients’ symptoms, thus improving the fidelity of clinical documentation in the EHR; and this approach could save clinicians’ valuable time by moving reporting of symptoms to outside the clinic visit. While the necessary technology is already available for PRO collection, multiple stakeholders need to align their interests before this can become a widespread reality. First, EHR vendors must expand current systems and support functionalities to enable health systems to easily create questionnaires without significant programming effort; provide standardized, validated questionnaires as a standard feature of EHR model systems; enable auto-population of PRO data into clinical documentation to facilitate workflow; and provide displays of PRO data that are meaningful to both patients and providers. Second, clinicians must come to value the collection of PROs and integrate them into daily clinical practice. Third, researchers must work to determine the optimal timing for PRO collection, to standardize and harmonize PRO measures, and to elucidate how to best utilize PROs collected during clinical care for research purposes. Finally, medical professional societies must assist in identifying the PROs most salient to their specialties and articulate approaches to integrate PROs into clinical workflows. The American Society for Clinical Oncology is exemplary in this regard,

having started an initiative to identify core symptoms across cancer populations for integration into EHRs.

Bringing the patient’s voice into routine symptom assessment during clinical care offers the unique opportunity to enhance engagement and partnership with our patients, while improving efficiency and quality by harnessing the existing infrastructure afforded by EHRs.

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COMPETING INTERESTS

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