

Back to the Future: Integrating Technology to Improve Patient-Provider Interactions

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PRACTICE POINTS

- Electronic medical records afford many benefits, but documentation burdens on health care providers can impede positive patient-provider interactions.
- Integration of current and future technology can shift the focus back to the patient and facilitate shared decision-making.

The adoption of electronic medical records (EMRs) resulted in both improvement and deterioration of different aspects of patient-provider interactions. We envision further integration of current and future technology to optimize patient-provider interactions, which we present using a hypothetical patient encounter.

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The advent of electronic medical records (EMRs) is arguably the most important technological revolution in modern medicine. The transition from paper documentation to EMRs has improved organization of medical records, consolidating all physician notes, orders, consultations, laboratory test results, and radiologic studies into a single accessible location.¹ However, this revolution has led to mixed consequences for patients, especially in the outpatient setting. The use of EMRs can facilitate questions, clarification, and discussion between patients and health care providers, prompted by the sections of the EMR. Unfortunately, patients too often encounter pressed-for-time, documentation-focused providers who may not even look up from the computer. Provider behaviors such as making eye contact, stopping typing during discussion of sensitive topics, and allowing

patients to view the computer screen and using it as an educational tool are important for patients to have a positive care experience.² We envision further integration of current and future technology to overcome the challenges of outpatient care. We use a hypothetical patient encounter to illustrate what the future may hold.

Hypothetical Patient Encounter

An established patient, Ms. PS, comes to the dermatology clinic for a follow-up appointment and walks into an examination room (Figure). Prior to entering the room, the provider, Dr. FT, reviews Ms. PS's history via a dermatology-specific EMR and reads that Ms. PS has a 1.5-year history of psoriasis and is considering other therapeutic options.

Upon entering the room, Dr. FT tells Ms. PS that the visit is being recorded and transcribed. A large interactive screen is a key component of the examination room. A remote medical assistant is virtually present via video to transcribe and document the patient-provider interaction. There is potential for artificial intelligence to replace the remote medical assistant in the future. Wearable technology, including a smartwatch and Bluetooth headphones, allow the provider to record audio of the visit as well as through microphones on the interactive screen.

As the interaction begins, Ms. PS reports that her psoriasis is poorly controlled with her current regimen of topical steroids. Dr. FT inquires about Ms. PS's current symptoms and psychosocial well-being. Dr. FT then performs a skin examination and is easily able to evaluate her skin vs prior visits, as clinical images from prior visits are automatically displayed on the interactive screen. Dr. FT also closely examines Ms. PS's nails and conducts a joint examination, reminded by a notification on his wearable technology. After capturing clinical images of Ms. PS's skin and nails with a secure EMR-connected tablet, Dr. FT briefly steps

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The patient examination room of the future with a large, wall-to-ceiling interactive screen to display the electronic medical record (EMR) and a remote medical assistant. Image courtesy of Rutgers University Libraries (New Brunswick, New Jersey) and James Galt, EdM (New Brunswick, New Jersey).

out of the room to allow Ms. PS to get dressed and feel more comfortable in the discussion to follow.

Once he reenters the examination room, Dr. FT initiates a discussion on next steps. Ms. PS's pathology report and clinical images are displayed on the interactive screen, along with her most recent laboratory test results, which were completed prior to the visit in anticipation of changing therapies. Dr. FT presents Ms. PS with several evidence-based therapeutic options for psoriasis, and she expresses interest in methotrexate. Following the discussion, the remote medical assistant displays information about methotrexate on the interactive screen, including evidence for treatment of psoriasis, contraindications, laboratory monitoring requirements, and possible adverse effects for both the patient and provider to review together. Dr. FT reviews the laboratory test results displayed on the screen, specifically her transaminase levels, and confirms that methotrexate is an appropriate therapeutic option. After a full discussion of risks and benefits, Ms. PS chooses to initiate methotrexate treatment. Reminded by a notification on his wearable technology, Dr. FT follows evidence-based dosing guidelines and sends the prescription electronically to Ms. PS's pharmacy, which concludes Ms. PS's visit.

Analysis of the Patient Encounter

In this interaction, Dr. FT was able to fully engage with the patient, unencumbered by the demands of documentation. There were only a few instances when the provider

looked at or touched the interactive screen. Furthermore, joint decision-making was optimized by allowing both the patient and provider to review diagnostic test results and current evidence-based therapeutic guidelines together through the interactive screen. Ms. PS goes home feeling satisfied that she received her provider's complete attention and that they selected a therapeutic option supported by evidence. After the visit, the remote medical assistant's transcript populates a patient note template, which Dr. FT reviews and amends to create the final note. Reducing the time required to write patient notes increases the speed at which Dr. FT can complete patient encounters and may improve clinic flow and productivity. In addition, a patient summary is generated from Dr. FT's final note, with an emphasis on patient instructions, and is sent to Ms. PS.

Final Thoughts

Our proposed integration of currently available and future technology can help minimize documentation burdens on providers and improve patient-provider communication in the age of the EMR, thus optimizing patient satisfaction and outcomes.

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