Where Errors Occur: Inadequate Family and Medication Histories

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One of the first tasks taught during medical training is taking a complete and accurate medical history. Billings and Stoekle, in *The Clinical Encounter: A Guide to the Medical Interview and Case Presentation,* explain that one of the purposes of the medical interview is to elicit the "standard database" on each patient, including the past medical history, medications, allergies, family history, and social history.[1] However, while these tasks are quickly learned during medical training, it is clear that obtaining and maintaining a complete and up-to-date database—and providing that information when needed to all medical personnel—is hindered by the complexity of our health care system, advances in medical science, and the aging of our population. Two particular pieces of this database, family history and medication history, are recognized as places where errors occur, errors that can lead to patient harm if not corrected.

Family History

Family history often provides the first clues that a patient may be at high risk for developing certain conditions. While the primary care provider (PCP) is on the front line for making this identification, this process is less than ideal in most office settings.[2] Malpractice data show that many high-risk patients are not in fact identified, even those with strong family histories *(see LaValley, page 1)*. (Equally troubling are those cases in which the risk was identified, but proper action, such as increased surveillance, risk factor modification, and/or genetic testing, was not always taken.) As the genetic basis of more conditions is identified and the potential to take action increases, failure to take and update a patient's family history will expose providers to greater liability.

One recent study at Partners Healthcare[3] illustrates this problem: 53 percent of patients surveyed had no easily retrievable family history information in the electronic health record (at Partners, the Longitudinal Medical Record, or LMR).[4] When asked about six medical conditions (coronary artery disease, colon cancer, breast cancer, diabetes, osteoporosis, and glaucoma), from 12–41 percent of the 163 patients reported positive family histories. For 82–97 percent of those cases, *the survey was the only source of this information,* i.e., it was not documented in the medical record. Depending on the condition, this information increased the patient's risk level for developing the disease in 33–95 percent of cases. The study also found that communicating this new family history information to physicians through an electronic clinical message and note in the LMR *was not sufficient* to achieve recommended follow-up care in the majority of cases.

The causes for this problem include:

- patients are not always aware of their family histories;
- physicians are not trained in taking a complete family history;
- physicians do not have time to take a complete history during a typical office visit;
- family histories are collected infrequently, sometimes only at the first encounter;
- family history, when collected, is often incomplete, i.e., without enough information to calculate risk (e.g., degree of relatedness, age of onset); and
- even if the provider has all the information, he or she does not have enough guidance on appropriate actions to take.

The solutions are difficult, especially with ever-shorter medical visits. Provider training, process redesign, and information technology are needed to ensure that family histories are taken properly, and updated regularly. Provider training should focus on taking a complete history, including the relationship of each family member to the patient and age of onset of the condition *(see accompanying Tips)*. Process redesign could include having patients or caregivers complete structured family history forms, e.g., in the waiting room, perhaps with the help of medical assistants. PCPs could then verify this information during the visit and add the annotated form to the medical record. These forms could include guidelines to risk-stratify patients and recommend specific follow-up actions.[5]

Lastly, information technology could facilitate this process. For example, Partners Healthcare has developed a module within its shared electronic patient portal (Patient Gateway) that asks patients to update their family history online in the weeks prior to an upcoming visit.[6] The system uses branching logic to simplify data entry and focus on conditions where evidence-based actions are most likely to be needed. During the visit, the PCP can verify the information and add it to the medical record. Regardless of how the information is entered, the Partners LMR allows for family history data to be stored in a structured format, automatically calculates the risk level for the patient, and provides decision support on actions to take.

Medication History

Perhaps an even bigger threat to patient safety are problems that arise from an incomplete or out-of-date medication history. Outpatient medication lists, even within electronic medical records, are notoriously inaccurate. In another recent study at Partners of 936 patients taking 5,799 medications, a survey found that:

- two percent of the medications listed in the LMR were never taken,
- 10 percent were being taken differently than indicated in the record,
- 22 percent were no longer being taken, and
- patients in the study were taking an additional 308 medications that were not in the LMR medication list.

The causes for such inaccuracies are many. Patients may have multiple outpatient providers, each of whom prescribes a subset of a patient's medications, and none of whom may have the knowledge of all the patient's medications nor responsibility for ensuring the accuracy of the regimen as a whole. Incomplete data sources and communication among providers and patients may exacerbate this problem. Patients may not fully understand their medication regimens.[7] Finally, acute care hospitalizations and subsequent discharges home often lead to drastic changes in medication regimens along with inadequate patient education, discontinuity of care, and miscommunication among providers.[8–11]

Medication discrepancies, i.e., unexplained differences between regimens patients think they should be taking and those ordered by their physicians—or between documented regimens across different sites of care—are common, especially after hospital discharge.[12] In a study at Boston's Brigham and Women's Hospital (and consistent with other studies), approximately half of all patients have at least one unexplained medication discrepancy at the time of hospital discharge compared with their preadmission regimens.[13] Moreover, just three days after discharge, 29 percent of patients had an unexplained discrepancy between the discharge medications and what they were actually taking. One month after discharge, 90 percent of LMR medication lists had at least one error.

Solutions to this problem will, again, need to be multifaceted. Physicians need guidance on taking an accurate medication history *(see Tips)*. When possible, patients should be encouraged to keep their own medication histories (forms can be found on the AARP web site,[14–15] among other places) and to update them whenever they see a medical provider, go to a pharmacy, change a medication, or at least twice a year. If patients or non-clinical caregivers are incapable of maintaining the list, then the PCP may want to take responsibility for maintaining this list and communicating with a patient's other providers.

The Joint Commission now requires hospitals to reconcile inpatient and discharge medications with a patient's preadmission medications, and to then communicate that information to the next provider of care.[16] This process must be followed up

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Tips for Taking an Accurate Family History

1. Focus on those conditions (below) for which a) the disease burden is high, b) family history can be accurately reported and is an established risk factor, c) evidence-based interventions for prevention exist, and d) family history alters management decisions:
   - colon cancer
   - breast cancer
   - coronary artery disease
   - diabetes mellitus
   - osteoporosis
   - glaucoma
   - asthma
   - stroke
2. A full family history for breast and colon cancer should include other associated cancers, e.g., endometrial, ovarian, stomach, kidney, bladder, pancreatic, and brain cancer.
3. Ask about all first-degree and second-degree relatives: parents, siblings, children; aunts, uncles, grandparents, nieces, nephews, grandchildren, and half-siblings.
4. Ask about the age of onset for each relative.
5. Make sure patients understand not to include relatives by marriage, but to include relatives who are no longer alive, and to include paternal relatives for female conditions such as breast cancer.

Tips for Taking an Accurate Medication History

1. Ask about:
   - medication allergies and reactions;
   - a typical day and what medications the patient takes at different times of the day;
   - if the patient receives medication prescriptions from more than one provider (obtain contact information for each provider);
   - the patient's local pharmacy(ies) and phone number or town;
   - how sure the patient is of his or her medications and who best knows the medications;
   - various types of medications: tablets, oral liquids, eye drops, ear drops, nasal sprays, inhalers, patches, creams, lotions, injections, suppositories;
   - over-the-counter products, herbals, vitamins, and supplements;
   - the indication for each medication;
   - the strength, dose, and frequency of all medications (e.g., one 20mg tablet twice a day; 440 mcg inhaler, two puffs twice a day);
   - as-needed medications and how often the patient uses them;
   - how long the patient has been taking each medication;
   - the last time the patient took each medication;
   - how many doses (if any) the patient has missed in the last week (explore reasons for non-adherence: cost, access to a pharmacy, lack of appreciation of need for medication, side effect, etc.); and
   - potential side-effects: type, duration, severity, previous actions taken by patient and prescriber.
2. Compare patient/caregiver information to objective sources of information: e.g., prescription pill bottles, outpatient medication lists, recent discharge or transfer orders, pharmacy refill information.
3. Explore discrepancies among the various sources of information.
4. Obtain additional objective information if the patient is unsure of medications or any discrepancies among sources.

Where Errors Occur (continued)

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with post-discharge medication reconciliation, ideally during the patient's first post-discharge visit with his or her PCP. This requires a review of what medications the patient was taking prior to admission, the discharge medication regimen, and the patient's clinical status, and then creating a new post-discharge medication list to be communicated with the patient and all providers. Partners is working on a post-discharge reconciliation screen within its LMR, but paper processes are also feasible.[17] Going forward, medication information, including lists from outpatient electronic health records and hospitals, as well as pharmacy and claims information, will need to be available in a standard electronic format that can be communicated across all sites of care so that an accurate medication list can be obtained wherever care is delivered. ■

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16. See 2007 National Patient Safety Goals 8, 8A, and 8B: www.jointcommission.org/PatientSafety/NationalPatientSafetyGoals/07_hap_cah_npsgs
17. Several examples are available in *What Works: Effective Practices in Office-based Care* at www.rmf.harvard.edu/patient-safety-strategies/office-practices.

PCP Extinction? (continued)

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Where I see problems occurring most is when patients obtain care at different systems. They come to see one doctor at Hospital A and go two blocks down the street to Hospital B and see another doctor who does not have access to Hospital A's information system. Communication cannot be as good under these circumstances. I have seen a number of lawsuits filed because patients went to multiple medical centers and no one person knew all of what was going on... and things were missed.

Whose responsibility should it be for coordinating such situations?

It is always easy to say that it should be the internist, but I think that if the internist has encouraged the patient to stay within the institution—so that continuity of care can be achieved—and the patient still chooses to go out of the system, then it is harder for the internist to be held completely responsible. Doctors do need to communicate across institutions, but we need to better educate patients who choose to go across institutions that there may be problems with the coordination and the continuity of their care. Of course, the ultimate solution is having all doctors and hospitals on one information system like Great Britain, Denmark, and the Veterans' Administration have achieved.

Are office staffs being asked to do too much, or not enough?

Better allocating of staff roles can improve care and decrease adverse events. For example, our practice cares for approximately 40,000 patients. Rather than relying on the memories and abilities of individual physicians, it may make more sense to have nurses look at patient registries and medical records to find out who might be missing a screening test.

Are hospitalists helping primary care providers?

It depends. Hospitalists are well trained, have the advantage of being on site most of the day, and provide a high level of care—those are all pluses. On the negative side, hospitalists, by definition, are unfamiliar with most of the patients who get admitted. They may not know some of the subtle historical issues that could be important about any given patient. I do know that our hospitalists work hard to communicate with the referring doctors during the hospitalization and at the time of discharge. That's another place where electronic medical records and systems can really facilitate the communication of accurate medication lists that are vital.

Why do people choose general internal medicine as a career?

People who are dedicated to caring for patients over a long period of time and enjoy building relationships with patients—and even their families—are best suited for internal medicine. I saw a patient in the hospital today with pneumonia complicated by myocardial infarction, someone whom I have cared for for 20 years. When he saw me, he broke in to a big smile. ■

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