

SOUNDING BOARD

The Family History — More Important Than Ever

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For many observers, the term “genomic medicine” conjures up space-age images of microarray chips, bioinformatics, and designer drugs. Today, with medicine poised at the dawn of the genomic era, it is seductive to believe that such high-tech options have already become the most important genomic tools in health care. However, as so often happens in medicine, new developments do not eclipse the tried-and-true method; instead, they give it new meaning and power.

Most diseases are the result of the interactions of multiple genes and environmental factors. Although these interactions are complex, almost every patient today has access to a free, well-proven, personalized genomic tool that captures many of these interactions and can serve as the cornerstone for individualized disease prevention. This valuable tool is the family history.^{1,2}

Although advances arising from the Human Genome Project and related efforts are already adding important new genomic tools,³ the family history will remain highly relevant for years to come. The family history has been shown to help predict the risk of such varied health concerns as heart disease,⁴ colorectal cancer,⁵ breast cancer,⁶ ovarian cancer,⁷ osteoporosis,⁸ atopy or asthma,⁹ type 2 diabetes,¹⁰ and suicide,¹¹ among many others. Yet many patients are unaware of the medical histories of their relatives, and many health professionals underuse this information in advising patients about how to maintain good health.^{12,13}

The family history has, of course, long been regarded as a mainstay in caring for the patient who is at increased risk for a relatively uncommon mendelian, or single-gene, disorder. For instance, in evaluating a patient with gastrointestinal bleeding, knowledge that one of the patient’s parents has von Willebrand’s disease substantially guides the work-up. Similarly, the approach to a patient who presents with newly diagnosed hypertension changes radically if his or her family history reveals the relatively common autosomal dominant polycystic kidney

disease. Knowledge that both parents are carriers for sickle cell disease can lead to early diagnosis in an asymptomatic but affected newborn, prompt introduction of prophylactic antibiotic therapy, and careful surveillance for painful crises, thus improving the likelihood of decreasing the baby’s disease burden. Knowledge that a woman has a brother and a maternal uncle with the fragile X syndrome affects both prenatal counseling and the evaluation of her child who has a developmental delay. The approach to a patient with shortness of breath changes dramatically if an alert physician obtains a history of a first-degree relative with frequent epistaxis and telangiectasis, suggesting that the patient may have hereditary hemorrhagic telangiectasia. As a case reported in this issue of the *Journal* illustrates, knowledge of a parental balanced chromosomal inversion can abbreviate an otherwise lengthy workup for failure to thrive.¹⁴

Although much of the teaching about the role of the family history has traditionally focused on mendelian disorders, we do our patients a disservice if we fail to realize the value of the family history in dealing with more common, multifactorial disorders as well. A clinician’s ignorance of a history of colon cancer in a patient’s family can easily result in a failure to offer potentially lifesaving early colonoscopy. In a similar way, failure to recognize that a family history of breast and ovarian cancer is just as important on the paternal side as it is on the maternal side can cause a clinician to overlook a woman’s increased risk of either type of cancer, with potentially tragic consequences. Awareness that a healthy, athletic middle-aged man has a family history of coronary artery disease can lead to an emphasis on interventions that are known to ameliorate such risk, including dietary and behavioral changes, as well as to early laboratory testing for disorders of lipid metabolism and a consideration of the aggressive use of statins. A family history of early stroke can lead to similar individualized changes in standard well-patient care. Knowledge that a patient has

a family history of type 2 diabetes can lead to an increased emphasis on weight control and to careful monitoring of glucose metabolism.

Of course, knowledge of individual risk does not always lead to better health. Particularly as advances in genomics make the family history even more helpful in preventing, diagnosing, and treating common diseases, it will be crucial to conduct careful studies that establish the best approaches for ensuring that increased knowledge leads to behavioral changes resulting in improved health outcomes.

OVERCOMING THE OBSTACLES

If the family history is such a useful tool, why do health professionals not use it more consistently and more effectively? Although there are several obstacles, none are intractable. The first one is a common underestimation by clinicians of the value of the family history, an obstacle that could be removed by better teaching and by more widespread use of role modeling in the effective use of the family history. The realities of today's health care also pose challenges. In clinical practice, it is often difficult to find sufficient time to obtain, organize, and analyze family-history information. Using creative approaches that demand less time from practitioners can diminish, if not entirely overcome, this obstacle. For instance, interactive software¹⁵ that allows patients to record their family history on a computer^{16,17} can eliminate much of the time that clinicians conventionally spend in obtaining and organizing the data, although software that is easier for patients to use would be helpful. By producing a copy of the pedigree for the patient as well as for the health care provider, such a program can also give the patient a more lasting reminder of the importance of family history and the need to keep it updated. Computer-based tools now under development¹⁸ may even produce more accurate information, since many patients will be able to enter data not only in the clinic but also in their own homes and over a span of time, thus allowing better access to records and family members than patients have during an office visit.

Computer-based approaches also offer clinicians the advantages of standardizing the family history and helping to overcome anxiety about their own lack of expertise in obtaining and organizing the data, another common obstacle.¹⁹ If optimally constructed, the software can offer patients the added

benefits of both education about the general importance and use of the family history in individualized care and an opportunity to be more active and involved in their own care. If such software also includes analysis of the family history, it can help assuage providers' anxiety about this step in the process and standardize care by offering updated information and guidance that is based on the latest evidence-based medicine. As Rich et al. have written, "One can envision a future where portable electronic family history data integrated through electronic medical records to PDAs [personal digital assistants] and evidence-based practice guidelines could overcome current barriers to the thorough collection, accurate interpretation, and wise application of the family history in primary care practice."¹

Since anything that is noted about family members in the medical record is potentially discoverable, many observers worry that recording the family history may lead to genetic discrimination in employment or health insurance. Many states have laws in place to prohibit such discrimination (see www.genome.gov/policyethics/legdatabase/pubsearch.cfm for a state-by-state listing of such laws), but appropriate national legislation, such as a bill that has been unanimously passed in the U.S. Senate and is now pending in the House of Representatives, would more successfully overcome this concern.

THE PAST AS THE FUTURE

Will the family history eventually become a relic of antiquated medical practice that has been replaced by more "modern" tools? For instance, in a decade or so, when sequencing a patient's genome may cost less than \$1,000, will it still be worth a practitioner's time to obtain the less precise information contained in a family history? We think so. Many years will pass before we completely understand the role of specific genetic factors and their interaction with environmental factors in health and disease. At least until that time, it will be most effective to integrate genotypic data with selected family history to suggest how best to individualize care. For instance, if genotypic analysis demonstrates that a woman has a mutation in a gene, such as *BRCA1*, that plays a role in breast and ovarian cancers, her risk of breast or ovarian cancer is higher if she has a positive family history.²⁰ If another patient has a hitherto unreported mutation in some identi-

fied gene, the family history may be instrumental in determining the likelihood of whether the mutation will be pathologic. Also, by affecting an individual's pretest risk, the family history can substantially alter the predictive value not only of genetic tests but also of other screening tests.¹

How can we increase the effectiveness and the use of the family history in clinical care? First, we need to remind both health professionals and patients about the value of the family history. Second, we need to make the process of collecting and analyzing the data easier and less time-consuming for health professionals. In conjunction with the National Institutes of Health, the Centers for Disease Control and Prevention, the Health Resources and Services Administration, and the Agency for Healthcare Research and Quality, the Office of the Surgeon General is spearheading a national campaign, the U.S. Surgeon General's Family History Initiative, to achieve both of these goals. The initial efforts of this campaign focus on designating the day that many American families traditionally gather, Thanksgiving Day, as the annual National Family History Day. The goals of this campaign are to increase the awareness of the medical value of the family history among both health providers and the public; to make the data easier to collect, organize, and use; and to augment "genetic literacy," an increasingly important part of overall health literacy, which is key to improving the health and well-being of all Americans.

Today (November 25) will serve as the inaugural observance of National Family History Day. A cornerstone of this year's event is the launch of a Web-based tool (www.hhs.gov/familyhistory) that allows people to collect, organize, and maintain their family history securely on their own computers. Users must download the tool onto their own computers, thus ensuring that the information they enter will not be available to the federal government or other parties. Although this tool allows for the collection of any family data, it highlights certain common disorders for which the family history is particularly helpful currently in guiding medical care, including breast cancer, ovarian cancer, colon cancer, stroke, diabetes, and coronary heart disease. This Web site, which has both English and Spanish versions, also contains information for families about how the data that are gathered can help guide their efforts to stay healthy.

There is reason to believe that many people will welcome such efforts to make the family history a

more available tool. A recent survey asked more than 4000 people the question "How important do you think knowledge of your family's health history is to your personal health?" Seventy-three percent of the survey respondents thought that it was very important, and 24 percent thought it was somewhat important. However, only 30 percent of the respondents reported that they had actually collected health information from relatives in order to develop a family health history (Yoon P: personal communication).

The Web site and the surgeon general's campaign are designed to encourage people to bring their family history to their health care providers for further discussion, evaluation, and use. The Web site and other activities that are focused on the topic will be expanded and updated in future years. The federal agencies that are involved in this work welcome the partnership of other groups and people in this campaign to promote the use of the family history in clinical care.

We look forward to the time, not far off, when detailed genotypic information will play an important and everyday role in guiding patient care. However, as we work toward that day, it is important that we not overlook what patients know about the health of their families. Moreover, we can use modern tools — refining electronic means for gathering and analyzing family history, further developing protocols that use evidence-based medicine to craft individualized care guided by family history, and continuing to update our approach to family history — to make the "old-fashioned" family history even more effective and useful.

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