Creating an Educational Blueprint

Patients expect that their primary care physician will be able to advise them on genomic topics, yet evidence suggests that primary care providers are ill prepared to do so. The recent burst of discovery in genomics coupled with the direct to consumer availability of genetic testing has served to widen the gap between patient expectations and physician knowledge. On June 8 and 9, 2009 the NIH and HRSA hosted a meeting of core primary care physician groups in order to revitalize efforts directed at narrowing that gap. The goal of the meeting was to develop a concrete plan for primary care physician education regarding genetic and genomic topics. Representatives of pediatric, internal medicine, ob/gyn, genetics and preventive medicine organizations came together to consider how advances in genomics are affecting their memberships and the U.S. health care system. There was recognition by the attendees that enhanced genomics education was needed by all primary care specialties– and that the structural and economic impediments to implementing genomics education make shared approaches desirable.

One clear consensus emerging from the meeting was that genomic discoveries are altering how physicians should think about the practice of medicine. Meeting attendees expressed the belief that genomics education must not be "added on" as a discrete entity to what is being taught but rather integrated into existing paradigms for teaching about health and disease. Suggested concrete educational reforms reflect this philosophy. For example, attendees thought that medical school curriculum committees should have at least one member knowledgeable about clinical aspects of genomics in order to ensure that the subject becomes incorporated longitudinally through all four years of medical training. It was widely acknowledged that this form of "genetic exceptionalism" in curriculum development would be met with resistance in medical schools. However, the need to include genomics in the clinical years is highlighted by two publications. In the May 2007 issue of *Academic Medicine* Thurston et al. reported on a survey demonstrating that only 47% of U.S. and Canadian medical schools incorporate medical genetic into 3rd and 4th year teaching. The second more recent paper by Greb et al. in the May 2009 issue of *Genetics in Medicine* suggests that third year students are largely incapable of applying genomics knowledge imparted in their first year of training to clinical encounters.

One of the key suggestions regarding resident education coming from the meeting was that Residency Review Committee criteria for the primary care specialties should be reviewed for genomics content. As with the approach to medical school education, the suggestion was not to add new competencies but to develop an explicit mapping of genomics onto existing competencies. A pragmatic suggestion for enhancing the genomics knowledge of the practicing clinician was to include genomics as part of the required checklist for granting CME accreditation to new educational offerings. This simple step would at a minimum ensure that authors consider whether or not there is a genomic dimension to their topic, and at best result in the inclusion of genomics content that might have been ignored otherwise. This approach has the advantage of distributing genomics education across the entire CME apparatus while ensuring that content will be

updated automatically as new programs are introduced. All recognized that faculty development would be a key component for success of each of these measures. The American Academy of Family Physicians is currently implementing such a program.

Consideration was given to refreshing and re-deploying the Genetics in Primary Care pilot initiative which used a case-based "train the trainer model" of interdisciplinary health professional education to develop genomics enabled faculty (see: http://www.genetests.org/servlet/access?id=INSERTID&key=INSERTKEY&fcn=y&filename=/tools/index.html). Attendees agreed on the need to ramp up the number of individuals with advanced genomics training in the U.S. health care system, including genetic counselors and medical geneticists. It was proposed that physicians with advanced genomics skills could be rapidly trained by developing a one year genetics fellowship program for primary care and other specialists that would provide a certificate of added qualification

Perhaps the most remarkable discussions involved the intersection of the patient centered medical home and genomics. The group came to consensus that a successful medical home incorporating genomics necessitates a team-based approach. Nursing, mid- level providers, primary care specialists and specialists with advanced genetics training are all necessary links to effective care delivery. Frustration was expressed by attendees that the current fragmented system imperils patients at times of care transitions, particularly in the preconception/peri-natal period and as special needs children transition from pediatric to adult care environments. There was a call for enhanced collaborations between relevant physician organizations to eliminate "dueling" specialty-specific care guidelines that result in confusion among rank and file primary care providers and their patients.

The June 5, 2009 issue of *Science* magazine contained an article relating a vision for the future of medical education produced by a panel of experts convened by the American Association of Medical Colleges and the Howard Hughes Medical Institute. "Scientific Foundations for Future Physicians" (available at: http://www.hhmi.org/grants/sffp.html) emphasizes the need to move towards an educational system that promotes teaching key scientific principles rather than rote memorization in order to produce physicians that are facile lifetime learners of biomedical knowledge. The "Overarching Principles" section of the report relates the need for new physicians to understand the role genetics plays though the spectrum of health, disease and society. The outcomes of the June 8-9 meeting dovetail quite well with these principles. It is imperative that the combined forces calling for an enhanced focus on genomics education for primary care professionals will lead to real gains in physician competency in the years to come.