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Medical genetics and genomics education and its impact on genomic literacy of the clinical workforce

To the Editor: We read with great interest the recent article by Bennett et al., "Medical Genetics and Genomics Education: How do We Define Success? Where do We Focus Our Resources?,"[1] describing challenges in maintaining genomic literacy in the clinical workforce and recruiting additional competent specialists to genetic counseling and clinical genetics specialties. The authors highlight the dual, potentially competing priorities of trying to increase the use of genetics in a variety of clinical disciplines while maintaining professional expertise in a complex and rapidly evolving field. We agree that these goals are paramount to insuring "access to a health-care workforce [competent] in medical genetics and genomics."

As medical genetics educators, we also note that trends in medical education have numerous unintended consequences for these goals. As described in our recent study,[2] a substantial proportion of preclerkship genetics education is directed by specialists in other disciplines. Moreover, the majority of medical schools included in our study did not incorporate medical genetics into the clerkship phase of teaching, thus missing an opportunity to highlight clinical genetics as a professional path. Finally, medical curricula are trending toward integrated structures, typically abolishing discipline-based courses such as genetics and sprinkling their content throughout the curriculum. For a subject that takes up an average of only 2% of overall preclerkship contact hours (A. Nees, personal communication, 8 April 2013), a real concern is the inadvertent dilution of that subject to the point where its unique identity is lost. Taken together, these curricular trends threaten to make clinical genetics less visible as a specialty option, potentially exacerbating the existing recruitment issues in the field.

How can we fill the gap and meet the increasing need for clinical geneticists? As Bennett et al.[1] suggest, we need to foster excitement about medical genetics specialties early, upon entry to medical school, as well as throughout their training. One way to do this is to increase the exposure of medical students to clinical geneticists in preclerkship courses and in early clinical experience. Medical students are presented with numerous role models from various clinical disciplines who teach in the preclerkship curriculum; medical geneticists and genetic counselors should be included in this revered group and could be given stipends for providing clinical opportunities in their field to motivated students. The formation of genetics–genomics student interest groups (SIGs), especially those registered with the American College of Medical Genetics and Genomics (ACMG) Student Interest Group Program (http://www.acmg.net/ACMG/STUDENTS/ACMG/ACMG_Student_Interest_Groups.aspx?hkey=3035864a-587a-4194-ae8c-7f5f5ed5c569), can offer further clinical genetics exposure to interested students, provide opportunities for students to connect with SIGs at other medical schools, and support attendance at an ACMG meeting. Expanding funding for genetics–genomics SIGs could greatly increase the exposure of students to the field of medical genetics. In addition, the ACMG Foundation sponsors a Summer Scholars Program (https://www.acmgfoundation.org/ACMGFound/ACMGF_Programs/Summer_Scholars/ACMGFound/ACMGF_Programs/Summer_Scholars_Program.aspx?hkey=e235b4f9-2775-4de3-a042-ca4c2f58b1c7), which offers medical students an opportunity to work with a clinical genetics team between their first and second years. Expanding this program could increase the number of medical students with firsthand experience of clinical genetics.

When teaching genetics content to medical students, it is important not only to ensure that the content is up to date and consistent with current medical genetics practice but also to include instruction on when it is appropriate to refer to a clinical genetics team. In addition to increased preclerkship exposure to clinical genetics, it is imperative to make specialized medical genetics training available during the third and fourth years of medical school, when students are making decisions about their future careers and applying for residencies. Since exposure to a genetics case during the standard clerkship rotations is dependent on the patients a student sees, case-based learning, led by clinical geneticists, genetic counselors, or genetic counseling students, could be incorporated into didactic sessions in specific rotations (e.g., pediatrics, obstetrics and gynecology, internal medicine, neurology, psychiatry). Using realistic cases that integrate genetics with different disciplines and include referral to a clinical genetics team when appropriate can help students appreciate both how genetics and genomics are being used across multiple disciplines and the role of clinical geneticists and genetic counselors. Indeed, as explained by Bennett and colleagues,[1] "We will never reach the mainstream practice of medicine until we consistently demonstrate that we have something to offer patients," and what better venue to begin making that case than in required clerkships? In addition, if appropriate resources and support are made available, institutions not already offering a clinical genetics elective in the fourth year could develop an innovative clinical educational experience for interested students, thereby directly increasing the potential pipeline for future clinical geneticists.

In summary, we commend Bennett and colleagues[1] for highlighting the important issue of expanding a competent clinical genetics workforce, and we advocate for the expansion of initiatives at the undergraduate medical education level to help train and recruit the next generation of geneticists. The development of novel four-year curricula that seek to expand the footprint of clinical genetics and genomics should be fostered and supported, both at individual medical institutions and at the national level.

DISCLOSURE

The authors declare no conflict of interest.

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