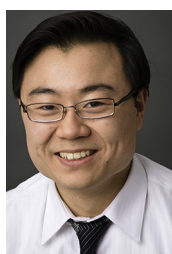




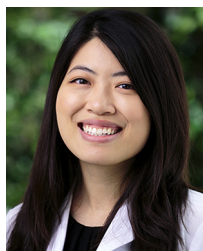
editorial



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Professional medical associations and the opportunity to promote breakthrough biomedical innovation

Editorial

Medical innovation is central to a high-performing medical system. However, promoting drug development and device innovation remains a continuous challenge. For instance, the number of new drugs approved per billion dollars spent has decreased 80-fold since the 1950s [1]. Biomedical innovators responsible for the most transformative drugs today have lamented the present-day focus on incremental developments, a practice that prioritizes shorter-term outcomes over higher-risk breakthroughs [2]. The promotion of breakthrough biomedical innovation is complex and multifactorial. Industry often argues for additional regulatory mechanisms for marketing approval in order to provide pathways that, when appropriate, can accelerate patient access and reduce the cost of drug and device development. In academic settings, recent initiatives have focused on human resource development to train and educate the next generation of medical innovators and entrepreneurs [3,4].

Fundamental to breakthrough innovation is direct exposure and deep understanding of unmet clinical needs. Physicians can offer this critical insight through their direct experience with patients. Accordingly, physicians have been involved with nearly every major medical breakthrough in recent history. From imatinib to statins, physicians have acted as investigators throughout the entire lifecycle of biomedical innovation, from fundamental basic science discovery to approval by FDA and other health authorities [2]. For example, with regard to devices, physicians submit a significant proportion of medical device patents filed. An analysis of 170 pre-market approval applications by four large incumbent device companies showed that 11% cited information from physician-founded start-ups, compared to 4% from non-physician-founded companies [5]. Clearly, industry values the input of physicians. However, many individual physicians face barriers to participating meaningfully in innovation. These include—but are not limited to—conflict of interest concerns within the academic setting, time and resource limitations, and lack of expertise and experience with product development.

We propose that organized involvement by physicians through their respective professional medical associations (PMAs) would be a positive force in driving medical innovation. Professional medical associations (PMAs) are uniquely positioned to foster innovation and entrepreneurship among physicians by providing credibility and pooling resources. Traditionally, PMAs publish practice guidelines and offer continuing medical education opportunities to their members, though more recently they have expanded their focus to other endeavors such as policymaking, lobbying, and awarding research grants. With their credibility and infrastructure, PMAs can play an influential role in the innovation ecosystem. Bringing together physicians with shared clinical interests and goals has proven effective in achieving real impact. One example is Choosing Wisely, a quality improvement initiative founded by the nonprofit American Board of Internal Medicine Foundation and Consumer Reports. Since its inception in 2012, Choosing Wisely has partnered with over 80 specialty PMAs and has published over 500 recommendations aimed at reducing medical overuse. Part of Choosing Wisely's success comes from the inherent trustworthiness of the participating PMAs, which span the entire range of medical specialties. "Innovating Wisely" is a conceivable next step.

Recently, there has been an acceleration of PMAs incorporating innovation into their core activities. In October 2017, the American Medical Association (AMA) released its Physician Innovation Network, an online community for physicians to connect with healthcare technology companies and vice versa. Other innovation pursuits of the AMA include partnerships with MATTER, a healthcare technology incubator based in Chicago, founded in 2015, and Health2047, a Silicon Valley health information technology innovation company founded in 2016. PMAs representing specialty groups are also directing attention to innovation. Since 2009, the Ophthalmology Innovation Summit has met several times a year in affiliation with the annual meetings of the American Academy of Ophthalmology, American Society of Cataract and Refractive Surgery and American Society of Retina Specialists. In December 2016, the American College of Cardiology (ACC) held its first Cardiovascular Innovation Summit, where attendees discussed problems and solutions surrounding innovation in cardiology. Out of the ACC summit, a Healthcare Innovation Workgroup was also established for developing entrepreneurial skills, knowledge, and leadership among members. Also in 2016, the American Psychiatric Association (APA) hosted its first Psychiatry Innovation Lab, where innovators competed for mentorship and funding to pitch their ideas at the APA Annual Meeting. An independent nonprofit, Advancing Innovation in Dermatology (AID), was founded by dermatologists in 2011 and serves to connect physicians with other innovators at their annual Dermatology Summit and Dermatology Innovation Forum, the latter of which is affiliated with the American Academy of Dermatology (AAD) [4]. The organization also works directly with the Society of Investigative Dermatology, which represents physician-scientists in the field. In addition to networking, AID directly invests in innovations through its Accelerator Program. One outcome is the success of the AID-supported "Magic Wand" Initiative at Massachusetts General Hospital, where dermatologists were empowered to identify unmet clinical needs and then paired with researchers who had the tools and know-how to solve the problems. Out of 30

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