The Ophthalmologist of the Future

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Who are the ophthalmologists of the future? How will the new generation practice? How will they interact with their professional organizations? What part will technology play in their lives and professions? A new paradigm is in place that will dramatically affect ophthalmologists' answers to these questions going forward. Given the uncertainty of our future professional lives, it is vital that we anticipate, contemplate, and formulate a plan. To begin this process, the Knapp Symposium at the 2011 Annual Meeting of the American Ophthalmological Society was devoted to a discussion of the ophthalmologist of the future.

Making sense of the tumultuous changes in the delivery of eye care led the American Ophthalmological Society to sponsor a symposium focusing on the ophthalmologist of the future. The topic was approached from 2 perspectives: that of the ophthalmologist and that of the ophthalmic practice environment. This article addresses the ophthalmologist of the future; a separate article addresses the ophthalmic practice of the future.

The ophthalmology workforce of the future will comprise practitioners from different generations. Although based on generalizations, certain generational characteristics are notable and have relevance to how practitioners interact with each other and with patients. Understanding differences in lifestyle expectations, professional and personal motivation, and interpersonal communication will be essential. The tools of the future ophthalmologist will increasingly be digital, resulting in the expectation of immediate access to validated, reasonably complete information. The tools themselves will reshape interactions among mentors, teachers, and students. Professional organizations will need to embrace these tools to enhance a sense of community, supplanting their diminishing role as a source of traditional didactic education.

GENERATIONAL CHARACTERISTICS

Ophthalmologists of the future will work in a constantly integrative environment, interfacing with other physicians, support personnel, regulatory and payer agencies, and patients. Just as the ophthalmologist of the future will need to adapt to various cultural differences, it will be necessary to understand and respect generational differences. Social scientists have described generational characteristics based on observations of a broad (nonmedical) population. At the Knapp Symposium, this lens was used to describe how generational characteristics may emerge in medicine. The generational descriptions that follow (Table) are based on the published

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Group Information: The Council of the American Ophthalmological Society members are listed at the end of this article.
work of one of us (A.B.) and are excerpted from a chapter in *The Vanishing Physician-Scientist*.1

In large measure, the generation born between 1922 and 1943, the traditionalists, have disappeared from the workforce. The subsequent generation learned many of its leadership skills from mentors who were traditionalists and may replicate those behaviors in professional interactions with subordinates. Specifically, traditionalists tend to give praise for a job well done, but absence of feedback is also to be considered good news. Similarly, ophthalmic patients are predominantly elderly and therefore traditionalist, and they may expect their physicians to represent more traditional values. However, the future workforce serving this traditionalist patient base will comprise the 3 subsequent generations—baby boomers, Generation Xers, and Millennials—each with strikingly different characteristics and values.

Social science researchers consider baby boomers (78 million in the United States) to be optimists.1 This population was born into a booming post–World War II economy between 1944 and the early 1960s. They occupy senior ranks and leadership positions in academic health centers and bring great ambition to their roles. Boomers have embraced the mission to make a difference in the world, as exemplified by the civil rights movement, the women’s rights movement, and the reaction to the Vietnam War.2 Boomers live to work. They identify and define themselves through their work; therefore, their rewards are job related and include money, title, and recognition.3

The term often applied to Generation Xers (46 million in the United States) is skeptical.4 Born roughly between 1965 and 1980, they may include some of our current residents and junior faculty. Generation Xers became self-reliant because their boomer parents were often busy at work. Many of these latchkey kids raised themselves and have come of age amid increased divorce rates, corporate downsizing, and a roller coaster economy. They commonly feel there is more to life than work. They are more interested in career security than job security and want to navigate professionally in more than 1 dimension, perhaps like rock climbing, rather than progressing along a single axis, like climbing a ladder. They seek to balance life and work, with life taking precedence. Unlike the boomers, this work-to-live outlook emphasizes a fulfilling personal life over changing the world. They are not interested in delayed gratification, preferring instead to be evaluated on merit now. They will work hard but need to be engaged, see results, and have content and meaning in their work. They also want to develop portable skills through their work.4 Generation Xers expect access to the latest technology, mentoring programs that are productive, and regular and specific feedback.5,6 They also expect a family-friendly environment and institutional recognition of the work/life balance.7 Their rewards include freedom, time, upgraded resources, opportunities for development, and results for their résumé.

Our current medical students and trainees, the generation following Generation X, are of the Millennial generation (77 million in the United States).1 Born between 1980 and 2000, they are the children of Generation Xers and of baby boomers who delayed parenthood. They are described as realistic.1 They have grown up with involved parents who praise them liberally and are used to packed schedules and structured time. Their orientation is toward achievement and brand.1 They believe that there is a specific, right school and career for them, so emphasis is placed on amassing the required credentials. Coming of age in the era of increased bicycle helmet and seat belt use, they are safety conscious. They are also globally conscious and attuned to multiculturalism, and they recognize the importance of collaboration and inclusiveness. They are a multicultural group, with nearly 40% between ages 18 and 25 years being nonwhite.8 For them, September 11, 2001, was a defining event, resulting in a respect for heroes, a resurgence of patriotism, and increased political interest.9

For Millennials, the Internet has been omnipresent in their lives and they are connected to technology at all times. They are known as “digital natives” (with Generation Xers being “digital pioneers” and boomers being “digital immigrants”).10 For them, paper and handwritten documents (such as prescriptions) are hopelessly out of date. They identify with technology more than any other generation and therefore have much to offer in the workplace, a fact of which they are well aware. They are uncomfortable without instant access to information and rely on technology to build communities and stay connected to them, eg, through e-mail, instant and text messaging, and social networking sites. They are accustomed to instant gratification via the Internet for entertainment, communication, and acquisition of knowledge: delayed gratification is less acceptable than

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**Table. Generational Characteristics**

<table>
<thead>
<tr>
<th>Category, Inclusive Birth Years</th>
<th>Rewards</th>
<th>Feedback</th>
<th>Career Goals</th>
<th>Motivation for Retention</th>
</tr>
</thead>
<tbody>
<tr>
<td>Traditionalists, 1922-1943</td>
<td>Job well done</td>
<td>No news is good news</td>
<td>Legacy</td>
<td>Loyalty</td>
</tr>
<tr>
<td>Baby boomers, 1944-1964</td>
<td>Recognition, money, corner office</td>
<td>Once a year, lots of documentation</td>
<td>Perfect career, excel</td>
<td>Salary</td>
</tr>
<tr>
<td>Generation X, roughly 1965-1980</td>
<td>Freedom</td>
<td>Sorry to interrupt, but how am I doing?</td>
<td>Portable, variety</td>
<td>Security and salary</td>
</tr>
<tr>
<td>Millennials, 1980-2000</td>
<td>Meaning, flexible work hours, opportunity to volunteer</td>
<td>Constant (praise)</td>
<td>Multiple parallel careers</td>
<td>Personal relationship</td>
</tr>
</tbody>
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for either of the 2 previous generations. Similar to Generation Xers, they seek good leaders in the workplace and look for guided orientation and strong mentoring. They want to be treated with respect from day 1, be challenged, and enjoy their work. Their constant connectivity means that they are used to being able to work anywhere, anytime. Their communication is often scattered with bullet points rather than paragraphs, having been raised with e-mail and texting. Older generations may perceive them as disrespectful in their communication because of their technical savvy, which may result in a casual and informal style. Constant connectivity may have caused them to undervalue face-to-face contact and made them impatient with tasks that require more extensive communication.

Millennials have fewer friends in the workplace, and their loyalty is to self, social network, and career over institution. Like Generation Xers, they seek workplaces that reflect their multifaceted interests, including family, community service, and avocations. It may be especially useful in motivating this generation to take time to point out the benefits they will receive from a task, such as increased knowledge and new skills. Millennials will require managers who have skills in setting clear objectives, can provide a broad overview, and take time to offer regular and prompt feedback so they feel valued and successful.

**COMMUNICATION**

Recognizing that younger generations of ophthalmologists will have different expectations than previous ones is particularly important as it applies to how they will communicate with each other, the healthcare system, and their patients. New methods of accessing information will have far-reaching implications for how ophthalmology is learned and practiced. The most dramatic advancement in telecommunication technology, the Internet allows instant access to information. This dramatically increased access includes some material that was previously sequestered and unavailable to the public. The impact has been profound for medicine. Educators and physicians now use the Internet to communicate and collaborate 24 hours a day, 7 days a week via Facebook, LinkedIn, Twitter, YouTube, and specialized sites such as the American Academy of Ophthalmology professional networking website, all at the individual's convenience. Needs of medical students and young physicians for just-in-time learning are fulfilled by Internet resources. Young physicians are shifting from traditional textbooks to online educational resources as their primary information source. Preparing for surgical cases, ophthalmology residents often use narrated surgical videos rather than textbooks. Just before the surgical case or when evaluating a clinic patient, students and young physicians will search online for references just in time, when they most need the information.

Educational resources online are available in many different modalities. Although they differ in format, the unifying features are immediate access and availability on multiple platforms, including portable devices. These modalities are discussed here.

Discussion forums are where participants hold discussions and pose and answer questions, which are often posted anonymously, alleviating the fear of asking "the stupid question." Search engines such as Google index discussion forums for easy searching and access. Frequently visited discussion forums move up the hierarchy of search results as they gain in popularity.

Internal peer-reviewed websites are being created by universities to publish articles, case reports, and presentations. Internal peer review assures quality and accuracy. An example of this is EyeRounds.org. Search engine indexing allows easy access to multiple topics and references as more universities create websites.

Online video archives such as YouTube.com and Eyetube.net provide unparalleled video resources. In the same way that images enhance the teaching of anatomy, videos expand the teaching of surgical techniques. Physicians around the world can access videos on multiple devices, including smartphones.

Podcasts allow listeners to download audio content and listen when they choose, like radio on a personal schedule. There are libraries of audio and video programs such as AsSeenFromHere.com that can be accessed through multiple devices, including portable devices like the iPod.

Social networking websites combine many of the media mentioned earlier. The most popular example is Facebook, where Thomas Oetting, MD, has archived more than 200 cataract surgery videos, allowing access for thousands of surgeons around the world. His video resource has more than 7600 subscribers globally.

Distance learning via multimedia resources such as cameras, high-resolution monitors, and video streaming is especially useful for educators in highly specialized disciplines. Eye pathologists, for example, whose numbers are dwindling, are able to participate in distance training programs to more widely share their specialized knowledge. In addition, graduate medical education requirements can be met in programs that do not have an eye pathologist on faculty.

PubMed provides easy access to classic peer-reviewed articles, and it will grow as more peer-reviewed literature moves to open access. In guiding clinical decision making, it is important that educators emphasize the value of peer-reviewed literature over other material on the Internet. Because some peer-reviewed articles are not open access or may not be accessible immediately after publication (and/or require a fee for access when they are), the use of non-peer-reviewed, open-access resources increases. Peer-reviewed publications need to become open access in the future or PubMed and similar resources may become irrelevant.

The American Academy of Ophthalmology provides access to peer-reviewed resources and links to useful online resources through the ONE Network (http://www.one.aao.org/CE/EducationalContent). The website is being upgraded to allow distribution of video, audio, ar-
OPHTHALMIC ASSOCIATIONS

How does organized ophthalmology engage the younger generations who will be our ophthalmologists of the future? Fostering communication with younger members is key to current and future success and can be enhanced by considering 5 factors: demographics, engagement, community, wisdom, and global perspective.

DEMOGRAPHICS

The demographics of ophthalmology are changing. A 2011 American Academy of Ophthalmology membership survey (Figure) showed that of US members, 76% were male and white. Ophthalmology’s next generation, however, the subset of ophthalmologists younger than 40 years, is more diverse.14

Because ophthalmic associations are membership, volunteer organizations, leadership demographics must reflect membership. Leadership must recognize that although they may exhibit it differently than previous generations, our new colleagues have a commitment to ophthalmology and want to be represented.15 Every ophthalmic organization will benefit by having younger ophthalmologists on its board.

ENGAGEMENT

Young ophthalmologists must be engaged in member organizations early.

Medical organizations have traditionally been hierarchical: respect and deference to leaders and “paying your dues” is part of the culture. By contrast, young ophthalmologists want to be part of the process immediately. The new generation has remarkable communication skills, they are confident, and they have been raised with a focus on self-esteem. They do not value a token presence. This will shape the organizations of the future. To be successful, ophthalmic organizations need younger members with a seat at the table early on.

Wisdom

The primary purpose of medical organizations has traditionally been education. While ophthalmic organizations branched into advocacy, policy development, leadership development, quality care, and charity, their primary purpose remained education: ophthalmologists attended meetings to obtain continuing education, and organizations existed to address specific educational needs. Today, however, ophthalmologists can choose from dozens of clinical meetings and an array of digital methods for education. So while education remains an important part of ophthalmic organizations, the new glue for organized ophthalmology is a sense of community. Organizations play an enormous role in cultivating the community of ophthalmology. Ophthalmologists tend to be isolated from the medical community, and their work can also create isolation in their personal lives. Technology has redefined community by linking individuals with common interests and creating a “digital neighborhood.” As such, the most important aspect of clinical meetings is no longer to share information, but to sustain the culture and community of ophthalmology. The American Academy of Ophthalmology, for example, is a trusted source, offers peer review, and serves an important role in developing community standards.
programs that are interactive, fluid, and accessible at any time, eg, lectures that can be downloaded as a podcast or be delivered in short video segments and viewed as time permits so that the lecture fits into the doctor's schedule rather than the inverse.

GLOBAL PERSPECTIVE

Young ophthalmologists grew up in an electronically connected world and have a more global perspective. The commitment to sharing resources and assisting the underserved is genuine. They want to volunteer internationally and locally. They value sustainable living. An organization can energize young ophthalmologists by developing service projects and by providing structure and guidance for volunteering.

CONCLUSIONS

Increasingly, the ophthalmologists of the future will be Millennials and Generation Xers expressing their new values, work, and lifestyles. This will require changes in how they will be educated, employed, and rewarded professionally. It will affect communication with colleagues and patients and will advance the use of technology in the delivery of patient care. It is yet to be seen how these generations of ophthalmologists will negotiate imposed external requirements such as governmental systems, institutional guidelines, and patient care demands in the future. These paradigm shifts may be on a collision course with new public accountability requirements and major changes in eye care delivery.

This change will also shape the professional organizations of the future. The sustainability of ophthalmic organizations requires the engagement of their younger generations. Ophthalmology has an extraordinary opportunity to energize its organizations, make them more relevant, and develop a new vision for our future. Ophthalmology must embrace the ideas and the culture of our young colleagues and invite them to help guide us, while senior leadership provides the key resources of wisdom and experience. Our organizations have much to gain by respecting and empowering the ophthalmologists of the future.

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REFERENCES