TRANSFORMATIONAL TECHNOLOGY IN OPTOMETRY

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I recently attended a faculty retreat where we learned about different general-purpose technologies (GPTs) throughout history. GPTs are innovations so transformational that they change the way society functions globally.[1] They weave themselves into every facet of daily life. These innovations have included things such as the wheel, electricity, the internet and, now, artificial intelligence (AI), to name a few. The discussion on GPTs served as a preface to a workshop assisting the faculty in better use of AI in the workplace; (a quick note that the GPT referenced throughout this editorial differs from the GPT in ChatGPT, which stands for "generative pre-trained transformer"). After the AI workshop, I started to think about what might be considered a GPT within the world of optometry. When pondering the technology that is ubiquitous in primary eye care, though there is some overlap, instruments seemed to fall into one of two categories: those used to diagnose and treat refractive error and those used to diagnose and treat ocular disease.

Technology that has revolutionized the optometrists' ability to manage refractive error has included things such as the Snellen acuity chart, retinoscope, lensometer, phoropter®, spectacle and contact lenses. Both the Snellen acuity chart (first developed in 1862) and the phoropter® (developed in the 1920s with a trademarked name) still exist in some form in most optometric practices today.[2,3] They might be modified and digitized but still operate using the same underlying principles as they did over 100 years ago. Contact lenses revolutionized the way optometric physicians are able to correct ametropia. Their capabilities continue to expand with therapeutic benefits including scleral lenses for ocular surface disease, custom print prosthetics, and drug-eluting contact lenses.[4,5]

Optometrists' adeptness to diagnose and treat ocular disease would not be the same without the slit lamp, tonometer, indirect ophthalmoscope, automated visual field, optical coherence tomography, or diagnostic and therapeutic pharmaceutical agents (DPAs and TPAs). The slit lamp evolved from two separate technological advancements in the 1910s, that of slit beam ophthalmoscopy and the corneal biomicroscope.[6,7] Optometrists had to battle legislatively for the ability to use DPAs and TPAs in practice.[8] As a profession, we are indebted to those who fought for their use because it would be difficult to imagine managing ocular disease without those tools.

Some of Hindsight's most popular articles outline the evolution of various technologies or procedures in eye care. This issue includes an article that documents the history of fluorescein angiography (FA) and a video summarizing the advancement of optical coherence tomography. The video submission was part of the Optometric Historical Society's Blast from the Past event. This annual event encourages optometry student submissions on an optometric historical topic of their choosing. The event finalists are published in Hindsight each year. Take a moment to check out all three finalists from the 2025 event featured in this issue! It should also be noted that the final article included within this publication is the second installment of a two-part piece on the intriguing process of establishing a school of optometry in the state of Alabama. The second half in particular is filled with political drama! Please see Hindsight 56-1 for the first half of the article.[9]

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Aside from the above-mentioned optometry specific instrumentation, more general technology has certainly transformed health care as a whole. Things such as electronic health records, billing and coding, and telemedicine systems have revolutionized our care delivery. It is safe to say that AI is here and is already being used in many facets of health care. Only time will tell the full extent and impact of this new GPT on health care and optometry.

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