Media and Book Reviews

AUDIO PODCASTING IN NEUROLOGY There is not enough time in the day for neurology trainees to read as much as they are expected to read. But how often are trainees afforded the opportunity to flip through the pages of a journal article? Residents and fellows are on the move, so they need an educational medium that moves with them.

DEVELOPMENT OF EDUCATIONAL PODCASTS

This is where alternative forms of self-directed learning come into play. Podcasting is an ideal approach to arming the studious with concise, high-yield clinical information, and graduate medical leadership is encouraging educators to leverage these and other online technologies.¹ Podcasts are also increasingly used as a means to record and store live faculty lectures for students and residents so they may be accessed at a later time, with the advantages of pausing or replaying components for added educational value. One survey of residents in the United States found that trainees spent as much time listening to medical podcasts (35.0% of extracurricular time) as they did reading textbooks (33.6%).¹ The number of podcasts and online blogs has exploded over the last decade,² and the advantages of this approach to learning are intuitive. Educational content can be reviewed at a moment's notice, distributed quickly and easily to mobile devices, and accessed at the leisure of the learner while he or she may be carrying out his or her activities of daily living. Several investigators have even evaluated the efficacy of their podcast content,^{3,4} with at least one study showing an improvement in test scores after listening to episodes on various subjects,⁵ and several studies reporting subjective appreciation of these digital didactics.^{4,6,7}

CURRENT STATE OF PODCASTING IN NEUROLOGY

Medical periodicals like *Neurology*[®] and *The Lancet Neurology* have pioneered their own podcasts, which provide outstanding summaries of original articles published under their own domains, and these podcasts meet the 13 quality indicators identified by expert consensus on podcasting (table).⁸ The American Academy of Neurology produces a weekly audio program, available on iTunes and other podcast applications, that briefly summarizes the recent

online or printed content of *Neurology*. Opening with a summary statement by the Editor-in-Chief, Robert Gross, each episode is divided into 3 sections to address trending topics, clinical e-pearls, and interviews discussing recently published original research with the authors. Because the episodes feature original content across a range of subspecialty fields, it may be more accessible to listeners of varying research or clinical interests. One of the major advantages of the *Neurology* podcast that other podcasts fail to offer is that it offers continuing medical education (CME) credits to its participating listeners. This is a feature shared by few other clinically oriented podcasts, namely *JAMA Clinical Reviews* and *Continuum Audio*.

In contrast to the *Neurology* podcast, which highlights 3 major topics in every episode, the podcasts produced by *The Lancet Neurology* and *The Journal of Neurology, Neurosurgery, and Psychiatry (JNNP)* showcase a single topic—usually the findings from a recently published research article. The episodes feature an interview in which the authors discuss the current state and future of research in that sub-discipline of neurology. Although these episodes are released at a less frequent interval compared to *Neurology* (once monthly for *The Lancet Neurology*, twice monthly for *JNNP*, and once weekly for *Neurology*) and are shorter in duration than those produced by the *Neurology* podcast (8–15 minutes for *The Lancet Neurology* and *JNNP* vs 20–30 minutes for *Neurology*), they are equally comprehensive in the material covered.

Other medical podcasts may be affiliated with academic institutions rather than peer-reviewed periodicals, and they offer their listeners an equally wide range of valuable educational content. For example, *Brain Matters* is a popular neuroscience podcast developed by scientists at the University of Texas at Austin. *Brain Matters* may meet the rigorous 13 criteria mentioned previously,⁸ but it does not carry the same reputation or popularity as the podcasts generated by internationally recognized neurology publications.

Other podcasts may neither be affiliated with a peer-reviewed medical journal nor associated with an academic institution, but are still capable of broadcasting rich and intellectually stimulating perspectives on clinical medicine. An example of this would be

Table Quality indicators for blogs and podcasts developed by expert consensus⁸

Quality metric

Do the authorities who created the resource list their conflicts of interest?
Is the identity of the resource's author clear?
Does the resource make a clear distinction between fact and opinion?
Is the information presented in the resource accurate?
Does the resource employ technologies that are universally available to allow learners with standard equipment and software access?
Does the resource cite its references?
Are the resource's statements consistent with its references?
Does the resource clearly differentiate between advertisement and content?
Is the resource transparent about who was involved in its creation?
Is the content of this educational resource of good quality?
Is the content of the resource professional?
Is the resource useful and relevant for its intended audience?
Is the author well-qualified to provide information on the topic?

Inquiring Minds, a popular program developed by educators like Dr. Indre Viskontas, a cognitive neuroscientist at the University of California, San Francisco. This podcast has produced 30- to 60-minute episodes each week since 2013 spanning various scientific and medical topics that have attracted the attention of the news and media. Unlike the podcasts affiliated with medical periodicals, podcasts like *Brain Matters* and *Inquiring Minds* are directed at the layperson. I would also categorize *TEDTalks Science and Medicine* and *Sci Fri* among these clinically oriented, scientific podcasts that target a non-medical audience. Although the episodes in these podcasts are fascinating and deeply informative, they provide the neurology trainee with more entertainment than education.

Regarding the content addressed by audio programs, only a small number of them (several of the journal-affiliated podcasts and *UpToDate Talks*) offer topical summaries in neurology that may be of educational value to residents and fellows. Instead, many of the journal-affiliated podcasts focus their efforts on recently published research findings and not trainee education. There is a deficiency in the audio literature for neuro-medical education—a gap that is filled in other medical disciplines like emergency medicine (e.g., the *EMCrit* podcast, which also offers CME credits).

In that vein, this author has collaborated with faculty, residents, and fellows across various medical disciplines to develop a podcast to address this deficiency: *BrainWaves*. It may sound ironic to tack on another podcast to this seemingly endless library of audio options, but this podcast fills a unique and previously unexplored niche in neurology education. *BrainWaves* is a weekly audio podcast whose purpose

is to deliver concise yet comprehensive medical education to residents and fellows on topics in various disciplines of neurology, medicine, and the humanities. *BrainWaves* releases reviews on major clinical topics relevant to resident and fellow education (e.g., prion diseases, thunderclap headache syndromes), diseases attracting attention in recent news (e.g., Zika virus, acute flaccid myelitis), and case presentations where clinical reasoning is applied. The episodes are produced in such a way as to leverage the educational value of academic audio podcasts (*The Lancet Neurology*, *JNNP*, *UpToDate Talks*) with the entertainment value of privately operated programs (*Brain Matters*, *Inquiring Minds*). Similar to the programs produced by academic journals, primary source data are cited within *BrainWaves* episodes and the associated blog⁹ so that listeners and readers can refer to these publications. However, because the podcast targets neurology trainees, CME credits are not offered.

LIMITATIONS The ease with which a podcast can be developed and broadcasted permits rapid and widespread dissemination with little oversight. Lower quality educational content (or even inaccurate information) can be distributed without peer review, and listeners may not be aware of which podcasts have undergone rigorous, systematic validation. It is fair to assume that the podcasts produced by peer-reviewed journals conscientiously prepare and scrutinize their content before release, while others may not have as extensive or specialized support to prepare content of comparable quality. Certainly, an interested listener is more likely to find podcasts like those produced by *Neurology* and *The Lancet Neurology* than *BrainWaves* on a web-based search due to popularity alone, and the popularity of these podcasts is practically synonymous with quality here. But it can be daunting for trainees to browse each of the remaining podcast titles, some of which may be more suited to their level of training and perhaps even more likely to meet their specific educational needs.

I briefly acknowledge a number of major audio podcasts in this *Media Review*, some affiliated with academic medical journals, some with academic institutions, and others that are independently produced. But there are still dozens more that the reader may find more intellectually satisfying or educational. With the growing number of podcasts and other digital resources, trainees may be hard-pressed to identify the tool best suited for their own education. Ultimately, it is up to graduate medical leadership to recognize and recommend the most appropriate social media platforms and extracurricular programming to supplement the education of trainees.

Reviewed by James E. Siegler, MD

Disclosure: J. Siegler is a team member of the Neurology Resident & Fellow Section. Go to Neurology.org for full disclosures.

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Neurology®

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Neurology 2017;88:e150-e152

DOI 10.1212/WNL.0000000000003818

This information is current as of April 10, 2017

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