Original Publication

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Urinary Tract Infections: Pediatric Primary Care Curriculum Podcast

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Abstract

Introduction: Demands on residents' time during training make it difficult for them to engage consistently with a primary care curriculum. In response to this, the emergency medicine and critical care fields have successfully utilized podcasting to the point where a recent study showed US emergency medicine residents ranked podcasts as the best use of their time for extracurricular education. **Methods:** We produced a 30-minute podcast on urinary tract infections from a primary care perspective, based on descriptors from Entrustable Professional Activity 4, "Manage acute common illnesses in the ambulatory setting." A moderator, a primary care pediatrician, and a pediatric nephrologist used a loose script of salient points, allowing for a natural evolution of the dialogue. The podcast was distributed to residents via email, along with a 7-question survey. **Results:** The survey was completed by 50 out of 84 residents. Ninety-two percent listened to all or part of the podcast, 98% found it educational, 93% enjoyed listening, and 74% felt more confident identifying and managing patients with possible urinary tract infections after listening. Ninety-six percent felt podcasts were a good alternative method for delivering this curriculum. One comment read, "This was great! It makes the information more accessible so that I can listen while working out or driving or just laying on the couch." **Discussion:** Based on this success, we are producing additional podcasts and will strive to keep them under 20 minutes, provide key summary points at the end, and improve ease of access by utilizing an RSS (rich site summary) feed.

Keywords

Resident Education, Curriculum, Podcast, Urinary Tract Infections, Pediatrics, Primary Care

Appendices

- A. UTI Podcast.mp3
- B. UTI Script.docx
- C. UTI Podcast Satisfaction Survey.docx

All appendices are peer reviewed as integral parts of the Original Publication.

Educational Objectives

By the end of this resource, learners will be able to:

1. Identify risk factors for urinary tract infections for children 2 months old to 2 years old.
2. Identify signs, symptoms, and physical examination findings that may indicate urinary tract infection
3. Identify a patient at risk for urinary tract infection and articulate his/her pretest probability based on risk factors, signs, symptoms, and physical examination findings.
4. Choose a modality of testing that optimizes positive predictive value and negative predictive value and considers the thought of the patient's caregiver in the process (shared decision making).
5. Choose the appropriate imaging for a child after a urinary tract infection according to current American Academy of Pediatrics standards.
6. Select an appropriate first-line antibiotic for first-time urinary tract infection in a child less than 2 years old accounting for local resistance patterns.

Introduction

Residency can be a difficult time for residents, who have to balance direct patient care on rotations, continuity clinic, morning and noon conferences, teaching of medical students, self-directed learning, and longitudinal curricula. It has been our experience that residents find it hard to consistently engage in the

longitudinal primary care curriculum because the weekly readings require dedicated time to complete. Podcasts are audio or video files that are accessible over the internet as digital media files and offer an innovative means for delivering medical education. They are more easily accessible, and their format allows for flexibility in listening, including listening at home, while driving, or while performing other day-to-day activities.

Podcasts have been leveraged extensively by the emergency medicine and critical care fields and have increased from just one podcast in 2002 to 42 podcasts in 2013.¹ Prominent podcasts in the field include Life in the FastLane, EMCrit, and EM:RAP. Within the pediatric field, PedsCases is a popular podcast that is directed at medical students and covers general pediatric topics. These above-mentioned podcasts are part of the emerging community of *free open-access meducation*,¹ are most often accessed by individuals for self-directed learning, and are not part of a comprehensive curriculum. There currently are no pediatric podcasts that target residents as the audience, cover primary care topics specifically, or are part of a comprehensive curriculum. Our goal in developing this podcast was to provide high-quality content based on entrustable professional activities (EPAs) that can be used as part of a primary care curriculum or for self-directed learning and that targets residents as the listening audience.

Podcasts have shown noninferiority to traditional didactic or lecture-based teaching on a variety of topics including electroencephalogram interpretation² and bedside ultrasound.³ What sets podcasts apart is that they are for residents the preferred method of obtaining extracurricular education.^{4,5} Our hope is that podcasts will allow residents to access the primary care longitudinal curriculum in a variety of settings and increase residents' engagement with the curriculum.

The goal of this resource is for residents to be able to understand how to identify children with urinary tract infections. Likewise, they should be able to apply urine testing modalities to patient care in order to increase positive predictive value and negative predictive value, as well as decide on imaging testing after a urinary tract infection.

Methods

The topic for this podcast, urinary tract infection, was selected from the current primary care curriculum used by the University of Colorado Pediatric Residency. The topic is based on EPA 4, "Manage acute common illnesses in the ambulatory setting." The director of the primary care curriculum, Dr. Daniel Nicklas, developed the learning objectives and script for the podcast. To facilitate an engaging and informative podcast, a pediatric nephrologist, Dr. Danielle Soranno, and a primary care pediatrician, Dr. Tai Mara Lockspeiser, were selected as guests. Dr. Nicklas acted as the moderator for the podcast. A loose script was provided to the speakers to ensure that the learning objectives were covered and that the podcast had a logical progression. The podcast was recorded and edited by the University of Colorado Media Department.

Quality indicators for podcasts have been established in the literature and were followed in the production of this podcast.^{6,7} These indicators include a clear introduction of speakers and disclosure of any conflicts of interest. Speakers indicated throughout the podcast if their statements were based on current guidelines versus personal opinion. Learning objectives and the involvement of three pediatric physicians ensured accurate information was presented. The podcast (Appendix A) was distributed via email as a standard MP3 file that allowed it to be accessed by residents through smartphones, computers, or tablets and did not require special equipment. A transcript (Appendix B) is also provided. Feedback on the resource was elicited through the accompanying survey (Appendix C) sent to residents.

This podcast can be used within a primary care curriculum to cover the topic of urinary tract infections or for self-directed learning by a learner. Traditionally, our primary care curriculum is sent as a weekly email with readings attached. The week of the podcast curriculum, the email included the audio file in place of the readings for residents to access. If being used as part of a curriculum, the podcast should be sent as an MP3 file to listeners via email, or the file could be uploaded to a website such as Bright Space, Canvas, or a department site where users can access and download it. Listeners can choose to download the file

to a playback program of their choice, or it can be listened to directly from an email attachment. If trying to gauge learners' satisfaction with the podcast, the satisfaction survey (Appendix C) can be sent with the podcast. Learning objectives and goals are available in this document, and goals are restated in the audio file.

Results

The podcast and survey were sent to the 84 pediatric residents at the University of Colorado. The response rate on the survey was 59%. Of 50 respondents, 78% listened to the entire podcast, and an additional 14% started the podcast but did not finish it. Most listeners used a smartphone (52%) or computer (38%) to access the podcast. The podcast was listened to in a variety of locations, including at home (39%), while driving (27%), during downtime at the hospital or clinic (20%), while working out (8%), while traveling (6%), and other (2%). Six percent indicated that they did not listen to the podcast. Multiple responses were allowed, so these percentages total more than 100%.

Eighty-three percent of people did not have issues accessing the file. Issues playing the file that were identified included playback pausing when a smartphone screen would go to sleep and difficulty changing the playback speed of the audio. Forty-three respondents gave their opinions of the podcast; 93% enjoyed listening (Kirkpatrick Level 1), 98% found it educational (Kirkpatrick Level 2), and 74% felt more confident identifying and managing possible urinary tract infections (Kirkpatrick Level 3).⁸ Additionally, 58% felt the podcast content was at an appropriate level, whereas 2% felt the content was too basic. Fourteen percent felt that the podcast was too long. Again, multiple responses were allowed, explaining why these percentages total more than 100%.

Ninety-six percent of respondents felt podcasts were a good alternative method for delivering the primary care curriculum, whereas 4% preferred traditional readings. One suggestion was to send the podcasts in combination with the readings. The survey elicited many comments expressing enjoyment of the podcast and hope for future podcasts, including the following:

- “FANTASTIC alternative! I would DEFINITELY listen to them while on at nights.”
- “I love the podcast method! Great for learning on the go, in the car, working out, etc. I’m honestly much more likely to listen to a podcast than read articles.”
- “This was great! It makes the information more accessible so that I can listen while working out or driving or just laying on the couch. I really appreciate this a lot.”
- “Loved it! Much more engaging than the readings.”
- “This was way easier than reading six pages of text. I think I learned a lot more too and I think I processed it better in this dialogue format.”

A number of comments made suggestions for improvements:

- “20 minutes would be better time frame to shoot for so easier to fit in to listen at work or other down time.”
- “I would have liked the podcast to be under 15 minutes.”
- “I really liked it! If it was something that we could subscribe to on iTunes podcast, I would totally listen to it to/from work. I just had a hard time finding a time to sit down and download it from my work email.”
- “Good alternative but would be best in combination with the usual handout and article to allow the option to listen or read depending on circumstances in any given week. Would be nice to know how long the podcast is before opening it.”
- “Main problem is size of files and mailbox.”

Discussion

Residents' demanding schedules have made it difficult for them to consistently participate in our longitudinal primary care curriculum. By including podcasts in the primary care curriculum, we gave our residents increased opportunities to access the content. Our results show that residents were receptive to

podcasts, with 96% supporting this format for the curriculum. We also received multiple comments from residents that they were more likely to listen to a podcast over reading written materials and that they processed the material better in this format.

Reflecting on our process and reviewing comments from residents, we have identified the following areas for improvements in future podcasts. From a content perspective, we will include key points at the end of each podcast, strive to decrease the length of podcasts to under 20 minutes, include content quizzes with the podcasts, and consider including the traditional handout forms of the curriculum with the podcasts.

From a technological perspective, we will work to utilize an RSS (rich site summary) feed that allows streaming through iTunes or to use a site like SoundCloud for storing and accessing the podcasts. Logistically, our team has learned that development and production of podcasts are time and cost intensive. In order to decrease the cost associated with professionally recording the podcast, we will try recording and editing on a personal computer with basic microphones and standard software. From a time and organization perspective, our goal is to produce one podcast a month going forward.

Ensuring that the content of a podcast is accurate and easily accessible is key to successfully implementing podcasts as part of a residency curriculum. We have produced a podcast that adheres to quality standards, is based on EPA 4, and has been well received by the target audience of residents. This podcast successfully achieved our goal of offering an innovative means for residents to access the primary care curriculum and thereby increasing their engagement with the material. Podcasts have shown to be well liked by learners^{4,5} and have great potential for being incorporated into residency curriculums.

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Ethical Approval

Reported as not applicable.

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