Sharing New knowledge requires New methods

Research dissemination & medical education in the digital world

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Division of Emergency Medicine

Cincinnati
Children's

Disclosure

I am the dissemination champion for the PECARN HOMERUN Node and the Podcast Chair for the EMSC Innovation & Improvement Center. I receive funding via PECARN from HRSA, and the EMSC via Yale University and will be discussing my experience with both organizations.

Objectives #Bloom's Taxonomy

After listening to me talk for an hour attendees will be able to...

- Describe how FOAM came to be and how it is impacting medical education
- Develop a plan to utilize quality assessment tools to critically appraise blogs and podcasts
- Illustrate how FOAM can be used to disseminate new knowledge and research findings
- Develop a plan to incorporate FOAM and digital scholarship into your professional development activities in a meaningful and measurable way

Prelude Whyme?









ORIGINAL RESEARCH

Pediatric Emergency Medicine Residency Experience: Requirements Versus Reality

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JAVIER A. GONZALEZ DEL REY, MD, MED

Abstract

Background An important expectation of pediatric education is assessing, resuscitating, and stabilizing ill or injured children.

Objective To determine whether the Accreditation Council for Graduate Medical Education (ACGME) minimum time requirement for emergency and acute illness experience is adequate to achieve the educational objectives set forth for categorical pediatric residents. We hypothesized that despite residents working five 1-month block rotations in a high-volume (95 000 pediatric visits per year) pediatric emergency department (ED), the comprehensive experience outlined by the ACGME would not be satisfied through clinical exposure.

Study Design This was a retrospective, descriptive study comparing actual resident experience to the standard defined by the ACGME. The emergency medicine experience of 35 categorical pediatric residents was tracked including number of patients evaluated during

training and patient discharge diagnoses. The achievability of the ACGME requirement was determined by reporting the percentage of pediatric residents that cared for at least 1 patient from each of the ACGME-required disorder categories.

Results A total of 11.4% of residents met the ACGME requirement for emergency and acute illness experience in the ED. The median number of patients evaluated by residents during training in the ED was 941. Disorder categories evaluated least frequently included shock, sepsis, diabetic ketoacidosis, coma/altered mental status, cardiopulmonary arrest, burns, and bowel obstruction.

Conclusion Pediatric residents working in one of the busiest pediatric EDs in the country and working 1 month more than the ACGME-recommended minimum did not achieve the ACGME requirement for emergency and acute illness experience through direct patient care.

Introduction

One important expectation of pediatric residency is imparting the physician with the ability to assess rapidly, resuscitate, and stabilize an ill or injured child. Most pediatricians, regardless of their practice environments, will encounter patients in need of emergent resuscitation and stabilization. Pediatric emergency departments (EDs)

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There was no honorarium, grant, or other form of payment given to anyone to produce this manuscript. There are no real or perceived potential conflicts of interest for any of the authors of this study. There was no study sponsor, and there are no additional disclosures.

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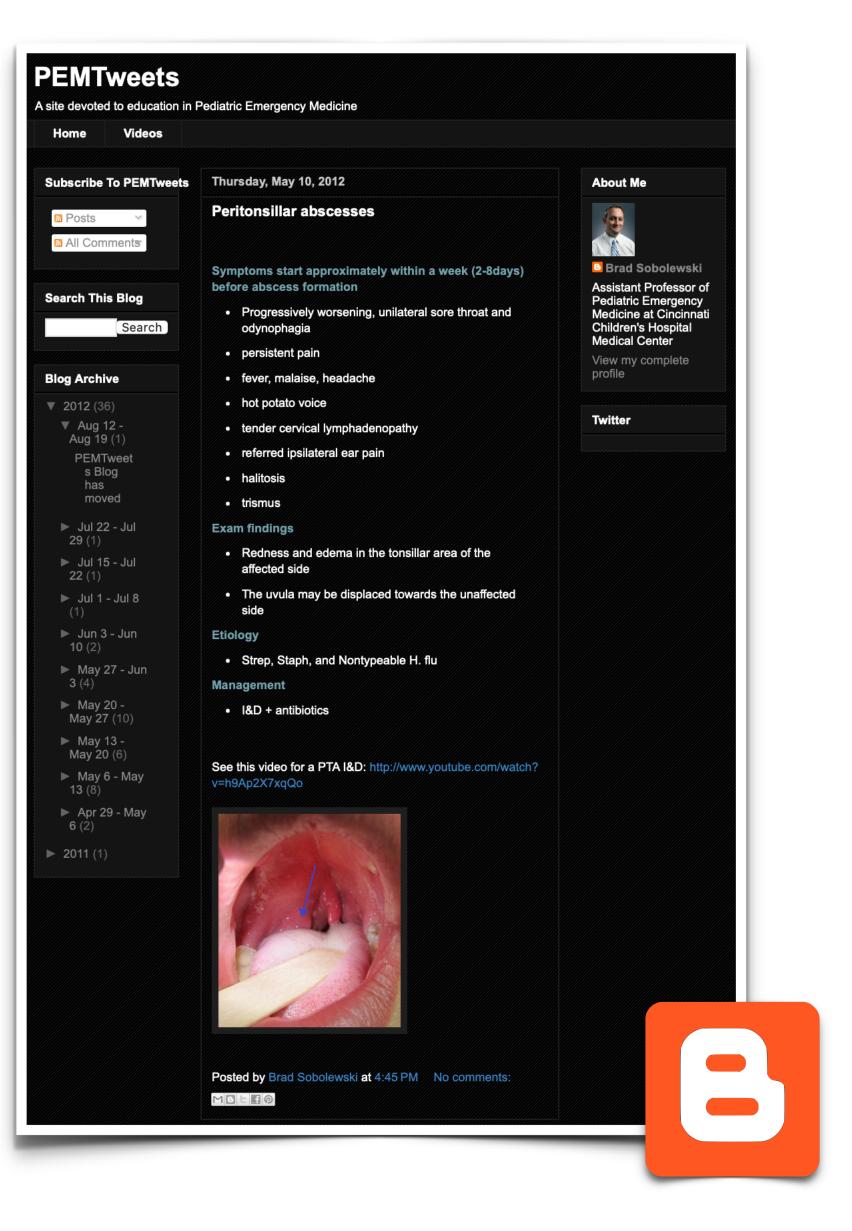
traditionally have sought opportunities to teach the cognitive and psychomotor skills needed for early recognition, resuscitation, and management of ill and injured pediatric patients.

The Accreditation Council for Graduate Medical Education (ACGME) has set minimum standards for pediatric residency training, including both a minimum time requirement spent learning in a pediatric emergency medicine (PEM) department as well as expectations for the breadth of exposure during that time. The ACGME describes what should be accomplished during this "comprehensive experience" in emergency and acute illness for pediatric residency training. The list is lengthy and includes exposure to medical and surgical conditions such as cardiopulmonary arrest, appendicitis, diabetic ketoacidosis, poisonings, physical and sexual abuse, and major trauma. These standards are meant to ensure that training programs graduate pediatricians capable of properly recognizing and treating children with these acute illnesses. It is unclear which of these suggested conditions are more or less likely to be encountered during the PEM clinical training

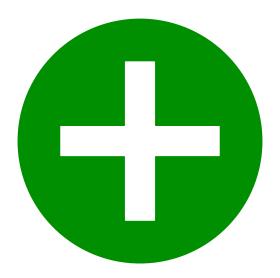
The objective of this study was to determine whether the 4-month minimum time requirement for emergency and

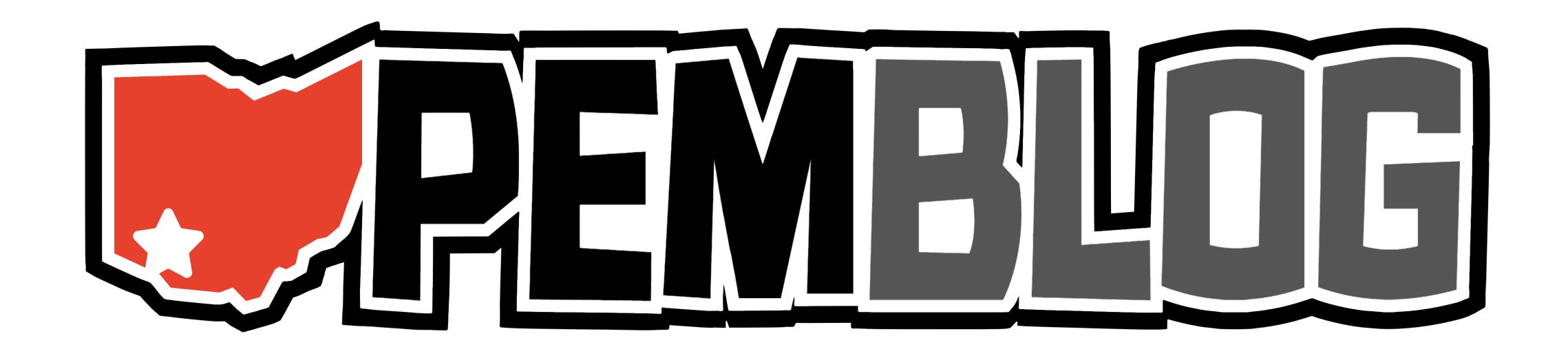
Journal of Graduate Medical Education, December 2010 571

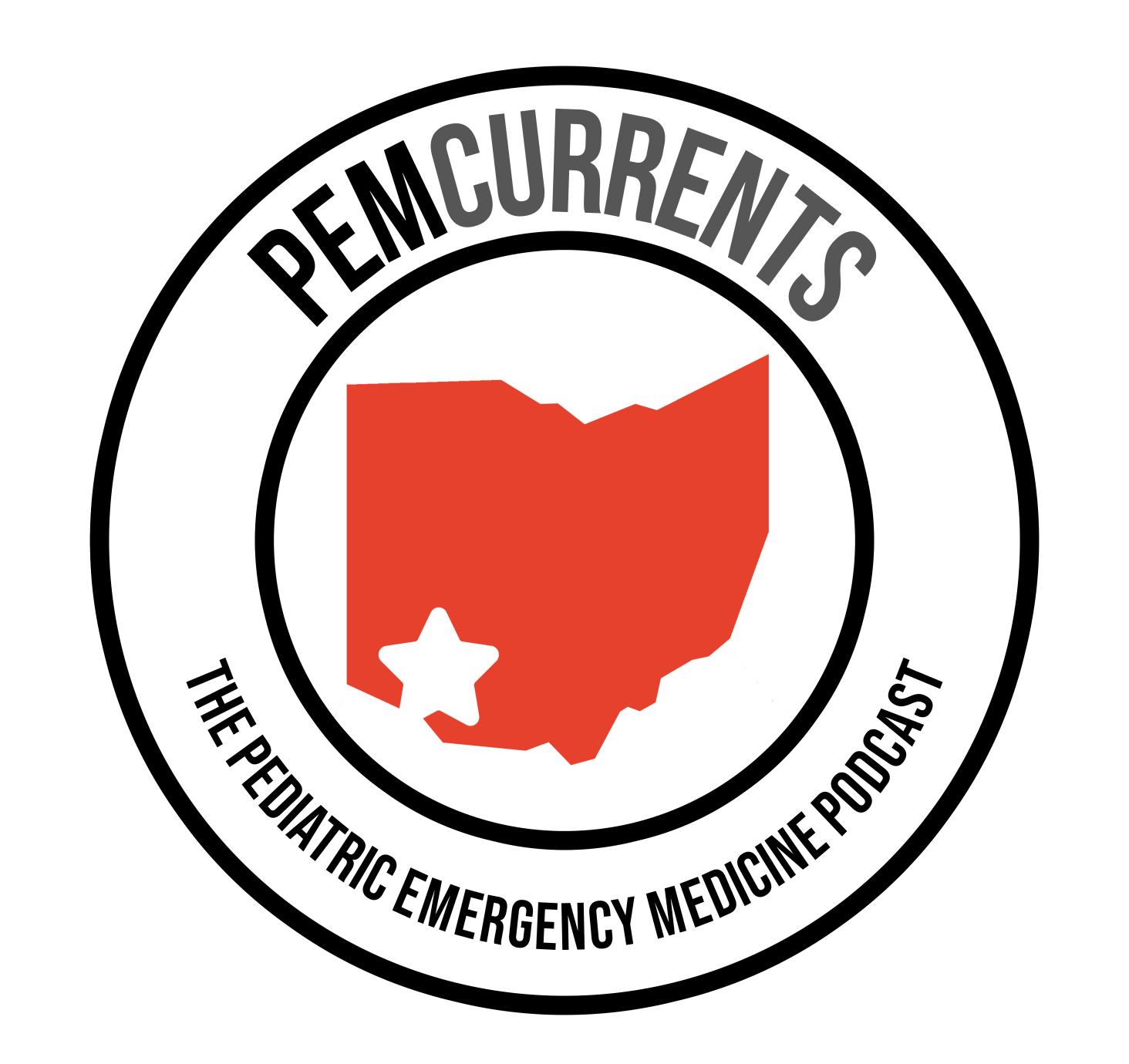
pediatric emergency medicine Contest



Stuff I have done



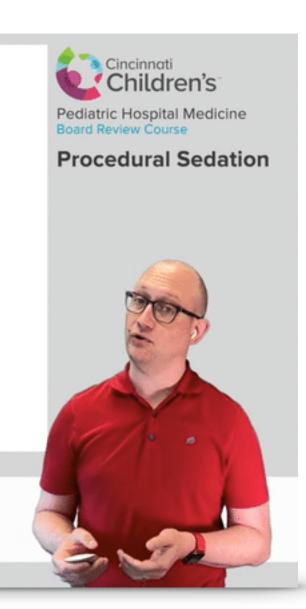


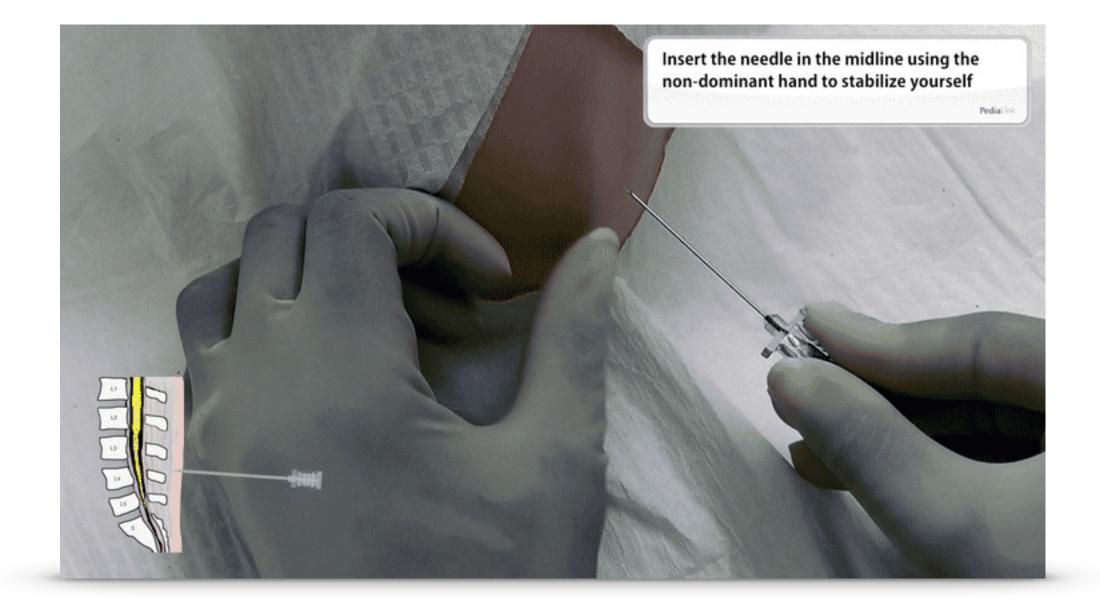




A PCP derivative dissociative sedative

Brad Sobolewski, MD, MEd Associate Professor, Division of Emergency Medicine

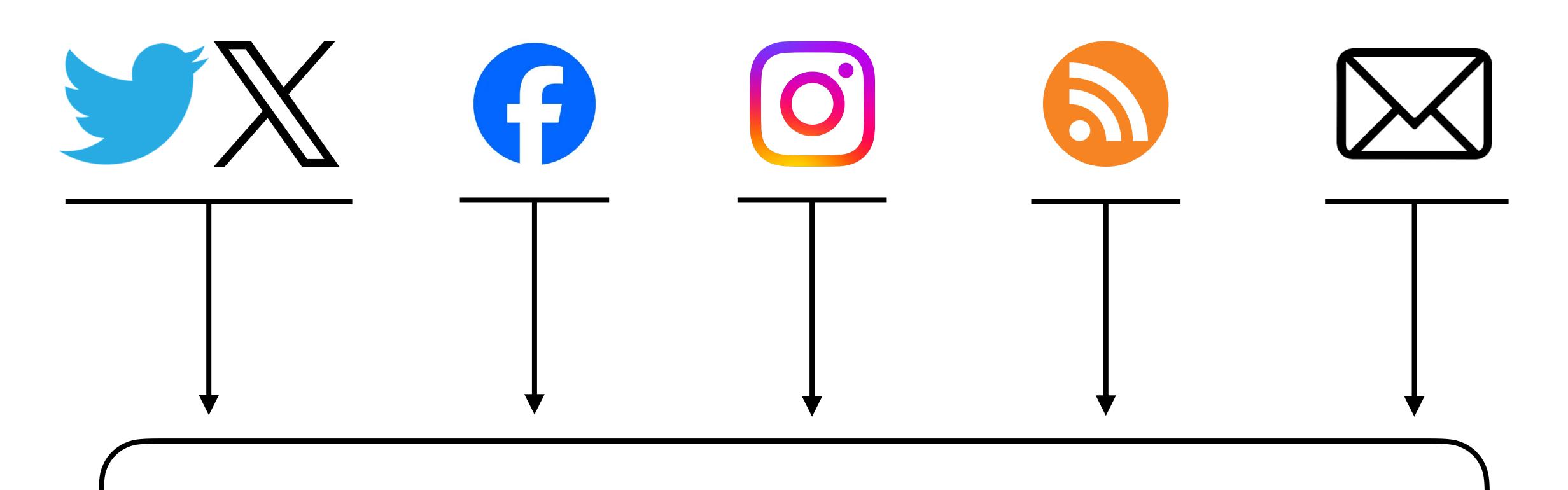




My journey with FOAM

It took a while...

- Since 2012 I've had over 1.4 million views on PEMBlog and more than 750,000 listens to PEM Currents: The Pediatric Emergency Medicine Podcast
- Multiple presentations and workshops, published articles and ongoing research
- My efforts to create online educational materials were a key component in my two promotion cycles
- I continue to mentor health care professionals formally and informally in the creation of FOAM content and work to evolve how we disseminate research





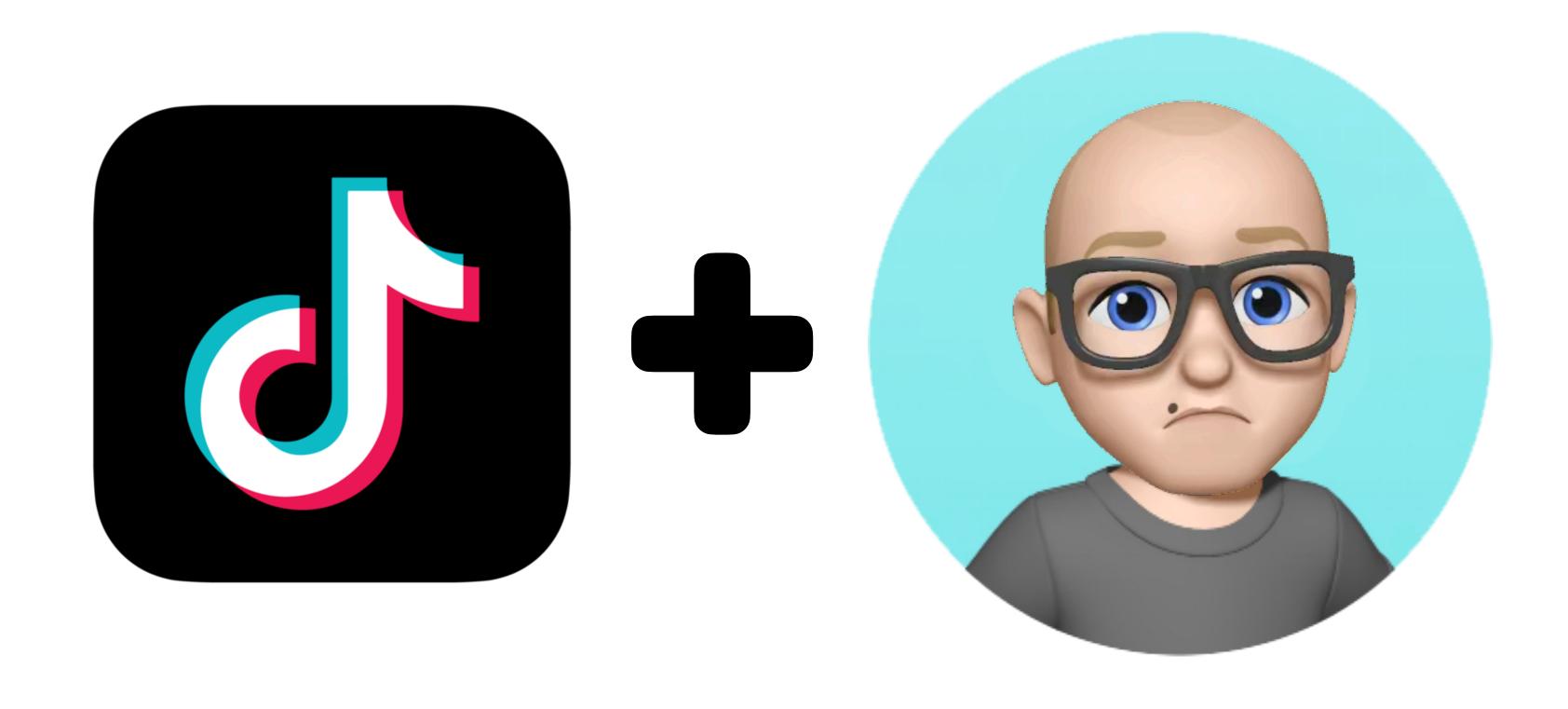






Stuff I haven't done





This is my career niche

Part 1 The story of FOAM... so far



If you want to know how we practiced medicine 5 years ago, read a textbook

If you want to know how we practiced medicine 2 years ago, read a journal

If you want to know how we practice medicine now, go to a (good) conference

If you want to know how we will practice medicine in the future, listen in the hallways and use FOAM

Free Open Access Medical Education (FOAM) was conceived at the 2012 International Conference on Emergency Medicine

Mike Cadogan wanted to help used online technologies to help make education stick and spread

#FOAMed is the movement and conversation that supports the concept of **FOAM**



A rich tradition of knowledge sharing

Educational mix-tapes?

- Emergency Medicine Physicians were sharing cassette tapes of abstracts and journals freely via mail as far back as 1988
- Over the past 20 years many moved from textbooks and journals to open-access, web-based, digital learning resources
- These resources and the trends to use them are collectively termed FOAM
- Resources are produced in any format that is freely available online, across many different platforms, without a required log-in

Blogs Podcasts

Subscription-free Websites



The rise of FOAM

The price was right

- Accessible content that wasn't "behind a paywall"
- Early concerns centered around the lack of peer review and consensus criteria for quality assessment
- Social media (especially Twitter) was a major factor in engaging the audience
- Democratized and disrupted medical education by providing rapid, convenient, and open access to a breadth of clinical content on demand

The rise of FOAM

The price was right

- Rapid growth outside the US (especially the UK and Australia)
- Providers in practice and trainees used it for personal learning and in formal health professions curricula
- Trainees seem to primarily use trusted blogs and podcasts when building their foundational medical knowledge
- COVID-19 pandemic drove education further towards web-based content, making the integration of FOAM in formal curricula more common

"You're able to reach across the world almost instantaneously. Information technology has really transformed how we learn and what we learn."

Michelle Lin

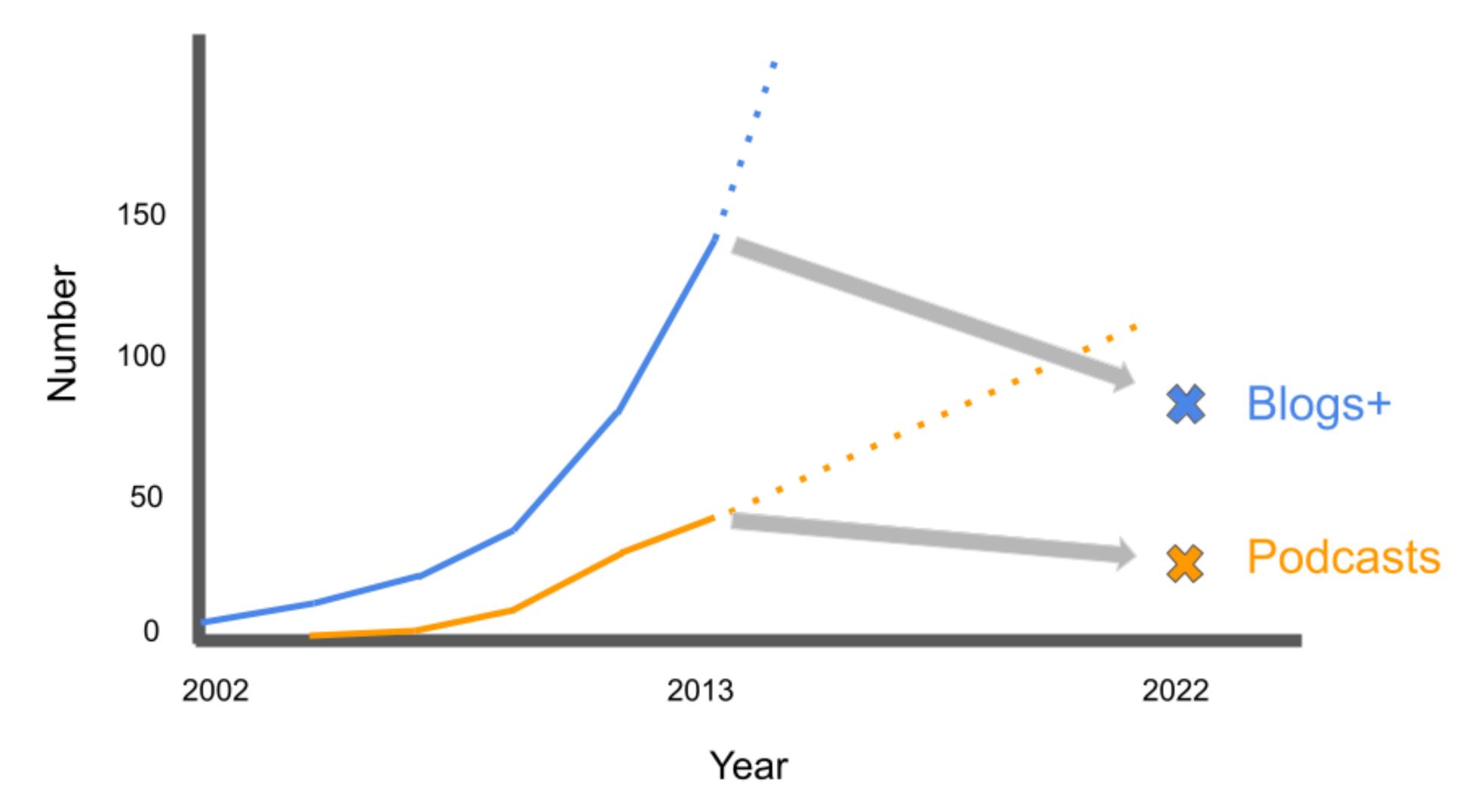
Emergency Medicine, University of California San Francisco Editor-in-Chief, Academic Life in Emergency Medicine

Disruptive nnovation

Christensen's Theory of Disruptive Innovation

...and what the heck is "peak blog?"

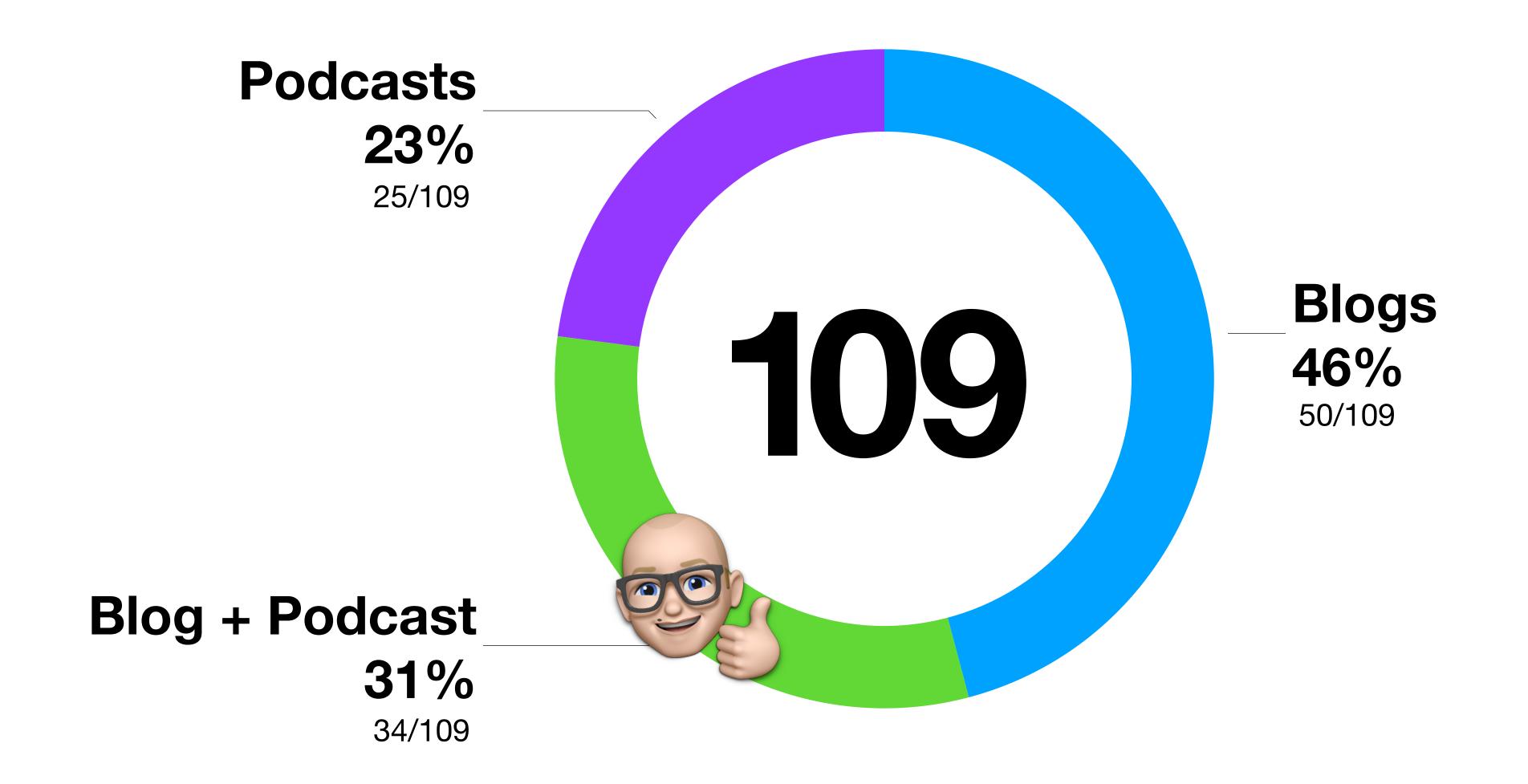
- FOAM resources disrupted the incumbent resources (journals, texts, in-person conferences)
- Incumbent organizations co-opted the disruptive innovation and created their own online learning resources, blogs, and podcasts & the need for new independent FOAM waned
- Around 2013-14 we hit "peak blog" and the number of active EM and critical care FOAM sites declined 40% from the peak of >180



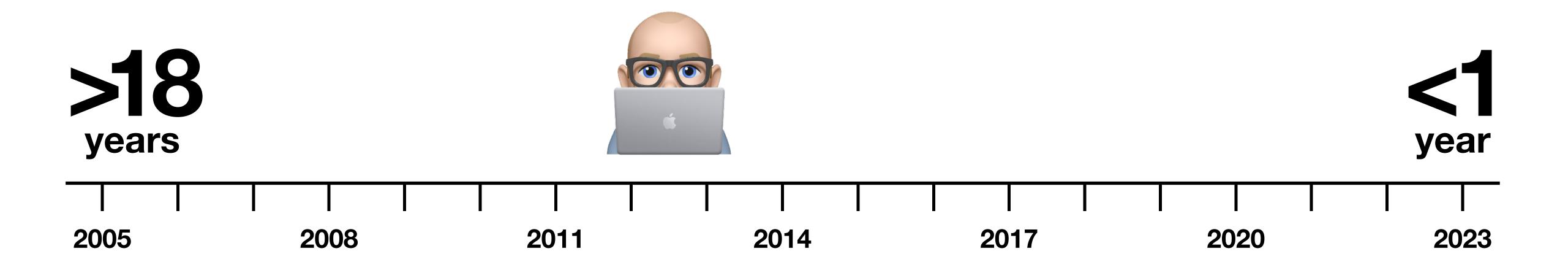
Number of active blogs+ (defined as blogs or blogs with podcasts) and podcasts during 2002-2013 compared to 2022. The dotted lines represent predicted trends if growth had continued at a consistent rate.

Currently active FOAM sites

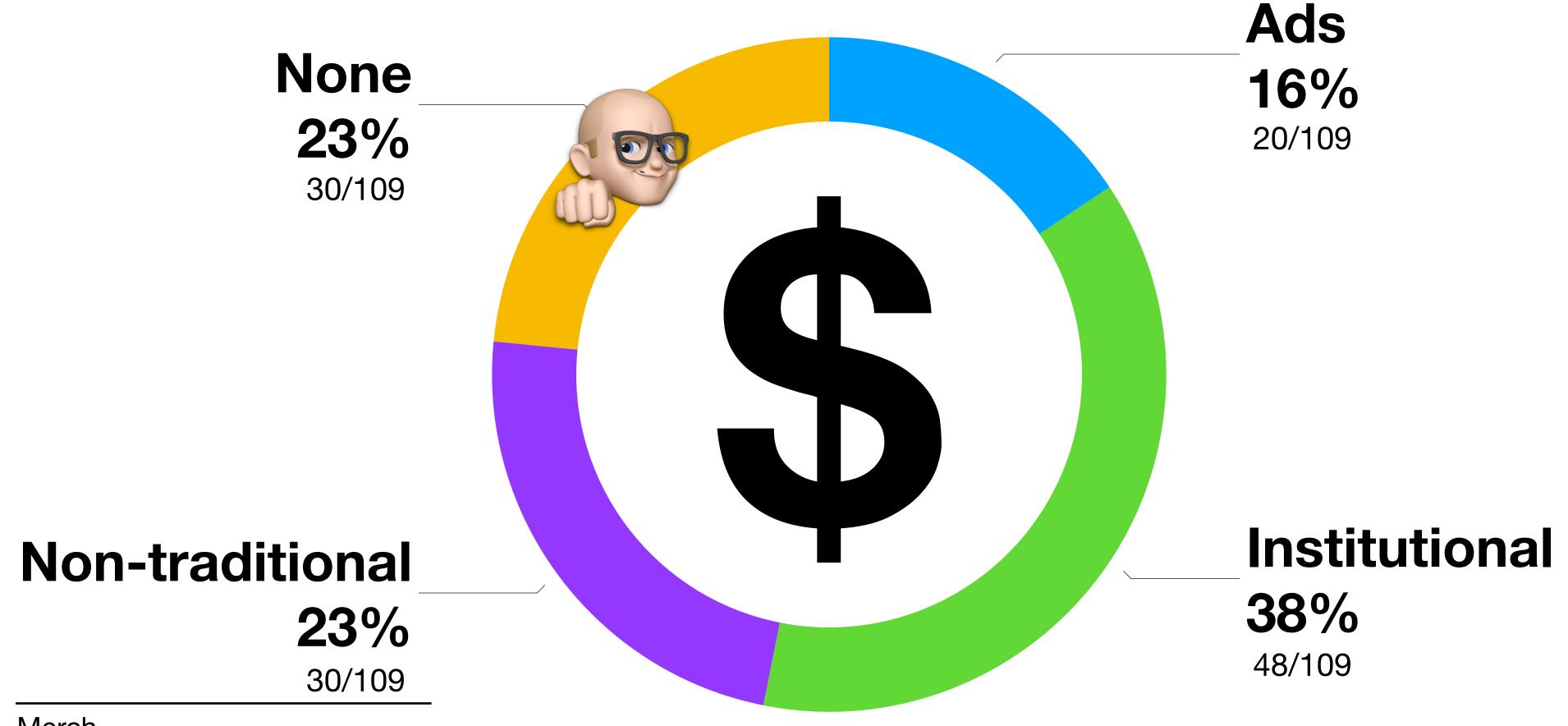
as of late 2022



The age of FOAM sites



Sources of support for FOAM sites



Merch
Online books
Web-based content
Premium podcast subscriptions

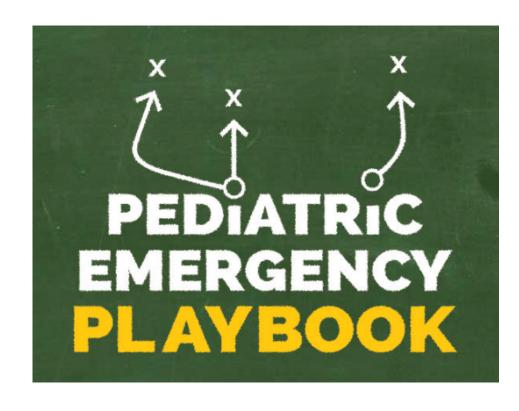
It's tough out there for a blogger

It's so hard to say goodbye...

- Because FOAM sites generate little revenue or academic credit for their creators it is difficult to challenge the incumbents
- It is expensive to run a site, including server costs, and dealing with malware
- Did now defunct sites succumb to these financial and academic opportunity costs as well as high user expectations for design and functionality

Where have all the FOAM sites gone?

They're still here...









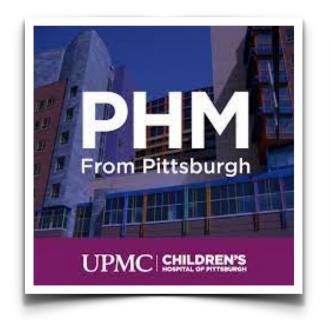






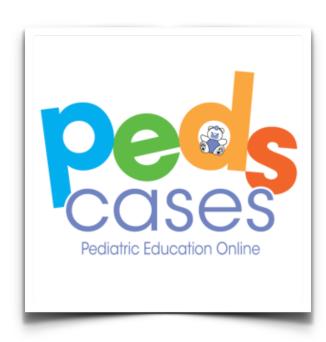




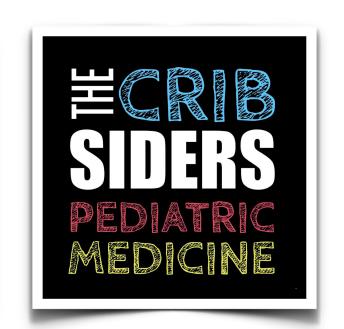














~2,700 listens/episode

~2600 listens/episode

~8,700 listens/episode

~12,900 listens/episode

~11,800 listens/episode

~14,900 listens/episode

~4,500 listens/episode

FOAM isn't going anywhere

Dun dun dun... oh no, oh no, oh no, no, no, no, no...

- FOAM has proven to be a resilient medium for educational content delivery
- The remainder of this talk will focus on...
 - Quality assessment
 - Integration into curricula
 - Knowledge dissemination
 - Academic and professional development

Is any of this stuff any good?

Part 2 Quality assessment of FOAM

Uncurated & Accessible

FOAM goes too fast, too far, and it's not vetted...

FOAM critically appraises the literature

But is it free from peer review?

"Skepticism exists among educators and scholars, especially given that most online medical education resources lack the traditional peer-review process and that one might easily publish material online, using disruptive technologies such as blogs or podcasts."

Chan et. al

Annals of Emergency Medicine, 2016

Pre / Post

peer review strategies in FOAM



PEM POCUS Series: Pediatric Appendicitis

May 31, 2022 | Pediatrics, PEM POCUS, Ultrasound By: Stacey Lakin, MD, Mindy Minh-Thu Duong, MD and Margaret Lin-Martore, MD



Read this tutorial on the use of point of care ultrasonography (POCUS) for **pediatric appendicitis**. Then test your skills on the ALiEMU course page to receive your PEM POCUS badge worth 2 hours of ALiEMU course credit.



Brad Sobolewski, MD, MEd

@PEMTweets

@ALiEMteam PEM POCUS Series: Pediatric Appendicitis is a good review. What they didn't mention is that in 40-45% of humans the appendix is retrocecal and thus even the most skilled sonographer wo see it. Obesity (BMI >80%) also plays a role.



aliem.com

PEM POCUS Series: Pediatric Appendicitis PEM POCUS Series: Performing a bedside ultrasound to diagnose pediatric appendicitis by Drs. Lakin, Duong, and

4:33 PM · May 31, 2022

...Post publication peer review in action



Academic Life in EM @ALiEMteam · Jun 1, 2022

Replying to @PEMTweets

Thanks for the feedback - we added a section on this. This post was meant primarily to be a tutorial on the scan technique. The authors feel that it's still worth learning this skill since you may just pick up an appendicitis on your POCUS exam.



Facts and Literature Review

Benefits of Appendix POCUS

An appendix POCUS benefits children with suspected appendicitis, as demonstrated in the literature:

- 1. Decrease in CT scan utilization [2-4]
- 2. Decrease in lengths of Emergency Department stay [3, 4]
 - Tsung et al, Critical Ultrasound J, 2014 [4]: There was a shorter ED length of stay (LOS) with mean LOS reported for the following modalities:
 - POCUS: 154 minutes
 - Radiology US: 288 minutes
 - CT scan: 487 minutes

Equivocal Findings on POCUS

- Oftentimes an appendix cannot be visualized on both POCUS and radiology-performed ultrasound, especially in patients with higher BMI [5].
- In situations with an experienced sonographer, where the appendix is not visualized and there are no secondary signs on radiology-performed ultrasound, patients are at low risk for appendicitis with a negative predictive value in the 80's% [6, 7].
- Serial ultrasound has been recommended in equivocal ultrasound cases as ultrasound's sensitivity increases with length of pain [8].
- For POCUS for appendicitis, non-visualized appendix studies continue to represent a diagnostic dilemma [1, 9]. For more on this topic, read a deeper-dive on this topic in a PEM Pearls post.



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Brad Sobolewski, MD, MEd @PEMTweets · Jun 1, 2022

Replying to @ALiEMteam @margalinma and @MindyDuong

Of course - RLQ POCUS is an incredibly useful skill. Highlighting that there are factors that even great technique can't overcome is welcome. Thank you for the follow up!

Pre / Post

peer review strategies in FOAM

We now have validated, meticulously developed quality assessment tools for FOAM

These tools are being used to assess the broad array of FOAM content out there

the MIETRIO SIUCIY

METRIQ Quality assessment of FOAM materials

There are now validated pre-publication tools to asses the quality of blogs and podcasts

The revised METRIQ score is the current iteration

Ongoing validity work and study of practical applications of the tool

THE THE TOTAL STUDY

The rMETRIQ Score

		0	1	2	3
1	resource provide enough background information to	No, the information presented within the resource cannot be situated within its broader context without looking up information independently.	No, the information presented within the resource cannot be situated within its broader context, but users are directed to other valuable resources with this information.	Yes, the resource provides sufficient background information to situate the user.	Yes, the resource provides sufficient background information to situate the user and also directs users to other valuable resources related to the topic.
2	resource contain an appropriate amount of information for	Insufficient content.	Lots of unnecessary, redundant, or missing content.	Some unnecessary, redundant, or missing content, but most content was essential.	No unnecessary, redundant, or missing content; all content was essential.
3	well written and	The resource is poorly written and/or formatted, and should not be a resource for learning.	The resource is somewhat well-written and formatted, but could benefit from substantive editing (e.g. grammatical errors are seen, or better organized).	The resource is reasonably well- written and formatted, but aspects of the organization or presentation are distracting or otherwise detrimental to learning.	The resource is very well- written and formatted in a way that optimizes and benefits learning.
4	resource cite its	No, no references are cited.	Yes, there are references listed but they do not map to specific statements within the resource.	Yes, the references are cited and clearly map to specific statements within the resource, but statements of fact that are not common knowledge are made without the support of a reference.	Yes, the references are cited, clearly map to specific statements within the resource, and all statements of fact that are not common knowledge are supported with a reference.
5	created the resource and do they have any conflicts of	No, the author of the resource has significant conflicts of interest; or the author is not clearly identified (e.g. no name or a pseudonym is used).	Yes, the identity of the author is clear, but they do not list their qualifications or disclose whether they have any conflicts of interest.	Yes, the identity and qualifications of the author are clear, but they do not disclose whether they have any conflicts of interest.	Yes, the identity and qualifications of the author are clear and they specify that they have no relevant conflicts of interest.
6	Are the editorial and pre- publication peer review processes that were used to create the resource clearly outlined?	No, it is unclear whether or not the website has a review process; or, there is no process.	Yes, a review process is mentioned on the website, but it was not clearly described.	Yes, a clear review process is described on the website, but it was not clear whether it was applied to the resource.	Yes, a clear review process is described on the website and it was clearly applied to the resource.
7	Is there evidence of post- publication commentary on the resource's content by its users?	No, there was no mechanism to leave comments; or comments that were present were either unrelated to the post or unprofessional.	There was a mechanism to leave comments but none had been made.	Yes, some comments have been made on the resource, but a robust discussion about the resource's content has not occurred.	Yes, a robust discussion of the resource's content has occurred that expands upon the content of the resource.
	3	Joes the resource cite its references? Is it clear who created the resource and do they have any conflicts of interest? Are the editorial and prepublication peer review processes that were used to create the resource clearly outlined? Is there evidence of postpublication commentary on the resource's content by its	Does the resource provide enough background information to situate the user? Does the resource contain an appropriate amount of information for its length? Is the resource well written and formatted? Does the resource well written and formatted? Is it clear who created the resource cite its references? Is it clear who created the resource and do they have any conflicts of interest? Is it clear who created the resource and do they have any conflicts of interest? Are the editorial and prepublication peer review processes that were used to create the resource clearly outlined? Is there evidence of post-publication commentary on the resource clearly outlined? No, the author of the resource interest; or the author is not clearly identified (e.g. no name or a pseudonym is used). No, it is unclear whether or not the website has a review processes that were used to create the resource clearly outlined? No, there was no mechanism to leave comments; or comments o	Does the resource provide enough be situated within the resource cannot be situated within its broader context without information to situate the user? Does the resource contain an appropriate amount of information for interest. Is the resource well will appropriate amount of information for its length? Does the resource will insufficient content. The resource is poorly written and for learning. The resource is poorly written and or learning. The resource is poorly written and or learning. The resource is poorly written and for learning. The resource is poorly written and or learning. The resource is poorly written and for learning. The resource is poorly written and for learning. The resource is poorly written and for learning. The resource is poorly written and formatted, but could benefit from substantive adding leagrammatical errors are seen, or better organized). Pees the resource cite its references? Is it clear who created the resource has significant conflicts of interest; or the author of the resource has significant conflicts of interest; or the author is not clearly conflicts of interest; or the author is not clearly conflicts of interest; or the author is not clearly conflicts of interest; or the author is not clearly conflicts of interest; or the author is not clearly conflicts of interest; or the author is not clearly conflicts of interest; or the author is not clearly conflicts of interest; or the author is not clearly conflicts of interest; or the author is not clearly conflicts of interest; or the author is not clearly conflicts of interest; or the author is not clearly conflicts of interest; or the author is not clearly or disclose whether the resource dearly outlined? Are the editorial and prepublication peer review process; in the website has a review process; in mentioned on the website, but it was not clearly described. There was a mechanism to leave comments but none had been made.	Does the resource provide in the internation presented within the resource and of the product context without the district within the resource cannot be student without the district within the resource cannot be student without the district within the resource cannot be student without the district within the resource cannot be student without the district within the resource cannot be student without the content. Does the resource contain independently. Insufficient content. Lots of unnecessary, redundant, or missing content, was essential. Some unnecessary, redundant, or missing content, was essential. The resource is somewhat well-written and formatied, but could benefit made and formatied and elocated without and elocated within the resource is somewhat well-written and formatied, and elocated within the resource is somewhat well-written and formatied, and elocated within the resource is somewhat within the content. The resource is somewhat well-written and formatied, and elocated within the resource is somewhat well-written and formatied, and elocated within the resource is somewhat well-written and formatied, and elocated within the resource is somewhat well-written and formatied, and elocated within the resource of the organization or organized). The resource is somewhat well-written and formatied, but made of the resource of the organization or organized. The resource cite its references: No, the author of the resource and do the resource and do the resource and do they have an organized and organize



The rMETRIQ Score

0 No, the information presented Yes, Does the No, Yes, the information presented the resource provides resource provide within the resource cannot the resource provides within the resource cannot sufficient background information to situate the user be situated within its enough sufficient background be situated within its broader context, but users are directed to other background information to information to situate the and also directs users to other broader context without valuable resources related to looking up information independently. valuable resources with this user. situate the user? the topic. information. Does the No unnecessary, Some unnecessary, resource contain Lots of unnecessary, redundant, or missing content. redundant, or missing redundant, or missing an appropriate amount of Insufficient content, but most content; all content was content. content information for essential. was essential. its length? The resource is somewhat The resource is reasonably well-written and formatted, but well-written and formatted, The resource is poorly written and/or formatted, The resource is very well-written and formatted in a way Is the resource but could benefit from aspects of the organization or presentation are distracting or well substantive editing (e.g. that optimizes and benefits and should not be a resource written and grammatical errors for learning. learning. otherwise detrimental to formatted? are seen, or better learning. organized).

The rMETRIQ Score

0 1 2

Does the resource cite its references?

No, no references are cited. Yes, there are references listed but they do not map to specific statements within the resource.

Yes, the references are cited and clearly map to specific statements within the resource, but statements of fact that are not common knowledge are made without the support of a reference.

Yes, the references are cited, clearly map to specific statements within the resource, and all statements of fact that are not common knowledge are supported with a reference.

Is it clear who created the resource and do they have any conflicts of interest?

No, the author of the resource has significant conflicts of interest; or the author is not clearly identified (e.g. no name or a pseudonym is used).

Yes,
the identity of the author is
clear, but they do not list
their qualifications
or disclose whether they
have any conflicts of
interest.

Yes,
the identity and
qualifications of the author
are clear, but they do not
disclose whether they have
any conflicts of interest.

Yes,
the identity and
qualifications of the author
are clear and they specify
that they have no relevant
conflicts of interest.

The rMETRIQ Score

0 Are the editorial Yes, and pre-Yes, Yes, a clear review process is No, it is unclear whether or publication peer a review process is a clear review process is described on the website, not the website has a review processes described on the website mentioned on the website, but it was not clear review process; or, there is that were used to but it was not clearly and it was clearly applied whether it was no process. create the described. to the resource. applied to the resource. resource clearly outlined? Is there evidence No, there was no Yes, some comments have of post-Yes, a robust discussion of mechanism to leave been made on the publication the resource's content has There was a mechanism comments; or comments resource, but a robust commentary on occurred that expands to leave comments but that were present were discussion about the the resource's upon the content of the none had been made. either unrelated to the post resource's content has not content by its resource. or unprofessional. occurred. users?

These tools are also being used in actual educational settings to guide content curation for official educational credit for EM programs

Educators are beginning to implement curricula that provide instruction in the quality assessment of blogs and podcasts

Part 3 Integration into curricula

Is any of this blog stuff actually being used in an official capacity?



In 2008 the ACGME's Review Committee for Emergency Medicine launched the **Individualized Interactive Instruction** (III) Initiative

EM programs can replace up to 20% of didactics with faculty-monitored asynchronous learning

ACGME III Criteria

- 1. The program director must monitor resident participation
- 2. There must be an evaluation component
- 3. There must be faculty oversight
- 4. The activity must be monitored for effectiveness

ALIEN

ALIEN

>12,000 users

154 countries

100 Emergency Medicine residency programs

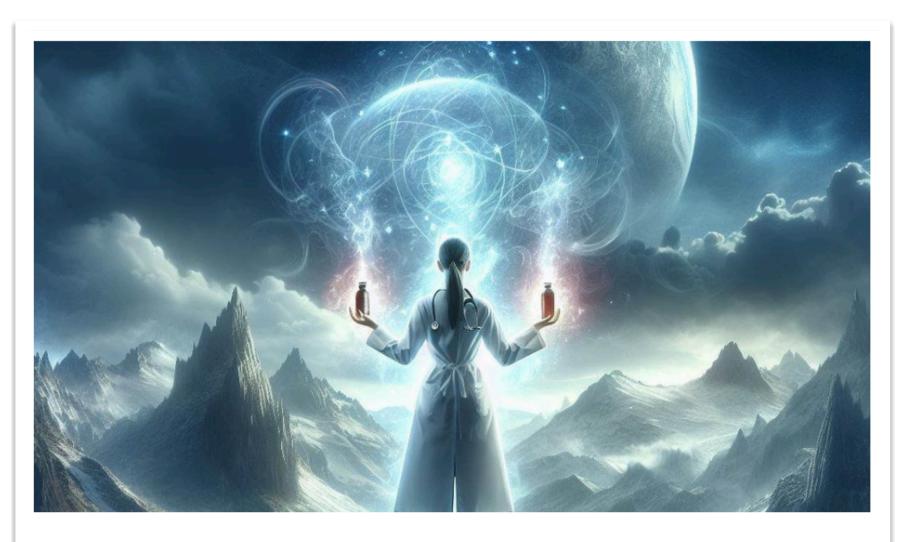
>60,000 courses completed

All free to learners





Online Journal Clubs



Zibotentan and Flozins: Climbing to the ZENITH of nephroprotection?

This week, we will discuss yet another endothelin antagonist trial, on a background of flozins, in proteinuric CKD. Will flozins help breakthrough the endothelin badness?

Dec 5, 2023



FOAMClub

Digital scholarship curriculum @



- Division of Emergency Medicine
- Quarterly conference focused on FOAM
- One fellow works with me on a topic review
- They also create a piece of digital scholarship that attendees critique
- Examples infographics in medicine, a Spanish language podcast for patients and families, videos providing education to patients and families

Podcasts and more @ Cincinnati Children's







Jill Schaffeld, MD & Paul Bunch. MD



Temara Hajjat, MD



Todd Ponsky, MD



Part 4 Dissemination and FOAM

The history of research dissemination in PEM

Pediatrics

VOLUME 4 DECEMBER 1949 NUMBER 6

ORIGINAL ARTICLES



AAP Pediatrics

@aap_peds

Pediatrics is an official peer-reviewed journal of the @ameracadpeds, continuously publishing ground-breaking research since January 1948.

PEDIATRICS

OFFICIAL JOURNAL OF THE AMERICAN ACADEMY OF PEDIATRICS

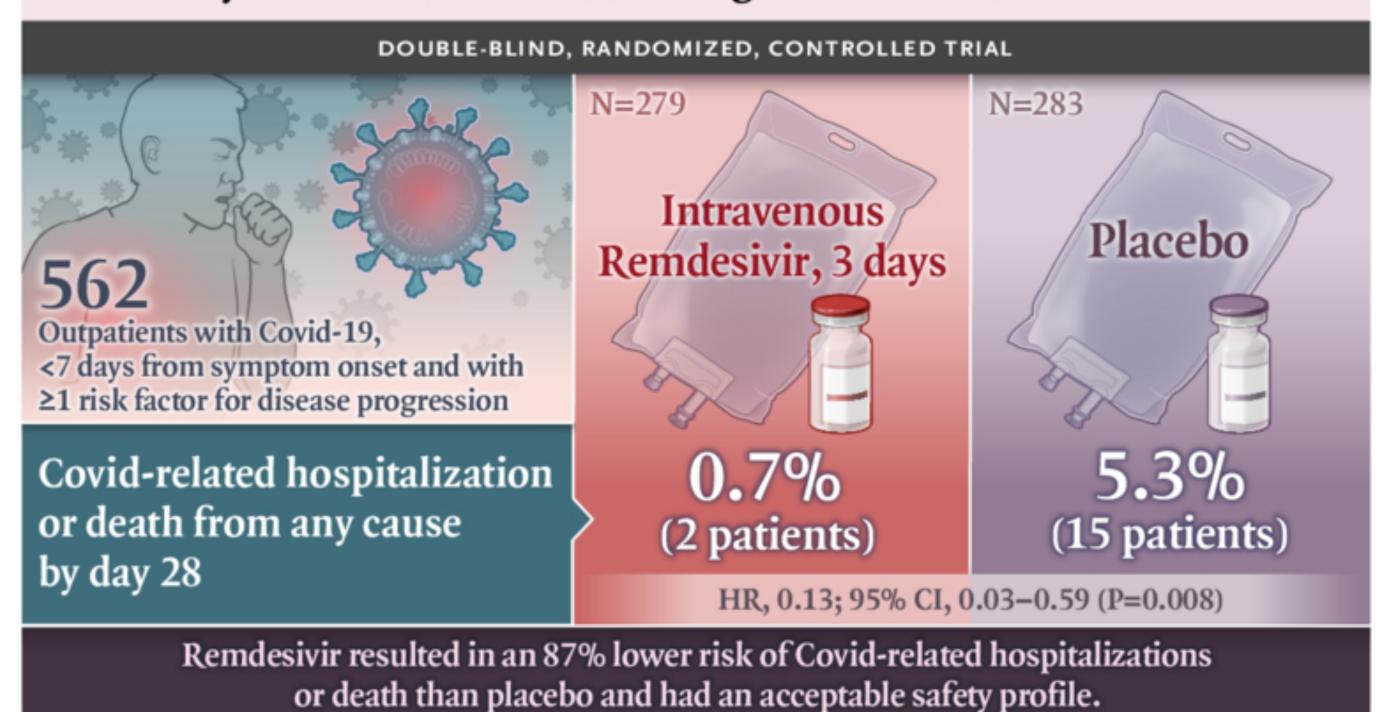
Serum Sodium Concentration and Mental Status in Children With Diabetic Ketoacidosis Glaser et al

Pediatrics (2021) 148 (3): e2021050243



The NEW ENGLAND JOURNAL of MEDICINE

Early Remdesivir to Prevent Progression to Severe Covid-19



Tried and True

The stuff we pay for...

PEDIATRICS

OFFICIAL JOURNAL OF THE AMERICAN ACADEMY OF PEDIATRICS

Annals of Emergency Medicine

An International Journal





Why are these new methods grown so quickly? And is this scary?

- Knowledge translation has traditionally been slow
- New methods can be cheaper, faster, different, and more accessible
- They can allow one to reach new and different audiences
- Run in parallel to "traditional" dissemination channels
- Concerns about authenticity have arisen...



We are excited to announce insulin is free now.

1:36 PM · 11/10/22 · Twitter for iPhone



We apologize to those who have been served a misleading message from a fake Lilly account. Our official Twitter account is @LillyPad.

4:09 PM · Nov 10, 2022





We apologize to those who were have been served a misleading message from a fake Lilly account about the cost of diabetic care. Humalog is now \$400. We can do this whenever we want and there's nothing you can do about it. Suck it. Our official Twitter account is @LillyPadCo.

5:02 PM · Nov 10, 2022 · Twitter Web App

Integration with traditional methods

Journal publications and conferences

- Journals now have social media editors
- You may be tasked by journals with crafting tweets to promote your work post-publication
- Twitter/X has been the dominant method of communication for sharing research findings presented at conferences...
- How the impact of this integration increases engagement is not yet understood

Can we measure impact?

More then just retweets

- Website, social media, and podcast creators follow metrics such as page views, downloads, likes, and retweets
- Third party algorithms (e.g., Altmetric) provide an aggregate and alternative lens through which to measure the spread of information
- There are no studies yet on clinical behaviors or patient outcomes



- Proprietary scoring system
- Measures "attention," good or bad
- Is there a difference between the "quantity" of mentions and "quality" of mentions
- Weighted by source

News	8
Blog	5
Policy document (per source)	3
Patent	3
Wikipedia	3
Peer review (Publons, Pubpeer)	1
Weibo (not trackable since 2015, but historical data kept)	1
Google+ (not trackable since 2019, but historical data kept)	1
F1000	1
Syllabi (Open Syllabus)	1
LinkedIn (not trackable since 2014, but historical data kept)	0.5
Twitter (tweets and retweets)	0.25
Facebook (only a curated list of public Pages)	0.25
Reddit	0.25
Pinterest (not trackable since 2013, but historical data kept)	0.25
Q&A (Stack Exchan)	0.25
Youtube	0.25
Number of Mendeley readers	0
Number of Dimensions and Web of Science citations	0



About this Attention Score

In the top 5% of all research outputs scored by Altmetric

MORE...

Mentioned by



Citations

114 Dimensions

ORIGINAL ARTICLE

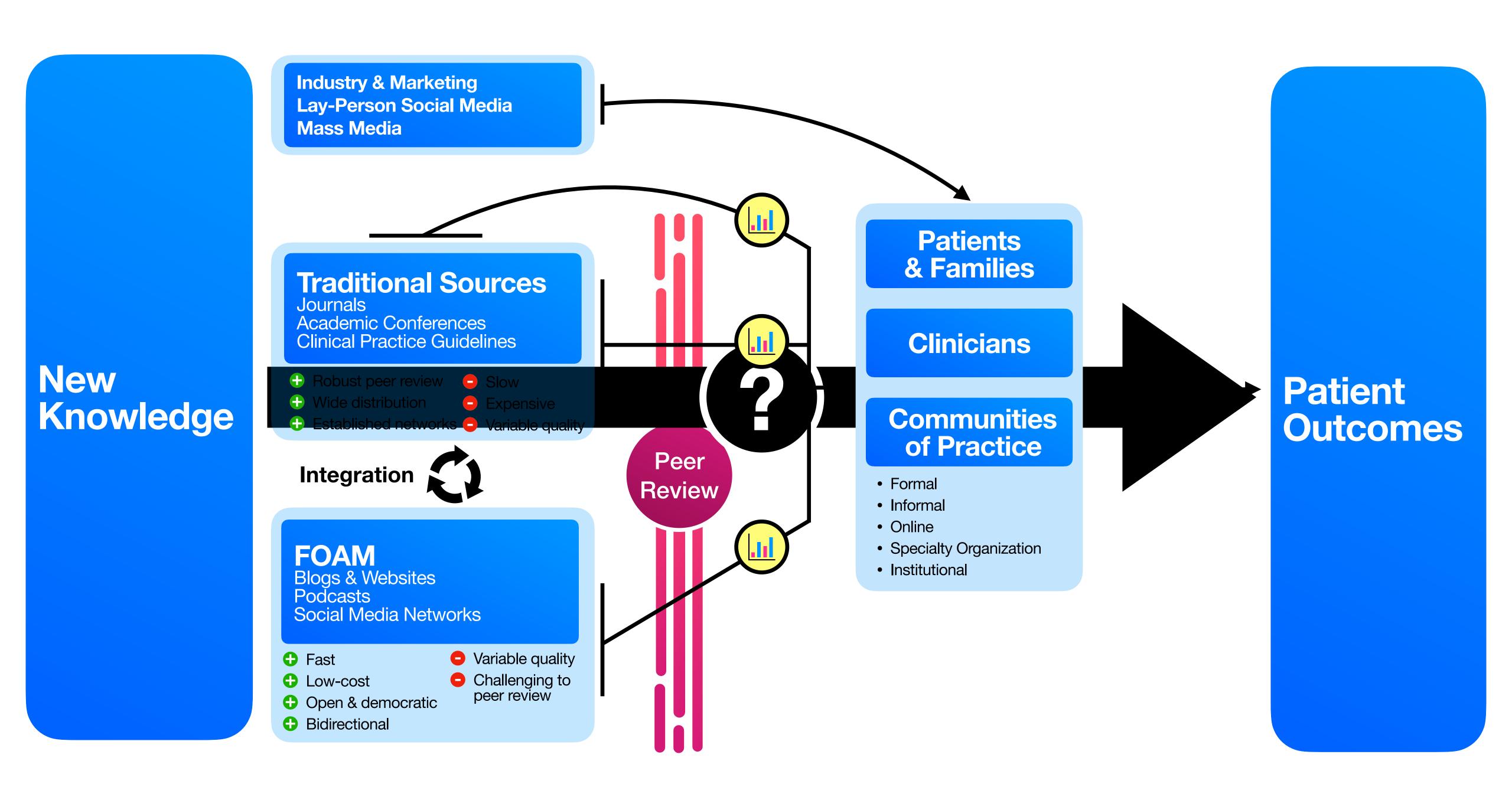
Lactobacillus rhamnosus GG versus Placebo for Acute Gastroenteritis in Children

David Schnadower, M.D., M.P.H., Phillip I. Tarr, M.D., T. Charles Casper, Ph.D., Marc H. Gorelick, M.D., M.S.C.E., J. Michael Dean, M.D., Karen J. O'Connell, M.D., Prashant Mahajan, M.D., M.P.H., Adam C. Levine, M.D., M.P.H., Seema R. Bhatt, M.D., Cindy G. Roskind, M.D., Elizabeth C. Powell, M.D., Alexander J. Rogers, M.D., et al., for the PECARN Probiotics Study Group

Research dissemination planning

We don't just wing it?

- Dissemination planning starts during the grant writing / IRB protocol stage (PECARN TREKK, EMSC)
- The "Discussion" and "Conclusion" sections of a manuscript, and posters, presentations, and digital media should all have the same message
- Identify and support collaborators with skills to help disseminate (co-authors, funding, academic credit)
- Use quality assessment tools to develop these materials





AEM Education and Training A GLOBAL JOURNAL OF EMERGENCY CARE

Going viral: A scoping review of the current state and impact of online research dissemination in emergency medicine

Gray et al., 2022

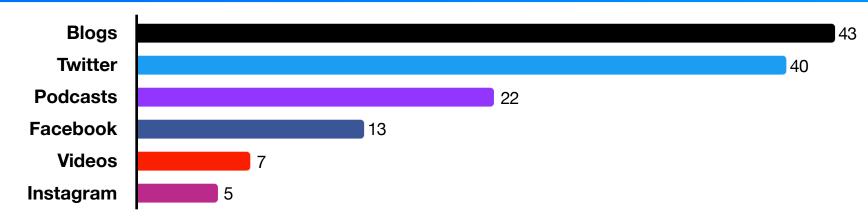
6 Major Domains

62 Traditional literature Full text articles

38 descriptive studies 20 commentaries

2 case studies or series2 randomized controlled trials

17 Grey literature Citations



Integrating with traditional knowledge sources: FOAM as a novel dissemination vehicle



Use of Twitter, podcasts, and blogs have dramatically increased in recent years amongst physicians, particularly trainees, and publishers and conference organizers have attempted to maximize FOAM as a complement to their traditional offerings.

Exemplar Article

Lin et al. Accelerating Knowledge Translation: Reflections From the Online ALiEM-Annals Global Emergency Medicine Journal Club Experience. *Ann Emerg Med*, 2017.

The integration of traditional literature with FOAM is an essential way to shorten the knowledge translation gap.

Online organizations and communities of practice



FOAM and novel methods of dissemination allow researchers, research networks, clinicians, and to engage in a bidirectional conversation.

Exemplar Article

Scott et al. Pediatric information seeking behaviour, information needs, and information preferences of health care professionals in general emergency departments: Results from the Translating Emergency Knowledge for Kids (TREKK) Needs Assessment. *CJEM*, 2018.

More than 60% of participants used the internet as an additional practice information source in addition to more traditional methods, such as discussion with colleagues, conferences, and journals.

FOAM quality assurance tools and techniques



Tools for the assessment of FOAM quality are becoming more robust and reliable. They should be used routinely in evaluating FOAM resources, particularly those used for trainee education.

Exemplar Article

Ting et al. Quality Appraisal and Assurance Techniques for Free Open Access Medical Education (FOAM) Resources: A Rapid Review. *Semin Nephrol*, 2020.

Tools for FOAM quality assessment exist and have been validated. Further refinement will improve FOAM quality and individual appraisal skills.

Impressions, engagement, and reach: quantitative measurement of non-traditional methods of dissemination



The best metrics for quantifying success in non-traditional means of dissemination remain elusive. Progress is being made in measuring proximal effects, but a large gap remains in measuring patient outcomes.

Exemplar | Article

Huang et al. The effect of an infographic promotion on research dissemination and readership: A randomized controlled trial. *CJEM*, 2018.

A FOAM-based intervention arm resulted in a two-fold increase in abstract views compared to no online, but no change in full-text downloads of the article on the journal website.

Professional development, medical education, and FOAM



The acknowledgement of FOAM efforts by traditional academic institutions will allow for more engagement by faculty and trainees in the creation, curation, and analysis of novel dissemination methods.

Exemplar Article

Husain et al. Consensus Guidelines for Digital Scholarship in Academic Promotion. *West J Emerg Med*, 2020.

Proposed guidelines for integrating FOAM into professional development include: demonstration of scholarship criteria; provision of external evidence of impact; and inclusion of digital peer-review roles

Great potential, notable barriers



Social media and FOAM represent great potential for education and knowledge translation, but useful, high quality content should underpin efforts

Exemplar | Article

Radecki et al. Social Media is Exploding – But is it Effective? Emerg Med J Blog, 2015.

The potential for FOAM to transform knowledge translation is great, but it should be built on a foundation of high quality content and further development of methods to measure its success at the bedside.

Dissemination campaigns

Kind of like advertising...

Integrating with traditional knowledge sources: FOAM as a novel dissemination vehicle

How do online asynchronous media complement publications and presentations?

Impressions, engagement, and reach: quantitative measurement of non-traditional methods of dissemination

Define how you will measure reach and impact in advance?

Online organizations and communities of practice

Determine which channels/communities of practice will be involved

Professional development, medical education, and FOAM

Are their junior faculty and trainees that can contribute in a meaningful way?

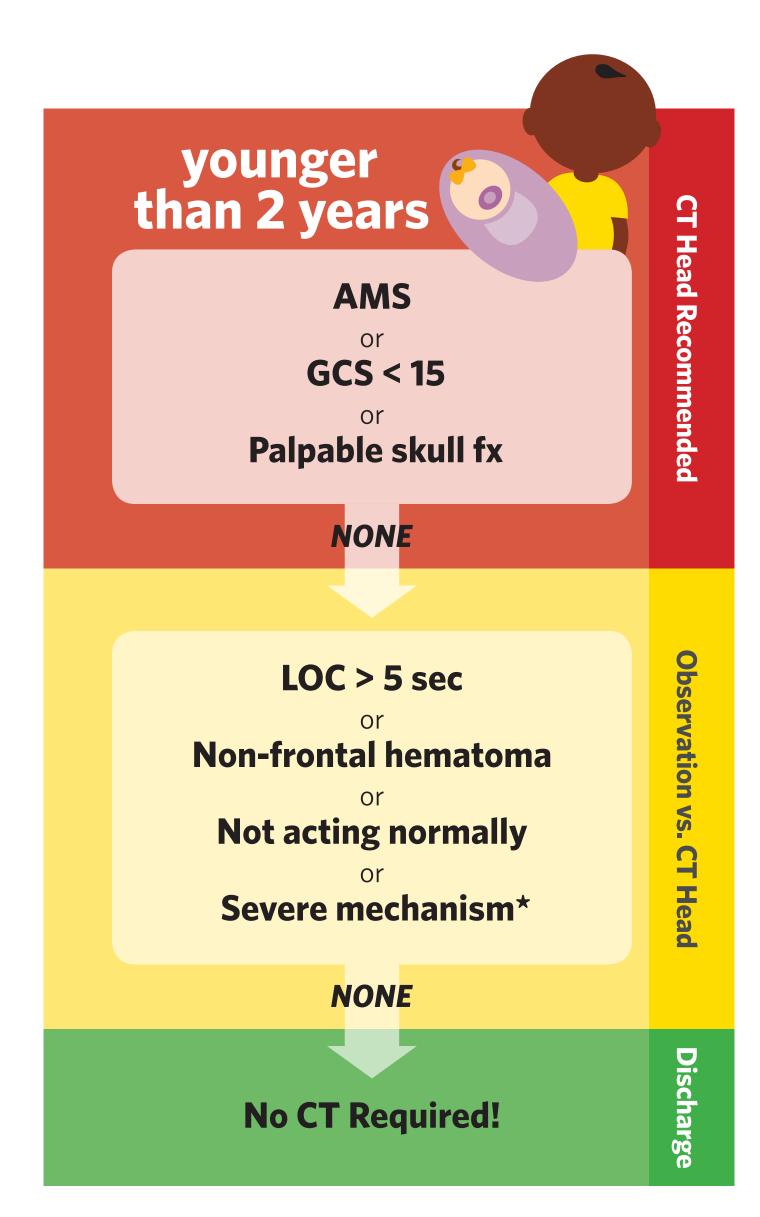
FOAM quality assurance tools and techniques

Assure that all materials created adhere to the METRIQ quality assessment criteria and are subject to pre and post publication peer review

Example

Information and graphics - a match made in heaven





***SEVERE MECHANISMS**















AMS

GCS < 15

Signs of basilar skull fx

NONE

History of LOC

History of vomiting

Severe headache

Severe mechanism*

NONE

No CT Required!

Discharge

Observation vs. CT Head

CT Head Recommended















I PECARNed that kid

More than just the head CT rule

- The Pediatric Emergency Care Applied Research Network has a Dissemination Working Group
- Each research node has funded dissemination leads
- Dissemination was a major part of funding renewal this year
- In the pipeline: C-spine imaging, STEC/HUS, Pneumonia severity

Example 2

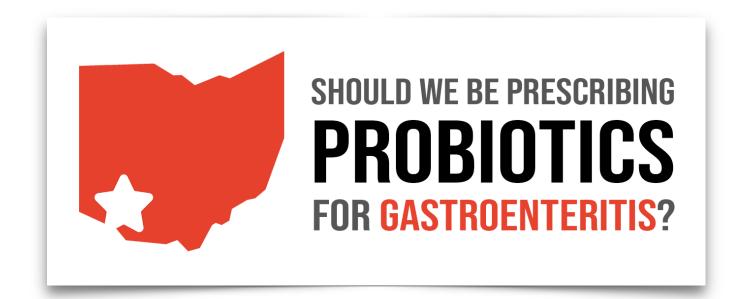
A blog, a podcast, and a video walk into a bar...

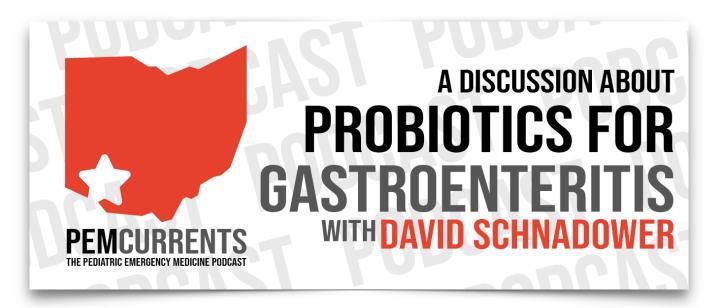




Lactobacillus rhamnosus GG versus Placebo for Acute Gastroenteritis in Children

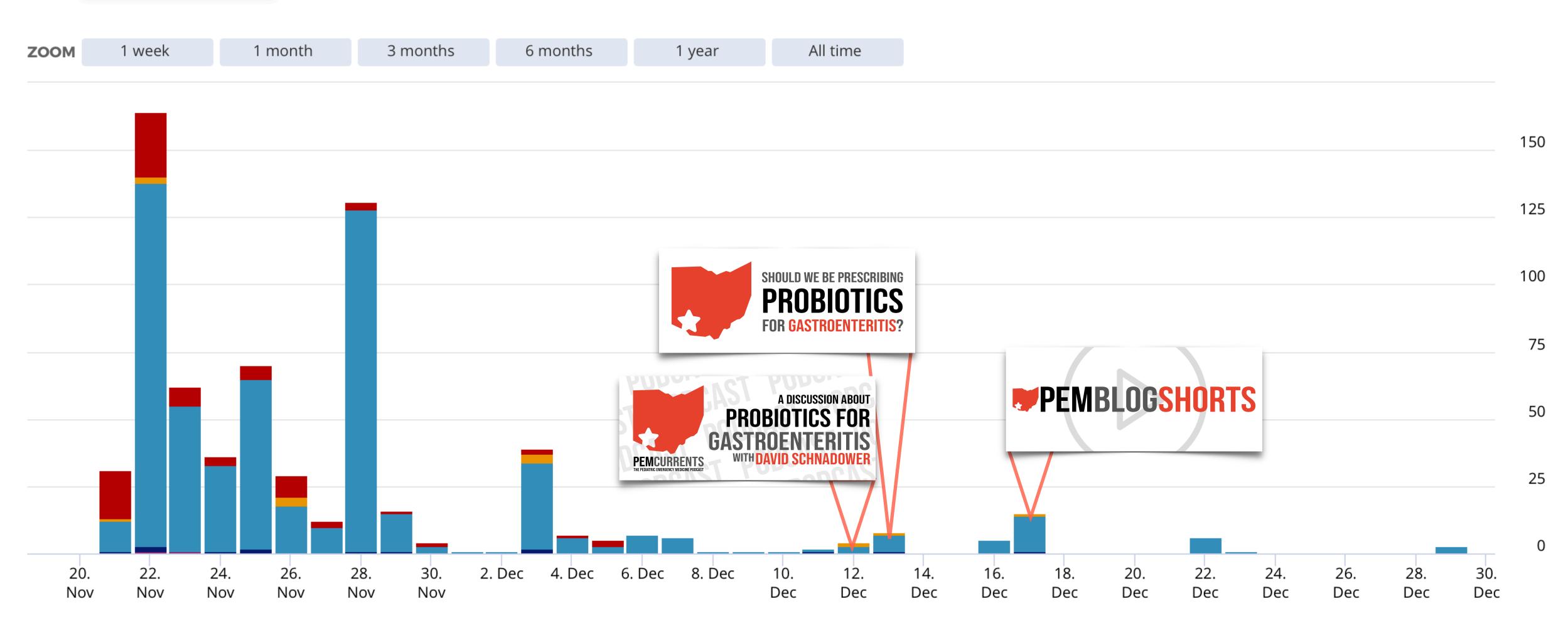
David Schnadower, M.D., M.P.H., Phillip I. Tarr, M.D., T. Charles Casper, Ph.D., Marc H. Gorelick, M.D., M.S.C.E., J. Michael Dean, M.D., Karen J. O'Connell, M.D., Prashant Mahajan, M.D., M.P.H., Adam C. Levine, M.D., M.P.H., Seema R. Bhatt, M.D., Cindy G. Roskind, M.D., Elizabeth C. Powell, M.D., Alexander J. Rogers, M.D., et al., for the PECARN Probiotics Study Group







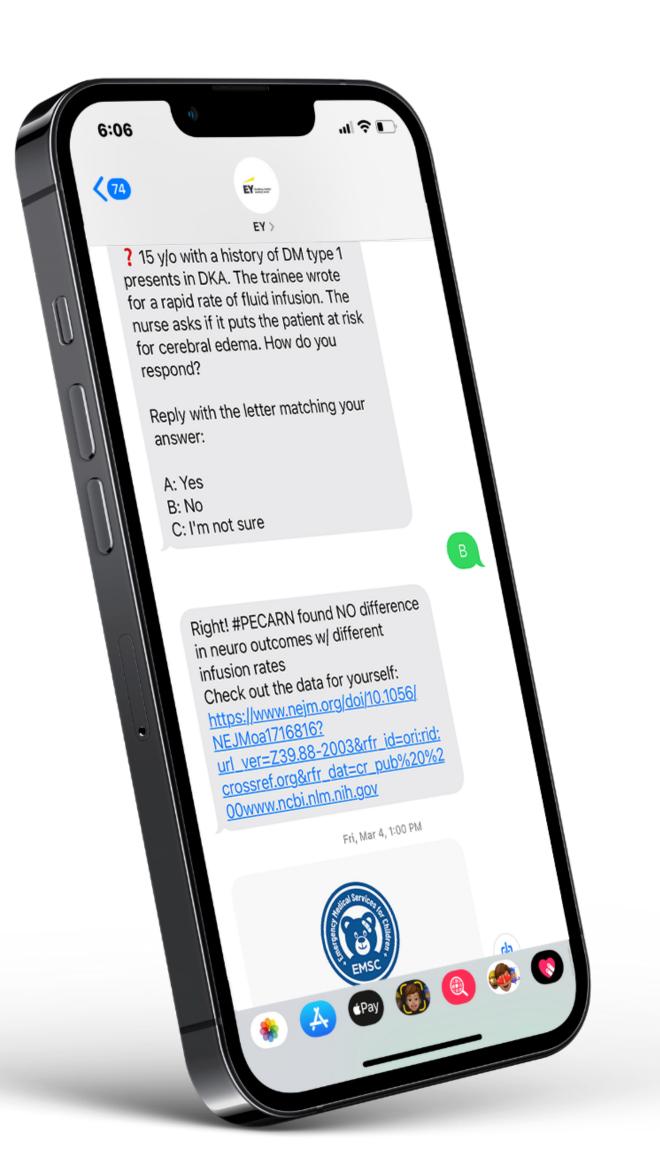




Example 3

Dissemination via text messages & micro learning















Example 4

Podcasters... Assemble!



EMSC Innovation and Improvement Center



A 5 episode podcast season co-produced with the



EMSC Innovation and Improvement Center

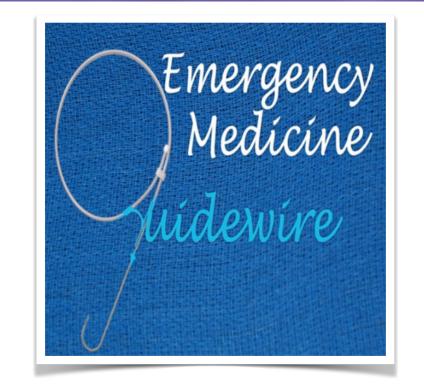


PediaCast CME













Ouch-less Pediatrics

Hosts: Joelle Donofrio-Odmann, DO, Assistant Professor of Pediatrics Rady Children's Hospital-San Diego and UC San Diego School of Medicine and Dr. Joseph Finney, MD, Clinical Fellow, Pediatric Emergency Medicine and EMS Washington University in St. Louis School of Medicine



Please Don't Hurt Me!

Hosts: Dr. Julia Magaña, Associate Professor of Pediatric Emergency Medicine at UC Davis and Dr. Sarah Medeiros, Associate Professor of Emergency Medicine at UC Davis Guests: Kimberly Wheatley, RN, UC Davis Pediatric Nurse, and Katheryn Finan, UC Davis Child Life Specialist



Pain management for laceration repair in children

Host: Brad Sobolewski, MD, MEd, Professor Division of Emergency Medicine Cincinnati Children's and University of Cincinnati Department of Pediatrics



Pediatric pain management

Hosts: Bryant Allen, MD Assistant Professor, Emergency Medicine, Carolinas Medical Center, and Sean Fox Professor of Emergency Medicine & Professor of Pediatrics and Professor of Emergency Medicine, Carolinas Medical Center



Pediatric Pain... from the Family Perspective

Host: Mike Patrick, MD, Assistant Professor of Clinical Pediatrics at The Ohio State University College of Medicine and an Attending Physician with the Section of Emergency Medicine at Nationwide Children's Hospital

Guests: David J. Scherzer Professor of Clinical Pediatrics at The Ohio State University College of Medicine and an Attending Physician with the Section of Emergency Medicine at Nationwide Children's Hospital, and Courtney Hall, Child Life Specialist Nationwide Children's Hospital























EMSC Innovation and Improvement Center

BONUS CONTENT FROM empocs

EPISODE 1 / MAY 17

DIFFERENTIATING ORGANIC VS PSYCHIATRIC CAUSES OF AGITATION & ALTERED MENTAL STATUS

EPISODE 2 / MAY 24

NON-PHARMACOLOGIC MANAGEMENT OF AGITATED CHILDREN

EPISODE 3 / MAY 31

PHARMACOLOGIC MANAGEMENT OF AGITATED CHILDREN

EPISODE 4/JUNE 7

SAFE PRE-HOSPITAL TRANSPORT OF THE AGITATED CHILD

EPISODE 5 / JUNE 14

MANAGEMENT OF THE CHILD WITH MENTAL HEALTH PROBLEMS BOARDED IN THE ED



Example 5

You have chosen... Wisely!

Choosing Wisely®



- Do not obtain radiographs in children with bronchiolitis, croup, asthma, or first-time wheezing
- Do not obtain screening laboratory tests in the medical clearance process of pediatric patients who require inpatient psychiatric admission unless clinically indicated
- Do not order laboratory testing or a CT scan of the head for a patient with an unprovoked, generalized seizure or a simple febrile seizure who has returned to baseline mental status
- Do not obtain abdominal radiographs for suspected constipation
- Do not obtain comprehensive viral panel testing for patients who have suspected respiratory viral illnesses

Dissemination campaigns

I'm showing this slide again...

Integrating with traditional knowledge sources: FOAM as a novel dissemination vehicle

How do online asynchronous media complement publications and presentations?

Impressions, engagement, and reach: quantitative measurement of non-traditional methods of dissemination

Define how you will measure reach and impact in advance?

Online organizations and communities of practice

Determine which channels/communities of practice will be involved

Professional development, medical education, and FOAM

Are their junior faculty and trainees that can contribute in a meaningful way?

FOAM quality assurance tools and techniques

Assure that all materials created adhere to the METRIQ quality assessment criteria and are subject to pre and post publication peer review

Integrating with traditional knowledge sources: FOAM as a novel dissemination vehicle

Each recommendation had an accompanying blog post on PEMBlog, an episode on PEM Currents: The Pediatric Emergency Medicine Podcast, and a video on YouTube + a social media campaign

Impressions, engagement, and reach: quantitative measurement of non-traditional methods of dissemination

We are tracking page views, listens, streams, social media impressions as well as visits to the Choosing Wisely site

Online organizations and communities of practice

Materials were also disseminated on Don't Forget the Bubbles to stimulate an international discussion

Professional development, medical education, and FOAM

Each recommendation has 2-3 team members that worked with me on the materials

FOAM quality assurance tools and techniques

All materials adhered to the METRIQ quality assessment criteria and have been subject to pre and post publication peer review





Choosing Wisely®









Part 5 Professional development

Digital scholarship refers to all forms of research, analysis, and publications that exclusively generate reusable digital artifacts or utilize digital tools to create, share, disseminate and advance scientific knowledge

What constitutes digital scholarship?

All the computer stuff, right?

Digital Education

Podcast, blog, virtual education website, YouTube channel

Digital Tools

Research application, research platform / library

Reusable Digital Artifacts

 Data sets, reusable code, EMR materials, Applications of Artificial Intelligence

Should this

C V Educator Portfolio?



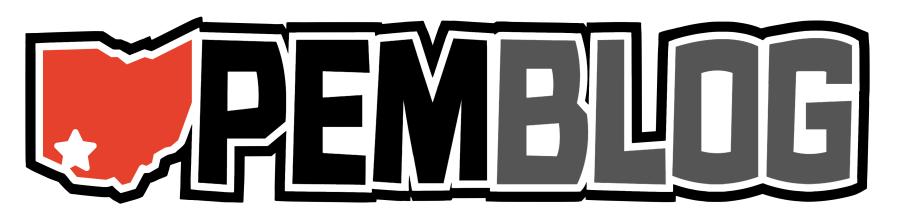
You should document and show where your effort is going

Develop a plan to measure and share the impact

Digital scholarship tracking tools

A sample of how to measure engagement...

- Blogs: page views, location and device data
- Podcasts: Episode listens/downloads, location and device data
- Social media: Impressions, retweets, likes, link clicks
- Publications: Altmetric, PlumX, Publons, Event Data, data from FOAM sources, Google Scholar, PubMed, h-index
- Digital artifacts: Downloads, usage metrics, clinical applications





It's not the heart? Red flags in children with syncope

It's not the heart. Or is it? When do children who have syncope need to see a Cardiologist? these questions and more will be answered in this post focused on red flags in children with syncope.

By Brad Sobolewski | February 11th, 2020 | Cardiology

Read More

Sobolewski, B. It's not the heart? Red flags in children with syncope. PEMBlog. http://pemcincinnati.com/blog/redflags-syncope/. Published February 11, 2020. Accessed January 12, 2021.



Sobolewski, B. Hemophilia. PEM Currents: The Pediatric Emergency Medicine Podcast. http://pemcincinnati.com/blog/podcast-hemophilia/. Published February 18, 2020. Accessed January 12, 2021.

FOAM and professional development

Seriously, will I get credit for this stuff?

- Husain et al, 2020 West J Emerg Med offered a framework for reappointment, promotion, and tenure committees via development of a blended expert consensus from the Council of Emergency Medicine Residency Directors
- RP&T committees can develop well-defined criteria to measure the quality and impact of digital scholarship
 - Demonstrate that your efforts show impact and reach the intended audience
 - Demonstration of your "brand" or role within digital scholarship and how it helps establish your area of expertise
 - Highlight novel quality assurance methods unique to digital scholarship

Impact & Reach

Role

Quality

Pageviews

Time Spent on Page

Likes

Impressions

Shares

Unique Users

Geographic Reach

Followers on Professional Social Media Accounts

Social Media Index

Digital Object Identifier (DOI)

Altmetric

Editor

Author

Curator

Reviewer

Invited Commentaries

Podcast Guest or Editor

rMETRIQ

ALIEM AIR Score

SAEM Online Academic Resources (SOAR)

Social Media Index (SMi)

The Quality Checklists for Health Professions Blogs and Podcasts

Impact & Reach

Thoma B, Chan T, Benitez J, Lin M. Educational Scholarship in the Digital Age: A Scoping Review and Analysis of Scholarly Products. *The Winnower*. 2014. doi:10.15200/winn.141827.77297

- Pageviews 4137
- Altmetric Score 61
- 202 tweets from 86 users, with an upper bound of 263,362 followers

Role

Invited Commentary

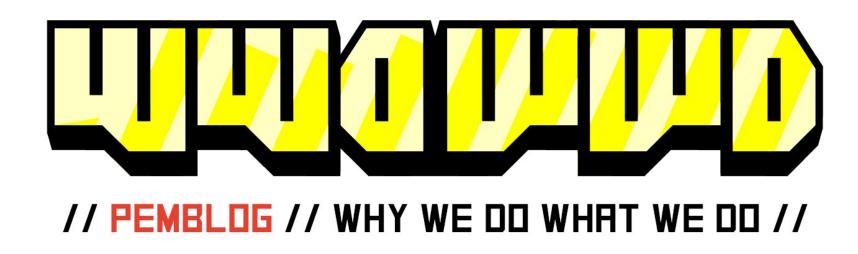
Berg A, Weston V, Gisondi MA. Journal Club: Coronary CT Angiography Versus Traditional Care. NUEM Blog. http://www.nuemblog.com/blog/cta-for-chest-pain/Published online 4/12/16.

Quality

Peer-reviewed blog Sobolewski, B. "Why We Do What We Do: Treatments for Severe Asthma" PEMBlog.com https:// pemcincinnati.com/blog/wwdwwd-severe-asthma/ published online 8/23/2022.

This post was deemed to have an acceptable score within the ALiEM AIR Scoring tool,

and was granted the designation "AIR Approved" by the adjudicating group of educators. There is a second tier below, known as "honorable mention" for posts of moderate quality that did not meet the threshold for inclusion.



Selected as ALIEM AIR Respiratory Module 2023



Respiratory

Part 6 The path forward

What's next for FOAM and digital scholarship? Once you're on board...

- Content creators need to focus on sustainability and decide if they want to stay independent
- Measure quality of content and platforms
- Utilize platforms to disseminate research systematically
- Advocate for academic credit (DOI, Altmetric, RPT criteria revisions)
- How will Al impact content development and dissemination?
- Could FOAM adopt a model similar to the Khan Academy?

Ask yourself the following...

...I'm almost done

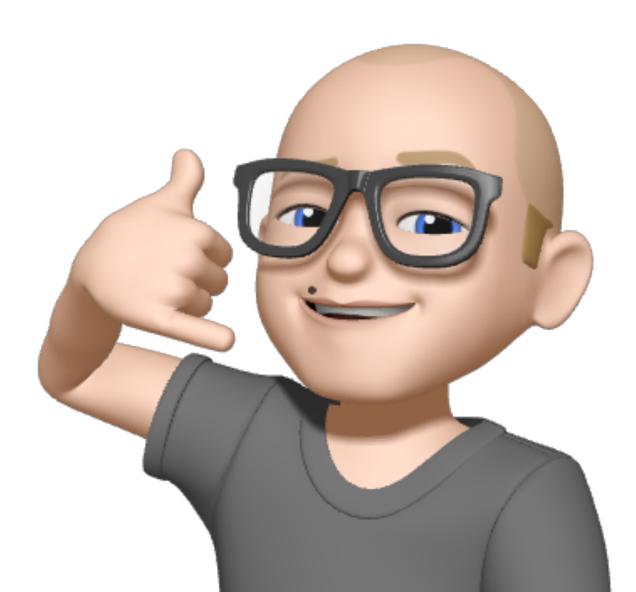
- Are you currently active in consuming and/or producing FOAM?
- Do you support the sites you frequent with feedback and/or other contributions?
- Do you have professional social media accounts? What is plan to use them now that some platforms are imploding?
- Is your specialty/division using FOAM and social media to spread knowledge or disseminate new research findings?

Stuff you can do

Homework?

- Familiarize yourself with the broad array of available FOAM resources in your specialty
- Learn about the work of the METRIQ collaborative and use it to critically appraise FOAM
- Include a FOAM resource in your next educational presentation
- Share feedback with a FOAM creator advance peer review
- Develop a plan to use FOAM and social media to disseminate new knowledge and research findings

If anybody (especially trainees) want to learn how to produce a podcast episode or author a blog post please let me know!



I'm listing just the ones you should read because you're busy



Chan et al, ATS Scholar, 2020

The best available summary of the development of and current state of the FOAM movement

Chan TM, Stehman C, Gottlieb M, Thoma B. A Short History of Free Open Access Medical Education. The Past, Present, and Future. ATS Sch. 2020 Jun 3;1(2):87-100. doi: 10.34197/ats-scholar.2020-0014PS. PMID: 33870273; PMCID: PMC8043296.

I'm listing just the ones you should read because you're busy



Lin et al, JMIR Med Educ, 2022

An exploration of the future of FOAM and a discussion of the disruptive innovation going forward

Lin M, Phipps M, Yilmaz Y, Nash C, Gisondi M, Chan T. A Fork in the Road for Emergency Medicine and Critical Care Blogs and Podcasts: Cross-sectional Study. JMIR Med Educ 2022;8(4):e39946. URL: https://mededu.jmir.org/2022/4/e39946. DOI:10.2196/39946

I'm listing just the ones you should read because you're busy



Colmers-Gray et al, AEM Educ Train, 2019

This paper details the development of the revised METRIQ score for quality assessment of blogs and podcasts.

Colmers-Gray IN, Krishnan K, Chan TM, Seth Trueger N, Paddock M, Grock A, Zaver F, Thoma B. The Revised METRIQ Score: A Quality Evaluation Tool for Online Educational Resources. AEM Educ Train. 2019 Jul 30;3(4):387-392. doi: 10.1002/aet2.10376. PMID: 31637356; PMCID: PMC6795360.

I'm listing just the ones you should read because you're busy



Trueger et al, Ann Emerg Med, 2015

A review of how the Altmetric score allows for assessment of impact and dissemination efforts.

Trueger NS, Thoma B, Hsu CH, Sullivan D, Peters L, Lin M. The Altmetric Score: A New Measure for Article-Level Dissemination and Impact. Ann Emerg Med. 2015 Nov;66(5):549-53. doi: 10.1016/j.annemergmed.2015.04.022. Epub 2015 May 23. PMID: 26004769.

I'm listing just the ones you should read because you're busy



Gray et al, AEM Educ Train, 2022

This scoping review defined the main themes that can form the structure of dissemination campaigns.

Gray JM, Schnadower D, Lafolette R, Shah AS, Sobolewski B. Going viral: a scoping review of the current state and impact of online research dissemination in emergency medicine. Academic Emergency Medicine Education and Training. January 24, 2022. https://doi.org/10.1002/aet2.10725

I'm listing just the ones you should read because you're busy



Husain et al, West J Emerg Med, 2020

The key paper offering guidance to RPT committees and clinicians on how to incorporate digital scholarship into career development processes.

Husain A, Repanshek Z, Singh M, et al. Consensus Guidelines for Digital Scholarship in Academic Promotion. West J Emerg Med. 2020;21(4):883-891. Published 2020 Jul 8. doi:10.5811/westjem.2020.4.46441

Point your smartphone camera at this QR code to visit a microsite with my slides and links to the key references







Sharing New knowledge requires New methods

Research dissemination & medical education in the digital world

Brad Sobolewski, MD, MEd

Professor Division of Emergency Medicine Cincinnati Children's