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ORIGINAL CONTRIBUTION

Current Workforce Characteristics and Burnout in Pediatric Emergency Medicine

Marc H. Gorelick, MD, MSCE, Robert Schremmer, MD, Holly Ruch-Ross, ScD, Carrie Radabaugh, MPP, and Steven Selbst, MD

Abstract

Objectives: Changes in health care delivery and graduate medical education have important consequences for the workforce in pediatric emergency medicine (PEM). This study compared career preparation and potential attrition of the PEM workforce with the prior assessment from 1998.

Methods: An e-mail survey was sent to members of the American Academy of Pediatrics (AAP) Section on EM and to non-AAP members board certified in PEM. Information on demographics, practice characteristics and professional activities, career preparation, future plans, and burnout (using two validated screening questions) was analyzed using standard descriptive statistics.

Results: Of 2,120 surveys mailed, 895 responses were received (40.8% response). Over half (53.7%) of respondents were female, compared with 44% in 1998. The majority (62.9%) practiced in the emergency department (ED) of a free-standing children's hospital. The distribution of professional activities was similar to that reported in 1998, with the majority of time (60%) spent in direct patient care. Half indicated involvement in research, and almost half had dedicated time for other activities, including emergency medical services (7.3%), disaster (6.9%), child abuse (5.0%), transport (3.6%), toxicology (2.3% of respondents), and other (13.6%); additionally, 21.3% had dedicated time for quality/safety. Respondents were highly satisfied (95.6%) with fellowship preparation for clinical care, but less satisfied with preparation for research (49.2%) and administration (38.7%). However, satisfaction with nonclinical training was higher for those within 10 years of medical school graduation. Forty-six percent plan to change clinical activity in the next 5 years, including reducing hours, changing shifts, or retiring. Overall, 11.9% of all respondents, including 20.1% of women and 2.6% of men ($p < 0.001$), report currently working part time. Large majorities endorsed feeling burned out at work (88.5%) or more callous toward people as a result of work (67.5%) at least monthly, with one in five reporting such feelings at least weekly.

Conclusions: While satisfaction with fellowship preparation for professional activities in PEM is improving, gaps remain in training in nonclinical skills. Symptoms of burnout are prevalent, and there is likely to be substantial attrition of PEM providers in the near future.

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In a constantly evolving world of medical care, there is a need to evaluate the state of the provider workforce on a regular basis. The last comprehensive assessment in pediatrics—the Future of Pediatric Education II (FOPE II)—occurred in 1998.¹ Seventeen subspecialties, including pediatric emergency medicine (PEM), were included in FOPE II. It provided a valuable description of practice and workload characteristics for

PEM and general emergency physicians (EPs), as well as estimates of attrition.² In the subsequent 16 years, continuing changes in the demographics of medical professionals,³ federal and private sector health reform,^{4,5} and duty hour changes from the Accreditation Council on Graduate Medical Education,⁶ all have had the potential for profound effects on the supply and demand of pediatric EPs.

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More recent work has revealed additional points of stress for the pediatric workforce. Surveys done by the American Board of Pediatrics (ABP) in 2012 showed potential concerns among trainees, recent graduates, and midcareer physicians about the suitability of their fellowship training as preparation for diverse career pathways.^{7,8} A growing literature on burnout and physician wellness has raised awareness of this issue and its impacts on quality of care for patients and quality of life for providers.⁹ However, the extent to which this applies to the specialty of PEM is unclear.

The American Academy of Pediatrics (AAP) Section on Emergency Medicine (SOEM) therefore participated in a membership survey in 2013, with the goal of obtaining an updated picture of the current demographics and practice characteristics of pediatric EPs. We were also interested in understanding factors that may affect the adequacy of the PEM workforce, including attitudes about preparation for professional roles, the prevalence of burnout, and future career plans.

METHODS

Study Design and Population

The survey was approved and deemed exempt by the institutional review board of the AAP; consent from all subjects was waived. In an effort to capture all PEM practitioners, an e-mail invitation from section leaders containing the survey link was sent to all members of SOEM and to individuals who were not section members but were board certified in PEM using a list provided by the Sub-Board of Pediatric Emergency Medicine (both ABP and American Board of EM diplomates). Respondents were told they would be entered into a gift card drawing.

Survey Content and Administration

The AAP Division of Workforce and Medical Education Policy has worked with subspecialty sections of the AAP to develop the Workforce Survey of Pediatric Medical Subspecialties and Surgical Specialties. The survey includes 44 standard items for all sections; most of these questions were drawn from a 1997–1998 AAP workforce survey. These common questions address issues of training, clinical practice, and demographic characteristics of respondents. Division staff and representatives of the AAP SOEM collaborated to develop an additional 28 questions for pediatric EPs, focused on the specific workload, roles, and demands of PEM (Data Supplement S1, available as supporting information in the online version of this paper). Some questions were selected to be the same as those in the FOPE II survey to allow for comparisons over time. Two screening questions related to burnout were also included.¹⁰ These items are subset of the 22-item Maslach Burnout Inventory, a validated tool considered the criterion standard for measuring burnout.¹¹ The two screening items have been demonstrated to have strong correlation and predictive value for the full scale score and have been used previously for large-scale population studies.

The confidential survey was conducted through SurveyMonkey (SurveyMonkey.com) and was fielded late summer through fall 2013. Five reminder e-mail

messages were sent to those who did not respond to the survey.

Data Analysis

Descriptive statistics, including frequency distributions and measures of central tendency, were used to summarize all survey responses. Chi-square was used to compare frequencies, and t-test was used for means (after confirming normal distribution). Correlation between ordinal variables was measured using the Spearman rho. Statistical significance was set at a level of $p < 0.05$ with no adjustment for multiple comparisons. Data analysis was performed using SPSS 18.0. Given the descriptive nature of the survey, no formal sample size calculation was undertaken.

RESULTS

The survey was sent to 2,120 potential respondents, including 1,096 members of the AAP SOEM, and 1,024 physicians who were not SOEM members but were board certified in PEM. A total of 895 responses were received (overall response rate 40.8%). Of these, 555 were from SOEM members (50.6% response rate), while 340 were from nonmembers (33.2% response rate). Table 1 shows demographic and practice characteristics of the respondents. Compared with the prior FOPE II survey, respondents were more likely to be female (53.7% in the current survey vs. 44.0% in FOPE II; $p < 0.001$). The sex distribution in the current survey is very similar to that for all PEM board certified physicians (52.9% female).¹²

Reported total hours and clinical hours worked were significantly lower in the current survey than in FOPE II (42.7 vs. 50.6 total and 26.7 vs. 35.3 clinical hours; both $p < 0.001$). In the current sample, 75% reported working full time; this was not reported in the 1998 FOPE II survey. Those working full-time reported a mean of 45.1 hours per week versus 27.9 hours for those working part time. Females were more likely to report working part time, with 20.1% of women working part time versus 2.6% of men ($p < 0.001$); mean time since medical school graduation was similar between those working part time (21.0 years, 95% confidence interval [CI] = 19.2

Table 1
Respondent Characteristics (N = 895)

Characteristic		95% CI
Female sex, %	53.7	50.4–57.0
Patients in your ED < 17 years of age, %	90.1	88.1–92.1
Patients in your ED < 10 years of age, %	59.3	56.1–62.5
Years since medical school graduation	19.6	19.0–20.2
ED census (n = 462)	62,319	59,451–65,187
Patient census < 18 years (n = 429), n	45,713	42,825–48601
ED mean shift (hours)	8.9	8.8–9.0
Number of shifts worked per month	10.6	10.3–10.9
Total clinical hours per week	26.7	25.8–27.6
Total hours worked per week	42.7	41.8–43.6

to 22.8 years) and full time (19.2 years, 95% CI = 18.5 to 19.9 years; $p = 0.07$).

The most common practice settings were an ED in a free-standing children's hospital (62.9%) or a dedicated pediatric unit within a general ED (26.7%). General ED, urgent care, or fast track each accounted for less than 2% of clinical settings. Two-thirds of respondents were employed by either a university/medical school (43.1%) or hospital (22.7%), while 15% were employed in either a multi- or single-specialty group practice. Compensation plans include variable components related to clinical productivity (49.6%), quality (24.2%), patient satisfaction (24.2%), and service (25.6%); note that more than one variable could be specified. Overall, 75% reported their hospital or practice requires some type of ongoing performance evaluation. Chart review (44.2%) and simulation (35.1%) were the most common methods; 13.5% use direct observation.

Professional Activity

The majority of time (59.6%) was reported to be spent in direct patient care activities, as shown in Figure 1. The distribution of effort among various professional activities is similar to that reported in FOPE II (65.1% direct patient care, 13.9% administration, 13% teaching).² The mean shift length was just under 9 hours, with a maximum reported 14 hours. In a typical month, respondents reported working a mean of 10.6 total shifts, which includes 3.2 weekend shifts, 2.4 overnights, and 5.0 evenings.

Respondents in the current survey indicated having time dedicated to activities including emergency medical services (7.3% of respondents), disaster medicine and preparedness (6.9%), child abuse (5.0%), transport (3.6%), toxicology (2.3%), and other (13.6%). Twenty-one percent had time dedicated to quality/safety. Formal leadership roles were held by 45.4%: medical director (19.1%), division chief (12.7%), fellowship director (12.0%), residency director (5.5%), and other (18.0%).

Just over half (50.4%) of respondents reported some involvement in research. Clinical research was the most common (44.4% of all respondents and 88% of those

involved in any research), followed by quality improvement (18.8%), health services (10.6%), and basic science (0.8%). Of those who reported any research activity, the percentage of effort devoted to research was lowest for those doing clinical (12.6% of effort) and highest for those in basic science research (29.2% of effort). Among the 451 respondents reporting research activity, 29.6% have current funding, and another 7.4% have had funding at some point in the past. Sources of current support for research activity were competitive internal funding (12.3%), noncompetitive internal funding (12.2%), external foundation funding (8.7%), and federal funding (9.3%).

Career Preparation

A series of questions asked how well respondents felt residency or fellowship had prepared them for various professional activities (Figure 2). Overall satisfaction with preparation for clinical work was high, but respondents were less satisfied with preparation for nonclinical activities. While there was no difference in satisfaction with training for clinical activities based on years since graduation, more recent graduates were significantly more satisfied with training in research, teaching, and business and administrative activities ($p < 0.01$). There was no difference in satisfaction with career preparation for various activities based on whether or not the respondent indicated current involvement in those activities except for research: 57.4% of those involved in research felt well or very well prepared, compared with 42.2% of those not involved in research ($p < 0.01$).

Burnout

There were two screening questions about burnout (Table 2). Large majorities of respondents endorsed feeling burned out at work (88.5%) or more callous toward people as a result of their job (67.5%) at least once a month. One in five reported feelings of burnout at least weekly. These sentiments were less common among those with more years of experience. There was a modest positive correlation between feeling more

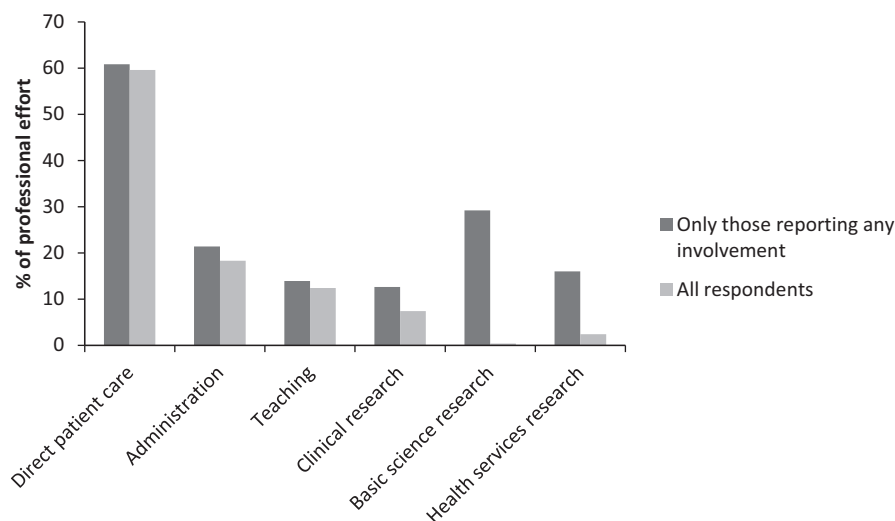


Figure 1. Distribution of professional effort.

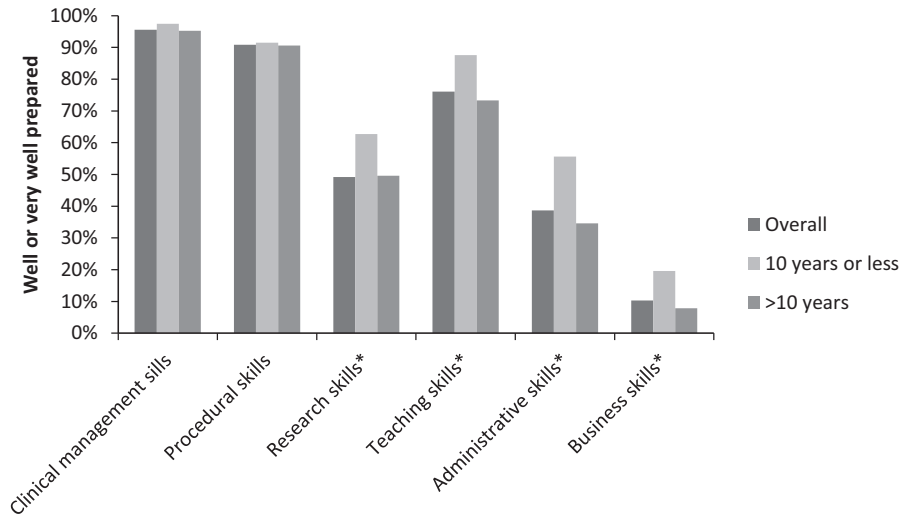


Figure 2. Residency/fellowship preparation for professional activities. *p < 0.01 for difference based on years since graduation.

Table 2
Screening Questions Related to Burnout

Years since medical school graduation	Never	Less Than Once a Month	A Few Times a Month	Once a Week	A Few Times a Week	Every day
<i>How often do you agree with the statement, "I feel burned out from my work"??*</i>						
Overall (n = 764)	88 (11.5)	267 (34.9)	256 (33.5)	54 (7.1)	66 (8.6)	33 (4.3)
<15 years (n = 308)	30 (9.7)	110 (35.7)	115 (37.3)	23 (7.5)	23 (7.5)	7 (2.3)
15-30 years (n = 366)	41 (11.2)	124 (33.9)	115 (31.4)	29 (7.9)	34 (9.3)	23 (6.3)
>30 years (n = 90)	17 (18.9)	33 (36.7)	26 (28.9)	2 (2.2)	9 (10.0)	3 (3.3)
<i>How often do you agree with the statement "I have become more callous toward people since I took this job"??†</i>						
Overall (n = 761)	247 (32.5)	230 (30.2)	172 (22.6)	44 (5.8)	42 (5.5)	26 (3.4)
<15 years (n = 306)	78 (25.5)	95 (31.0)	86 (28.1)	17 (5.6)	18 (5.9)	12 (3.9)
15-30 years (n = 361)	120 (32.9)	111 (30.4)	74 (20.3)	24 (6.6)	23 (6.3)	13 (3.6)
>30 years (n = 90)	49 (54.4)	24 (26.7)	12 (13.3)	3 (3.3)	1 (1.1)	1 (1.1)

Data are reported as n (%).
 *p < 0.05 for group difference by years since graduation by Spearman rho.
 †p < 0.001 for group difference by years since graduation.

callous toward people and both percent of clinical effort (Spearman $\rho = 0.223$, $p < 0.01$) and clinical hours worked ($\rho = 0.208$, $p < 0.01$); such a correlation was not seen between measures of clinical workload and self-reported feeling burned out at work.

Future Plans

Answers to the question about plans in the next 5 years are shown in Table 3. Overall, 46% indicated that they planned some type of change in professional activity in that time period. The likelihood of planning a change increased with time since medical school graduation. Thirteen percent plan to leave PEM entirely, including 7.8% of those within 15 years of graduation, 17.9% of those 15 to 30 years since graduation, and 29.3% of those more than 30 years since graduation.

DISCUSSION

There have been many consequential changes in the practice of medicine in the 14 years between FOPE II and the current survey. Some of the more important

shifts include significant curriculum and work hour modifications for trainees; an increasing reliance on technology, especially the electronic health record; continued increases in regulation with decreasing physician autonomy; and the advent of national health care reform. It is no surprise that the PEM workforce has changed along with the practice of medicine.

The profile of the "typical" pediatric EP has also changed in that time. According to FOPE II, 56% of PEM respondents were male,² compared to 46% in the current survey. This increase in percentage of female pediatric EPs mirrors the trend for an increasing proportion of women entering pediatrics¹³ and general EM.¹⁴ Sex influences may impact the PEM workforce in a number of ways, including an increased emphasis on lifestyle choices and structured hours.¹⁵ Similarly, both generation X (born 1964–1980) and the Millennial Generation (early 1980s–2000) highly value work–life balance.¹⁶ Very few members of Gen X would have been included in FOPE II, when the oldest members of that cohort would have been only 33 years old. Either generational or sex differences may account for the decrease in

Table 3
Career Plans in the Next Five Years

Plan	Years Since Medical School Graduation			
	Overall	<15 Years	15–30 Years	>30 Years
Decrease clinical workload*	286/750 38.1%	113/305 37.0%	129/361 35.7%	44/84 52.4%
Discontinue clinical work†	22/694 3.2%	1/287 0.3%	11/335 3.3%	10/72 13.9%
Decrease night or evening shifts†	235/718 32.7%	65/294 22.1%	141/354 39.8%	29/70 41.4%
Practice in an alternate setting†	65/698 9.3%	21/288 7.3%	37/340 10.9%	7/70 10.0%
Pursue another clinical specialty	15/686 2.2%	4/289 1.4%	10/329 3.0%	1/68 1.5%
Pursue another career outside medicine‡	34/691 4.9%	5/287 1.7%	23/335 6.9%	6/69 8.7%
Fully retire†	17/668 2.5%	0/279 0%	5/317 1.6%	12/72 16.7%

Data are reported *n/N* responding to the question, %.
 **p* < 0.05 by years since graduation.
 †*p* < 0.001 by years since graduation.
 ‡*p* < 0.01 by years since graduation.

average weekly number of hours worked by a PEM provider from 50.6 in 1998² to 42.7 in 2013. Decreasing work hours is also not unique to PEM. An increasing number of pediatricians are working part time, and the Association of American Medical Colleges has found that the majority of physicians would not voluntarily work longer hours for a higher salary. Most, in fact, would work shorter hours if financially feasible.¹³

Another focus of the current survey was opinion of preparation for individual professional activities. Most providers who completed the AAP questionnaire, regardless of years since medical school graduation, were satisfied with their fellowship preparation for clinical practice. This finding matches the 2012 ABP survey that found that 87% of subspecialists felt that the duration of their clinical training adequately prepared them for their first appointment following fellowship.⁷ Our current survey also revealed, however, that respondents who graduated medical school within the past 10 years are significantly more satisfied with their preparation for the nonclinical activities of research, teaching, administration, and business than those who graduated more than 10 years ago. Although we do not have data to explain this finding, we can speculate about a number of factors. Pediatric EM fellowship curriculum changes, especially the addition of an extra year of training beginning in 1995, may have had a positive impact on scholarly activities. On the other hand, those who graduated from medical school less than 10 years ago may not yet have had much experience with non-clinical activities, especially business and administration, and may not know what they do not know.

Anticipated attrition within 5 years is one characteristic that has not varied since FOPE II. In the current survey 13% of respondents plan to leave PEM, which matches 14% of those surveyed in 1998. A similar trend of a higher presumption of discontinuing PEM practice with increasing age was also seen in FOPE II. It is

unknown how many of those who believed there was a strong likelihood they would leave EM within 5 years of the previous survey indeed did leave. A 2004 longitudinal cohort study of physicians showed that intention to relinquish clinical practice is actually a poor predictor for leaving medicine.¹⁷ Rittenhouse et al.¹⁷ found that the probability a clinician who indicated intent to depart practice within 3 years had really done so was only 35%. Instead, career dissatisfaction was a strong predictor of intention to depart, but not actual departure.

Not all workforce attrition is due to complete departure from PEM practice, however. Over a third of current survey respondents indicated a plan to decrease clinical workload in the next 5 years, including those providers who graduated from medical school less than 15 years ago. A considerable number of respondents also specified that they would decrease their time spent working evening and night shifts. This finding is not surprising since 47% of providers noted they work in an institution that accommodates aging physicians through a change in distribution of shifts. A 2009 survey of general ED leaders revealed similar findings. In that study over 60% reported some accommodation for aging faculty, including reduced or eliminated night shifts, reduced clinical time, or an altered shift complement.¹⁸

The current survey included two validated screening questions regarding burnout. Burnout is a syndrome characterized by three domains: emotional exhaustion, depersonalization, and a decreased sense of accomplishment.¹¹ It is associated with persistent occupational stress and can lead to adverse personal as well as professional consequences. Work-home conflict, relationship problems, alcohol abuse, physical and mental health disorders, and suicidal ideation have all been associated with career burnout.^{19–21} Occupational ramifications can include reduction in productivity, deterioration in professionalism and patient/family rapport

building, increased risk for medical error, absenteeism, and early career exit. The high rate of burnout found in the current survey is even more striking than previous studies. A 2011 study comparing the rate of burnout in U.S. physicians to that of the general population found that almost half of physicians experienced at least one symptom, which was significantly higher than population controls (27.8%).²² It also compared rates of burnout among physician specialties and found that pediatrics subspecialties had one of the lowest rates (42%), but EM had the highest (67%). The prevalence of burnout for PEM has not been previously reported, but the findings in the current survey found a rate of burnout exceeding that found for general EM in the 2011 study.²²

The same 2011 data set revealed statistically significant differences in burnout during different career stages.²³ Middle career physicians (out of training for 11 to 20 years) were found to have the highest rates of emotional exhaustion and burnout, while early career physicians (10 years or fewer from end of training) reported the highest levels of depersonalization. It is difficult to compare those findings to the current survey because of dissimilar definitions of early, middle, and late career. However, the current survey did find a higher rate of self-perceived callousness toward patients, one component of depersonalization, in PEM providers who graduated from medical school within the past 15 years. In contrast, the most experienced respondents actually reported the least amount of burnout. Our findings suggest that clinical workload may be a factor in burnout. However, the correlation between workload and burnout was modest and was only observed for one of the two screening questions. A more in-depth study of burnout in pediatric EPs would be beneficial in informing strategies for mitigation.

LIMITATIONS

The 41% response rate, although not atypical, may subject the results to response bias. Although the rate of response for AAP SOEM members was higher than nonmembers, only 50% of members completed the survey. Several of the findings are consistent with previously published studies of physician workforce, however. In addition, the limited data we have on sex distribution suggests that the study sample is similar to the universe of pediatric EPs. Second, career factors queried in this survey were not comprehensive. A more complete survey would have been obtained through a longer survey instrument, which likely would have further impacted the response rate. Similarly, we chose to use a subset of two questions from the complete 22-item Maslach Burnout Inventory. Although these two items have been found to have excellent screening properties, they do not provide a complete and nuanced picture of the aspects of burnout.²⁴ Third, due to the cross-sectional nature of this survey, the associations implied by these findings may or may not be causally related. Many questions remain unanswered, especially in the areas of attrition and burnout. Future efforts to further elucidate issues related to burnout could include longitudinal surveys, using an expanded burnout instrument.

CONCLUSIONS

Pediatric emergency medicine currently maintains a robust yet vulnerable workforce. Members work fewer hours per week than those surveyed 14 years ago, but still serve a variety of capacities within their organizations, including research and leadership. Satisfaction with fellowship preparation is high, although shortfalls remain in training for nonclinical skills. On the negative side, symptoms of burnout are widespread in pediatric emergency medicine, and there may be substantial attrition in the workforce within the next 5 years. Current and future leaders in the specialty should pursue additional study to clarify causative factors, while proactively developing strategies to mitigate burnout and to address workforce needs.

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Supporting Information

The following supporting information is available in the online version of this paper:

Data S1. Pediatric Emergency Medicine Workforce Survey.

Academic Emergency Medicine is going green!

Effective January 2017, *Academic Emergency Medicine* will cease to print a paper journal, and will transition to online-only publication. All other aspects of the journal, including the manuscript submission, review, editing, and typesetting processes, will remain the same; the only change will be the elimination of the print journal. Robust online tools are already available for electronic viewing of the journal, through our app (available free at the Apple online store for iPad and iPhone; coming soon for Android) and our pdf and enhanced HTML versions (available on the Wiley Online Library, www.aemj.org). Content alerts, RSS feeds, Twitter, and other productivity tools are also already available for our readers.