Original Investigation

Teaching Principles of Patient-Centered Care During Radiology Residency

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Abbreviations and Acronyms

PGY
postgraduate year

ACGME
Accreditation Council for Graduate Medical Education

CI
confidence interval

Rationale and Objectives: Patient-centered healthcare delivery has become increasingly established as a cornerstone of quality medical care, but teaching these principles in a radiology residency setting is often difficult and ineffective in a traditional lecture format. We developed a novel educational session in which actual patient letters about a healthcare provider are used to facilitate a case-based discussion of key principles of patient-centered care.

Materials and Methods: A novel patient letter-facilitated, case-based session was conducted at two different university-based teaching institutions. Prior to the educational session, patient letters introducing the principles of patient-centered care were distributed to residents for review. During the session, radiology-specific cases were discussed in the context of the principles introduced by the letters. A post-session survey was administered to evaluate the efficacy and usefulness of the session.

Results: Forty-six of the 61 session attendees (75%) completed the post session survey. Most respondents (93%) preferred this case-based, interactive session to a typical didactic session. A majority of the residents indicated that both the patient letters (64%) and radiology specific cases (73%) helped them think differently about how they interact with patients. They indicated that the session enhanced their understanding of professionalism (3.7 out of 5.0 [95% CI 3.4–4.0]) and increased their motivation to become more patient-centered (3.0 out of 4.0 [95% CI 2.8–3.3]).

Conclusions: Our findings suggest that patient letter-facilitated, case-based sessions may influence resident attitudes regarding the principles of patient-centered care and may help to increase resident motivation to become more patient-centered in their own practice.

Key Words: Case-based learning; medical education; patient letters; patient-centered care; residency training.

INTRODUCTION

Patient-centered healthcare delivery has become increasingly accepted as a cornerstone of safe and high-quality medical care (1–3). The Institute of Medicine includes patient-centered care as one of its six principles of quality health care (4). Because of the increasing importance of patient-centered care in the practice of modern medicine, the Accreditation Council for Graduate Medical Education (ACGME) now includes its teaching as an essential component of resident training, under the purview of the core competency of professionalism (5).

The term "patient-centered care" was introduced into the medical lexicon in 1988 by the Picker/Commonwealth Program for Patient-Centered Care (6). A few years later, the Picker Institute elaborated on this concept, identifying several characteristics of health care that have come to be identified as core principles of patient-centered care. These core principles include (1) respect for patient values, preferences, and expressed needs; (2) coordinated and integrated care; (3) clear communication between patient and provider, including education for the patient and family; (4) physical comfort, including pain management; (5) emotional support and alleviation of fears and anxiety; (6) involvement of family members and friends, as appropriate; and (7) continuity of care, including during transitions between sites of care (6,7).

Since this first introduction of the concept of patient-centered care to the healthcare community, several studies have

Acad Radiol 2016; 23:802–809

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http://dx.doi.org/10.1016/j.acra.2016.01.021

demonstrated an association of patient-centered care with greater patient satisfaction and overall better patient outcomes (8–11). It is therefore important that the principles of patient-centered care are taught effectively to trainees so that they will be prepared to function within patient-centered teams throughout their careers. Even within radiology, a field with traditionally less direct patient interaction, there is a need for instruction on the principles of patient-centered care, particularly in this era of emphasis on adding value to healthcare services (12). The number of image-guided procedures is on the rise (13), as are patient expectations for direct communication with the interpreters of their imaging studies (14–16). As the number of these patient interactions increases, so will the need for radiologists who are familiar with principles of delivering patient-centered care. However, despite the increasing patient interaction experienced by many radiologists, the radiology literature shows a relative paucity of studies related to patient-centered care. This suggests that more could be done to focus the attention of the radiological community on the importance of the principles of patient-centered care.

One of the primary obstacles to increasing resident instruction concerning patient-centered care and other professionalism topics is the difficulty of teaching them in a traditional lecture format. Multiple studies have demonstrated that traditional lecture teaching is often ineffective (17,18), particularly in teaching concepts such as professionalism that involve complex human interactions (19). A variety of approaches have been used to teach and foster professionalism in medicine, including lecture series (with variable interactivity) (20–22), departmental mission statements and faculty evaluations (23), and web-based modules (24,25). Data regarding the efficacy of many of these approaches, however, are limited. Some success has been demonstrated in utilizing case-based educational sessions (26–29), although the cases used in such instruction may vary widely in how closely they simulate reality.

In this multi-institutional pilot study, we developed and explored a new format for teaching the principles of patient-centered care to augment the existing curriculum of radiology residency training programs. This new format used an innovative adaptation of case-based learning in which residents first reflected on actual patient letters that highlighted key aspects of patient-centered care and then applied these principles to radiology-specific real case scenarios from our own department. In this way, the letters and cases were used as a springboard for open group discussion and reflective-based learning, which have been shown to be effective means of teaching a variety of non-clinical topics related to professionalism and non-interpretative skills (29,30).

MATERIALS AND METHODS

This study was conducted at two different university-based teaching institutions, and was deemed exempt by the Institutional Review Boards at both institutions. At one of the sites, there were 9–10 radiology residents in each year of training for a total of 38 residents, and at the other site there were 7 radiology residents in each year of training for a total of 28 residents.

A reflective case-based session on patient-centered care was held as part of a broader series of six radiology-specific, reflective case-based sessions designed to foster professionalism, about which we have previously published (30). This broader series of professionalism sessions was held every other month between July 2011 and June 2012 and again between January 2015 and December 2015. These sessions were attended by postgraduate year-2 (PGY-2) through PGY-5 residents and were facilitated by the program directors of each program. The program directors involved in this study represented a variety of subspecialties within radiology, including Breast Imaging (2), Musculoskeletal Imaging (1), and Chest Imaging (1). Each of the program directors also had years of experience teaching topics related to professionalism, such as patient-centered care.

In this study, the patient-centered care session was run with three non-overlapping groups of radiology residents at two different institutions, with one session occurring in 2011 and the other two sessions occurring in 2015. On average, 20 residents were in attendance at each of the sessions. The patient-centered care sessions lasted 90 minutes and were held in lieu of the morning resident didactic conference in the departmental conference room. A roundtable format was used with the tables and chairs being arranged in one large circle to facilitate an atmosphere of openness and equality between all participants during the discussions.

Prior to the session, the residents were given several anonymized actual patient letters to review (Fig 1, Appendix). These letters, which were personally available to one of the researchers in this study, highlighted the experiences of several patients with a particular surgeon/general practitioner and also included patients' descriptions of their experiences interacting with the broader healthcare system. Based on the content of these patient letters, we focused our session on the following subset of the core principles of patient-centered care: respect for patient values and preferences, coordination of care, physical and emotional comfort, and continuity of care.

During the first half of the session, the residents were encouraged to discuss their views on the letters and to work together to identify the key elements of patient-centered care that were addressed in them. They were also encouraged to discuss whether any of the identified principles from the letters applied in radiology and to justify their positions. As needed, neutral facilitating questions were occasionally contributed by the program directors, but the vast majority of the time was spent in uninterrupted, open discussion by the residents. When used, typical facilitating questions included questions such as "What general thoughts did you have about the letters?" "What qualities did you like or dislike about the doctor-patient relationship described in the letters?" and "Are any of these qualities good or bad in radiology context?"

During the second half of the session, a radiology-specific case dealing with patient-centered care issues surrounding the

The goal of the session is to better understand what qualities patients value in physicians and to reflect on one's own values and beliefs as a means to becoming a patient-centered radiologist. By the end of the session, residents will learn which professional attributes will likely best serve them as physicians specializing in radiology.

Prior to the Session:
Read the three attached letters that were written by patients about their deceased physician to the surviving spouse. Spend time reflecting on what qualities patients value, whether these or other values are of importance to you, and how you might apply these values to the practice of radiology. Think about ways you might develop these skills during residency.

For the Session - Radiology-specific Case Scenario
Mrs. Smith undergoes an image-guided biopsy of her right breast. At the time of the biopsy, she expresses considerable anxiety that her primary care physician is on maternity leave and that she has never met the covering physician. She states that she feels very comfortable with you and asks you to call her with the results. Departmental policy states that results go to her primary physician. What should you do?

1. Take the stance that you cannot relay the results yourself. Justify your position. How do you explain this to her?

OR

2. Take the stance that you are able to communicate results directly to the patient. Justify your position. What process do you take to communicate the results with her? Does it depend on whether the results are positive or negative?

Figure 1. Patient-centered care pre-session handout.

reporting of breast biopsy results was introduced by the program directors (Fig 1). Residents were encouraged to discuss the case in the context of the patient-centered care principles introduced by the letters. When used, typical facilitating questions used in this portion of the session included questions such as: "What role do the principles of patient-centered care identified in the letters play in this situation?" "How would you handle this situation?" and "Has this type of situation ever happened to you?" After discussing the provided case, the conversation was then opened up to allow the residents to share any personal experiences related to patient-centered care that they had had during radiology residency. The session was then concluded with a brief synopsis of the themes that had emerged in the discussion by the program directors.

At the conclusion of the session, an anonymous post-session survey was conducted. Responses regarding the format, learning environment, efficacy, importance, and impact of this session were collected using the Survey Monkey online survey service (http://www.surveymonkey.com). The post-session survey consisted of statements with possible ratings using a 5-point Likert scale (1 = strongly disagree; 2 = disagree; 3 = neither agree nor disagree; 4 = agree; and 5 = strongly agree), statements with possible ratings using a 4-point Likert scale (1 = strongly disagree; 2 = disagree; 3 = agree; and 4 = strongly agree), multiple choice questions, and free response questions (Table 1).

The session was recorded using an audio recording application on a standard tablet computer and was subsequently anonymized. Recording was performed to better capture meaningful insights or themes that emerged during the discussion.

RESULTS

Of the 104 residents in our training programs at the times that the sessions were held, 61 were able to attend the session (59%). The 43 residents who were not in attendance at this mandatory session were excused due to call, vacation, or away rotations. After the session, 75% (46 of 61) of residents responded to our survey (Table 1). Most of the non-responding residents were attendees of the very first session that was held, likely because these attendees were asked to complete the post-session survey on their own time over the few days following the session. After this first session, however, we began allocating the last 15 minutes of the session as time for answering the survey, and our response rate dramatically improved to 90% (36 of 40) of session attendees. The responding residents represented all years of training (Table 2).

Residents were generally satisfied with the format of this session and felt it was helpful to have the cases and patient letters distributed prior to the session. Ninety-three percent (43 of 46) of the respondents preferred this case-based, interactive session over a typical didactic session. Almost all of the residents felt comfortable discussing their opinions with the program directors present (61% felt completely comfortable, 37% felt to some extent comfortable), and most (82%) indicated that the audio recording of the session did not inhibit their participation in the group discussions.

Residents were satisfied with the content of the session, with a majority indicating both the patient letters (63%), and the radiology-specific cases (73%) helped them think differently about how they might want to interact with patients during residency and in their career. Residents also felt that the topic of patient-centered care was important to their future careers (average 5-point Likert scale score of 4.18 [95% CI 4.01–4.35]) and that the session was worth their time (4.18 [95% CI 3.92–4.44]). They indicated that the session caused them to reflect on their personal values related to patient-centered care (4.27 [95% CI 4.05–4.49]) and that it added to their understanding of professionalism (3.69 [95% CI 3.40–3.97]).

TABLE 1. Post-Assessment Patient-Centered Care Survey

Format of the Session	Number/Respondents (%)
How helpful was it to preview the letters by e-mail prior to the session?	
A. Not at all helpful	3/45 (3.0)
B. Somewhat helpful	25/45 (55.6)
C. Very helpful	17/45 (37.8)
Was it helpful to preview the radiology-specific case scenario prior to the session?	
A. Not at all helpful	2/45 (4.4)
B. Somewhat helpful	26/45 (57.8)
C. Very helpful	17/45 (37.8)
How helpful was the open discussion format useful for this topic?	
A. Not at all helpful	1/45 (2.2)
B. Somewhat helpful	19/45 (42.2)
C. Very helpful	25/45 (55.6)
Would you have preferred a didactic format?	
A. Yes	3/46 (6.5)
B. No	43/46 (93.5)
Listening to others speak about their experiences was useful.	
A. Definitely yes	20/46 (43.5)
B. Somewhat yes	24/46 (52.2)
C. Neutral	2/46 (4.3)
D. Not really comfortable	0/46 (0.0)
E. Definitely no	0/46 (0.0)
Was there sufficient time to review the letters and case-specific scenario prior to the session?	
A. Yes	43/46 (93.5)
B. No	3/46 (6.5)
Was the time appropriate for the session?	
A. Too much	3/46 (6.5)
B. Just right	43/46 (93.5)
C. Too little	0/46 (0.0)
Learning Environment	**Number/Respondents (%)**
I felt comfortable speaking about my own experiences related to this topic.	
A. Definitely yes	22/44 (50.0)
B. Somewhat yes	16/44 (36.4)
C. Neutral	5/44 (11.4)
D. Not really comfortable	1/44 (2.3)
E. Definitely no	0/44 (0.0)
Did the microphone (or the knowledge that you would be recorded) inhibit your participation in any way?	
A. Yes a lot	1/45 (2.2)
B. Yes somewhat	7/45 (15.6)
C. Not really	25/45 (55.6)
D. Not at all	12/45 (26.7)
Did you feel safe discussing your opinion openly with the program directors present?	
A. Yes completely	28/46 (60.9)
B. Yes to some extent	17/46 (37.0)
C. Not really	1/46 (2.2)
D. Not at all	0/46 (0.0)
Would you prefer to have the session facilitated by a peer or non-involved professional?	
A. Yes	10/45 (22.2)
B. No	35/45 (77.8)

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TABLE 1. ***(continued)*** **Post-Assessment Patient-Centered Care Survey**

Efficacy of the Session	Number/Respondents (%)
Did the letters help you to think differently about how you might want to interact with patients?	
A. Yes to a great extent	5/44 (11.4)
B. Yes somewhat	23/44 (52.3)
C. Not really	16/44 (36.4)
D. Not at all	0/44 (0.0)
Did the radiology-specific case scenario help you think differently about how you might interact with patients?	
A. Yes to a great extent	6/45 (13.3)
B. Yes somewhat	27/45 (60.0)
C. Not really	12/45 (26.7)
D. Not at all	0/45 (0.0)
	Mean (95% CI)
Rate 1–5 scale (1 Not at all, 2 Not really, 3 Neutral, 4 Somewhat, 5 Definitely)	
This session focused on the importance of patient-centered radiology.	4.36 (4.15–4.56)
This session made me reflect on my own values.	4.27 (4.05–4.49)
This session made me think about radiology in a way I have not done.	3.18 (2.83–3.53)
This session added to my understanding of professionalism.	3.69 (3.40–3.97)
I will apply what I learned in this session to my residency training.	4.11 (3.87–4.35)
This session was worth my time.	4.18 (3.92–4.44)
Professionalism Topics	
Attitudes Regarding Importance of the Topic	
	Mean (95% CI)
Rate 1–5 scale (1 Not at all important, 2 Unimportant, 3 Neutral, 4 Important, 5 Extremely important)	
How important is this session topic to radiology in general?	4.07 (3.90–4.24)
How important is this session topic to radiology residency?	4.05 (3.87–4.23)
How important is this session topic to your future career?	4.18 (4.01–4.35)
Motivational Impact of This Session	
	Mean (95% CI)
Rate 1–4 scale (1 Not at all, 2 Not really, 3 Somewhat, 4 Definitely)	
As a result of participating in this session, I will change how I interact with patients.	2.78 (2.56–2.99)
As a result of participating in this session, I will actively find ways to become more patient centered.	3.05 (2.83–3.26)
As a result of participating in this session, I will be more available to my patients in order to convey test results or explain imaging findings.	3.27 (3.08–3.46)
As a result of participating in this session, I will take a more active role in patient care.	3.33 (3.14–3.53)
Attitudes Regarding Physician Characteristics	
	Mean (95% CI)
Rate 1–5 scale (1 Strongly disagree, 2 Disagree, 3 Neutral, 4 Agree, 5 Strongly agree)	
Honesty is an important trait in physicians.	4.78 (4.57–4.98)
Being available to patients is important.	4.64 (4.49–4.80)
Being available to referring physicians for consults is important.	4.71 (4.54–4.88)
Cultural differences play an important role when conveying test results.	4.59 (4.40–4.79)
Free Response/Suggestions	
Name at least two strengths of this session.	
Name at least two weaknesses of this session.	
This session could be improved by:	
Any other thoughts or suggestions:	

TABLE 2. Demographics of the Respondents

Respondent Demographics	
Postgraduate Year of Training	Number/Respondents (%)
PGY-2	15/46 (32.6)
PGY-3	11/46 (23.9)
PGY-4	10/46 (21.7)
PGY-5	10/46 (21.7)

Residents reported that as a result of participating in this session, they felt increased motivation to become more patient-centered (average 4-point Likert scale score of 3.05 [95% CI 2.83–3.26]), to be more available to their patients to convey imaging findings (3.27 [95% CI 3.08–3.46]), and to take a more active role in patient care (3.33 [95% CI 3.14–3.53]).

DISCUSSION

The principles of patient-centered care are widely accepted as being important to the practice of medicine and the instruction of medical trainees, but the difficulty of teaching these principles in a traditional lecture format is also widely recognized. Our multi-institutional pilot study sought to address this difficulty by creating a small-group, case-based reflective practice session to teach the principles of patient-centered care. While previous studies have demonstrated the use of case-based instruction in teaching other concepts of professionalism (31), our format was innovative in using actual patient letters along with real radiology-specific case scenarios from our own department to highlight key aspects of patient-centered care.

Using these patient letters and cases as a starting point for open group discussion and reflective practice-based learning, residents freely shared their experiences related to patient-centered care. During the discussion, several themes emerged. Commenting on what the physician referenced in the letters had done to provide patient-centered care, one resident said, "I felt like there was a consistent tone through [the letters] that it was the things that he did separate from actually medically treating them or surgically treating them. He was always there to talk to them. He kept this relationship going." During a discussion of how to apply principles of patient-centered care to radiology, one resident shared, "When we're interacting with patients, often it's at a critical time. It's not just a regular checkup, it's something they're stressed about. There are little things [like helping with follow-up appointments] we can do that can make a huge difference." Another resident offered a suggestion of using downtime during minimally labor intensive procedures, such as paracentesis, to engage with patients: "It's kind of therapeutic for them to really be able to just talk to a physician for 30 minutes to an hour about whatever they've been through and to know that somebody's listening. I think we have opportunities like that in radiology, I think we should just utilize them."

On the post-session survey, the residents indicated that they felt that the format and content of the session allowed for open communication and caused them to think differently about their own personal interactions with patients. They also indicated a strong preference for this interactive session over a didactic lecture format. Most importantly, the residents indicated that the topic of patient-centered care was important to their future careers and that they felt an increased motivation to become more patient-centered, to be more available to their patients to convey imaging findings, and to be more active in providing patient care in the future as a direct result of this session.

Our findings agree with results from the literature and our own prior studies demonstrating the efficacy of using case-based scenarios and reflective practice to teach principles of professionalism (29–32). In addition, the current study demonstrates that our novel use of actual patient letters with real case scenarios enhances the perceived learning value of the session by the residents, who indicated that the letters and cases helped them to think differently about their own interactions with patients.

Our study has a few limitations. The sample size in this pilot study was relatively small, with only 61 residents participating in the session and only 46 responding to the post-session questionnaire. In addition, our case scenarios were radiology-specific, so these findings may not be generalizable to other specialties. However, given that the concept of using real case scenarios and patient letters is not specific to the field of radiology, it is hoped that future studies will be able to demonstrate a broader utility of this teaching format in teaching the principles of patient-centered care across disciplines in medicine.

In conclusion, this multi-institutional pilot study suggests that patient letter-facilitated, case-based sessions may influence resident attitudes regarding the core principles of patient-centered care in radiology and may help to increase resident motivation to become more patient-centered in their own practice. Given that residents indicated that they value this topic and identify it as important to their future career, residency programs could consider incorporating this type of patient-centered care session into the formal curriculum.

REFERENCES

1. McMillan SS, Kendall E, Sav A, et al. Patient-centered approaches to health care: a systematic review of randomized controlled trials. Med Care Res Rev 2013; 70:567–596.
2. Richards T, Coulter A, Wicks P. Time to deliver patient centred care. BMJ 2015; 350:h530.
3. Parish E. BMJ roundtable debate: how can we get better at providing patient centred care? BMJ 2015; 350:h412.
4. Committee on Quality of Health Care in America, Institute of Medicine. Crossing the quality chasm: a new health system for the 21st century. Washington, DC: National Academy Press, 2001.
5. Ludwig S, Day S. New standards for resident professionalism: discussion and justification. In: Philibert I, Amis S, eds. The ACGME 2011 duty hour standard. Chicago, IL: Accreditation Council for Graduate Medical Education, 2011; 47–51.
6. Barry MJ, Edgman-Levitan S. Shared decision making—pinnacle of patient-centered care. N Engl J Med 2012; 366:780–781.

7. Gerteis M, Edgman-Levitan S, Daley J, et al., eds. Through the patient's eyes: understanding and promoting patient-centered care. San Francisco, CA: Jossey-Bass, 1993.
8. Rathert C, Wyrwich MD, Boren SA. Patient-centered care and outcomes: a systematic review of the literature. Med Care Res Rev 2013; 70:351–379.
9. Record JD, Rand C, Christmas C, et al. Reducing heart failure readmissions by teaching patient-centered care to internal medicine residents. Arch Intern Med 2011; 171:858–859.
10. Ratanawongsa N, Federowicz MA, Christmas C, et al. Effects of a focused patient-centered care curriculum on the experiences of internal medicine residents and their patients. J Gen Intern Med 2012; 27:473–477.
11. Moncayo VM, Applegate KE, Duszak R, Jr, et al. The nuclear medicine therapy care coordination service: a model for radiologist-driven patient-centered care. Acad Radiol 2015; 22:771–778.
12. American College of Radiology. Imaging 3.0. Available at: http://www.acr.org/Advocacy/Economics-Health-Policy/Imaging-3. Cited January 20, 2016.
13. Smith-Bindman R, Miglioretti DL, Johnson E, et al. Use of diagnostic imaging studies and associated radiation exposure for patients enrolled in large integrated health care systems, 1996–2010. JAMA 2012; 307:2400–2409.
14. Pahade J, Couto C, Davis RB, et al. Reviewing imaging examination results with a radiologist immediately after study completion: patient preferences and assessment of feasibility in an academic department. AJR Am J Roentgenol 2012; 199:844–851.
15. Brown SD, Lehman CD, Truog RD, et al. Stepping out further from the shadows: disclosure of harmful radiologic errors to patients. Radiology 2012; 262:381–386.
16. Berlin L. Communicating results of all radiologic examinations directly to patients: has the time come? AJR Am J Roentgenol 2007; 189:1275–1282.
17. Knight JK, Wood WB. Teaching more by lecturing less. Cell Biol Educ 2005; 4:298–310.
18. Freeman S, Eddy SL, McDonough M, et al. Active learning increases student performance in science, engineering, and mathematics. Proc Natl Acad Sci U S A 2014; 111:8410–8415.
19. Huddle TS, Accreditation Council for Graduate Medical Education (ACGME). Viewpoint: teaching professionalism: is medical morality a competency? Acad Med 2005; 80:885–891.
20. McGinty KL, Larson JJ, Hodas G, et al. Teaching patient-centered care and systems-based practice in child and adolescent psychiatry. Acad Psychiatry 2012; 36:468–472.
21. Chapman T, Chew FS. Introductory lecture series for first-year radiology residents: implementation, investment and assessment. Acad Radiol 2013; 20:332–337.
22. Hochberg MS, Kalet A, Zabar S, et al. Can professionalism be taught? Encouraging evidence. Am J Surg 2010; 199:86–93.
23. Donnelly LF, Strife JL. Establishing a program to promote professionalism and effective communication in radiology. Radiology 2006; 238:773–779.
24. Hendee W, Bosma JL, Bresolin LB, et al. Web modules on professionalism and ethics. J Am Coll Radiol 2012; 9:170–173.
25. Radiological Society of North America. Professionalism modules. Available at: http://www.rsna.org/Professionalism/. Cited January 8, 2016.
26. Christianson CE, McBride RB, Vari RC, et al. From traditional to patient-centered learning: curriculum change as an intervention for changing institutional culture and promoting professionalism in undergraduate medical education. Acad Med 2007; 82:1079–1088.
27. Meo SA. Evaluating learning among undergraduate medical students in schools with traditional and problem-based curricula. Adv Physiol Educ 2013; 37:249–253.
28. Reed S, Shell R, Kassis K, et al. Applying adult learning practices in medical education. Curr Probl Pediatr Adolesc Health Care 2014; 44:170–181.
29. Bethune C, Brown JB. Residents' use of case-based reflection exercises. Can Fam Physician 2007; 53:471–476, 470.
30. Kung JW, Slanetz PJ, Huang GC, et al. Reflective practice: assessing its effectiveness to teach professionalism in a radiology residency. Acad Radiol 2015; 22:1280–1286.
31. Metter D, Harolds J, Rumack CM, et al. The disruptive professional case scenarios. Acad Radiol 2008; 15:494–500.
32. Kung JW, Eisenberg RL, Slanetz PJ. Reflective practice as a tool to teach digital professionalism. Acad Radiol 2012; 19:1408–1414.

APPENDIX. EXCERPTS FROM THREE PATIENT LETTERS

(Full text of letters available at: www.aur.org/WorkArea/DownloadAsset.aspx?id=1249).

Letter #1:

When my Mom was diagnosed with cancer in 1997, it was Dr. S. with his superior intellect, kindness, and honesty who helped us to cope as a family until she passed in 1999 just 3 months after Dad died. I will never forget how Dr. S. encouraged her to continue working and living each day to the fullest. In the last month of her life he was like a Dad to me. His care did not stop when she died. He made himself available to me to talk and cope with my loss.

Letter #2:

Sixteen years ago when my mother needed breast surgery, it was only natural that we chose your husband to perform the operation. In time it proved to be a success because the cancer never returned. As the years passed, my mother came to trust her doctor's decisions regarding her health. She looked forward to her visits to the doctor's office more and more in recent years. She especially found comfort and reassurance when she unburdened her anxieties to Dr. S. He had a wonderful way of making her feel much better as he chuckled when he empathized with her. My mother is now ninety-two years old. I do believe that the medical care she received from Dr. S. has contributed to her long life.

Letter #3:

I have so many other stories, but the last one is the most recent. On June 3, 2006, my father, a patient of Dr. S., was celebrating his 100th birthday and my youngest son was graduating from high school. On June 2nd my son developed a rash on his body. Four years ago, he had the same kind of rash and was diagnosed with Steven Johnson disease. Doctors at the hospital concluded that he was allergic to Zythromax. This time the doctor had given him Amoxicillin. Upon calling his doctor, I was informed that he could not help as he was going to a party and to take my son to the emergency room at a hospital. It was 10:30 pm when we were on our way to the hospital. My first instinct was to call Dr. S. My oldest son said to me, "Let's be reasonable, it's 10:30 pm no doctor is going to call you back at this time." I told my son, "you don't know Dr. S., he will call me back within 15 minutes." Both my sons were shocked when Dr. S. called me on my cell and told me exactly what to expect in the emergency room, and if I was not satisfied, to call him back and he would be at the hospital within minutes. I felt reassured by his kind words and guidance, as my son's life was in danger. All went well. My son attended his graduation and was at my Dad's 100th celebration. On Monday June 5th Dr. S. called me to find out how my son was doing. My son's doctor never even called. Dr. S. was a great man.