

CAN VISUAL ARTS TRAINING IMPROVE PHYSICIAN PERFORMANCE?

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ABSTRACT

Clinical educators use medical humanities as a means to improve patient care by training more self-aware, thoughtful, and collaborative physicians. We present three examples of integrating fine arts — a subset of medical humanities — into the preclinical and clinical training as models that can be adapted to other medical environments to address a wide variety of perceived deficiencies. This novel teaching method has promise to improve physician skills, but requires further validation.

INTRODUCTION

Medical curricula change in response to new disease paradigms and rapidly evolving socioeconomic forces affecting medicine; medical educators often find themselves — simultaneously — on the vanguard of culture change and behind the times. In critiquing 19th century US medical training, Abraham Flexner recognized the value of balancing humanities with the emerging scientific foundation (1); the balance since Flexner has tilted heavily in favor of science. More than half a century later, Robert Coles drew a direct connection between the ethical lapses common among physicians he encountered and their stark disconnection with the humanities (2).

Unintended consequences of the technical and scientific revolution include over reliance on exotic tests and therapies, professional burnout, and a public that recognizes the value of the scientific advances while simultaneously distrusting that the profession has patients' best interests at heart. Darrell G. Kirch, President of the American Association of Medical Colleges, stated, "In surveys, the public had great confidence in doctors' knowledge but much less in their bedside manner" (3).

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The application of literature, narrative, poetry, theater, and visual arts to medical training and care is broadly referred to as the “medical humanities” (4). Compared to traditional didactics and clinical immersion, medical humanities have the potential for trainees at all levels to step outside their comfort zone, become open to new methods of learning, and access competencies in tangential ways that are not possible through the traditional medical school curricula. This paper will review three examples of visual arts training at Harvard Medical School (HMS) that are used to improve skills at a variety of clinician levels. The work described here represents a decade of curriculum design conceived and performed by a fully multidisciplinary team of educators, including professional museum educators, students of all flavors, nurses, and physicians. Any progress reported here was possible only through the creativity and valuable feedback provided by students and collaborators, including, but not limited to, those acknowledged below.

MATERIALS AND METHODS

HMS has joined a chorus of national programs that use visual arts training to further medical education objectives. We describe three HMS and/or Brigham and Women’s Hospital (BWH) courses that address specific health care provider competencies. Each of these programs draws on Visual Thinking Strategies (VTS), which is an evidence-based, widely used method of museum art education that lends itself well to cross-disciplinary, immersive, and sustained learning (5).

VTS was developed to facilitate teacher-initiated discussions of art images to promote broader thinking skills that become habitual and transfer from lesson to lesson, oral and written language literacy, visual literacy, and collaborative interactions among peers. In its simplest construction, this method relies on trained arts facilitators initiating discussions about art (and life) with three sequential cuing questions: What is going on in this image? What do you see that makes you say that? What else can you find?

VTS provides a way to jumpstart a process of learning to think deeply applicable to subjects ranging from poetry to math, social studies to science. Discussion of art enables students to use visual cues and cognitive skills to build confidence and experience, learning to recognize what they know and do not know; students are thereby better prepared to explore other complex subject matter alone and with peers (6). We present three courses developed as collaborations between our

academic medical center and local art museums to address specific medical competencies, as outlined below.

RESULTS

Training the Eye: Improving the Art of Physical Diagnosis

Confidence in and reliance on core physical examination has diminished, and the result is reliance on unnecessary and expensive tests, and a consequent distancing between the patient and the provider. Since 2003, HMS has offered a 9-week elective course to first-year medical students, "Training the Eye: Improving the Art of Physical Diagnosis" (TTE), developed in collaboration with the physical examination faculty and museum educators Alexa Miller, MA, and Judy Murray, MA. (7). TTE addresses competencies in physical examination, communication, and clinical reasoning, which we have shown can be achieved (8). The goals of this course are to provide opportunities for students to understand and practice the physical examination; to expand students' abilities in observation (the central feature of physical examination), description, and analysis; to increase students' confidence in visual and communication abilities used in examining patients; and to provide opportunities for students to work as teams, similar to the medical teams on the wards: listening, analyzing and further developing each other's observations and hypotheses.

TTE is comprised of nine paired museum exercises (1.5 hours) and clinical lectures (1 hour), in which students learn about artistic concepts (eg, line and symmetry, form, and texture) and practice linking them to related physical examination topics (eg, neurological, respiratory, and skin examination, respectively). In some cases, patients with the specific maladies attend the clinical lectures to allow the students to directly apply VTS methods to diagnosis. All students participate in two bedside physical examination rounds with the course directors, applying and practicing skills learned at the museum (9). Other course activities include reading assignments, course sketchbooks, and a weekend life drawing workshop led by professional artist, Johanna Nash.

In the museum, students work directly with original works of art in a variety of media to practice observation, description, and collaborative meaning-making. These interactive sessions present a time for students to gain confidence in skills critical to the physical examination and the process of formulating a diagnosis: observing, interpreting, analyzing, collaborating, speculative thinking, and the ability to

slow down and notice details. Clinical lectures led by physician-educators focus on visual diagnosis and the physical examination linked to the artistic concept (Table 1). In the final session, a patient with a complex medical condition (eg, myasthenia gravis) is interviewed and examined by the course directors, with active participation by the students, as a method to summarize the methods and bring clarity to their practical application.

The BWH Internal Medicine Humanistic Curriculum

The rigors of a demanding internship can unwittingly dehumanize otherwise caring physicians (10). The BWH Internal Medicine Residency Humanistic Curriculum began in 1992 for interns (ie, post graduate year 1 [PGY-1] trainees) in primary care. The curriculum is now a mandatory part of the training of all internal medicine and preliminary medicine interns, and addresses competencies in humanism, empathy, and career sustenance. The overall goals of the curriculum are to foster resident well-being and humanistic qualities while preventing trainee burnout that can compromise personal and professional satisfaction. Trainees participate in 4-hour opening (“Becoming a Physician”) and closing (“Becoming a Team Leader”) retreats, five monthly 2-hour discussions sessions, and a “Night at the Museum of Fine Arts” that was designed by arts educators Ray Williams, MFA, and Barbara Martin, MA, and physician-educators Mariah Quinn, MD, and Holly Gooding, MD.

The Night at the Museum of Fine Arts session aims to explore how artistic works allow physicians-in-training to connect to humanistic values. The session is co-facilitated by a museum educator and a clinician educator who lead the 7 to 10 interns per group in five exercises. In its current iteration, the first exercise is the “Interpretive Challenge,” in which interns are introduced to VTS questions to uncover multiple interpretations of an object. The second exercise is on “Meanings and Metaphors” (Figure 1). Divided groups are assigned a

TABLE 1
TTE Didactic (Physical Examination) and Museum (Artistic) Theme Pairings

Examination Element	Artistic Theme
Vision	Color
Gait	Line
Cranial nerves	Symmetry
Dermatology	Texture, pattern
Respiratory	Form
Diagnosis	Visual literacy



FIG. 1. An example of a painting used as a catalyst for discussion in *Meanings and Metaphors*. One can easily imagine that, depending on their experience and natures, interns may identify with any of the characters depicted: from those reaching out to save the victim, to those cowering in helpless fear at a distance, to the victim about to be dismembered, to the trolling shark itself. Abstract art works are equally effective, when chosen carefully. (“Watson and the Shark,” by John Singleton Copley, 1778. Reproduced with permission of the Museum of Fine Arts, Boston.)

carefully chosen contemporary or representational work of art, and are asked to discuss how that work relates to an aspect of their current professional life. (A similar exercise can be done with pairs of students, asking each to choose an artwork to share, in response to an invitation such as “Find a work of art that has something to say about a joy or a struggle in your work.”) Thinking metaphorically opens the door to discussion of the challenges and rewards of their new professional roles.

The third exercise is on “Connections.” Interns are instructed to choose a work of art from the Impressionist Gallery that they are drawn to and to pair with a colleague whom they do not know well to share why they chose that particular piece. The fourth exercise is “Difficult Conversations: Death and Dying.” As a large group the interns view a sarcophagus and are instructed to reflect on their experiences caring for dying patients. The fifth exercise is “Meditation

and Self-Care,” in which interns are led through a relaxation meditation exercise in the museum’s replica Buddhist temple.

Multidisciplinary Teambuilding Curriculum

Resident duty-hour reform and other changes have led to an increasing recognition that health care should be provided in teams; exposing physicians’ poorly developed collaborative abilities. Prioritizing a physicians’ own point of view over that of other team members jeopardizes quality and value gains possible through “accountable care.”

In response to the evolving demands for effective ways to teach collaborative care, BWH developed a curriculum to improve teamwork and communication. In 2009, Multidisciplinary Teambuilding Museum Workshops for the Brigham’s Integrated Teaching Unit (ITU) (11 inpatient general medicine rotation) were established to address improving awareness of team dynamics, collaboration, communication styles, and respect, initially designed by Ray Williams, MFA, Ellen Clemence, MS, RN, and Mary Thorndike, MD, and is now being carried forward in collaboration with Akiko Yamagata, MA, and Corinne Zimmermann, MA. The 90-minute sessions are explicitly designed to break down hierarchical relationships, to encourage respectful discussion and multiple perspectives, to stimulate awareness of how the group works together as a team, and to be fun. Throughout, participants are asked to notice their patterns of communication and interaction (ie, metacognition). ITU teams include attending physicians, nurses, residents, interns, medical students, pharmacy students, physical therapists, and care coordinators; the program has served more than 70 teams since its inception. Before each session, the museum educator(s) join the clinical team rounds to get a baseline sense of how each team operates. At the museum, teams are asked to participate in specially designed activities revolving around works of art, some examples of which are listed below.

Sessions begin with the introductory exercise “Interpretive Challenge,” described above. In “Improv Theater,” an abstract sculpture is explored in silence. Taking turns, each person makes a gesture that reflects some aspect of the object and shares it with the rest of the group, who then interpret what they see in the motion. The team then links their gestures to create a fluid movement piece that embodies their collective response to the artwork. The activity requires participants to be present to one another, highlights how a range of perspectives can deepen understanding, and provides an opportunity to discuss the role of nonverbal communication in the hospital.

In “Creative Response,” teams are divided and asked to create a dynamic tableau based on their reaction to a painting from the perspective of the subject, a family member, or a care provider (“write one line of dialogue in the voice of the character from the perspective of. . .”). Working together in small groups, they arrange their lines into a pleasing composition or poem, which is then performed for the rest of the team.

In “Interpretive Challenge, Revisited,” the group gathers in front of an extremely complex work of modern art that defies interpretation to share observations and to work together to make meaning. The artwork is carefully selected for its multiple possible interpretations to reward close looking and to elicit a wide range of responses. After approximately 20 minutes, participants are asked to step back and reflect on the process (“What did we do?” “What did you notice about how you worked together as a group?”), generally highlighting the value of hearing different viewpoints, the importance of listening, and the benefits of not rushing to judgment. Participants often comment that they did not know the names of their fellow “team members” before the museum gathering. This exercise serves as a gateway to a final “Reflection,” led by the museum educator, on what participants consider their own definitions of and images of effective teamwork, linking the evening’s discussions to professional interactions that emerged on the team rounds the previous day (eg, team dynamics, communication styles/miscommunications, hierarchy, and interdisciplinary relationships) (Table 2).

ANALYSIS

Engaging medical trainees and professionals with works of art has the potential to solve some of the most vexing professional development challenges. “Through the humanities — literature, art, theater,

TABLE 2
Examples of Arts Education Programs Used to Address Specific Medical and Related Competencies

Competency	Reference
Physical examination (inspection)	Naghshineh (8), Braverman (12), Jasani (13), Klugman (14)
Critical thinking	Schaff (15), Cambra (16)
Empathy	Liao (17), Cutler (18), Gonzales (19)
Respect	Malamut (20), <i>BWH Bulletin</i> (21)
Teamwork	Malamut (20), <i>BWH Bulletin</i> (21)
Curiosity	Milkova (22)
Career sustenance	Gaufberg (23)

and film — we can keep the students' imagination of the suffering of others alive," said physician-author Abraham Verghese (24). "It is precisely because art is so richly complex that our possibilities for learning from it are endless," wrote nurse-educator Geri Berg (25). These deep and historic connections between medicine and art may, in part, be attributed to the positive impact of linking left (rational, details) and right (emotional, broad concepts) brain functions.

Other medical schools and hospitals have developed programs to use visual arts training in the medical curriculum; our work has relied on the field's forerunners, particularly Irwin Braverman, MD, and his colleagues at Yale (26), and the cognitive psychologist Abigail Housen, EdD, who elucidated the transferability of rigorous arts training to other areas of cognitive development (27). The cost of our programs is low, and when an art museum is not convenient, the curriculum can be adapted to slide presentations or the use of hospital hallway art, which is nearly ubiquitous.

Art museums offer the opportunity to teach medical students some of the most difficult to reach competencies, including professionalism, communication, teamwork, and empathy. In our experience, arts education is most effectively used as a means to address challenging medical competencies, rather than as an ends in itself. The value as an educational prompt, as Parker Palmer states, is that "works of art [can be] 'third things' because they . . . have voices of their own, voices that tell the truth about a topic but, in the manner of metaphors, tell it on the slant. Mediated by a third thing, truth can emerge from, and return to, our awareness at whatever pace and depth we are able to handle" (28). Art is inherently ambiguous — the artist's intent can never be known for sure — and comfort with ambiguity is a core characteristic of the successful patient-physician encounter (29). Art is simultaneously emotional and intellectual and allows the student to narrow the perceived wide gap between bioscience and human experience. Finally, art can take students out of their "comfort zone"; in the confines of the museum they can escape preconceptions, distance inhibitions, and minimize performance anxiety. The art museum provides a unique environment where participants can relax, share clinical stories, reflect on professional concerns, and collaborate with one another outside the pressing demands of a busy hospital.

Although we have encountered some student skeptics (and more frequently, administrator skeptics), feedback has been overwhelmingly positive; enrollment requests for the elective TTE course consistently exceed the number of positions available. Some fertile areas for future curricular development include using museum experiences

to build skills in leadership, social justice, identifying and addressing access to care, and improving patient engagement relative to their own health care. In addition, engaging patients with providers at the art museum has great promise. The value of partnering with professional arts educators in designing and conducting the curriculum cannot be overstated.

Can such curriculum improve physician performance or, more importantly, patient care? Answering this question requires outcomes data from well designed, randomized studies, which are limited. Satisfaction surveys or measures of acceptability are subject to bias. We advocate for investigators to study the impact on clinically relevant outcomes data, such as the accuracy of diagnosis (8), improved resource use, or markers of efficient or effective clinical care.

Finally, how could there possibly be room for medical humanities in the dense medical school schedule, and why would it merit such valuable attention? In each of the programs presented above, we have confronted a curricular challenge and asked ourselves: "Can this be done better or in a more enduring fashion at an art museum?" In each case, the goals are to train better physicians, and art objects simply become the means to do so.

CONCLUSION

Fine arts training is being used to address a variety of vexing deficiencies in medical education at our and other institutions; the examples presented can be adapted to creatively address local needs. The acceptability of these novel methods is established; the next major challenge is to perform outcomes research that will define the value and durability of such programs.

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DISCUSSION

Goodenberger, St Louis: Thanks Joel, I really enjoyed that. The part that interested me most actually is the potential for dehumanization that occurs in training and afterwards. I would postulate that actually dehumanization — the opportunity for it — continues after the end of training. Emergency physicians, in particular I think, are exposed repeatedly to patients with maladaptive behaviors who have sociopathic tendencies and so on, and so on. Interestingly enough, police have the same problem. Police, as you know, after a period of time begin to — and carny workers, carny workers call the people that come in flats because they look flat in the light — and the police call people citizens, and it's not in a nice way. You may know that Fred Schiffman has a program in Providence called Cops and Docs which he may care to say something about aimed at addressing some of these problems. I am wondering if you have any outcomes data. Because if you can demonstrate, for example, that a group of students that take your course have a positive outcome as compared to people who don't, then perhaps that has implications for lifelong exposure to the arts.

Katz, Boston: Thank you for the question. Two parts of it, actually the “Cops and Docs” course at Brown run by Dr Schiffman has been one of my personal inspirations and our inspiration, so I do know a lot about it. But I'll let Fred talk about that. Second piece is outcomes data. We have very little outcomes data. It's tricky business. We have short-term outcomes. It does improve students' abilities to accurately make observations and make diagnoses. But we don't have any long-term data other than anecdotal data that people who have taken the course come back to us years later and tell us how much that positively influenced their life. But it's not adequate. We need better outcomes data.

Zeidel, Boston: This is really terrific. Of course it's happening a block from us, and it's great to hear about it. I really would urge that we try to identify, in Fred's course and

others, ways to look at outcomes so that we can spread this to other places. It looks great. It looks very interesting. It would be, obviously, great to understand how it could work elsewhere. I would really hope that we could eventually develop some modest funding mechanisms, even through NIH or elsewhere, whereby we could start to study outcomes of interventions like this, because then we could begin to make them more universal.

Katz, Boston: Thank you very much. One outcome that we are looking at in the team building is the number of pages that house staff receive from their teams, and the efficiency — the speed — at which rounds occur. So that is now something we are going to look at.

Hochberg, Baltimore: I'm actually particularly interested in empathy. This is unscientific. I have our fellows over the years complete an empathy quiz, which was developed by, well it's referred to at least by Simon Baron-Cohen in one of his books. There was recently an article in the *New York Times* which reported results of a study that compared the reading literature and different types of literature associated with increases in empathy. Literary fiction was associated with significantly greater improvement in empathy than reading current fiction or reading nonfiction. The specific literature that was cited was studies of reading Chekov. I am going to get to the question here. I give a talk often times on management of osteoarthritis. This would have applied to all of the chronic diseases that Dr Barondess talked about on Friday morning. In the "Cherry Orchard" there was a quotation that if there are a number of treatments available for a disease then you can be sure that it's incurable. I ask people in the audience how many of them have ever seen Chekov performed, the play performed. Invariably, there are fewer than a half a dozen hands. Then I ask them how many of the house staff have read Chekov, and it's zero. So, I think this is very important that there needs to be an increase in the focus on liberal arts education for the medical students that are accepted into medical school as opposed to the trends towards only accepting scientists and then reinforcing liberal arts education during medical school. So I think your work in arts and similar work in literature is wonderful. Frank Lee has talked about this a number of times to me and lamented, while he was still active at the University of Maryland School of Medicine, that this was not done as part of the curriculum. So the question is, could you measure patient satisfaction, because we measure satisfaction now in everybody who is discharged from the hospital by a telephone call 24 to 48 hours later in order to get some metrics? So you could look at patient satisfaction among those teams of house officers who have completed your intervention versus those who haven't in a randomized fashion.

Katz, Boston: Well ultimately, if we are going to be able to justify funding, which I am in favor of, we do need to show that it impacts patient outcomes and that is a great one to think about.