

# Using Visual Arts Education in Dermatology to Benefit Resident Wellness and Clinical Communication

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## Abstract

**Introduction:** Art education interventions improve observation skills among dermatology residents, but there is limited data regarding their benefits to wellness and clinical communication. **Methods:** Residents in the Stanford dermatology residency program participated in an arts-based education session, repeated in the fall of 2018 and 2019, that included a rotation of observational exercises adapted from the Artful Thinking program through Harvard Project Zero. The 2018 session featured exercises on identification and understanding of visual observation, while the 2019 session featured exercises on perspectives and objectivity of visual observation. Participants completed preintervention, postintervention, and 3-month follow-up surveys in fall 2018 and a postintervention survey in fall 2019. **Results:** Twenty-one residents participated in the 2018 education session and produced an adequate response rate (62%-90%) across surveys. At 3 months, five of 13 residents (39%) reported new use of art for mindfulness and stress reduction, 12 of 13 (92%) could recall an example of use of observation to improve patient communication, and four of 13 (31%) confirmed and described adjustments to their handoff technique. In 2019, 13 out of 18 participants (72%) completed the postintervention survey. Responses reinforced themes from the prior iteration but focused on perspective, objectivity, context, and uncertainty in observations. Respondents also identified additional arenas of communication to benefit from these observational techniques. **Discussion:** Dermatology residents increased use of art for personal wellness and adjusted clinical communication strategies after a single arts-based education session. Annual repetition with novel exercises maintained engagement and yielded additional participant insights.

## Keywords

Arts Education, Art of Observation, Wellness, Communication Skills, Humanities (Art, Literature, Music), Dermatology, Clinical/Procedural Skills Training

## Educational Objectives

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

1. Describe the benefits and limitations of visual observation in provider-patient communication.
2. Describe the benefits and limitations of visual observation in provider-provider communication.
3. Incorporate art observation into their wellness toolbox for mindfulness and stress reduction.

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## Introduction

Observation skills are fundamental to the practice of medicine, particularly dermatology, a field in which visual inspection is critical to diagnosis. Thus, the visual literacy of dermatologists and physicians in general is of ongoing interest.<sup>1</sup> For centuries, art depicting human forms has attracted medical scrutiny; in the study of Rembrandt's work alone, viewers confront varied colors and textures of disease, from breast cancer to flaring rosacea.<sup>2,3</sup> Medical educators have recognized that these experiences in the visual arts not only engage but also improve observation and raise awareness of personal and structural biases.<sup>4</sup> Accordingly, visual arts-based initiatives have been developed and implemented at different stages of medical education.

In medical education, defined methods appear to improve the quality and feasibility of arts-based observational training. Recent arts-based medical training initiatives have incorporated

specific methodologies, such as visual thinking strategies (VTS) or Artful Thinking, that are defined by guiding questions (e.g., “What do you see?”, “What makes you say that?”, and “What else do you see?”) or structured activities (e.g., comparing and contrasting, exploring viewpoints, and finding complexity).<sup>5-9</sup> VTS has successfully been used in a formal fine arts course through the Harvard Combined Dermatology Training Program that significantly improved residents’ observation scores.<sup>10</sup> Similar outcomes with confirmation of durability were demonstrated by another VTS-based visual arts course for dermatology trainees in the United Kingdom.<sup>11,12</sup> The Harvard-based program involved dermatology faculty facilitators in addition to professional art educators; as demonstrated elsewhere, even informal training in visual thinking methodologies can successfully enable nonexpert facilitators.<sup>6</sup>

While previous studies of arts-based training have documented improvements in the observation of objective features and the subjective components of the human experience—including nuances in emotion and relationships<sup>13,14</sup>—they have not specifically assessed the impact of such training on participant wellness or clinical communication skills.<sup>15</sup> To assess for these potential benefits of arts-based training, we evaluated a dermatology faculty-led, arts-based education session for dermatology residents at Stanford University.

Detailed arts-based curricula for graduate medical professionals have yet to be published in *MedEdPORTAL*. Given the journal’s readership, we sought to provide a training design to promote feasibility and replicability at other residency programs. Current published arts-based initiatives in medical education—including those designed for dermatology house staff<sup>10,11</sup>—disfavor implementation in residency programs as they typically require four to 18 sessions each over 1.5 hours, often prohibitive in the setting of competing time and programmatic commitments.<sup>15</sup> Thus, a single-session, annual design, if successful, could potentially increase sustainability and generalizability. Although our implementation of this design involved museum partnership, the curriculum does not require use of professional facilitators or museum access and has the potential to be used in virtual formats, increasing accessibility to residency programs that do not have such resources available.

## Methods

### Curriculum Development

Stanford University dermatology residency program directors (Elizabeth E. Bailey, Bernice Y. Kwong, Kristin M. Nord, and Laurel A. Stevens), in discussion with art educators at the Cantor Center for the Visual Arts at Stanford University, collaboratively

developed the curriculum. We adapted content from the Artful Thinking program through Harvard Project Zero, a longitudinal teaching collaborative with an open-access repository of dynamic practices for arts-based education.<sup>16</sup> Our selected exercises addressed specific learner objectives, based on program needs endorsed by program directors: (1) enhancement of observation strategies for provider-patient communication, (2) enhancement of observation strategies for provider-provider communication, and (3) expansion of residents’ wellness resources.

We chose a combination of small- and large-group exercises with the goal of encouraging interactive learning and discussion. Complete descriptions of exercises are found in their associated facilitator guides (Appendices A-D), including instructions with time marks and discussion points.

Exercise 1 (Appendix A) focused on building specificity and economy of description. In a spacious art gallery, participants and facilitators divided into small groups of four to five participants to independently select and describe an art piece. Each group collectively wrote a three-sentence description of its selected piece on a note card. Facilitators collected the note cards and redistributed them among the groups, which were then tasked with attempting to identify the art piece corresponding to their newly dealt description. After reconvening, the entire group walked to each identified piece, where each small group presented the descriptors necessary for identification. The ensuing discussion touched upon on discrimination—those descriptors that distinguished an art piece from similar pieces and those that might be insufficient, such as color common to many pieces.

In exercise 2 (Appendix B), participants honed observation and communication skills promoting understanding. Participants split into pairs in which one participant drew an artwork without looking at the art, purely based on the verbal description of the other participant. The drawer was able to ask questions of the describer, but the describer could neither ask questions nor look at the in-progress drawing. Subsequent comparison of the completed drawing with the original artwork generated discussion about what the drawer might have understood or not understood from the description, ways in which clarifying questions informed the drawer and the describer, and how preconceptions might influence understanding (e.g., different ways that a person might visualize a cat, leading to different renderings of the same artwork).

The objective of exercise 3 (Appendix C) was recognition of multiple perspectives through an Exquisite Corpse exercise.

This exercise emerged during the Surrealist movement, when artists converted a parlor game into a creative experiment: artists took turns drawing body segments (e.g., head, torso, legs) on successive folds of a piece of paper, with prior contributions hidden from view, to produce collaborative artwork.<sup>17</sup> In our version, small groups of five to six participants moved to separate preselected artworks. Using a piece of paper folded accordion-style, each participant independently wrote key observations and interpretations of the artwork that were not shared with other group members until the end of the exercise. Once each participant had recorded his or her thoughts, the group unfolded the paper and compared responses. Similarities and differences highlighted how perspective might influence observation, such as the way a person with familiarity with Biblical stories might describe a Biblical scene on a triptych versus how a person without such prior knowledge might describe the same scene.

Finally, exercise 4 (Appendix D) focused on honing observation skills as a large group. All participants and facilitators gathered around a single artwork and answered the three guiding questions of the Artful Thinking routine: see/think/wonder (“What do you see?”/“What do you think about what you see?”/“What do you wonder about?”).<sup>9</sup> The ordering required participants to ground interpretations in evidence but also encouraged them to recognize uncertainty and to approach it constructively.

We delivered this curriculum annually, as a onetime arts-based educational session for dermatology residents at all levels of training. Each session featured two of the four arts-based exercises described above, along with a preceding dinner, introduction (script in the head facilitator guide, Appendix E), and final debrief (notes in the head facilitator guide, Appendix E) where participants generated clinical takeaways based on their experiences throughout the session. We provide alterations to replicate this session in the absence of an accessible museum or art gallery in the individual exercise facilitator guides (Appendices A-D).

#### Implementation

Our education sessions took place at the Cantor Center for the Visual Arts at Stanford University. This on-campus museum offered access to over 38,000 pieces of world art: from Rodin bronze sculptures to European oil paintings to historic photography of California’s natural parks. Two consecutive iterations were held on August 16, 2018, and September 26, 2019. We conducted each session within 2 hours, including a 15-minute introduction, 30 minutes for each exercise with 5- to 10-minute breaks in between, and 30 minutes for debrief at the end of the session. Participants used personal internet-

capable electronic devices to complete optional evaluations but were otherwise encouraged to silence these devices during the session. We supplied writing instruments (e.g., colored pencils, paper, clipboards).

Dermatology residency program directors at Stanford University served as facilitators, in addition to their role as study investigators. We provided the necessary training materials to familiarize facilitators with session objectives and relevant visual arts-based educational frameworks (Appendix F).

We obtained exempt status from the Stanford University Institutional Review Board prior to evaluating the sessions. We invited all dermatology residents to voluntarily participate each year.

#### Evaluation

Due to lack of standardized or validated tools to assess these measures, we evaluated the session using customized same-day preintervention and postintervention surveys, as well as a 3-month follow-up survey, with questions oriented around our three educational objectives: wellness, team building, and clinical skills building. We included an observational exercise in pre- and postintervention surveys for the 2018 session. We paired responses between preintervention and postintervention surveys using participant-generated anonymous identifiers. We administered surveys and collected data with the Qualtrics survey tool. Outlines of our surveys are provided for reference in Appendix G.

#### Data Analysis

We performed Fisher’s exact tests to evaluate pooled survey responses across time points. We also performed McNemar’s exact tests and Wilcoxon signed rank tests for paired analyses of categorical and continuous data, respectively. Of note, we performed a descriptive analysis of the 2019 session postintervention survey data. Our data could not be pooled across years given overlap in participants and variation in arts-based exercises each year. We used SAS version 9.4 (SAS Institute, Inc.) and R version 3.5.2 (R Foundation) for quantitative data analyses.

#### Results

Twenty-one of 25 Stanford dermatology residents (84%) participated in the teaching session in 2018. This session featured exercises 1 and 2 outlined in the Methods. Out of the 21 resident attendees, 19 completed the preintervention survey (90%), 18 completed the postintervention survey (86%), and 13 completed the 3-month survey (62%). In 2019, 18 of 26

Stanford dermatology residents (69%) participated in the teaching session featuring exercises 3 and 4. Thirteen participants (72%) completed the postintervention survey. Residents from all years of training attended each iteration (Table 1).

Residents showed increased use of art in personal wellness after the educational intervention (Table 2). Before participation in the 2018 intervention, no resident explicitly identified art as a personal wellness technique. Postintervention, seven of 18 residents (39%) reported they were likely to use art for personal wellness, and at the 3-month follow-up, five of 13 residents (38%) newly reported using art for wellness. Furthermore, at the 3-month follow-up, three of 13 residents (23%) had independently returned to the Cantor Arts Center. We found no statistical difference in resident fulfillment in patient interactions or in clinical learning at 3 months.

Residents also reported adjustments to communication techniques both with patients and with other providers after the 2018 arts-based session (Table 3). Although there seemed to be a trend towards increased comfort when communicating medical errors to coresidents, attendings, and program directors, these improvements were not statistically significant ( $p$ s = .38, .06, and .50).

Before the 2018 intervention, eight of 19 residents (42%) could recall an example of using observation to improve patient communication, compared to 12 of 13 residents (92%) at 3 months ( $p = .0079$ ). Postintervention, 12 of 18 residents (67%) reported that they were likely to adjust their handoff technique based on communication techniques they had developed during the art session, and at the 3-month follow-up, four of 13 (31%) confirmed having adjusted their technique. The reported adjustments were congruent with the clinical

**Table 1.** Demographics and Art Education History Characteristics of Dermatology Resident Participants in Arts Education Initiative

Characteristic	No. (%)	
	2018 (n = 19)	2019 (n = 13)
Year		
PGY 2	8 (42)	6 (46)
PGY 3	6 (32)	4 (31)
PGY 4+	5 (26)	3 (23)
Art education history		
Prior arts education initiative attendee <sup>a</sup>	9 (47)	6 (46)
Art museum visits in past 5 years		
0	2 (11)	0 (0)
1-3	8 (42)	4 (31)
4-7	5 (26)	5 (38)
8+	4 (21)	4 (31)
Prior course on art history	8 (42)	0 (0)
Prior course on art and clinical skills	5 (26)	0 (0)

<sup>a</sup>Attended an arts education session hosted by the dermatology program during a prior year.

takeaways generated during the session (Figure), including “ask[ing] consultants to describe what they see in more detail,” “try[ing] to be more practical and visual in my descriptions and presentations,” and “trying to make sure the language I use is understandable; verifying understanding.”

In 2019, participants echoed the enthusiasm of the prior year. All 13 respondents reported that they were somewhat to very likely to apply the strategies discussed during the session to clinical encounters. Furthermore, nearly half of the participants in a given year attended a prior iteration of the arts education session (Table 1), demonstrating ongoing interest in and commitment to the program. This continuity—and the experience of novel exercises—reinforced and evolved participant takeaways. The large-group clinical takeaways reflected the thoughts generated by the specific exercises employed during the iteration and focused on “objectifying descriptions,” “noting the potential

**Table 2.** Wellness Attitudes and Behaviors Before and After Participation in Arts Education Initiative (2018)

Parameter	No. (%)			$p^a$
	Presurvey (n = 19)	Postsurvey (n = 18)	3-Month Survey (n = 13)	
Fulfillment in patient interactions <sup>b</sup>	15 (79)		12 (92)	.6247
Fulfillment in clinical learning <sup>b</sup>	14 (74)		12 (92)	.3606
Stress reduction techniques				
Exercise	18 (95)			
Time outdoors	11 (58)			
Meditation	1 (5)			
Time with friends/family	17 (90)			
Other	0 (0)			
Likely to revisit Cantor after arts education initiative <sup>b</sup>		12 (67)		
Likely to use art for personal wellness <sup>b</sup>		7 (39)		
Revisited Cantor after arts education initiative			3 (23)	
Used art for personal wellness			5 (38)	
Developed other techniques for personal wellness			2 (15)	

<sup>a</sup>Difference in proportions by Fisher’s exact tests with threshold for significance at  $p < .05$ .

<sup>b</sup>Converted binary scale (1 = All of the Time–Sometimes, 0 = Neutral–Never).

**Table 3.** Clinical Communication Attitudes and Behaviors Before and After Participation in Arts Education Initiative (2018)

Parameter	No. (%)			p
	Presurvey <sup>a</sup>	Postsurvey <sup>b</sup>	3-Month Survey <sup>c</sup>	
Team building				
Paired analysis				
Comfort disclosing medical error to coresident <sup>d</sup>	11 (65)	14 (82)		.375 <sup>e</sup>
Comfort disclosing medical error to attending <sup>d</sup>	7 (41)	12 (71)		.0625 <sup>e</sup>
Comfort disclosing medical error to program director <sup>d</sup>	10 (59)	12 (71)		.5 <sup>e</sup>
Comfort communicating to team change in initial clinical impression <sup>d</sup>	13 (76)	15 (88)		.5 <sup>e</sup>
Pooled analysis				
Likely to adjust handoff technique after arts education initiative <sup>f</sup>		12 (67)		
Adjusted handoff technique after arts education initiative			4 (31)	
Clinical skill building				
Recalls example from clinic of observation improving communication	8 (42)		12 (92)	.0079 <sup>g</sup>
Will seek additional information in clinical encounter to improve patient communication		11 (61)		

<sup>a</sup>For team-building paired analysis, presurvey  $n = 17$ ; for team-building pooled analysis, presurvey  $n = 19$ .

<sup>b</sup>For team-building paired analysis, postsurvey  $n = 17$ ; for team-building pooled analysis, postsurvey  $n = 18$ .

<sup>c</sup>For team-building pooled analysis, 3-month survey  $n = 13$ .

<sup>d</sup>Converted binary scale (1 = *Very-Somewhat Comfortable*, 0 = *Neutral-Very Uncomfortable*).

<sup>e</sup>Difference in proportions by McNemar's exact test for paired pre-/postsurvey responses with threshold for significance at  $p < .05$ .

<sup>f</sup>Converted binary scale (1 = *Very-Somewhat Likely*, 0 = *Neutral-Very Unlikely*).

<sup>g</sup>Difference in proportions by Fisher's exact tests with threshold for significance at  $p < .05$ .

for multiple interpretations of the same information,” “taking in context,” and “embracing uncertainty.” Participants further identified additional contexts in which to apply these strategies, including collaborations with other specialties in patient care, didactics, mentorship relationships, and even interpersonal relationships outside medicine.

## Discussion

Our single-session, 2-hour, arts-based curriculum, led by dermatology faculty, offers sustained benefits for resident participants, including increased use of art for personal wellness and increased use of observation in communication with both patients and providers. We have shown that arts-based education can achieve several educational goals simultaneously in a concise format fit for a busy residency training schedule. Our detailed, open-source resource enables residency programs not only to train their own faculty to execute our exercises but also to recreate them outside an art museum setting.

### Benefit to Resident Personal Wellness

After participation in our curriculum, residents reported attitudes and behaviors incorporating art as a wellness resource. This benefit aligns with ongoing efforts to leverage art for health promotion, such as dedicated art-wellness programs for students and professionals alike.<sup>18,19</sup> The growing evidence base for these efforts includes experiential data on contentment, dialogue, and flow during art engagement that promote long-term happiness and self-regulation,<sup>20</sup> as well as thematic frameworks clarifying the mechanisms by which art effects healing across domains and levels of society.<sup>21</sup> Though our curriculum can be implemented in

alternate settings, provided access, we encourage programs to establish partnerships with art institutions. Our 3-month museum revisitation statistic suggests that performing our exercises in an art institution can connect participants to a site and help them identify it as a personal resource. Moreover, the physical space and symbolism may have independent value for wellness.<sup>19</sup>

Though we view meeting in an art museum as ideal, we identify three elements of this environment that programs without access to a museum can recreate to extend the wellness benefits of our setup. First, we emphasize the social aspect of our training. Interacting in a group, responding to peer comments, and witnessing colleagues' hands raised in excitement all make the experience enjoyable. Second, we encourage gathering the group away from the hospital. The clinical setting reinforces professional roles and scripts. Moving elsewhere asks residents to step away from those roles and reflect on observation skills and personal bias in a professionally neutral environment. Third, we recommend using art pieces in our exercises instead of everyday objects or natural sights. Art is intentional; in trying to interpret the artist's vision within a group, members quickly notice potential differences in interpretation and perspective. They learn to wonder and build comfort with ambiguity, experiences that are essential to wellness.

### Benefits to Provider-Patient Communication

Resident participants not only self-reported greater use of observation in patient interactions postintervention but also shared stories that concretely demonstrated their developing skills (Table 1). Specifically, participants from 2018 used observation to identify patient anxieties and gaps in

	Immediately postintervention	3 months postintervention
Handoff	<p><b>What changes do you plan to make with your next handoff?</b></p> <ul style="list-style-type: none"> <li>Remember to not assume there is a shared knowledge/language</li> <li>Take time to better establish what the other party knows</li> <li>Ask more questions to ensure they understand</li> <li>Communicate more clearly with teachback</li> <li>Give big picture, use descriptive terms both understand</li> </ul>	<p><b>Have you implemented any changes to your handoff technique?</b></p> <ul style="list-style-type: none"> <li>Trying to make sure the language I use is understandable; verifying understanding and that everyone is on the same page</li> <li>I have asked consultants to describe what they see in more detail</li> <li>I have tried to be more practical and visual in my descriptions and presentations</li> </ul>
	<p><b>What will you look for in a patient to improve communication?</b></p> <ul style="list-style-type: none"> <li>Try to better gauge their level of understanding</li> <li>Ask for understanding</li> <li>Making sure the patient understands, both in body language and in verbal communication</li> <li>Clues from patient to see if they understand patient instructions</li> <li>Ask the patients to describe what they see</li> </ul>	<p><b>From your experience in clinic today, can you think of an example when you used an observation to improve communication with your patient?</b></p> <ul style="list-style-type: none"> <li>Took extra time to explain reassuring features of benign lesions to an anxious spouse of a patient</li> <li>Just yesterday I had an experience in surgery where I noticed the patient was feeling really sad/scared. She was undergoing a procedure on the back, so it would have been easy to not notice her emotions. But addressing them head-on was very helpful—we were able to address her fears/anxiety and help the rest of the experience run more smoothly for everyone involved</li> <li>Noticed a family member who wanted to help with logistics to carry out the plan and engaged them</li> <li>Patient was frustrated that no one has explained why he continues to flare in psoriasis/sebopsoriasis. Looked from his perspective and spent 5 minutes to explain the innate physiology, and he was very grateful</li> <li>Trying to take the patient's point of view that he didn't understand his diagnosis. Went through in detail in words he would understand of his disease process, then asked him to repeat in his own words to see if he really understood</li> </ul>
Patient communication		

Figure 1. Comparison of 2018 participant responses regarding handoff technique and use of observation in patient communication at postsurvey and 3-month follow-up.

understanding, to address these concerns with visually driven explanations, and to confirm comprehension with teach-back technique. These positive behaviors reflect many known benefits of an arts-based educational experience including awareness of emotion, narrative, multiplicity of perspectives, and cultivation of empathy—all essential skills for a practicing physician.<sup>13</sup> The reported behaviors correspond well to the learning points of specific exercises employed during the session, and participants were able to take ownership of their experience and apply it to their individual practices.

#### Benefits to Provider-Provider Communication

Participant adjustments to provider handoffs in 2018 reflected similar themes of visual-driven communication and active

confirmation of understanding. We found that residents benefited from revisiting these topics the following year and also that they appreciated new perspectives encountered in varied exercises. Participants from 2019 focused on objectivity of descriptors and observation of context to improve provider communication. They further recognized that these techniques apply not only to standard patient oral presentations and consult requests but also to communication with mentors and during didactics.

Just as successive clinic encounters allow patients time for contemplation or incremental implementation of treatment plans, our educational model allows participants to implement their session takeaways over the course of a year while accumulating new clinical experiences that inform their next arts education

session. The use of different subsets of the exercises each year allows participants to cycle focus between precision, clarity, empathy, and objectivity in order to form a faceted appreciation of observation in clinical practice.

#### Lessons Learned

Our 2-hour single-session model provided adequate time to complete two exercises along with an introduction and wrap-up; based on our experience, a longer session could pose challenges to maintaining participant engagement. We found the end of session wrap-up particularly helpful, as participants solidified connections between session exercises and day-to-day clinical work and showed ongoing reflection at 3-month follow-up from the 2018 session. We plan to continue using this format for future iterations.

Residents enjoyed the variety of exercises. In particular, the small-group exercises (exercises 1 and 3) created less intimidating settings that encouraged participation from all group members. We would recommend keeping these groups to at most six participants, which also optimizes spacing when small groups collect around an artwork. One challenge for exercise 1 was that participants could occasionally see where in the gallery other groups had clustered when formulating their original descriptions, limiting the subsequent challenge of identifying their artwork based on description alone. Nevertheless, we were able to have a fruitful discussion about observations and descriptions. The partner-based exercise (exercise 2) was universally well received, with positive feedback on the time spent drawing. Such unscripted time, infrequently part of residents' daily life, also provided an opportunity to mingle and bond. Finally, the see/think/wonder exercise (exercise 4) could be done in smaller groups provided multiple facilitators are available—and doing so may increase participation. In any case, we recommend providing several minutes of quiet observation before starting the discussion together.

#### Limitations and Future Directions

Limitations of our study include the small sample size, which limits power, and the single site design, which limits external validity and generalizability. Nearly half of the participants in 2018 and 2019 reported prior exposure to arts-based education (Table 1), suggesting ours may be a more experienced and engaged population than average. Lastly, we employed self-reported, nonvalidated survey instruments.

Improving resident physician wellness and communication skills is an ongoing challenge of great importance in residency education.<sup>22,23</sup> Future opportunities include replication of our arts

education in other specialty training programs, confirmation of results with performance-based observed behavior measures, and tracking durability of attitudes and behaviors in participants after all 3 years of residency. Furthermore, the COVID-19 pandemic has indelibly altered medical education, and as with other curricular content, we have adapted the arts session for remote learning this academic year. We conducted a virtual session of similar duration and structure—introduction, two exercises, and large-group debrief—using a video platform with breakout rooms. The first activity was a variation of exercise 4 (see/think/wonder). Members of each small breakout group were asked to look at the same photograph and come up with three questions they would like to ask the subject in the photograph. Upon reconvening as a large group, representatives from the small groups shared their questions, and the facilitator shared the subject's written narrative. This narrative sparked a discussion of what could have been missed with the proposed questions, what assumptions may have been made, and what clues were in the photograph. The second activity was an exercise in partial to complete images. Again, participants were split into small groups using breakout rooms, and each group viewed a series of three images, starting with the most incomplete narrow view and ending with the full image. Participants were asked to discuss what they saw in detail and what conclusions could be drawn from what was seen. In the larger group discussion, each small group shared what had been seen in each image and how conclusions may have shifted as the view expanded. Overall, the virtual platform lent itself well to large- and small-group discussions of two-dimensional artwork and could afford all medical training programs the opportunity to pursue arts-based education. If possible, we encourage collaboration with an art educator to help inform discussion questions and select artworks that not only provoke diverse discussion topics (e.g., framing, perspective, ambiguity) but also lend themselves to the virtual platform.

A single-session, dermatology faculty-led, arts education program for dermatology residents yielded sustained benefits for participant personal wellness and clinical communication. At 3-month follow-up, participants increased use of art for personal wellness and reported positive adjustment to provider handoffs. Given the minimal time and resource investment required for a wide array of benefits, the arts-based education session shows potential value for other dermatology residency programs, as well as for other specialties, to help address important longitudinal training goals including building personal wellness resources and building strategies to communicate effectively with patients and colleagues using visual information.

## Appendices

- A. Facilitator Guide for Arts-Based Exercise 1.docx
- B. Facilitator Guide for Arts-Based Exercise 2.docx
- C. Facilitator Guide for Arts-Based Exercise 3.docx
- D. Facilitator Guide for Arts-Based Exercise 4.docx
- E. Head Facilitator Guide.docx
- F. Facilitator Training Materials.docx
- G. Example Participant Surveys.docx

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

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## Prior Presentations

Bailey EE, Kumar A, Lee GH, Stevens L, Kwong B, Nord KM. Arts education in dermatology oral presentation. Presented at: Dermatology Teachers Exchange Group, Annual Meeting of the American Academy of Dermatology; March 1-5, 2019; Washington, DC.

## Ethical Approval

The Stanford University Institutional Review Board Review Committee approved this study.

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