

## Supplemental Digital Appendix 1

### Verbatim Questionnaire Items From a 2018 National Survey of Physicians, Nurse Practitioners, and Physician Assistants on Preferences Related to Continuing Medical Education Modalities

Are you aware of any of the following CME providers?

*Response options: Yes, No*

- MedStudy
- MER – Medical Education Resources
- Mayo Clinic
- UpToDate
- Medscape
- MedpageToday
- Professional organizations, e.g., ACP, ABIM, AAFP
- MD Anderson
- UCLA (University of California, Los Angeles)
- Harvard
- Cleveland Clinic
- Johns Hopkins
- UCSF (University of California, San Francisco)

From which of the following CME providers have you obtained CME credit in the last 2 years? Please select all that apply.

- MedStudy
- Medscape
- MedpageToday
- MER – Medical Education Resources
- UpToDate
- Professional organizations, e.g., ACP, ABIM, AAFP

From which of the following academic medical centers have you attended a CME course in the last 2 years? Please select all that apply.

- Cleveland Clinic
- Harvard
- Johns Hopkins
- Mayo Clinic
- MD Anderson
- UCLA (University of California, Los Angeles)
- UCSF (University of California, San Francisco)

Using a scale of 1 – 5, where 1 = not at all and 5 = very much, how well does each of the following characteristics describe [CME provider name]?

*This question was repeated for each of the providers selected in the preceding two questions.*

- Research focused
- Clinical practice focused
- Easy to access
- Reputation of institution
- Reputation of faculty

In the next 12 months, how likely are you to obtain CME credits through each of the following?

*Response options: 1 – Not at all likely, 5 – Very likely*

- Live activity (attend in person: live lectures or workshops)
- Streaming or webcast of a live event
- Online/web-based activities, e.g., MKSAP question bank
- Print/journal-based CME
- Performance improvement CME
- Internet Point-of-Care, e.g., Up-To-Date
- National/regional society meetings

For the following sources of CME credits, how desirable are each?

*Response options: 1 – Very undesirable, 3 – Neutral, 5 – Very desirable*

- Live activity (attend in person: live lectures or workshops)
- Streaming or webcast of a live event
- Online/web-based activities, e.g., MKSAP question bank
- Print/journal-based CME
- Performance improvement CME
- Internet Point-of-Care, e.g., Up-To-Date
- National/regional society meetings

Best-worst scaling (max diff) exercise:

On each of the next few screens, you will see a list of factors you may consider when selecting a CME course to attend. For each list, please indicate which is the most important and least important factor.

*Respondents were shown four factors in a set, randomly selected from the full list of 22. The exercise was repeated approximately seven times, depending on the number of features considered, using a different set of factors for each repetition.*

- Cost to attend/complete course
- Previous experience with course
- Keynote speakers
- Method of course presentation (online or in-person)
- Attractiveness of course location
- Travel time to course location
- Time to complete course
- Venue, e.g., Hyatt, Ritz-Carlton
- Topic (relevance)
- Content (quality and effectiveness)
- Opportunity to expand skills and scope of practice, e.g., hands-on learning option
- Training/alumni
- Referral frequency
- Affiliation
- Availability of CME or Maintenance of Certification (MOC) credit
- Research focused
- Clinical practice focused
- Reputation of institution
- Reputation of faculty
- Accrediting body
- Variety of content
- Scheduling/coordinating with practice needs

How appealing are each of the following attributes of an online CME course?

*Response options: 1 – Not at all appealing, 5 – Very appealing*

- Limits time away from practice
- Learn at my own pace
- Learn when I have time
- Lower cost than attending a destination course
- Subject matter is best taught through this medium

How appealing are each of the following attributes of a live, in-person CME course?

*Response options: 1 – Not at all appealing, 5 – Very appealing*

- Interaction with colleagues/peers
- Interaction with course faculty
- Time away from practice to focus on education
- Regionally located
- Located in a destination spot
- Able to bring family
- Subject matter is best taught through this medium

## Supplemental Digital Appendix 2

### Characteristics of Respondents and Nonrespondents to a 2018 National Survey of Physicians, Nurse Practitioners, and Physician Assistants on Preferences Related to Continuing Medical Education Modalities

Domain	Subdomain	Respondents No. (%); N=500	Non-respondents No. (%); N=1395	P
Gender	Female	251 (50%)	742 (53%)	.25
	Male	249 (50%)	653 (47%)	
Region of USA*	Northeast	140 (28%)	330 (24%)	.04
	Midwest	95 (19%)	292 (21%)	
	South	146 (30%)	491 (35%)	
	West	111 (23%)	279 (20%)	
Age (years)†	39 and younger	92 (24%)	189 (27%)	.59
	40-49	123 (33%)	203 (29%)	
	50-59	87 (23%)	161 (23%)	
	60 and older	74 (20%)	147 (21%)	

\* N=392 and 1392 for region, for respondents and non-respondents respectively, due to incomplete data in database.

† N=376 and 700 for age, for respondents and non-respondents respectively, due to missing responses.

### Supplemental Digital Appendix 3

#### Anticipated Future Use of Different Continuing Medical Education Modalities, by Age Group, From a 2018 National Survey of Physicians, Nurse Practitioners, and Physician Assistants

Modality	<40; N=92 Mean (SD)	40-49; N=123 Mean (SD)	50-59; N=87 Mean (SD)	≥60; N=74 Mean (SD)	p
<b>Likelihood of using in the next 12 months</b>					
Live activity (attend in person: live lectures or workshops)	3.5 (1.2)*	3.8 (1.2)	4.1 (1.2)*	3.8 (1.3)	.007
Online/web-based activities, e.g., MKSAP question bank	3.7 (1.3)	3.6 (1.3)	3.5 (1.3)	3.2 (1.4)	.08
Internet Point-of-Care, e.g., Up-To-Date	3.9 (1.3)*	3.7 (1.4)	3.3 (1.4)	3.0 (1.4)*	.001
Print/journal-based CME	3.4 (1.3)	3.5 (1.2)	3.5 (1.4)	3.5 (1.5)	.92
National/regional society meetings	3.4 (1.5)	3.2 (1.3)	3.2 (1.4)	3.1 (1.4)	.71
Streaming or webcast of a live event	2.7 (1.3)	3.0 (1.3)	2.9 (1.4)	2.7 (1.4)	.45
Performance improvement CME	2.7 (1.2)	2.9 (1.3)	2.7 (1.3)	2.5 (1.3)	.19
<b>Desirability</b>					
Live activity (attend in person: live lectures or workshops)	3.8 (1.0)	4.0 (0.9)	4.2 (1.0)	4.1 (1.0)	.04
Internet Point-of-Care, e.g., Up-To-Date	4.2 (0.9)†	4.0 (0.9)*	3.7 (1.0)	3.5 (1.0)*†	<.001
Online/web-based activities, e.g., MKSAP question bank	4.0 (1.0)	3.9 (0.9)	3.7 (1.0)	3.6 (1.0)	.02
Print/journal-based CME	3.7 (1.0)	3.8 (0.9)	3.7 (0.9)	3.8 (1.0)	.79
National/regional society meetings	3.7 (1.1)	3.7 (1.0)	3.8 (1.0)	3.7 (1.1)	.92
Streaming or webcast of a live event	3.3 (1.0)	3.5 (0.9)	3.3 (1.0)	3.4 (1.1)	.40
Performance improvement CME	3.3 (1.0)	3.2 (1.0)	3.3 (1.0)	3.1 (1.1)	.45

Response options: 1 = not at all likely/very undesirable, 5 = very likely/desirable.

\* Subgroups' ratings are statistically significantly different from one another using Tukey's test ( $p < .01$ ).

† Subgroups' ratings are statistically significantly different from one another using Tukey's test ( $p < .01$ ).

## Supplemental Digital Appendix 4:

### Appeal of Specific Features of Online and In-Person Continuing Medical Education Courses, by Age Group, From a 2018 National Survey of Physicians, Nurse Practitioners, and Physician Assistants

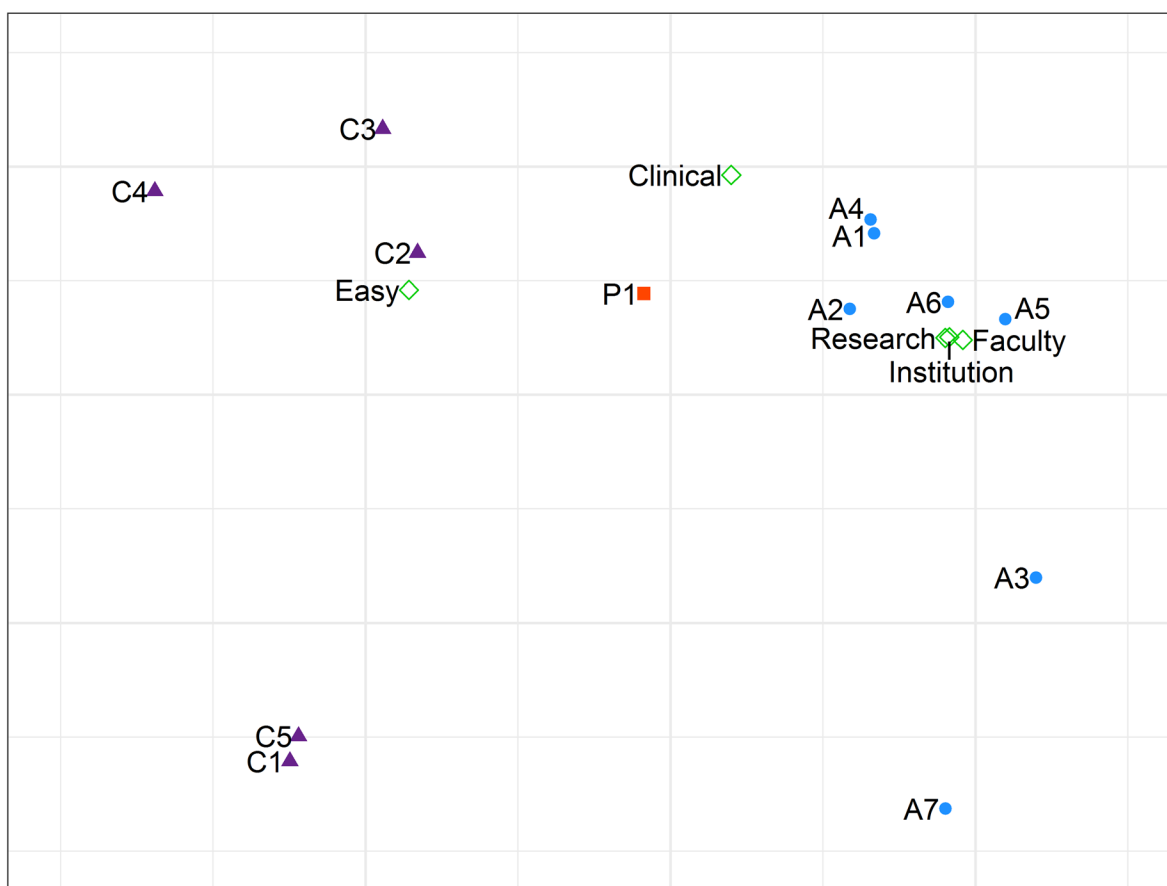
Course Feature	<40; N=92 Mean (SD)	40-49; N=123 Mean (SD)	50-59; N=87 Mean (SD)	≥60; N=74 Mean (SD)	p
<b>Online Course</b>					
Learn when I have time	4.4 (0.9)	4.4 (0.8)	4.3 (0.9)	4.3 (1.0)	.98
Lower cost than attending a destination course	4.1 (1.0)	4.2 (0.9)	4.2 (0.9)	4.4 (0.9)	.54
Learn at my own pace	4.1 (1.0)	4.2 (1.0)	4.2 (1.0)	4.2 (1.0)	.92
Limits time away from practice	4.0 (1.1)	4.0 (1.0)	4.0 (1.0)	4.0 (1.0)	.99
Subject matter is best taught through this medium	3.4 (1.1)	3.7 (1.1)	3.6 (1.1)	3.6 (1.1)	.23
<b>Live, In-Person Course</b>					
Subject matter is best taught through this medium	4.0 (0.9)	3.9 (0.8)	3.9 (0.8)	3.9 (1.0)	.84
Located in a destination spot	4.0 (1.0)	4.0 (1.2)	3.9 (1.1)	4.0 (1.1)	.91
Regionally located	3.8 (0.9)	3.9 (0.9)	3.9 (0.9)	4.0 (1.0)	.45
Time away from practice to focus on education	3.7 (1.0)	3.6 (1.2)	3.7 (1.1)	3.6 (1.1)	.88
Interaction with colleagues/peers	3.6 (1.1)	3.6 (1.0)	3.7 (1.1)	3.7 (1.1)	.69
Able to bring family	3.6 (1.3)	3.6 (1.3)	3.4 (1.3)	3.3 (1.4)	.13
Interaction with course faculty	3.4 (1.0)	3.4 (1.1)	3.5 (1.1)	3.4 (1.2)	.81

Response options: 1 = not at all appealing, 5 = very appealing.

## Supplemental Digital Appendix 5

### Cluster Analysis of Perceived Characteristics of Specific Continuing Medical Education Providers, From a 2018 National Survey of Physicians, Nurse Practitioners, and Physician Assistants

Each specific provider was rated on five characteristics: research focus, clinical practice focus, easy to access, and reputation of institution and faculty. Ratings for these five characteristics were reduced to two dimensions using principal component analysis, and the clustering of providers around these characteristics was plotted. Providers have been anonymized as A[cademic], C[ommercial], and P[rofessional organizations], and correspond to those reported in Table 3.



● Academic ▲ Commercial ■ Professional ◇ Characteristic