

## Stethopedia: an e-learning resource for medical students to supplement Canadian clinical skills education

## Stethopedia : une ressource d'apprentissage électronique pour améliorer l'enseignement des compétences cliniques au Canada

Randi Q Mao,<sup>1</sup> Gurinder Sandhu,<sup>1</sup> Sophia Kerzner,<sup>1</sup> Shreyas Sreeraman,<sup>1</sup> Janhavi Nikhil Patel,<sup>1</sup> Eva Yiguan Liu,<sup>1</sup> Chad B Singh,<sup>2</sup> Jason Profetto<sup>3</sup>

<sup>1</sup>Michael G. DeGroote School of Medicine, McMaster University, Ontario, Canada; <sup>2</sup>Department of Medicine, Division of Emergency Medicine, McMaster University, Ontario, Canada; <sup>3</sup>Department of Family Medicine, McMaster University, Ontario, Canada

Correspondence to: Randi Q. Mao, BHSc; McMaster University, 1280 Main Street West, L8S 4L8, Hamilton, ON; email: randi.mao@medportal.ca

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### Implication Statement

Online clinical skills videos can supplement teaching and allow for greater flexibility when learning physical examination skills. There are currently few open access clinical skills video resources available for Canadian medical students. Stethopedia is an easy-to-use, open-access library of clinical skills teaching videos based on the Canadian medical curriculum. We created Stethopedia to increase accessibility to clinical skills resources and improve the competency and confidence of medical students performing clinical skills on examinations and clerkship rotations. Medical students would benefit from similar resources based on their school's specific curriculum in order to improve clinical skill performance.

### Énoncé des implications de la recherche

Les vidéos disponibles en ligne sur les habiletés cliniques peuvent améliorer l'apprentissage de nouvelles compétences cliniques. Cependant, il existe très peu de ressources canadiennes gratuites qui enseignent les compétences cliniques basées sur la vidéo. Stethopedia est une bibliothèque qui est facile à utiliser et à l'accès libre avec des vidéos d'enseignement des compétences cliniques basées sur le curriculum médical canadien. Nous avons créé Stethopedia pour accroître l'accessibilité aux ressources de compétences cliniques et améliorer la compétence et la confiance des étudiants en médecine qui exécutent des compétences cliniques pendant leurs examens et l'externat. Les étudiants en médecine bénéficieraient de ressources similaires basées sur le programme spécifique de leur école afin d'améliorer leurs compétences cliniques.

### Introduction

The COVID-19 pandemic prompted a paradigm shift in medical education from traditional in-person learning to adaptations via digital platforms.<sup>1,2</sup> During this time, medical students experienced suspended or altered clinical experiences, limiting opportunities to practice and learn crucial clinical skills.<sup>3</sup>

A recent systematic review found that e-Learning within diverse health professions programs is equivalent or even superior to traditional learning.<sup>4</sup> However, there are few

Canadian-based resources that provide online clinical skills teaching. Our goal was to address the educational gap created by the pandemic and supplement clinical skills learning with high-quality videos that help medical students better prepare for Objective Structured Clinical Examinations (OSCEs) and clinical encounters.

### Innovation

Stethopedia<sup>5</sup> is one of the first open-access websites created by medical students for medical students to supplement Canadian clinical skills curricula. The content

on our website is based on the McMaster Clinical Skills Guide and the Association of Faculties of Medicine of Canada Clinical Skills Document.<sup>6,7</sup> Our platform features OSCE-style physical examination videos, special examination videos that provide in-depth teaching on difficult maneuvers (i.e., diaphragmatic excursion), and tutorials on interpreting radiological findings. We filmed the videos at a local clinic with a resident or clerk preceptor, a videographer, and a standardized patient. After filming, videos went through a rigorous editing process and were promoted on social media prior to being released. Our website currently has 17 different instructional videos posted, with more in the production process. The total costs of the project amounted to \$1200 CAD. This project requires key logistical and personnel requirements, including filming locations, equipment, an experienced cameraman, video editors, and website developers.

## Evaluation

This study received a 'Review Exempt' letter from our local ethics board, as per Article 2.5 of the TCPS2 (2018).

We tracked website traffic statistics to evaluate uptake. In addition, we launched an anonymous feedback questionnaire directed towards McMaster medical students to evaluate the utility and satisfaction with

Stethopedia. This survey was developed iteratively with the input of the staff physician, resident, and medical students on the team. We disseminated our five-question survey via email and social media and hosted it on the SurveyMonkey platform (SurveyMonkey Inc., San Mateo, California) from March 22nd, 2021 to April 24th, 2021. Participants ranked their agreement to each questionnaire statement on a 5-point Likert scale (1 = strongly disagree, 3 = neutral, 5 = strongly agree). We used descriptive statistics to analyze rating scale responses and performed a Mann-Whitney U test on first- and second-year medical students' responses.

Since launching on Feb 22nd, 2021, Stethopedia has accumulated 7,769 cumulative views, with 2,025 unique visitors from 21 different countries. Our questionnaire yielded a response rate of 17.5% (108/617). Respondents consisted of 47 (43.5%) first-year pre-clerks, 57 (52.7%) second-year clerks, and four (3.7%) third-year clerks. The large majority of respondents either agreed or strongly agreed with all five questionnaire statements (Table 1). A Mann Whitney U test revealed that first- and second-year medical students had no statistically significant difference in survey responses ( $p > 0.05$  for all comparisons), indicating that the resource was similarly beneficial for both pre-clerks and second-year clerks.

Table 1. Participant responses to survey using a 5-point Likert scale

Question	Strongly Agree (%)	Agree (%)	Neutral (%)	Disagree (%)	Strongly Disagree (%)	Mean score $\pm$ SD	p-value*
<b>Q1: I feel more confident performing physical examinations after using Stethopedia.</b>							
Overall	26 (24.1%)	53 (49.1%)	27 (25.0%)	2 (1.9%)	0 (0%)	3.95 $\pm$ 0.75	0.89
First-year	14 (29.8%)	26 (55.3%)	7 (14.9%)	0 (0%)	0 (0%)	4.15 $\pm$ 0.66	-
Second-year	12 (21.1%)	25 (43.9%)	19 (33.3%)	1 (1.8%)	0 (0%)	3.84 $\pm$ 0.77	-
Third-year	0 (0%)	2 (50.0%)	1 (25.0%)	1 (25.0%)	0 (0%)	3.25 $\pm$ 0.96	-
<b>Q2: I feel that this is a useful supplementary resource for undergraduate clinical skills education.</b>							
Overall	64 (59.3%)	37 (34.3%)	6 (5.6%)	1 (0.9%)	0 (0%)	4.52 $\pm$ 0.65	0.89
First-year	33 (70.2%)	12 (25.5%)	2 (4.3%)	0 (0%)	0 (0%)	4.66 $\pm$ 0.56	-
Second-year	30 (52.6%)	24 (42.1%)	3 (5.3%)	0 (0%)	0 (0%)	4.47 $\pm$ 0.60	-
Third-year	1 (25.0%)	1 (25.0%)	1 (25.0%)	1 (25.0%)	0 (0%)	3.50 $\pm$ 1.29	-
<b>Q3: I think that the content covered by Stethopedia is representative of our curriculum.</b>							
Overall	45 (41.7%)	54 (50.0%)	8 (7.4%)	1 (0.9%)	0 (0%)	4.32 $\pm$ 0.65	0.77
First-year	24 (51.1%)	22 (46.8%)	1 (2.1%)	0 (0%)	0 (0%)	4.49 $\pm$ 0.55	-
Second-year	21 (36.8%)	29 (50.9%)	6 (10.5%)	1 (1.75%)	0 (0%)	4.22 $\pm$ 0.71	-
Third-year	0 (0%)	3 (75.0%)	1 (25.0%)	0 (0%)	0 (0%)	3.75 $\pm$ 0.50	-
<b>Q4: I find Stethopedia easy to use.</b>							
Overall	53 (49.1%)	47 (43.5%)	7 (6.5%)	1 (0.9%)	0 (0%)	4.41 $\pm$ 0.66	0.77
First-year	26 (55.3%)	19 (40.4%)	2 (4.3%)	0 (0%)	0 (0%)	4.51 $\pm$ 0.59	-
Second-year	26 (45.6%)	25 (43.9%)	5 (8.8%)	1 (1.8%)	0 (0%)	4.33 $\pm$ 0.72	-
Third-year	1 (25.0%)	3 (75.0%)	0 (0%)	0 (0%)	0 (0%)	4.25 $\pm$ 0.50	-
<b>Q5: I would recommend this resource to a colleague.</b>							
Overall	55 (50.9%)	42 (38.9%)	10 (9.3%)	1 (0.9%)	0 (0%)	4.40 $\pm$ 0.69	0.69
First-year	27 (57.5%)	18 (33.3%)	2 (4.3%)	0 (0%)	0 (0%)	4.53 $\pm$ 0.58	-
Second-year	28 (49.1%)	21 (36.8%)	7 (12.3%)	1 (1.75%)	0 (0%)	4.33 $\pm$ 0.76	-
Third-year	0 (0%)	3 (75.0%)	1 (25.0%)	0 (0%)	0 (0%)	3.75 $\pm$ 0.50	-

\*p-values for the comparison between first- and second-year responses on the 5-point Likert scale,  $p < 0.05$  was considered significant

## Next steps

Stethopedia is a high-quality resource that has been widely used and well-received at our institution. Stethopedia is endorsed by McMaster University. We plan to embed video links into the McMaster Clinical Skills Guide and encourage preceptors to use the resource during teaching sessions. We are also developing a 'diversity in medicine' series that focuses on teaching appropriate clinical skills for underrepresented populations (e.g., dermatological examination in different skin tones). Our study was limited by a low response rate from 3rd year students despite numerous dissemination attempts, representing potential sampling bias. We encourage other schools to consider the development of a similar resource to supplement their clinical skills curricula.

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## References

1. Masic I. E-learning as new method of medical education. *Acta Inform Med.* 2008;16(2):102-117. <https://doi.org/10.5455/aim.2008.16.102-117>
2. Alkhowailed MS, Rasheed Z, Shariq A, et al. Digitalization plan in medical education during COVID-19 lockdown. *Inform Med Unlocked.* 2020;20:100432. <https://doi.org/10.1016/j.imu.2020.100432>
3. Dhillon J, Salimi A, ElHawary H. Impact of COVID-19 on Canadian medical education: pre-clerkship and clerkship students affected differently. *J Med Educ Curric Dev,* 2020;7:2382120520965247. <https://doi.org/10.1177/2382120520965247>
4. George PP, Papachristou N, Belisario JM, et al. Online eLearning for undergraduates in health professions: a systematic review of the impact on knowledge, skills, attitudes and satisfaction. *J Glob Health.* 2014;4(1):010406. <https://doi.org/10.7189/jogh.04.010406>
5. Stethopedia. Available at [www.stethopedia.ca](http://www.stethopedia.ca) [Accessed on July 26, 2021].
6. Profetto J, McCarthy J. McMaster Clinical Skills Guide. 4th ed. Hamilton: Michael G. Degroote School of Medicine, McMaster University; 2019. [Accessed on May 9, 2021].
7. Neville A, Aaron S, Avern H, et al. AFMC national clinical skills working group evidence-based clinical skills document. Association of Faculties of Medicine of Canada; 2005 Available from: <http://clinicalskills.machealth.ca/index.php/content/table5> [Accessed on May 9, 2021].