

Reimagining Residency Selection: Part 1—A Practical Guide to Recruitment in the Post-COVID-19 Era

Mary R. C. Haas, MD
Shuhan He, MD
Kevan Sternberg, MD
Jaime Jordan, MD

Nicole M. Deiorio, MD
Teresa M. Chan, MD, MHPE
Lalena M. Yarris, MD, MCR

The COVID-19 pandemic has dramatically and rapidly changed the status quo for nearly every aspect of medical education, including resident and fellow recruitment.¹ Several organizations, including the Association of American Medical Colleges and the Canadian Resident Matching Service, have issued statements encouraging or mandating virtual-only interview processes for the upcoming recruitment season.²⁻⁴ Further, institutions have placed restrictions on visiting student clinical rotations.⁵ Traditionally, visiting student rotations have functioned as “audition rotations,” whereby applicants and residency programs can assess mutual compatibility.⁶ The loss of these opportunities limits applicants’ ability to experience programs in person, assess program culture, and obtain external letters of recommendation.

In this article we will review the recruitment process and provide guidance for overarching conceptual changes as well as practical, evidence-based recommendations for virtual residency recruitment.

Revisiting Recruitment

Every application cycle, residency programs devote an immense amount of time, effort, and resources to recruit residents who will be successful in their programs. Recruitment costs to programs include development of promotional materials and websites, interview day meals, transportation between clinical sites, and staff and faculty time dedicated to organizing and conducting interview days.^{7,8} Although the cost to residency programs varies, the mean cost of recruiting a single postgraduate year 1 position is estimated at \$9,899.⁹

Recruitment must be conducted thoughtfully in order to maximize the return on investment for applicants and programs. Effective recruitment requires an understanding of what applicants value in residency programs and which applicants are most likely to succeed in the program’s particular clinical learning environment. The 2019 National Resident Matching Program (NRMP) Applicant Survey

identified the top factors influencing applicants’ application and ranking decisions as perceived fit, program reputation, academic medical center program, quality of residents in the program, and the interview day experience.¹⁰ A 2015 study evaluating applicants’ priorities in selecting residency programs identified these top factors: the program’s ability to prepare residents for future training or position, resident morale, faculty availability and involvement in teaching, depth and breadth of faculty, and variety of patients and clinical resources.¹¹

Traditionally, program recruitment strategies have involved creating program branding,¹² fostering a national reputation,¹³ participating in residency and fellowship fairs at large specialty conferences, developing a program website,¹⁴ and having a social media presence.^{12,15} Additionally, many programs have recruited internal candidates through participation in mentorship, teaching activities, and medical school specialty interest groups.¹⁶⁻²⁰ Clerkships have traditionally served as one of the most powerful recruitment tools for both internal and visiting students, offering more prolonged, repeated contact between applicant and program.^{6,21-24}

Reimagining Recruitment

The COVID-19 pandemic has shifted recruitment toward digital media.⁵ This changing landscape provides potential advantages for residency programs that seize this opportunity for innovation. Looking to remote and digital companies may provide inspiration. For residency programs, factors such as geographical region, city, program size, or hospital affiliation are not modifiable. However, key virtual recruitment interventions may specifically highlight program and location strengths. We propose 4 key metrics in a residency program’s digital presence: marketing, content quality, accessibility, and technology.²⁵

Marketing to Expand Reach

Within the realm of marketing, social media provides an increasingly important source of information for applicants to residency programs.¹² Information

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BOX Ideas for Use of Digital Tools for Residency Recruitment**Social Media**

- Create a brief biography for the social media account.
- Dedicate protected time for educational staff to use social media tools to recruit potential applicants.
- Announce social events and open hangouts for medical students via social media.
- Post biographies of current residents and incoming interns including where they live, their thoughts on the food, and cultural advantages of the location.
- Post biographies of faculty with research and academic interests and allow for requests for interviews to be done with these faculty.
- Allow resident takeover days, where potential applicants can live blog or tweet about conference days with residents.
- Allow program directors and key faculty to host “Ask Me Anything” sessions with potential applicants.
- Post links to open educational forums and webinars.
- Use multiple social networks including Twitter, Instagram, Facebook, and WhatsApp.

Digital Space

- Create a digital space for residents, faculty, alumni, and potential applicants using a social network enterprise such as Slack.
- Create open channels where potential applicants, residents, and/or program leadership can join and spend time either synchronously or asynchronously.
- Create clear boundaries for channels where residents, faculty, and medical students can spend time.
- Create channels for people to introduce themselves and collaborate on projects together.

Website

- Continually update the website with new content, news, and highlights.
- Create a search function so that frequently asked questions and evergreen (ie, durable) content can be found.
- Make the website easily searchable (avoid PDFs) so that search engines can find content.
- Highlight the expertise of current residents by including full biographies.
- Create content such as interviews of residents about life in the program, living in the geographical location, and cultural perks.
- Allow residents to discuss their work and passions and highlight successful projects completed by residents.
- Create pages for topics and frequently asked questions.
- Go in depth on questions that are frequently asked, including popular housing resources, transportation needs, and career advice.
- Post webinars so that educational events can continue to provide value after the live event.

sharing via social media may facilitate the residency program application process for applicants and programs. Social media platforms such as Twitter, Instagram, and LinkedIn can give applicants a more intimate look at a program’s culture by featuring events, current faculty and trainees, and content reflective of the program’s mission, vision, and values.¹²

In addition to disseminating content via social media platforms for passive consumption, residency

programs can harness opportunities for bidirectional communication with applicants. Examples of bidirectional communication platforms include Reddit, an online network of communities based on personal interests. Reddit users can host an “Ask Me Anything” (AMA) session, whereby representatives of a residency program allow potential applicants to ask any questions anonymously.²⁶ The AMA format offers a unique opportunity to experiment with an online bidirectional dialogue with participants and to extrapolate from these experiences to determine best practices for the future.²⁷ These AMA opportunities should be considered not only with residency directors, but also with current residents, alumni, faculty, and departmental leadership.

Conveying Your “Brand” via Quality Content

In addition to marketing through social media, residency programs should enhance their digital presence through website content development and curation. Even before COVID-19, residency websites often influenced applicants’ first impression of the program and have been cited as a critically important factor in applicants’ decisions.²⁸ Residency programs can envision their websites as a first point of contact for general applicant communication and education.²⁹ While social media is essential for raising public awareness and excitement about a program, a website gives programs a home base for applicants to explore and find details about the program.

Including links to synchronous communication opportunities, such as Google Hangouts sessions that are open to any potential applicant, gives applicants opportunities to ask questions and can improve transparency.³⁰ Links to asynchronous hangout locations such as open Slack spaces can allow medical students to ask questions and interact with residents at their convenience.³¹ Links to blogs that allow for bidirectional communication permits indexing, inclusivity, and transparency that single closed sessions do not allow.³² Additionally, offering recordings of faculty lectures on the residency program’s website can deliver asynchronous learning opportunities for residents while simultaneously improving the visibility of program faculty.³³

In addition to synchronous and asynchronous communication forums and educational content, the residency program website creates a window into the program’s facilities and life in the area—which can be used pre-interview and also around the time of interviews and afterward.⁸ The limited opportunity for on-site visits makes this component critically important. Programs can harness technology to offer

virtual tours of facilities and surrounding areas.^{34,35} A low-cost video of a walking tour, filmed on a mobile device by a current trainee, can show the location in a way that feels authentic and personal. Note that care must be taken to maintain compliance with HIPAA regulations when filming patient care areas.

Beyond the residency program's digital presence, additional opportunities for pre-interview day interaction with applicants include remote electives or "virtual away rotations". Several specialties have adopted virtual rotation experiences, including emergency medicine,³⁶ neurological surgery,³⁷ and otolaryngology.³⁸ Social enterprise networks such as Slack have been previously used to provide asynchronous curricula for medical students³⁹ and residents,⁴⁰ and could also be opened to potential applicants.³¹

Programs can consider strategies to connect with applicants who are selected for interviews prior to the actual interview. For instance, programs can implement a "buddy system" to link applicants with one or more residents across a variety of training years as points of contact. This may foster longitudinal interactions that give applicants and programs enhanced insights into program-applicant compatibility. Additionally, programs may consider sending applicants a "virtual care package," with institution- or program-branded promotional items or personalized written messages from the program's trainees and/or faculty.

Accessibility and Technological Usability

Accessibility refers to a website's ability to appeal to a broad audience across varying literacy levels, technical aptitudes, and disabilities.⁴¹ This includes a webpage's meta description, readability, and the overall layout of the website. *Technological usability* refers to factors such as technological design, performance user experience, back-end coding infrastructure, and server management.⁴¹ Although the detailed aspects of accessibility and technology are beyond the scope of this article, we recommend that residency programs seek external reviews of these metrics because previous website evaluations have noted significant gaps in these areas.⁴¹ The TABLE displays the methods for increasing digital visibility for recruitment of potential trainees prior to interview day. The BOX provides ideas for using digital tools for residency recruitment.

Acknowledging Limitations of Virtual Recruitment

While digital platforms offer many solutions to the restrictions necessary during the COVID-19 pandemic, limitations exist. The first limitation involves the *actual creation* of the digital media and

materials for promoting the residency program.⁴² Creating and updating a program's website and promotional materials requires knowledge, money, and personal investment by program leaders. However, this can be a great opportunity for a junior faculty member, who has not yet carved out an academic niche. Involving residents who may have interest or prior experience in graphic and digital design can distribute the work and increase the relevance of the content to applicants.

Another limitation involves the program's *use* of technology, including the buy-in, effort, and knowledge to use different media. The goal is to create ways to interact with potential candidates to provide a polished yet authentic sense of the program, the people, and the overall culture. This engagement is critical and requires active and motivated faculty, residents, and others to reach out and promote the program and be available to interact and answer questions. Achieving the right balance of digital presence is a challenge.

The most important limitation is that real-life interactions, city and site visits, and personal experiences cannot be fully replicated using technology. Social interactions are reported to be extremely influential on an applicant's decision-making process and are difficult to replicate with an online format.³⁵ In addition to social experiences, immersion in a program and community through a visiting rotation is hard to recreate. Regardless of how well and creatively technology is used, it is unlikely to supplant actual in-person experiences entirely.³⁵

Conclusions

The transition to virtual recruitment strategies in the 2020–2021 NRMP Match cycle has begot new challenges and opportunities for residency program leadership. Special attention should be paid to 4 key factors: marketing via social media, website content quality, accessibility, and technological usability. Navigating a program's creation and use of recruitment-focused technology can be resource-intensive and requires achieving a balance between providing both a polished and authentic representation of the program. Although a program's digital presence cannot fully replace the power of in-person social interactions, virtual recruitment can differentiate a program among applicants when implemented with an evidence-based and innovative approach.

In these tumultuous times, it is our hope that this introduction to virtual recruitment strategies may inspire graduate medical education leaders to not just translate their current processes into the digital world, but rather use this opportunity to truly rethink their

TABLE

Methods for Increasing Digital Visibility for Recruitment Prior to Interview Day

Reason	Action/Purpose	Media	Use
Expanding your reach	Social media: allows for content dissemination and program branding	Twitter	Tweet educational content from residency programming Engage with individuals and other residency programs within and outside the institution Acknowledge accomplishments of residency program trainees and faculty
		Instagram	Post photos and videos of the residency community that reflect the culture of the program; include formal and impromptu residency gatherings
Conveying your “brand” via quality content	“Ask Me Anything”: allows bidirectional communication	Blog/Reddit	Provides an opportunity for applicants to ask questions of program representatives, including anonymously, in a transparent and authentic fashion
	Video or virtual tours: showcase the program’s facilities and location	Video or virtual tour platforms	Provides applicants a window into the everyday surroundings they will experience as a trainee
Accessibility	Asynchronous communication: allows for questions, collaboration on projects	Slack Microsoft Teams	Open channels for asking questions, collaborating on projects
	Synchronous communication: facilitates open dialogue and communication	Google Hangouts Zoom Skype	Host resident hangout sessions periodically throughout the interview cycle, which applicants can attend at any time, not just during the interview day.
Technology	Mobile responsiveness	Use a preexisting web framework that builds in this function	Over 50% of website visits are now on mobile; ensure that your website can handle screens of different sizes; use tools that are free and simple (ie, Wordpress, Magento, or Bootstrap)
	Search engine indexing	Yoast Search Engine Optimization tool	Ensuring content, such as teaching materials, is easily searchable enhances trust and conveys the message that your residency is a great place to learn

recruitment and selection processes going forward. Now is the time to pause before repeating the same old processes, examine the best evidence available, and make our recruitment processes better.

References

- Joshi A, Bloom DA, Spencer A, Gaetke-Udager K, Cohan RH. Video interviewing: a review and recommendations for implementation in the era of COVID-19 and beyond. *Acad Radiol*. Published online June 8, 2020. doi:10.1016/j.acra.2020.05.020
- Association of American Medical Colleges. Conducting Interviews During the Coronavirus Pandemic. <https://www.aamc.org/what-we-do/mission-areas/medical-education/conducting-interviews-during-coronavirus-pandemic>. Accessed August 11, 2020.
- The Association of Faculties of Medicine of Canada. AFMC decision regarding the 2021 R-1 match. <https://afmc.ca/en/node/357>. Accessed August 11, 2020.
- CaRMS. Interviews. <https://www.carms.ca/match/r-1-main-residency-match/faculty-file-reviewer/interviews-r1-reviewer>. Accessed August 11, 2020.

5. Akers A, Blough C, Iyer MS. COVID-19 implications on clinical clerkships and the residency application process for medical students. *Cureus*. 12(4). doi:10.7759/cureus.7800
6. Mueller PS, McConahey LL, Orvidas LJ, Lee MC, Bowen JM, Beckman TJ, et al. Visiting medical student elective and clerkship programs: a survey of US and Puerto Rico allopathic medical schools. *BMC Med Educ*. 2010;10(1):41. doi:10.1186/1472-6920-10-41.
7. Shah SK, Arora S, Skipper B, Kalishman S, Timm TC, Smith AY. Randomized evaluation of a web based interview process for urology resident selection. *J Urol*. 2012;187(4):1380–1384. doi:10.1016/j.juro.2011.11.108.
8. Sternberg K, Jordan J, Haas MRC, He S, Deiorio NM, Yarris LM, et al. Reimagining residency selection: part 2—a practical guide to interviewing in the post-COVID-19 era. *J Grad Med Educ*. 2020;12(5):xxx–xxx.
9. Brummond A, Sefcik S, Halvorsen AJ, Chaudhry S, Arora V, Adams M, et al. Resident recruitment costs: a national survey of internal medicine program directors. *Am J Med*. 2013;126(7):646–653. doi:10.1016/j.amjmed.2013.03.018.
10. National Resident Matching Program DR, Committee R. *Results of the 2013 NRMP Applicant Survey by Preferred Specialty and Applicant Type*. Washington, DC: National Resident Matching Program; 2013.
11. Phitayakorn R, Macklin EA, Goldsmith J, Weinstein DF. Applicants' self-reported priorities in selecting a residency program. *J Grad Med Educ*. 2015;7(1):21–26. doi:10.4300/JGME-D-14-00142.1.
12. Shappell E, Shakeri N, Fant A, Branzetti J, Gisondi M, Babcock C, et al. Branding and recruitment: a primer for residency program leadership. *J Grad Med Educ*. 2018;10(3):249–252. doi:10.4300/JGME-D-17-00602.1.
13. Barajaz M, Turner T. Starting a new residency program: a step-by-step guide for institutions, hospitals, and program directors. *Med Educ Online*. 2016;21(1):32271. doi:10.3402/meo.v21.32271.
14. Embi PJ, Desai S, Cooney TG. Use and utility of web-based residency program information: a survey of residency applicants. *J Med Internet Res*. 2003;5(3):e22. doi:10.2196/jmir.5.3.e22.
15. Sterling M, Leung P, Wright D, Bishop TF. The use of social media in graduate medical education: a systematic review. *Acad Med*. 2017;92(7):1043–1056. doi:10.1097/ACM.0000000000001617.
16. Schmidt LE, Cooper CA, Guo WA. Factors influencing US medical students' decision to pursue surgery. *J Surg Res*. 2016;203(1):64–74. doi:10.1016/j.jss.2016.03.054.
17. Tesche LJ, Feins RH, Dedmon MM, Newton KN, Egan TM, Haithcock BE, et al. Simulation experience enhances medical students' interest in cardiothoracic surgery. *Ann Thorac Surg*. 2010;90(6):1967–1974. doi:10.1016/j.athoracsur.2010.06.117.
18. Pitre CJ. The unique educational value of emergency medicine student interest groups 1 1 AAEM Medical Student Forum is coordinated by Raymond Roberge, md, of Ohio Valley Medical Center, Wheeling, West Virginia. *J Emerg Med*. 2002;22(4):427–428. doi:10.1016/S0736-4679(02)00442-0.
19. Schwartz MD, Linzer M, Babbott D, Divine GW, Broadhead E. Medical student interest in internal medicine: initial report of the Society of General Internal Medicine Interest Group survey on factors influencing career choice in internal medicine. *Ann Intern Med*. 1991;114(1):6–15.
20. Gharahbaghian L, Hindiyyeh R, Langdorf MI, Vaca F, Anderson CL, Kahn JA, et al. The effect of emergency department observational experience on medical student interest in emergency medicine. *J Emerg Med*. 2011;40(4):458–462. doi:10.1016/j.jemermed.2010.02.020.
21. Spollen JJ, Beck Dallaghan GL, Briscoe GW, Delanoche ND, Hales DJ. Medical school factors associated with higher rates of recruitment into psychiatry. *Acad Psychiatry*. 2017;41(2):233–238. doi:10.1007/s40596-016-0522-2.
22. Nellis JC, Eisele DW, Francis HW, Hillel AT, Lin SY. Impact of a mentored student clerkship on underrepresented minority diversity in otolaryngology-head and neck surgery. *Laryngoscope*. 2016;126(12):2684–2688. doi:10.1002/lary.25992
23. Rabinowitz HK. The effect of a required residency based student clerkship on resident selection. *Fam Med*. 1986;18(5):287–289.
24. Jacobson RA, Daly SC, Schmidt JL, Fleming BP, Krupin A, Luu MB, et al. The impact of visiting student electives on surgical Match outcomes. *J Surg Res*. 2015;196(2):209–215. doi:10.1016/j.jss.2015.03.031.
25. Huerta TR, Hefner JL, Ford EW, McAlearney AS, Menachemi N. Hospital website rankings in the United States: expanding benchmarks and standards for effective consumer engagement. *J Med Internet Res*. 2014;16(2):e64. doi:10.2196/jmir.3054.
26. Campbell L, Evans Y, Pumper M, Moreno MA. Social media use by physicians: a qualitative study of the new frontier of medicine. *BMC Med Inform Decis Mak*. 2016;16(1):91. doi:10.1186/s12911-016-0327-y.
27. Hara N, Abbazio J, Perkins K. An emerging form of public engagement with science: Ask Me Anything (AMA) sessions on Reddit r/science. *PloS One*. 2019;14(5):e0216789. doi:10.1371/journal.pone.0216789.
28. Long T, Dodd S, Licatino L, Rose S. Factors important to anesthesiology residency applicants during recruitment. *J Educ Perioper*. 2017;19(2):E604.

29. Wen K-Y, Kreps G, Zhu F, Miller S. Consumers' perceptions about and use of the internet for personal health records and health information exchange: analysis of the 2007 Health Information National Trends Survey. *J Med Internet Res*. 2010;12(4):e73. doi:10.2196/jmir.1668.
30. Chan T, Joshi N, Lin M, Mehta N. Using Google Hangouts on Air for medical education: a disruptive way to leverage and facilitate remote communication and collaboration. *J Grad Med Educ*. 2015;7(2):171–173. doi:10.4300/JGME-D-14-00545.1.
31. Sarkisian SA, Kagel A. The use of slack for medical residency development and recruiting. *BMJ Health Care Inform*. 2018;25(3):194–195. doi:10.14236/jhi.v25i3.1019.
32. Khadpe J, Joshi N. How to utilize blogs for residency education. *J Grad Med Educ*. 2016;8(4):605–606. doi:10.4300/JGME-D-16-00357.1.
33. Kircher MF, Hines-Peralta A, Boiselle PM, Donohoe K, Siewert B. Implementation of screen-capture video recordings of resident conferences in an academic radiology department. *Acad Radiol*. 2010;17(2):255–263. doi:10.1016/j.acra.2009.07.028.
34. Zertuche J-P, Connors J, Scheinman A, Kothari N, Wong K. Using virtual reality as a replacement for hospital tours during residency interviews. *Med Educ Online*. 2020;25(1):1777066. doi:10.1080/10872981.2020.1777066.
35. Kenigsberg AP, Khouri RK, Kuprasertkul A, Wong D, Ganesan V, Lemack GE. Urology residency applications in the COVID-19 era. *Urology*. Published online June 17, 2020. doi:10.1016/j.urology.2020.05.072.
36. Chandra S, Laoteppitaks C, Mingioni N, Papanagnou D. Zooming-out COVID-19: Virtual clinical experiences in an emergency medicine clerkship. *Med Educ*. 2020 Jun 5:10.1111/medu.14266. doi: 10.1111/medu.14266 [Epub ahead of print]
37. Dawoud RA, Philbrick B, McMahon JT, Douglas JM, Bhatia N, Faraj R, et al. Letter to the editor “virtual neurosurgery clerkship for medical students.” *World Neurosurg*. 2020;139. doi:10.1016/j.wneu.2020.05.085.
38. Farlow JL, Marchiano EJ, Fischer IP, Moyer JS, Thorne MC, Bohm LA. Addressing the Impact of COVID-19 on the Residency Application Process Through a Virtual Subinternship. *Otolaryngol Head Neck Surg*. 2020 June 9;0194599820934775. doi:10.1177/0194599820934775.
39. Nagji A, Yilmaz Y, Zhang P, Dida J, Cook-Chaimowitz L, Dong JK, et al. Converting to connect: a rapid RE-AIM evaluation of the digital conversion of a clerkship curriculum in the age of COVID-19. *AEM Educ Train*. 2020 June 9. E-published ahead of print. doi:10.1002/aet2.10498.
40. Hill J, LaFollette R, Grosso R, Axelson D, Hart K, McDonough E. Using Slack to facilitate virtual small groups for individualized interactive instruction. *AEM Educ Train*. 2019;3(1):92–95. doi:10.1002/aet2.10201.
41. Calvano JD, Fundingsland EL Jr, Lai D, Silacci S, Raja AS, He S. JMIR Preprints #20721: website rankings for digital health centers in the USA: applying usability testing for public engagement. Published online May 26, 2020. <https://preprints.jmir.org/preprint/20721>.
42. Hariton E, Bortoletto P, Ayogu N. Residency interviews in the 21st century. *J Grad Med Educ*. 2016;8(3):322–324. doi:10.4300/JGME-D-15-00501.1.



Mary R. C. Haas, MD, is Instructor and Assistant Program Director, Department of Emergency Medicine, University of Michigan Medical School; **Shuhan He, MD**, is Clinical Fellow, Harvard University, Department of Emergency Medicine, Center for Innovation in Digital HealthCare, Massachusetts General Hospital; **Kevan Sternberg, MD**, is Associate Professor and Director of Urologic Research, Division of Surgery, University of Vermont; **Jaime Jordan, MD**, is Assistant Clinical Professor, and Vice Chair, Acute Care College, Department of Emergency Medicine, David Geffen School of Medicine at UCLA, and Associate Program Director, Department of Emergency Medicine, Ronald Reagan UCLA Medical Center; **Nicole M. Deiorio, MD**, is Professor, Department of Emergency Medicine, and Associate Dean, Student Affairs, Virginia Commonwealth University School of Medicine, and Executive Editor, *Journal of Graduate Medical Education (JGME)*; **Teresa M. Chan, MD, MHPE**, is Associate Professor, Division of Emergency Medicine, Department of Medicine, and Assistant Dean, Program for Faculty Development, Faculty of Health Sciences, McMaster University, Hamilton, Ontario, Canada, Adjunct Scientist, McMaster Program for Education Research, Innovation, and Theory, and Associate Editor, *JGME*; and **Lalena M. Yarris, MD, MCR**, is Professor, Vice Chair for Faculty Development, and Education Scholarship Fellowship Co-Director, Department of Emergency Medicine, Oregon Health & Science University, and Deputy Editor, *JGME*.

Corresponding author: Teresa M. Chan, MD, MHPE, McMaster University, Department of Medicine, 237 Barton Street East, McMaster Clinics, Suite 255, Hamilton, Ontario L8L 2X2, Canada, 905.906.8981, teresa.chan@medportal.ca