



# Development and Assessment of Early Utilization of the Standardized Letter of Recommendation for Use in the Radiology Residency Match

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**Rationale and Objectives:** Letters of recommendation are essential for residency applications. Traditionally, narrative letters have been used. Standardized letters of recommendation (SLOR) have been developed and have benefits to the writer and reader. The goal was to develop an informative, meaningful, and efficient SLOR for the radiology residency Match and to assess its early use.

**Materials and Methods:** An Association of University Radiologists (AUR) Research and Education Venture Fund Grant was awarded for the development of a SLOR for use in the radiology residency Match. Grant recipients developed the letter and modifications were based on feedback from the Alliance of Medical Student Educators in Radiology (AMSER) SLOR task force and a larger task force including additional AUR and Association of Program Directors in Radiology (APDR) members. AUR and APDR members were surveyed in 2020 to assess the radiology SLOR.

**Results:** The radiology SLOR became available for use in September 2018. It highlights the top six traits or abilities deemed most valued in a resident candidate and guides the writer to develop a concrete narrative. Top perceived benefits of the Radiology SLOR are ease of reading and interpretation. Top perceived drawbacks are an impersonal format and concerns regarding program directors' perceptions of the new SLOR. SLOR utilization increased in the second year of availability.

**Conclusion:** The radiology SLOR was developed and first used in 2018. Its use increased over two years and will likely continue to increase given the perceived benefits and increasing awareness of the SLOR.

**Key Words:** Letter; Radiology; Recommendation; Residency; Standardized.

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## INTRODUCTION

Letters of recommendation are an essential part of the application for every residency, including radiology. Traditionally free-form narrative letters of recommendation have been composed and submitted to support applicants applying to radiology and other medical residency programs. A standardized letter of recommendation (SLOR) provides structure and therefore can guide the writer and the

reader, simplifying both letter composition and interpretation respectively.

## BACKGROUND

A strong narrative letter of recommendation provides important information. The writer informs the reader of their academic background and years of experience, as well as the length and context of the relationship the author has had with the candidate being recommended. The applicant's qualifications for a given residency are described and supported with specific examples of the applicant's personal traits, performance, and skills. The writer may provide insight into unique aspects of the applicant. The applicant often is compared to current peers and predecessors and finally, a global recommendation with a reference range is provided (1,2).

Unfortunately, not all narrative letters are substantive or meaningful. Studies of narrative letters have revealed many drawbacks of these letters (1-5). For example, narrative letters

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often contain excessive praise and flattery (3). They can be hard to interpret, employing a hierarchy of praise phrasing or code words that may mean something very specific to the writer, but may not have that same meaning for different readers, which may contribute to poor inter- or intra-rater reliability (3). Narrative letters can be very vague and lack specific examples of the candidate's demonstrated abilities, or redundant, simply restating information found elsewhere in the application (3). Narrative letters may also contain elements of gender bias (2,5) and take longer to interpret (1,3).

SLORs have recently been used in the orthopedic surgery residency Match (6,7), and have been used for many years in the dermatology (3) and otolaryngology (1,2) Matches. Standardized letters have been in use for over two decades in the emergency medicine Match (8).

Comparing the SLOR to narrative letters in dermatology, Kaffenberger et al. found that the SLOR was faster to interpret than the narrative letter, saving on average one minute per letter, ( $p < 0.0001$ ), and had higher intra-rater and inter-rater reliability for determining the applicant's personality, work ethic and reliability ( $p < 0.001$ ), had less exaggeration of positive traits ( $p < 0.0001$ ), and provided two more pieces of information regarding the status of the author/student relationship (3). Assessing SLORs in the otolaryngology Match, Perkins et al. noted that the SLOR took less time to interpret and to write, averaging less than 5 minutes to write (1). Additionally, there was higher inter-rater reliability regarding assessment of the applicant's qualifications for otolaryngology, the author's global assessment and summary statement, and for rating the overall letter ranking (1).

A SLOR was developed for use in the emergency medicine residency Match in 1997. A survey of the Council of Emergency Medicine Residency Directors (CORD) was published in 2014 (9). One hundred fifty of the 159 program directors (94.3%) responded to the survey, which speaks to the value and utility of the standardized letter in the emergency medicine Match. However, respondents noted that some writers did not follow instructions, some questions were not answered, and some authors modified the SLOR or used a longer narrative. Nonetheless, 99.3% supported the SLOR as an evaluative instrument and 92.7% indicated that the SLOR was the number one aspect of the application that they use in making their decision of which applicants to invite for an interview (9). The SLOR in the emergency medicine Match has evolved in form and function to become a Standardized Letter of Evaluation (SLOE) with a required online electronic format (10).

The goal of this project was to develop a SLOR for use in the radiology residency Match, with the hope that it would provide more informative, meaningful, and efficient communication between letter writers and resident selection teams.

## MATERIALS AND METHOD

A Research and Education Venture Fund Grant from the Association of University Radiologists (AUR) was awarded

to three AUR members in 2017 to develop a SLOR for use in the radiology residency Match. The SLOR used in otolaryngology, dermatology, and emergency medicine were reviewed and a literature search was performed investigating the use of SLORs in the medical literature. These SLORs had some common features which influenced the structure of the radiology SLOR.

The first draft of the radiology SLOR was reviewed by the newly formed SLOR Task Force composed of twelve members of the Alliance of Medical Student Educators in Radiology (AMSER). The revised letter was sent to AUR members including members of AMSER and the Alliance of Clinical Educators in Radiology (ACER), as well as to the Association of Program Directors in Radiology (APDR) members for additional feedback. Excluding the authors, 79 people from the membership of the AUR, AMSER, ACER, and APDR ultimately provided feedback by way of surveys or emails, which contributed to the sequential revisions of the SLOR. The final version of the letter was first posted on the AUR website and was available for use in September of 2018.

Feedback to the developers of the letter was continuously available via the combined Radiological Society of North America (RSNA) and AUR reporting feedback email link. Given the scant feedback from 2018 to 2019, in order to assess membership awareness of the availability of the SLOR, its real and potential use, usefulness, and composition, a two-part survey was created and sent to members of the AUR and APDR on March 16, 2020. Membership to the APDR can occur with or without concurrent membership to the AUR.

The first part of the survey was composed of 11 brief questions that assessed the awareness, use, and usefulness of the SLOR. The survey taker had the option of ending the survey at that point. The second part of the survey gave the survey taker the opportunity to provide suggestions for improvement regarding the composition and elements of the letter. In this portion, the entire radiology SLOR was printed and divided into sections. The survey taker had a free text box to write suggestions for letter modification for each individual section.

The survey was distributed on March 16, 2020, before Match Day. This would usually be a quiet time after program directors had completed their Match rank lists and before the matches are announced. Letter readers would have just read many letters and would likely have many useful ideas to share at that time. Unfortunately, due to the arrival of the Covid-19 virus to the United States, this usually quiet time became very busy with transitions to social distancing and remote teaching and working. Nonetheless, there were several responses.

Based on AUR/APDR email data, the survey was sent to 923 people in the AUR and to 112 people in the APDR. Of the emails sent, 511 (49%) were opened. Eighty-four of the email recipients, (8%), opened the email and continued to the survey. The survey link was embedded in the AUR/APDR email and some likely forwarded the survey to other radiologists in their department or other at institutions and or

accessed the survey outside of the email link given that 91 surveys, presumably completed by 91 different individuals, were completed and submitted March 16 through June 1, 2020. The survey was unofficially closed on June 1, 2020, and data was aggregated and sent to the authors for assessment on June 2, 2020. The link however remained open and unbeknownst to the authors; a single additional survey was completed weeks later. The information from that single late survey response was not included in the survey results that follow.

## RESULTS

The final version of the radiology SLOR has four sections (Fig 1). Prior to Section 1, there are boxes to indicate whether the student has waived the right to view the letter.

*Section 1: Student and Author Data.* This includes applicant identifiers and author identifiers with contact information and relevant teaching experience. There are check boxes and free text options that help to define the nature and duration of the working relationship of the applicant and the letter writer.

*Section 2: Applicant's Actions and Traits Demonstrated Routinely.* The top six actions and traits that were deemed most valued in a candidate for radiology residency are addressed in Section 2. These are that the student communicates effectively, demonstrates a strong work ethic, exhibits intellectual curiosity, possesses a strong fund of medical knowledge, shows leadership, and works well with a team. The student is then compared to their peers regarding the student's demonstrated qualities and actions in each of these areas. To do this the writer is asked to rate the student from 0 to 100 percentile for each action and trait. The writer is instructed to provide a concrete example in the narrative section, Section 4, for any rating in the top 10 percent, the 91 to 100 percentile. There is also an option to state that the writer cannot assess the student regarding any or all of the valued traits. This instruction, to support high ratings with performance examples in the narrative section, is intended to help create a substantive letter with specific examples of the student's abilities as they were demonstrated in the workplace or learning center, while simultaneously minimizing praise inflation.

*Section 3: Global Assessment.* In this section, the author indicates their overall assessment of the candidate on a 0 to 100 percentile scale. In both Section 2 and Section 3, the letter writer indicates if the student is being compared to all students that the writer has ever worked with or to students that the author had worked with within the last 5 years.

*Section 4: Narrative Section.* In Section 4, the author is encouraged to provide concrete examples of the student's abilities and traits that were rated in Section 2 and to provide supportive information that is not found elsewhere in the application. A 300-word limit is suggested but is not enforced. The provided text box is expandable.

The AUR Executive Committee and the APDR Board of Directors approved the use of the Standardized Letter of Recommendation in 2018. The radiology SLOR and instructions for its use were officially posted on the AUR website on September 7, 2018. A feedback link was posted on the AUR/AMSER website for letter users to have a place to send feedback and suggestions regarding the SLOR. The link remains active <https://www.aur.org/resources/standardized-letter-recommendation>. Feedback can also be sent directly via email to [aur@rsna.org](mailto:aur@rsna.org) with the subject line: Standardized Letter of Recommendation (SLOR).

## FEEDBACK AND FOLLOW-UP SURVEY

After receiving feedback in 2018 that the file size was too large to be accepted by the Electronic Residency Application Service (ERAS), the format was changed from a PDF to a modifiable Word document (Fig 1).

The instructions for uploading the letter to ERAS were modified, and it was confirmed with ERAS personnel that all letters could be uploaded free of charge by ERAS staff. The writer simply has to email the letter to ERAS at [eraslorportal@aamc.org](mailto:eraslorportal@aamc.org) and in the subject line put: Reformat LoR.

## SURVEY RESULTS

The 91 respondents self-identified their departmental role or roles, as shown in Table 1.

The survey asked, "How important is the standardized or narrative letter of recommendation in determining which candidates you will invite for an interview?" Eighty-seven people replied to this question. A letter of recommendation is: extremely important, main factor (9.2%) moderately important (39.1%), only important if extreme (27.6%), and rarely used as a deciding factor (17.2%). Other comments included that a letter has increased value if the reader knows the writer, or if the letter declares a strong candidate or hints at a suboptimal candidate.

Survey takers were asked to speculate on the importance of the letters of recommendation after the STEP 1 examination becomes Pass/Fail. Eight-eight people replied indicating that the importance of the letter would have a marked increase (26.1%), a moderate increase (50%), would not change (22.7%), would have a moderate decrease (zero %), or a marked decrease (1.1%).

Regarding the current use of the SLOR, the survey asked, "How many radiology SLORs did you receive during this year's radiology Match?" This referred to the 2019-2020 Match cycle. They were then asked, "How many radiology SLORs did you receive during the 2018-2019 Match cycle (the first year the letter was available)?" 61.4% reported receiving at least one SLOR the first year it was in use and that increased to 76.7% for the 2019-2020 Match cycle. The number of respondents that received 6-25 letters in a year more than tripled and those that received more than 25

### Radiology Residency Match Standardized Letter of Recommendation

The student has waived the right to view this letter.

Yes  No

Section 1: Student and Author Data

Applicant's Name: \_\_\_\_\_

AAMC ERAS ID no. \_\_\_\_\_

Reference Provided by:

Name: \_\_\_\_\_

Degree and Title: \_\_\_\_\_

Specialty area of practice: \_\_\_\_\_

Contact phone: \_\_\_\_\_ Email: \_\_\_\_\_

Institution: \_\_\_\_\_

Years of experience teaching: Medical students:  Residents:  Fellows:

Number of medical students you assess/evaluate per year:  
 0-5  6-20  21-50  51-100  >100

How long have you known the applicant? \_\_\_\_\_

Nature of contact with the applicant: (check all that apply)

Direct Clinical Contact:  0-20 hours  21-40 hours  >40 hours

Direct Research Contact:  0-20 hours  21-40 hours  >40 hours

Radiology Residency Program Director:  years,  Associate Program Director:  years

Radiology clerkship director:  years

Medical student course director, title of course(s):  years

\_\_\_\_\_

Other \_\_\_\_\_

Section 4: Narrative Section (300 word limit is suggested)

This narrative section gives you the opportunity to provide specific examples of one or more demonstrated qualities listed in Section 2. Concisely describe specific events. You may also provide insight into unique qualities of the candidate and details of the following: a skill set or strengths that will be useful in residency; the student's relevant special interests outside of medicine; and/or supportive information not found elsewhere in the application.

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Print the completed standardized letter of recommendation.

Sign the printed letter, then submit PDF version to ERAS or send to other intended recipient.

Section 2: Applicant's actions and traits demonstrated routinely

Indicate if you are comparing to:  All medical students  Students in the last 5 years

Indicate the applicant's rating with an "X" on the scales below relative to the students that you have taught (e.g. In bottom 10th percentile to the top 9 – 100<sup>th</sup> percentile, or type in a specific percentile in the range box).

Provide concrete examples in the narrative section for ratings in the top 91-100<sup>th</sup> percentile.

Communicates effectively

| 0-10%ile lowest | 11-20 | 21-30 | 31-40 | 41-50 | 51-60 | 61-70 | 71-80 | 81-90 | 91-100 highest | Cannot assess |
|-----------------|-------|-------|-------|-------|-------|-------|-------|-------|----------------|---------------|
|                 |       |       |       |       |       |       |       |       |                |               |

Demonstrates a strong work ethic

| 0-10%ile lowest | 11-20 | 21-30 | 31-40 | 41-50 | 51-60 | 61-70 | 71-80 | 81-90 | 91-100 highest | Cannot assess |
|-----------------|-------|-------|-------|-------|-------|-------|-------|-------|----------------|---------------|
|                 |       |       |       |       |       |       |       |       |                |               |

Exhibits intellectual curiosity

| 0-10%ile lowest | 11-20 | 21-30 | 31-40 | 41-50 | 51-60 | 61-70 | 71-80 | 81-90 | 91-100 highest | Cannot assess |
|-----------------|-------|-------|-------|-------|-------|-------|-------|-------|----------------|---------------|
|                 |       |       |       |       |       |       |       |       |                |               |

Possesses a strong fund of medical knowledge

| 0-10%ile lowest | 11-20 | 21-30 | 31-40 | 41-50 | 51-60 | 61-70 | 71-80 | 81-90 | 91-100 highest | Cannot assess |
|-----------------|-------|-------|-------|-------|-------|-------|-------|-------|----------------|---------------|
|                 |       |       |       |       |       |       |       |       |                |               |

Shows Leadership

| 0-10%ile lowest | 11-20 | 21-30 | 31-40 | 41-50 | 51-60 | 61-70 | 71-80 | 81-90 | 91-100 highest | Cannot assess |
|-----------------|-------|-------|-------|-------|-------|-------|-------|-------|----------------|---------------|
|                 |       |       |       |       |       |       |       |       |                |               |

Works well with a team

| 0-10%ile lowest | 11-20 | 21-30 | 31-40 | 41-50 | 51-60 | 61-70 | 71-80 | 81-90 | 91-100 highest | Cannot assess |
|-----------------|-------|-------|-------|-------|-------|-------|-------|-------|----------------|---------------|
|                 |       |       |       |       |       |       |       |       |                |               |

Section 3: Global Assessment

Compared to other medical students that you have assessed, approximately where does this candidate rate in percentile?

Indicate if you are comparing to:  All Medical Students  Students in the last 5 years

Indicate the applicant's global assessment rating with an "X" on the scales below or type in a specific percentile in the relative range box below.

| 0-10%ile lowest | 11-20 | 21-30 | 31-40 | 41-50 | 51-60 | 61-70 | 71-80 | 81-90 | 91-100 highest |
|-----------------|-------|-------|-------|-------|-------|-------|-------|-------|----------------|
|                 |       |       |       |       |       |       |       |       |                |

Figure 1. Radiology standardized letter of recommendation for use in the radiology residency Match. (Color version of figure is available online.)

**TABLE 1. 2020 Survey Respondents. There were 91 Total Respondents, Some of Which Held More Than 1 Role**

| Title                                   | Number of Respondents |
|---|-----------------------|
| Residency Program Director              | 40                    |
| Associate or Assistant Program Director | 17                    |
| Clinical Faculty                        | 29                    |
| Clerkship Director                      | 12                    |
| Vice Chair for Education                | 10                    |
| Department Chair                        | 2                     |
| Research Faculty                        | 2                     |
| Former Residency Program Director       | 1                     |
| Former Clerkship Director               | 1                     |
| Medical Student Advisor                 | 1                     |
| Director of Medical Student Education   | 1                     |
| Program Administrator                   | 1                     |
| Chair of Resident Selection Committee   | 1                     |
| Member of Resident Selection Committee  | 1                     |
| Fellowship Director                     | 1                     |

SLORs more than doubled the second year that the letter was used (Table 2).

Eighty-eight people answered the question “Did you choose to use the SLOR when writing letters?” 72% responded that they never did, 8% used it less than half of the time, 5.7% used it more than half of the time and 13.6% always used the SLOR. The main reason offered by the group that stated that they never used the standardized letter included: 26.4% do not write letters, 12.5% were not aware that the SLOR was available for use, 36.1% did not like the SLOR format, and 29% had a variety of other reasons, including that they prefer their own template. None of the 72 respondents that offered reasons for not using the SLOR selected the option “I had technical difficulty uploading the SLOR to ERAS”. Sixty percent of the 91 survey respondents were not aware that SLORs were used in dermatology, otolaryngology, orthopedic surgery, and emergency medicine residency Matches.

**TABLE 2. SLOR Use 2018-2020. This Table Shows the Number of Letters That were Reportedly Received by Survey Takers the First Year the Radiology SLOR was Available (2018-2019) and the Second Year That the SLOR was Used (2019-2020) in the Radiology Residency Match**

| Match Cycle                | 2018-2019<br>(n=83) | 2019-2020<br>(n=86) |
|----------------------------|---------------------|---------------------|
| No letters were received   | 38.6%               | 23.3%               |
| Some letters were received | 61.4%               | 76.7%               |
| 1-5 letters                | 48.2%               | 32.6%               |
| 6-10 letters               | 6%                  | 22.1%               |
| 11-25 letters              | 3.6%                | 14%                 |
| >25 letters                | 3.6%                | 8.1%                |

The survey takers were asked to indicate perceived benefits and drawbacks to using the SLOR compared to composing a narrative letter. For both, there were items listed that could be checked and there was a free text box. Respondents were asked to check all that apply and to write in benefits and drawbacks that were not listed in the free text box.

Respondents were asked to indicate perceived benefits of the radiology SLOR; results are shown in Table 3.

When asked to indicate perceived drawbacks to using the radiology SLOR responses included that the SLOR has a less personal format (66%), the writers had concerns about how the SLOR would be perceived by program directors (38%), the SLOR is new and untested in radiology (21%), and that the letter writers did not know the candidates well enough to give specific examples of the student's traits as requested in the SLOR (19%).

The second part of the survey gave the survey taker the opportunity to provide suggestions for improvement regarding the composition and elements of the letter. None of the respondents continued to section two to suggest structure modifications.

## DISCUSSION

The radiology SLOR is similar to SLORs used in other medical specialties in that it focuses the letter writer to provide details about their relationship with the applicant, rate the student on a 0 to 100 percentile scale in specific areas considered important for success in residency, and to provide a global assessment. These assessments are substantiated with specific examples from the letter writer's interactions with the student and are detailed in the narrative section.

With input from the radiology education community as detailed above, six important criteria were selected for

**TABLE 3. Perceived Benefits of the SLOR. Percentage of Respondents Indicating Each Perceived Benefit of the SLOR are Shown**

| Perceived Benefit                    | Percentage of Respondents |
|--------------------------------------|---------------------------|
| Easier to read                       | 54                        |
| Easier to interpret                  | 49                        |
| Saves time                           | 43                        |
| Easier to write                      | 42                        |
| Facilitates rating candidates        | 38                        |
| Greater inter-rater reliability      | 36                        |
| More transparent                     | 30                        |
| More concrete examples of strengths  | 24                        |
| More concrete examples of weaknesses | 18                        |
| More objective                       | 17                        |
| Less praise inflation                | 17                        |
| Less grade inflation                 | 11                        |
| Limits gender bias                   | 10                        |

inclusion in the SLOR: 1) communicates effectively, 2) demonstrates a strong work ethic, 3) exhibits intellectual curiosity, 4) possesses a strong fund of medical knowledge, 5) shows leadership and 6) works well with a team.

The SLOR aims to help both the writer and the reader be efficient. This is achieved by standardizing the location of specific information within the letter and by guiding the writer to produce a robust substantive letter rather than a string of unsubstantiated superlatives. In the survey, 19% of the 86 respondents that identified perceived drawbacks to using the SLOR stated that they do not know the applicants well enough to use the SLOR. This acknowledges that unlike narrative letters, the SLOR requires the letter writer to know the student well enough to rate various skills and traits and to provide examples of the student's performance in the narrative section. This likely produces a more meaningful letter.

The narrative section has a suggested 300-word limit, though this is not enforced, as the text box is expandable. The suggested limit encourages brevity. However, the expandable text box allows the author to provide rich and concrete examples of the student's abilities and traits that were rated in the top 10%, as well as allowing inclusion of supportive information not found elsewhere. The writer is not forced to omit any meaningful and supportive information simply because of a word limit. The otolaryngology SLOR 2014 revision has no word limit in the narrative section (11). The dermatology letter limits the writer to 200 words and focuses the author to describe the candidate's greatest strength, but additional comments are welcomed (12). The emergency medicine 2016–2017 letter requests that authors limit the narrative about the student to 250 words and has a separate requested 250-word limit narrative section for the author to describe essential information regarding the institution and the rotation/course (13).

The main perceived drawbacks for using the radiology SLOR were the less personal format and that it is untested in radiology and as such, there is uncertainty as to how the letter would be received by program directors. However, recall that 19% expressed that they did not know the candidate well enough to give specific examples of the student's traits and abilities that were supposed to be described in the letter. Interestingly this directly contradicts the main perceived drawback which is that the SLOR is thought to be a less personal format. The format may seem less personal, with lack of letterhead designs and institutional symbols, but hopefully, when used correctly, the personal substance will be greater.

To encourage the author to write a letter that genuinely supports the candidate, the letter writer is not asked to comment on match potential or likely position on the rank list. The author is not asked to state if they anticipate that the student would likely match into the specialty as in the otolaryngology SLOR (11). Similarly, the author is not asked to state if or roughly, where the student may be ranked for the Match at the author's institution as in the emergency medicine SLOE (13).

Seventy-six of the radiology SLOR survey respondents speculated that letters of recommendation would have a marked (50%) or moderate (26%) increase in importance after the STEP 1 examination becomes Pass/Fail. Some schools do not have uniformly tiered grading but rather limit some grades to Pass/Fail (14,15). As fewer objective assessments are available, resident selection committees may place greater weight on letters of recommendation when choosing candidates to interview and select for residency.

The radiology SLOR is relatively new. Emails to the AUR and APDR members have been sent prior to each Match season beginning in September of 2018 to inform and remind members that the SLOR is available for use. Nonetheless, in the 2020 SLOR survey, of the 72 respondents that answered the questions that asked why they did not use the radiology SLOR when writing letters for the radiology Match, 12.5% said that they did not know that the letter was available for use. The recent Covid-19 pandemic and lack of in-person national meetings have limited the opportunities for the SLOR to be discussed in large forums and in small groups. This publication, workshops, and discussion panels at future meetings and continued email campaigns will be useful to increase awareness and likely increase subsequent use. Additionally, 60% of the 91 survey respondents stated that they were not aware that SLORs were used in dermatology, otolaryngology, orthopedic surgery, and emergency medicine residency Matches. Recognition of the building trend in the use of SLORs may also increase the use and acceptance of the radiology SLOR.

There is a great opportunity for research and development regarding the radiology SLOR. Studies should be performed to assess the time required for composition and interpretation, inter-reader reliability, gender-related issues, grade, and praise inflation, the utility of the format for inducing the letter writer to add details and information not found elsewhere in the application, and the correlation of the interpretation of the letter with interview and rank lists.

A repeat survey of the AUR and APDR membership is planned for early 2023. This will be used to gather feedback to determine what portions of the SLOR should be modified and how.

In the future, a national committee could curate feedback and update the SLOR as recruiting practices change, modify the accessibility and ease of use of the SLOR, and develop a variety of SLORs. A variety of SLORs could be developed including 1) a specific letter for the interventional radiology residency Match, 2) a Group Letter to be filled out by a clerkship director, chairman, and or program director that summarizes input from many faculty, or two or three faculty could compose a consensus letter, 3) a letter for the non-radiologists physician to compose, or 4) fellowship letters.

Limitations of this study include the relatively low numbers of survey respondents. Additional formative feedback from a larger number of radiology educators could lead to further substantive changes to the SLOR, which could improve its functionality. Similarly, the novelty of the letter and limited

early utilization makes it difficult to ascertain any tangible improvements it may provide to the recruitment process. Future studies will be important to assess this. In addition, continued education about the SLOR's existence will be important to increasing its use. This will require discussion at national meetings, publications such as this one, as well as social media and email campaigns to increase awareness of the letter's existence and potential benefits of its utilization.

## CONCLUSIONS

The SLOR was developed through research funding support by an AUR Venture Fund Grant and was first available for use in September 2018. While the use of the radiology SLOR increased during the first two years, more needs to be done to increase use and awareness. Many remain unaware that the radiology SLOR is available and that other medical specialties have used standardized letters in the Match for years or decades. As the utilization of the SLOR increases, further research to evaluate its effectiveness in comparison to narrative letters will help inform future modifications to optimize its utility. Artificial intelligence and deep learning may facilitate this research. Lastly, the SLOR's importance in the residency selection process will likely increase significantly, as some schools reduce or eliminate tiered grading and the USMLE STEP 1 examination shifts to a binary pass/fail exam.

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