

Review

Standardized Letters of Recommendation in Medical Residency Selection, a Critical Review of the Recent Literature

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Abstract

Standardized Letters of Recommendation (SLORs) were introduced in the United States and Canada to address limitations of narrative letters in residency selection by improving objectivity, comparability, and reliability. This review evaluates their structure, performance, and broader adoption across regions. This narrative review synthesizes the literature published between 1995 and 2025, including survey-based studies, a systematic review, and specialty-specific analyses. Key domains examined include SLOR structure, predictive validity, score inflation, interrater reliability, correlation with objective metrics, and potential bias. SLORs are widely used across multiple North American specialties but remain rare in Europe, with limited implementation such as in Swiss pediatrics. The summative ranking component consistently shows the strongest association with match outcomes, whereas other domains demonstrate limited discriminatory value due to ceiling effects and score inflation. Interrater reliability remains suboptimal, and correlations with objective metrics such as USMLE scores are weak. Although major demographic biases are not evident, local applicants and those with distinctions tend to receive more favorable evaluations. SLORs represent an improvement over narrative letters but require refinement. Enhancing rating scales, strengthening rater training, and developing more detailed structured assessments may improve their reliability and utility as evaluation tools.

Keywords: SLORs; residency selection; medical education; interrater reliability; score inflation; predictive validity; selection bias



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1. Introduction

A Standardized Letter of Recommendation (SLOR) is a structured evaluation tool used in residency selection.

While SLORs have gained traction in North America, their adoption in Europe remains limited, and few programs outside the USA and Canada rely on SLORs as a primary evaluation tool. This variability underscores the need to contextualize SLORs as one of multiple tools for candidate assessment rather than a universal standard. Beyond purely spatial geographical considerations, residency selection systems reflect important educational, cultural, structural and funding-related differences. In the United States, residency programs function primarily as workforce pipelines within hospitals, with selection processes aimed at identifying candidates who will perform best in specific institutional environments. In

contrast, many European systems conceptualize residency as a nationally or regionally coordinated educational pathway, with greater emphasis on longitudinal training and standardization across institutions. These differing perspectives influence the perceived role of evaluation tools such as SLORs and raise important questions about their transferability across systems. A meaningful comparison therefore requires consideration not only of structure, but also of underlying educational goals, funding models and workforce needs.

Residency selection is a high-stakes process where programs seek to identify applicants most likely to succeed in rigorous clinical training [1]. Traditional narrative letters of recommendation (NLORs) have long been a cornerstone of this process but have been criticized for their subjectivity, lack of standardization and difficulty of interpretation [2–5]. Traditional NLORs are highly variable in content, length, and tone, and often use ambiguous narrative language, which makes interpretation difficult for selection committees [2,3,5,6]. Many NLOR authors lack formal training in writing and NLORs are prone to implicit bias and to avoiding negative comments, limiting their utility for distinguishing candidates [5–7]. In response to NLOR limitations, SLORs were developed as early as 1995 [8]. Since their introduction 30 years ago, many medical specialties have instead adopted SLORs, which are designed to provide structured, objective, and comparable assessments of applicants [4,8].

This review critically examines the evolution, strengths, limitations, and potential future directions of SLORs in medical education. It is important to distinguish between SLORs, SLOEs (E for Evaluation) and other structured evaluative letters used across specialties. Although often used interchangeably, these instruments differ in format, required use, scoring structure, and degree of standardization. Some programs rely on structured narrative letters that incorporate rating elements without full standardization. These distinctions are important, as the evidentiary base and utility of these tools may vary depending on their level of structure and implementation context. However, for uniformity, this review uses the term SLOR throughout.

2. Materials and Methods

This study was conducted as a narrative review with a critical interpretative perspective. This approach was chosen due to the heterogeneity of the literature on SLORs. The scope of the literature searched included studies published between 1995 and 2025. The search strategy included Google Scholar and PubMed to identify relevant articles. Efforts were made to ensure transparency and breadth by searching multiple databases and cross-referencing key articles. Articles reviewed include: scoring specialty-specific analysis ($n = 18$ studies, references [1,4,8–23]), survey-based studies ($n = 3$, references: [5,24,25]), systematic review ($n = 1$, reference: [26]), perspectives, opinions or commentaries ($n = 7$, references: [2,3,6,7,27–29]), and 3 institutional online sources ($n = 3$, references: [30–32]). These sources differ substantially in study design, outcomes measured, and reporting standards, limiting the feasibility of a formal systematic review. The key domains explored in this review were: (A) SLORs' structure and adoption, (B) predictive validity, (C) score inflation, ceiling effects and bias, (D) interrater reliability, (E) correlation with objective metrics and (F) perceived utility and specialty-specific trends among letter writers and selection committees. These domains guided both the literature synthesis and the organization of the results and discussion section to maintain consistency and clarity.

The aim of this review was not to produce a quantitative synthesis, but rather to critically integrate and interpret available evidence across disciplines, identify recurring patterns and highlight conceptual and practical gaps in the use of SLORs. In this context, the term “critical” refers to an interpretative and reflective synthesis of the literature rather than to a formal systematic appraisal of the study quality. This approach aligns with the objective of providing a structured understanding of a complex and evolving field.

3. Results

3.1. SLORs' Structure and Adoption

Although formats vary, most SLORs include domain-specific ratings (e.g., patient care, medical knowledge, professionalism), a summative rank statement (SRS, the SLOR item in which evaluators provide an overall ranking of the applicant relative to peers) and brief narrative comments.

Historically, SLORs were developed as structured alternatives to traditional narrative letters rather than as simple electronic versions of NLORs. At the time of their development, narrative letters were already widely used, occasionally in digitized formats, but they lacked standardization in content and evaluation criteria.

SLORs aim to improve clarity and comparability. Studies suggest that readers generally find them easier and faster to interpret than NLORs (around 15 vs. 60 s in emergency medicine, 40 vs. 70 s in otolaryngology and 70 vs. 130 s in dermatology) [4,9,10]. Although SLORs offer some progress, they still require refinement, and the lack of the author's structured training continues to affect reliability. As early as 2007, Liu et al. stressed the absence of formal training as a factor that confounds the usefulness of recommendation tools [11]. This was empirically confirmed in 2014 by Hegarty et al., who found that two-thirds of evaluators were self-taught, a point emphasized by Martin et al. to explain the significant variability and superlative inflation observed in standardized forms [24,27]. More recent studies demonstrate that this gap in faculty development remains a critical barrier. In 2022, Tavarez et al. highlighted that most faculty still receive little to no training on how to complete these forms, and by 2024, researchers continued to note that evaluators lack the systemic instruction and feedback necessary to make these tools effective [5,28]. However, SLORs are typically completed by faculty members who have supervised the applicant in clinical or research settings, and this standardized approach may support more objective decision making in the selection processes [1].

As we mentioned in the Introduction, the concept of SLORs was introduced in 1995, by the Council of Emergency Medicine Residency Directors, but the practical adoption was not documented until 1997 [4,8]. Twenty years later, Bajwa et al. (2018) note that while SLORs were introduced to improve fairness and objectivity, they still fail to reliably discriminate among applicants and show weak correlation with final selection decisions in pediatric settings [1]. SLORs have been widely adopted in several North American specialties, including emergency medicine, pediatrics, dermatology, otolaryngology, plastic surgery, orthopedic surgery, urology, neurosurgery, radiology and gynecology [3,8,10,12–17,31]. In Europe, structured recommendation formats have been described only in isolated contexts, such as French-speaking Switzerland and selection programs in Germany (Charité) [1,31,32]. This geographic patching raises questions about the global applicability of SLORs and whether their perceived benefits extend beyond North American training systems.

While some specialties have periodically updated their SLOR formats, formal validation processes and systematic refinements based on predictive validity are variably reported in the literature. As a result, it is not always clear to what extent iterative improvements are consistently implemented across disciplines.

3.2. Predictive Validity

Some studies have examined whether SLORs predict successful match outcomes, specifically whether highly ranked applicants are more likely to secure a position in their preferred training. The differential performance of SLORs and NLORs across domains may be partly explained by the nature of the constructs being assessed. SLORs appear more effective in capturing global impressions such as reliability, work ethic, and overall ranking [9]. NLORs, in contrast, are more vulnerable to subjectivity and overly positive

descriptions [2,9,25]. These inconsistencies may also reflect the limited comparability of outcomes of both formats and the assessment of predictive validity. However, both formats perform similarly when assessing professionalism, procedural skills, research engagement, and commitment [10]. This suggests that NLORs and SLORs may offer complementary perspectives rather than serving as interchangeable tools.

Across specialties, the SRS or rank placement question appears as the most predictive selection component, particularly in orthopedic surgery and plastic surgery [13,14]. Other domains such as clinical skills and research did not differentiate matched from unmatched applicants [14]. Disciplines without objective ranking systems may struggle to ensure fairness during selection. Programs often rely on subjective impressions or honors such as Alpha Omega Alpha (AOA) membership, which can disadvantage applicants without access to these distinctions [15].

3.3. Score Inflation, Ceiling Effect and Bias

A recurrent limitation of SLORs is a pronounced ceiling effect and grade inflation [15,18,19]. In orthopedic surgery, most applicants were placed in the top two deciles which severely reduces the tool's discriminatory power [20]. This grade inflation may be further inflated when writers know applicants can read their SLORs [27]. Supporting this trend, Inclan et al. (2020) reported that 75% of candidates receive percentile ratings above 85 across nearly all competency domains, limiting, again, the utility of the instrument for the comparison of applicants [19].

Some studies have examined whether SLORs introduce or perpetuate bias based on gender, race, or institutional affiliation [15,26]. Overall, SLORs do not appear to introduce significant gender or racial bias, and observed differences in rating are minimal [15,26]. Institutional bias remains a concern as applicants from home institutions or with special distinctions (i.e., AOA) may receive higher ratings in certain domains [14,15].

3.4. Interrater Reliability

Interrater reliability reflects how consistently different evaluators rate the same applicant. SLORs show a higher interrater reliability than NLORs [4,9]. However, they are not free from variability. Faculty members often interpret rating categories differently [16]. A more recent study suggests that rater consensus improves when evaluators receive clear guidance and understand the evaluation criteria [21].

3.5. Correlation with Objective Metrics

SLOR domain ratings show weak or no meaningful correlation with objective applicant metrics such as USMLE scores, clerkship grades, or research productivity [15,20,22]. This pattern suggests that SLORs measure different aspects of applicant performance or that subjective impressions still play a major role, even within structured formats.

3.6. Perceived Utility and Specialty-Specific Trends

Most physicians who complete SLORs value their structured format for its clarity and efficiency, but they express concerns about the limitations of current rating scales [23]. Letter writers often feel pressured to assign high scores to avoid negatively impacting an applicant's chances, especially since most applicants are rated at the top levels [19]. Faculty believe that formal training on how to complete SLORs would enhance reliability and consistency in evaluations [11]. Specialty-specific trends show that otolaryngology and plastic surgery have well-established SLOR formats and high adoption rates in North America, while other fields are still transitioning away from narrative letters [10,22]. Some specialties also emphasize certain domains more heavily (e.g., technical skills in surgery), influencing interpretation [15].

An important conceptual distinction should be made between “subjective impressions” and professional judgment. While the former is often criticized for its implicit bias and lack of transparency, professional judgment is a recognized and essential component of health profession education. It refers to the informed, experience-based evaluation performed by trained clinicians who integrate multiple sources of evidence, contextual factors, and longitudinal observations. In this sense, SLORs do not eliminate subjectivity, but rather aim to structure and support professional judgment through standardized frameworks. A key challenge is therefore not to remove subjectivity altogether, but to enhance the validity, transparency, and consistency of professional judgment through clearer rating anchors, shared mental models, and faculty calibration.

3.7. Synthesis

- SLORs are here to stay: Despite their limitations, SLORs are valued by both writers and selection committees for their structure and efficiency.
- Global trends amplify SLOR importance: With objective metrics such as the transition to pass/fail formats, reliable, valid and fair SLORs will play an increasingly central role in residency selection.
- Score inflation is the Achilles’ heel: The lack of meaningful differentiation leads to clustering of candidates at the top of the scale. Addressing inflation through clearer anchors, forced distribution, and contextual explanation should be a top priority.
- Introducing an explicit position of the writer. This includes making the letter non-confidential and requiring every SLOR writer to explicitly state whether they would choose to recruit the applicant into their own department if a position were available.
- Narrative context remains valuable: Combining SLORs with brief, focused narrative comments may offer the best of both worlds, assisting the writer to evaluate objectively whilst allowing space for valuable personal insights. To strengthen the usefulness of these narrative elements, writers could also be guided to briefly justify their position on whether they would or would not choose to work with the applicant, thereby adding transparency and meaningful context to their endorsement.
- Customization and technology can help: Specialty-specific domains and electronic platforms can enhance SLOR usability and reduce administrative burden. Future work should also explore how clinical rotation data can be integrated with SLORs to avoid redundancy scoring while enriching the evaluation process with multiple observations from diverse supervisors and enhancing longitudinal competency assessment.
- AI offers practical opportunities not just theory: AI can synthesize multi-source feedback aggregating SLOR and EPA data, detecting inconsistencies and generating predictive analytics to flag competency gaps.
- Calibration sessions and explicit guidance on rating anchors can improve interrater reliability and avoid inflationary pressures.
- Equity must be monitored: As SLORs evolve, ongoing vigilance is needed to prevent new forms of bias.

All synthesis points are represented in Figure 1.

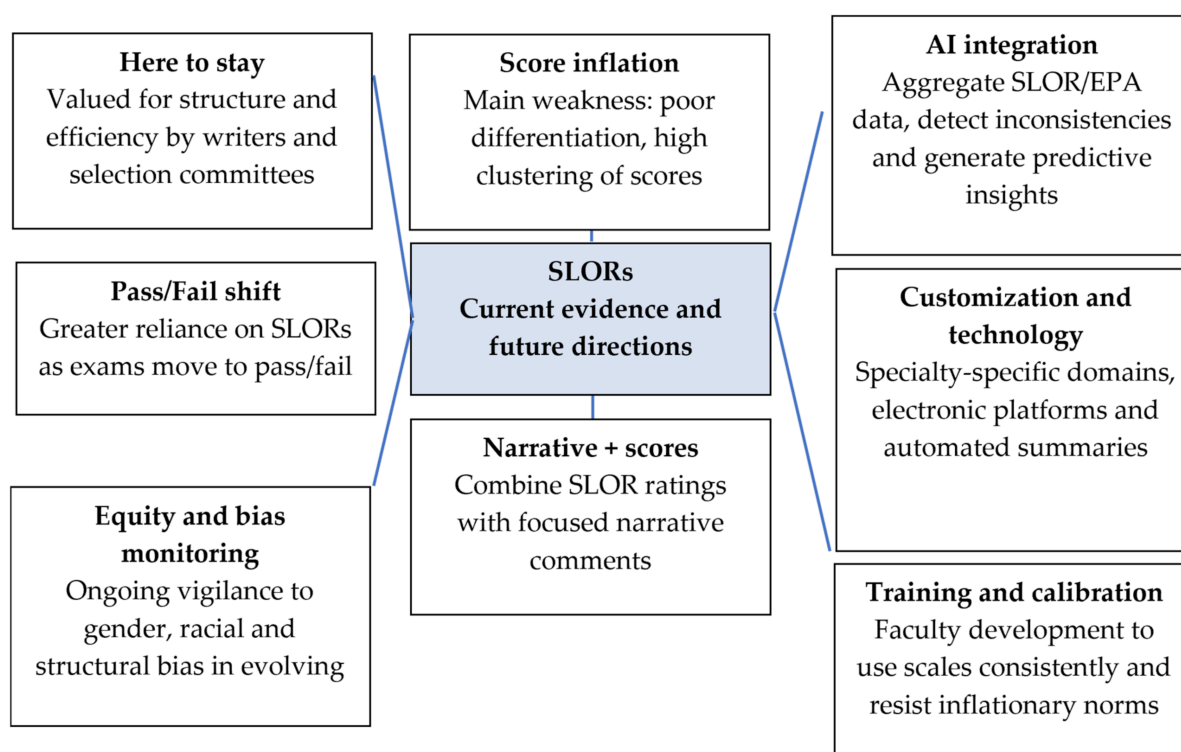


Figure 1. Synthesis and insights from the literature regarding SLORs.

4. Discussion

Letters of recommendation remain a complex but integral and necessary part of residency program applicant evaluation, regardless of format [32]. Their continued use underscores the need for assessment tools that are reproducible, unbiased and aligned with both competency-based and capability-oriented frameworks, recognizing that effective physicians must not only demonstrate competencies but also apply them flexibly in dynamic, uncertain clinical environments.

In contrast to NLORs, SLORs offer a few advantages such as greater clarity, standard structure, easier and faster interpretation, among others. For these reasons, SLORs have the potential to become or should become, a key element of residency selection processes.

However, given that SLORs were introduced 30 years ago and remain used primarily in North America, questions arise about whether their format should be refined to promote broader international adoption. Enhancing SLORs to better accommodate diverse educational cultures, while preserving their strengths in structure and comparability, may increase their global relevance and utility.

To align SLORs with evolving educational frameworks, several strategies could be undertaken. Articulating SLORs with Entrustable Professional Activities (EPAs) may help ensure evaluations reflect not only competency-based domains but also the application of these competencies in practice. EPAs are designed to assess the ability of trainees to perform professional tasks in real clinical contexts, thereby reflecting the concept of capability, defined as the capacity to integrate and apply competencies effectively in complex unpredictable situations [33]. Although SLORs already incorporate selected EPA-related competencies, such as clinical reasoning, professionalism, communication skills and reliability, candidates typically accumulate numerous EPA assessments from multiple clinical supervisors throughout their rotations. Integrating these existing multi-source EPA evaluations into the SLOR process would broaden the evidence base supporting faculty judgments and strengthen competency and capability assessment. This overlap between SLOR items and EPA domains currently creates inefficiencies and missed opportunities for integrated

feedback. A coherent approach would involve mapping SLOR items to EPA domains, ensuring complementarity rather than duplication. Future work should also explore how to use EPA data beyond its current scope, reducing repetitive documentation and enhancing longitudinal competency tracking of trainee progression.

Incorporating multi-source feedback 360 can provide a more holistic and reliable assessment of applicants. Allowing evaluators to provide subjective input during review sessions with structured tools should complement, rather than replace, expert judgment. Supplementing faculty SLORs with input from patients, other residents, nurses, or other team members who have worked closely with the applicant ensures a broader perspective on performance and professionalism. Furthermore, integrating EPAs into this multi-source feedback framework could strengthen the coherence and educational value of applicant evaluation, completing the so-called 360° action.

Technology can play a pivotal role in optimizing SLOR processes. Electronic SLOR and EPA platforms can standardize data collection, prompt for required fields, and flag inconsistencies or missing data. The use of artificial intelligence in this context should be understood primarily as advanced data processing and pattern recognition rather than autonomous decision making. AI-driven aggregation of multiple evaluations (e.g., multi-source feedback, SLORs, EPA ratings, narrative comments) can also highlight areas where certain competencies are under-assessed or inconsistently documented across evaluators, thereby informing targeted faculty development. Such analyses may strengthen reliability by helping faculty calibrate their evaluation practices with concrete, data-driven feedback. At present, these applications remain exploratory, and their integration into residency selection should be approached cautiously, with attention to transparency, interpretability, and potential unintended biases. Their potential use should be considered as complementary to, rather than replacing, professional judgment.

Revising rating scales is critical to address score inflation and poor discrimination. Anchoring scales to national percentiles such as “top 5% nationally,” or “top 10% regionally” rather than vague descriptions like “top third”, can clarify expectations. Forcing distribution by requiring faculty to rank applicants relative to all trainees they have supervised at the same level of training, not just those in the current year, will further improve differentiation. Incorporating narrative brief explanation and providing context about the rating scale to discourage score inflation.

Formal training for SLOR writers can improve consistency and reduce bias. Training programs should include clear definitions and examples for each specialty, rating category, discussion on unconscious bias and its impact, and practice exercises with sample applicants followed by group calibration sessions.

Future efforts should consider cost implications by allowing each training unit or department to keep its own internal selection and ranking processes rather than implementing a fully centralized system. Preserving these micro-level selection structures, with their local specificities, helps reduce administrative complexity and resource demands. At the same time, sharing common selection principles and procedural protocols across units could promote consistency and transparency, even if final decisions remain at the micro-level.

Ensuring global fairness also requires examining how SLORs function across languages and education systems, mainly in countries where a substantial proportion of medical trainees come from different cultural or linguistic backgrounds. This includes assessing international language compatibility, harmonizing evaluation standards, and addressing reproducibility concerns in diverse cultural contexts.

Additionally, future research could explore cross-cultural applicability by testing SLOR frameworks in different residency systems and examining integration with competency-based tools such as EPAs to assess whether combined approaches improve selection accuracy.

Ongoing research is needed to assess the impact of revised SLOR formats on match outcomes, evaluate the effectiveness of rater training interventions, explore the utility of multi-source feedback, and monitor for unintended consequences, such as new forms of bias. These initiatives will help ensure SLORs remain an equitable tool in residency selection if we decide to keep their use and extend them to Europe and beyond.

5. Conclusions/Perspectives

SLORs provide structure and compatibility that traditional narrative letters lack. Yet their potential is limited by score inflation, variability, and uneven adoption beyond North America. With high-stakes exams shifting to pass/fail formats, not only in the US but also in Europe, SLORs will become increasingly pivotal in residency selection. Future work should focus on refining rating anchors, implementing faculty calibration, and integrating competency-based tools such as EPAs. Given that SLORs usually evaluate only a defined subset of EPAs, such as clinical reasoning and teamwork, residency programs should ensure access to the complete portfolio of EPA assessments rather than relying only on the EPAs included within SLORs. In this context, greater attention could be given to the concept of capability and not only competency.

Emerging technologies, including AI-driven synthesis of multi-source data, offer opportunities to enhance fairness and predictive validity. These innovations are essential for SLORs to evolve into a globally relevant standard for equitable and reliable selection.

As the landscape of medical education continues to evolve, a broader question emerges: What qualities do we truly value in the next generation of physicians? Beyond technical proficiency in cognitive knowledge-based examinations, programs increasingly prioritize attributes such as clinical reasoning, humanism, adaptability, teamwork and a genuine commitment to lifelong learning. Engagement in quality improvement, scholarly curiosity, and the capacity to provide compassionate, patient-centered care have become essential markers of future success. At the same time, the motivation of educators to teach, mentor, and take pleasure in working with trainees plays a crucial role in shaping effective learning environments. Moving forward, the challenge lies in designing selection tools (including SLORs) that not only measure what is easily qualifiable but also capture these more nuanced dimensions of professional identity. As we consider the trajectory of residency selection, the field must collectively reflect on how to balance competence with character, knowledge with empathy, and procedural skill with reflective practice. Our goal should not only be to refine assessment instruments, but to ensure they help identify and cultivate physicians who can thrive in increasingly complex healthcare systems while upholding the core values of our profession: *primum non nocere, secundum cavere, tertium sanare*.

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evaluation of the system change described herein. During the preparation of this manuscript/study, the authors used Perplexity Standard and Microsoft 365 Copilot. Perplexity AI was used to explore references found in PubMed and fill gaps in the initial search, while Copilot assisted in adapting sections of the text for clarity and consistency. These tools were not used to generate primary data but served as supplementary aids for literature synthesis and text refinement. The authors have reviewed and edited the outputs and take full responsibility for the content of this publication.

Conflicts of Interest: The authors declare no conflicts of interest.

Abbreviations

The following abbreviations are used in this manuscript (in order of appearance):

SLOR	Standardized Letter of Recommendation
SLOE	Standardized Letter of Evaluation
NLOR	Narrative Letter of Recommendation
SRS	Summative Rank Statement
EPA	Entrustable Professional Activity
CBME	Competency-Based Medical Education
AI	Artificial Intelligence
USMLE	United States Medical Licensing Examination
AOA	Alpha Omega Alpha

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