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## Residency Placement Fever: Is it Time for a Reevaluation?

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### Abstract

The transition from undergraduate medical education to graduate medical education (GME) involves a process rooted in the final year of medical school. Students file applications through the Electronic Residency Application System platform, interview with residency training (GME) programs from which they have received invitations, and generate a rank-ordered preference list. The National Resident Matching Program reconciles applicant and program rank lists with an eye towards matching students and GME programs. This process has effectively served generations of graduating medical students. However, the past several decades have seen an intensification of the residency placement process that is exemplified by an inexorable increase in the number of applications filed and number of interviews accepted and attended by each student. The authors contend that this trend has untoward effects on both applicants and departments that are home to GME programs. Relevant information in the peer-reviewed literature on the consequences and benefits of the intensification of the residency placement process is scant. The authors address factors that may contribute to the intensity of the residency placement process, and the relative paucity of data. They propose approaches to reverse current trends, and conclude that any reevaluation of the process will have to include the generation of outcome data in order to afford medical educators the opportunity to explore changes in an evidence-based manner.

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Medical education in the United States subscribes to a continuum comprised of undergraduate premedical education, undergraduate medical education (UGME), graduate medical education (GME), and continuing medical education. The transition from UGME to GME, a process rooted in the fourth and final year of medical school, entails a tri-phasic sequence. The first phase of this process involves the filing of applications by graduating medical students with desired GME programs. Since 1995, this activity has been facilitated by the Electronic Residency Application Service (ERAS) platform.<sup>1–3</sup> The second

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component in this sequence involves interviews of a select contingent of invited applicants by GME programs.<sup>4</sup> The third and final element of this progression involves the compilation of rank-ordered preference lists by both applicants and GME programs, the algorithmic reconciliation of which yields a “match.” Since 1952, the placement of U.S. medical students with allopathic residency programs has been ably carried out by the National Resident Matching Program (NRMP, the Match).<sup>5,6</sup>

By many accounts, the aforementioned tri-phasic residency placement process has served generations of graduating medical students well. In recent years, however, the time-honored residency placement paradigm has displayed consequential intensification. Of particular note is a significant increment in the number of filed ERAS applications per U.S. medical school graduate, increasing by more than 50% from 30.3 in 2005 to 45.7 in 2015 (unpublished data provided by the Association of American Medical Colleges’ (AAMC’s) research unit, available from the authors on request). Based on discussions with medical educators at several institutions and on a survey of our own senior students, it appears that similar increments have been noted in the number of GME program interviews offered and accepted per applicant. This trend was also noted in a recent article by Benson et al.<sup>7</sup> These trends are not without untoward effects. If nothing else, time-starved UGME curricula, debt-ridden applicants, and strained departmental resources have been caught in the crossfire. In this Perspective article, we seek to characterize the intensification of the residency placement process, discuss its attendant implications, explore its root causes, and examine its potential redress.

## Evidence of Intensification in the Residency Placement Process

The peer-reviewed literature has largely been mum on the apparent intensification of the UGME-to-GME transition. This reality may reflect the fact that only a limited body of data is presently available in support of this contention. In part, the intensification phenomenon is borne out by the aforementioned growth in ERAS-associated traffic. In the eyes of many, this “new normal” draws on the widespread perception that a successful match in highly competitive disciplines is contingent on the filing of applications with a large proportion of the relevant GME programs. For example, in 2015, senior U.S. medical students applied, on average, to 73 of the 163 orthopedic surgery programs and 47 of the 105 neurological surgery programs (based on data extracted from the AAMC<sup>8</sup> and the NRMP<sup>9,10</sup>). What is more surprising is that even less competitive disciplines may now be seeing an ever-growing flood of applications. This contention is supported in part by recent observations according to which GME programs in nearly all disciplines have seen a marked increase in their application traffic. For example, the percentage of pediatric GME programs to which graduating U.S. medical students have applied on average increased from 9.8 to 13.7% during the 5-year interval from 2010 to 2015.<sup>10</sup> For internal medicine GME programs, the corresponding figures are 4.9 to 6.0%.<sup>8–10</sup> In making these decisions, students appear to be keeping their own counsel against the advice of medical school advisers and mentors advocating moderation.

Regrettably, precious little additional data exist to document the intensification of the residency placement process. Indeed, no national or discipline-specific data are available

relative to the number of GME program interviews offered and/or accepted per applicant. Whether or not the number of GME program interviews per applicant is predictive of a successful match remains equally uncertain. That said, the notion of “more is better” appears to have taken hold. Indeed, anecdotal insights suggest that the inflation in the number of ERAS-filed applications is linked to an increase in the number of GME program interviews offered and accepted per applicant. Clear-cut affirmation or rejection of the added utilitarian value of these trends will require that the relevant data be acquired with an eye towards rationalization of the time and human resources involved.

## Implications of a More Intensive Process

The aforementioned developments are hardly without implications. At the very least, both applicants and GME programs have been struggling with underwriting the ever increasing costs associated with the residency placement process. For their part, applicants have had to contend with the growing financial outlays associated with travel as well as with room and board. This financial burden may be of greater consequence for students with fewer resources, thus contributing to inequity in the placement process. The GME programs, in turn, have had to cope with costs related to staff and faculty time, foregone clinical revenue, and miscellaneous hospitality elements. These costs are bound to further increase if and when the multiple mini-interview model is implemented by a growing number of GME programs.<sup>11–14</sup> The increasing number of applications has another important consequence for GME programs. With an expanding burden of reviewing applications, the use of quantitative metrics as “screens,” the United States Medical Licensing Examination (USMLE) Step 1 exam in particular, may assume an increasing role. This trend, one that is viewed by many as a serious problem,<sup>15</sup> may further erode emphasis on students’ backgrounds and qualitative indicators of performance, including letters of recommendation and narrative performance evaluations. Should this occur, it could have a detrimental effect on the ability of GME programs to achieve diversity by reducing the selection of students from disadvantaged educational backgrounds who may be at risk for under-performance on standardized examinations.

Apart from the preceding considerations, the growing intensity of the residency placement process has been progressively eroding the residual educational value of the fourth and final year of medical school.<sup>16–19</sup> This reality, in its own right, would appear to warrant a reevaluation of the extant residency placement construct. Such reassessment may prove all but inescapable before too long if and when the four-year medical school curriculum was ever to be replaced with a three-year counterpart.<sup>20,21</sup> Under these circumstances, the current resident selection paradigm is likely to prove unworkable and in need of redesign.

## Why is the Residency Placement Process Intensifying?

The root cause undergirding the intensification of the residency placement process harks back to the fact that the number of total active applicants in the Match is increasingly exceeding the number of total first-year GME positions offered. Indeed, the ratio of first-year GME positions offered per active applicant (all applicants) decreased from 0.96 to 0.78, a decrement of 19%, between 1976 and 2015.<sup>10</sup> These observations have given rise to the

notion of the “GME Bottleneck”<sup>22,23</sup> and to the perception that the attainment of a match has become ever more difficult. Other contributors to this perception are the rising number of international medical graduates and U.S. osteopathic students vying for U.S. residencies.<sup>10</sup> The above notwithstanding, graduating U.S. allopathic seniors have largely proven immune from the threat that the bottleneck poses.<sup>21,24</sup> First, the ratio of first-year GME positions offered per active U.S. senior applicant has shown a moderate increase from 1.37 to 1.51 (12%) from 1976 to the present time.<sup>18</sup> Second, the fraction of active U.S. senior applicants matched to first-year GME positions offered has proven relatively non-variant, ranging from 92.1% to 95.1% between 1982 and 2015.<sup>10</sup> Finally, and perhaps most telling, the likelihood that active U.S. seniors applicants will match to their first choice GME program has held steady since 1997 at 50%–60%.<sup>10</sup> It would thus appear that active U.S. senior applicants have never wavered in their exemplary match record.

The aforementioned set of interrelated observations can be interpreted in one of several ways. By some accounts, the ongoing match success of active U.S. senior applicants reflects persistent increments in medical student qualifications and preparation. Imperfect evidence support of this contention includes the ever rising mean USMLE Step 1 scores for examinees from U.S. and Canadian medical schools: 215 in 2000, 217 in 2005, 222 in 2010, and 229 in 2015.<sup>25,26</sup> Alternatively, a case could be made that the unwavering success of active U.S. senior applicants is directly attributable to the intensification of the residency placement process. This outlook is supported by the observation that the increase in the number of applications filed was accompanied by an increase in the number of GME programs ranked per U.S. senior applicant (across all disciplines) from a value of 8.6 in 2005<sup>27</sup> to 9.6 in 2016.<sup>10</sup> Viewed in this light, few if any arguments could be marshalled to change the status quo wherein medical student applicants and residency program directors are keen to maximize their perceived gains. In this regard, reliance on the interview as a recruitment tool may well prove the most potent antidote to change.

Apart and distinct from the foregoing, several other elements are contributing to intensification of the residency placement process. In particular, note must be made of the apparent mushrooming of “audition electives” despite the absence of data in support of their role in improving individual Match results.<sup>28,29</sup> Not unexpectedly, this very practice has done its part to reduce the experiential diversity associated with the fourth year.<sup>18,19</sup> Yet another recent development is the growing designation of the USMLE Step 2 CK score as a residency application requirement. USMLE Step 2 CK, not unlike its Step 1 counterpart, is increasingly being used by some GME programs to rank applicants.<sup>30</sup> Not surprisingly, this reality has elevated the significance of the USMLE Step 2 CK in the eyes of applicants who are dedicating ever more time and effort to prepare for the examination.<sup>31</sup>

## Changing the Current Trends

The imperative of recalibrating the residency placement process will likely require that a number of potential approaches be explored. First, consideration should be given to the possibility of coordinating the timing of the interviews and of the Match across all disciplines and GME programs, including the “early match” disciplines of ophthalmology and plastic surgery.<sup>32</sup> Consolidation along these lines would address the disruption of fourth

year scheduling, thereby offering educators greater flexibility in designing the fourth-year curriculum. Implementing such changes will not be easy given the longevity, familiarity, and comfort associated with the extant construct. Voluntary action on the part of the relevant professional associations will be required should a realignment of current schedules ever come to pass. Second, reducing if not capping the number of interviews per student would go a long way towards stemming the time and resource drain on both applicants and GME programs. This too is not going to be easy given the near universal presumption that “more is better” and the notion that the times in effect demand such. In this context, consideration might be given to a tiered “screen and schedule” system wherein initial online interviews with many or all eligible applicants would be followed by a limited set of onsite interviews with a select group of “finalists.” As envisioned, this approach, widely used in both the public and the private sectors, stands to rationalize the current residency placement process while maintaining its fundamental premises of excellence and compatibility. Limiting the final onsite interviews to a select number of candidates will also give rise to palpable economies of scale that are likely to be welcomed by applicants, GME programs, and medical schools alike. This approach could in fact be facilitated by the growing focus on the assessment of “residency-ready” competencies in medical school.<sup>33</sup> Indeed, should residencies make known their expectation that an assessment of Core Entrustable Professional Activities be conducted early in the fourth year, the proposed first tier of the residency selection process could be further informed by this additional set of meaningful indeed objective data.

## Concluding Remarks

The residency placement process appears to have witnessed significant intensification in recent years. It is our opinion that this development represents a maladaptation that serves neither applicants nor GME programs. The UGME enterprise appears to be similarly compromised. None of this has been intended, prospectively planned, and/or endorsed by the relevant governing bodies. The best analysis appears to be that the apparent intensification of the residency placement process reflects an evolving response to perceived changes in the challenge of matching with a quality GME program. Reason thus dictates that a reevaluation of the process be explored. That said, we recognize that the very premise of this communication, let alone the redress explored, is bound to be the subject of healthy skepticism. Nevertheless, it is our opinion that the parties involved would do well to reassess the challenges identified herein, including the possibility of generating process outcome data which currently do not exist. What is the relationship between the qualifications of the applicant and the number of interviews offered and accepted? Do GME programs or applicants benefit from the apparent increase in the number of interviews being offered? What is the relationship between the “audition electives” and the Match outcome? With an eye towards answering these and other questions, the NRMP might take the lead by providing deidentified data, current and historical, on student rank lists, GME program rank lists, and corresponding Match results. This first step, in turn, could be followed by the development of a consortium of schools committed to analyzing and interpreting such data in order to shed light on consequences of trends in the residency placement process for

students and GME programs. Only in so doing will it be possible to explore a potential change in what we view as a disconcerting long-term trend in the UGME-to-GME transition.

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