The process by which medical students make a specialty choice is complex and multifactorial. This decision is influenced by both intrinsic (e.g., socioeconomic background, age, motivation, personality) and extrinsic (e.g., educational debt, length of residency, medical faculty, expected income, lifestyle) factors. Chief among the factors is students’ clerkship experiences during the third year of medical school. More than half of students change their specialty choice from the time they complete their preclinical coursework in the first 2 years to the time of graduation. This fact suggests a range of both commitment and exploration to a preferred specialty before beginning clerkship rotations.

Faculty and administrators who inform policies regarding the scheduling of the third-year clerkships must consider an array of program and student-level factors to maximize outcomes. For instance, students with a firm specialty choice may prefer to time their specialty clerkship experience in a way that will maximize potential for residency match. Recent investigations have posited

The Relationship Between Third-Year Clerkship Allocation Method and Specialty Choice

Francis S. Nuthalapaty, MD; Tameika T.F. Lewis, MD; Anne Zinski, PhD; and James R. Jackson, PhD

From Greenville Health System/University of South Carolina School of Medicine Greenville, Greenville, SC (F.S.N., T.T.F.L.), and Department of Medical Education, University of Alabama School of Medicine, Birmingham, Ala (A.Z., J.R.J.)

Abstract

Background: A lack of research surrounds the impact of third-year clinical clerkship scheduling tactics on timing of specialty choice. The objective of this study was to compare the timing of clerkship experience and eventual specialty choice between 2 medical schools that use random and non-random third-year clerkship allocation methodologies.

Methods: We conducted a retrospective cohort study using data for the graduating classes of 2003–2006 at the University of Alabama School of Medicine (UASOM) and the Medical University of South Carolina (MUSC). The third year was divided into 6 sequential clerkship blocks at both institutions. At UASOM, clerkship allocation was non-random, with students making 3 “wishes” in which they specified the clerkship, the block, and an alternate. At MUSC, clerkship positions were allocated randomly. Clerkship block order was determined for all graduates who matched into 1 of 4 specialties (Internal Medicine, Pediatrics, Obstetrics and Gynecology, and General Surgery). For each specialty at each institution, clerkship block order was compared to a uniform distribution using a Chi-square goodness of fit test.

Results: When the clerkship allocation method was non-random, the distribution of specialty choice across blocks differed significantly (P < .05) from a uniform distribution for each specialty, with the largest percentage matching in the fourth block for each specialty. When clerkships were assigned randomly, the distribution of specialty choice across blocks did not differ significantly from a uniform distribution for each specialty.

Conclusions: Random allocation of clerkship order was associated with an even distribution of specialty interest throughout all clerkship blocks. Allowing students a choice in clerkship scheduling resulted in clustering of specialty interest into the middle 2 clerkship blocks, with the largest percentages matching in the fourth block.
that the sequence of specific clerkships are associated with exam scores in that discipline. It is also established that third-year medical students’ scores on the National Board of Medical Examiners subject examinations tend to increase as they progress through the third-year curriculum. Medical schools must also consider faculty grading tendencies and associated outcomes to neutralize potential effects of clerkship block order, as students may strategically delay clerkships in their preferred specialty. In addition, as the letter of recommendation is cited as a factor in granting residency interviews by 86% of Residency Program Directors, students who seek to garner a favorable recommendation letter through their clerkship performance may choose to schedule the associated clerkship in the second half of the year or when they are likely to be at their peak clinical performance.

However, for the balance of students who have yet to solidify their specialty choice by the beginning of the third year, the priority may be to provide adequate opportunities for breadth and quantity of clerkship experiences to encourage exploration of all career options and maximize performance, regardless of timing. For example, Campos-Outlet et al demonstrated that the implementation of a required third-year family practice clerkship in any sequence led to an immediate, significant increase in the proportion of students choosing family practice. Additionally, Paiva et al showed that, for previously undecided students, clerkships taken early in the clinical experience sequence were associated with eventual specialty choice, and students who had identified other specialties as a potential career path were likely to switch to psychiatry following clerkship exposure. Further, other investigations showed no association with clerkship timing, performance, and ultimate specialty choice, indicating that random clerkship sequencing may be equally appropriate.

In the United States, 2 primary approaches to clerkship scheduling are commonly employed. The first allows students an opportunity to give input to their clerkship block schedule to determine their clerkship timing. The second approach eliminates student choice and assigns clerkship sequence randomly. Some educators advocate for the former system as it may allow students the opportunity to maximize their clerkship grade and opportunities to obtain letters of recommendation. Although both approaches are common, very little research has compared clerkship scheduling tactics with regard to eventual specialty choice. Therefore, the objective of this study was to compare the distribution of specialty selection within clerkship blocks between 2 medical schools that used random and non-random third-year clinical clerkship allocation methods.

Methods
We designed a retrospective cohort study that used data gathered from the Medical University of South Carolina (MUSC) and the University of Alabama School of Medicine (UASOM), both of which offer Liaison Committee for Medical Education-accredited 4-year medical degree programs. This investigation was reviewed and granted exempt status by Greenville Health System’s Institutional Review Board and the University of Alabama at Birmingham Institutional Review Board.

The study sample included all students graduating with an MD degree from the 2 institutions in 2003–2006, and who matched into 1 of the 4 primary specialties required in the third-year curriculum (Internal Medicine, Pediatrics, Obstetrics and Gynecology, and General Surgery). Students who had a prolonged or interrupted third or fourth year or who lacked a complete set of data (eg, transfer students and dual-degree students) were not included.

Both institutions scheduled third-year clerkship rotations in 6 blocks through the academic year. At UASOM, clerkship allocation was facilitated by the use of a locally developed computerized scoring algorithm. Students were allowed to make 3 “wishes” in which they specified the clerkship, the block, and an alternate block for each of their 3 wishes. In addition, students were permitted to indicate which clerkship they did not want during block 1. The scoring algorithm then tried to meet as many of a student’s wishes as possible, starting with the top-ranked wish.

It was common practice for some medical student advisors at UASOM to recommend that students who had identified their desired specialty pursue a clerkship in that specialty in the middle of the academic year. Conversely, at MUSC, students were not allowed to select the order of their clerkship sequence; rather, the rotations were randomly assigned using a locally developed computerized algorithm. Students were, however, able to switch rotations among one another to a very limited extent for special circumstances.

The third-year clerkship schedules for all eligible MUSC and UASOM graduates from 2003–2006, along with their specialty matches, were obtained from institutional records.
The percentage of students matching into the 4 specialties was determined at each institution, and the association between institution and specialty was examined with a Chi-square test of independence. Clerkship block order was determined for all graduates who matched into 1 of 4 specialties. For each specialty at each institution, clerkship block order was compared to a uniform distribution using a Chi-square goodness of fit test. IBM SPSS Statistics (version 22.0, (IBM, Armonk, NY) was used for all analyses, and an alpha level of .05 was used as the criterion for statistical significance.

Results
During the study period, 277 students at UASOM and 224 students at MUSC met the eligibility criteria for inclusion. The association between institution and specialty choice was not statistically significant, indicating that the percentages of students matching into the 4 specialties at each institution were similar (Table 1). Internal Medicine was the most common specialty choice, accounting for at least one third of the 4 specialties in each institutional cohort. Pediatrics accounted for more than one quarter of all included graduates.

The pattern of distribution of graduates across the 6 rotation blocks for each specialty was similar within each institutional cohort. At UASOM, where a non-random clerkship allocation method was used, the distribution of specialty choice across blocks differed significantly ($P < .05$) from a uniform distribution for each specialty (Table 2 and Fig. 1). A consistent clustering in the 2 middle blocks, with the highest percentages in block 4 (30.2%–41.9%) occurred and the second-highest percentages in block 3 (20.0%–29.7%).

By comparison, at MUSC, where a random clerkship allocation method was used, the distribution of specialty choice across blocks did not differ significantly ($P > .05$) from a uniform distribution for each specialty (Table 2 and Fig. 2).

Discussion
These findings demonstrate that contrasting approaches to clerkship allocation are associated with patterns of specialty interest within clerkship blocks. In the non-random allocation system, higher percentages of students participated in clerkships in their eventual specialty match during the middle 2 blocks of the academic year,

### Table 1
Specialty match distribution for graduates of the University of Alabama School of Medicine (UASOM) and the Medical University of South Carolina (MUSC), 2003–2006.

<table>
<thead>
<tr>
<th>Specialty Match Distribution, no. (%)</th>
<th>UASOM (N = 277)</th>
<th>MUSC (N = 224)</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Internal Medicine</td>
<td>106 (38.2)</td>
<td>74 (33.0)</td>
<td>.220</td>
</tr>
<tr>
<td>Pediatrics</td>
<td>74 (26.7)</td>
<td>65 (29.0)</td>
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<tr>
<td>General Surgery</td>
<td>50 (18.1)</td>
<td>33 (14.7)</td>
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<tr>
<td>Obstetrics &amp; Gynecology</td>
<td>47 (17.0)</td>
<td>52 (23.3)</td>
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</table>

### Table 2
Number and percent of students who matched in a specialty by clerkship block for specialty and institution.

<table>
<thead>
<tr>
<th>Clerkship Block for Specialty</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>Total</th>
<th>P Value</th>
</tr>
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<tr>
<td>Institution</td>
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<td></td>
<td></td>
<td></td>
<td></td>
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<td>UASOM, no. (%)</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Internal Medicine</td>
<td>3 (2.8)</td>
<td>14 (13.2)</td>
<td>24 (22.6)</td>
<td>32 (30.2)</td>
<td>19 (17.9)</td>
<td>14 (13.2)</td>
<td>106 (100.0)</td>
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<td>Pediatrics</td>
<td>6 (8.1)</td>
<td>5 (6.8)</td>
<td>22 (29.7)</td>
<td>31 (41.9)</td>
<td>8 (10.8)</td>
<td>2 (2.7)</td>
<td>74 (100.0)</td>
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<tr>
<td>Obstetrics &amp; Gynecology</td>
<td>1 (2.1)</td>
<td>3 (6.4)</td>
<td>10 (21.3)</td>
<td>16 (34.0)</td>
<td>7 (14.9)</td>
<td>10 (21.3)</td>
<td>47 (100.0)</td>
<td>.002</td>
</tr>
<tr>
<td>General Surgery</td>
<td>4 (8.0)</td>
<td>4 (8.0)</td>
<td>10 (20.0)</td>
<td>20 (40.0)</td>
<td>9 (18.0)</td>
<td>3 (6.0)</td>
<td>50 (100.0)</td>
<td>&lt;.001</td>
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<td>MUSC, no. (%)</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Internal Medicine</td>
<td>9 (12.2)</td>
<td>10 (13.5)</td>
<td>14 (18.9)</td>
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<td>Pediatrics</td>
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<tr>
<td>General Surgery</td>
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<td>5 (15.2)</td>
<td>6 (18.2)</td>
<td>3 (9.1)</td>
<td>10 (30.3)</td>
<td>7 (21.2)</td>
<td>33 (100.0)</td>
<td>.183</td>
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</table>
CLERKSHIP ALLOCATION METHOD AND SPECIALTY CHOICE

Figure 1
Percent of students who matched in a specialty by clerkship block for specialty at UASOM.

Figure Legend: The distribution of specialty matches across 6 sequential clerkship blocks, among 277 student graduates of the UASOM Birmingham Campus, from 2003-2006. This institution used a non-random clerkship allocation method. A clustering appears in the middle rotation blocks, regardless of specialty, with 60% of graduates completing their clerkship in their eventual chosen specialty during rotation blocks 3 and 4, as compared to 14% in rotation blocks 1 and 2, and 26% in rotation blocks 5 and 6.

Figure 2
Percent of students who matched in a specialty by clerkship block for specialty at MUSC.

Figure Legend: The distribution of specialty matches across 6 sequential clerkship blocks, among 224 student graduates of the MUSC, from 2003-2006. This institution used a random clerkship allocation method. A uniform distribution appears across the year, with 28% of students completing their clerkship in their chosen specialty during rotation blocks 1 and 2, compared with 39% in rotation blocks 3 and 4, and 33% in rotation blocks 5 and 6.

whereas the cohort with random allocation displayed evenly distributed specialty interest across the academic year.

While evidence suggests that non-random clerkship order may benefit students who have a clear specialty choice, it may also lead to practical challenges. First, a concentrated group of students may select their desired clerkship specialty in the middle of the academic year, building increased competition for patient care and procedural experiences. Second, a lack of student enrollment in specific clerkships early or later in the academic year could negatively impact faculty and resident motivations, as well as yield very large or small cohorts for which to provide clerkship oversight and feedback.

Importantly, although the non-random allocation method appears to show lower percentages of spe-
Abbreviations and Acronyms
UASOM = University of Alabama School of Medicine; MUSC = Medical University of South Carolina

Correspondence
Address to: Francis S. Nuthalapaty, MD. Greenville Health System, Department of OB/GYN, 890 W Faris Rd, Suite 470, Greenville, SC 29605 (fnuthalapaty@ghs.org)

Faculty who design policies regarding the scheduling of third-year clerkships may want to give consideration to allocation method. The benefits of even distribution of student specialty interest across the academic year seem to be in the best interest of both students and faculty. This approach has the potential to negate faculty bias toward students, based on the timing of their clerkships, and could presumably increase the quality of interactions, and hence, the education of students overall. This approach might also eliminate the competitive pressure created when too many students in a clerkship block share the same specialty aspirations. Finally, for those students who have yet to make a career choice, the random allocation methods may decrease stress and anxiety regarding clerkship selection in their second year, before they have had a chance to perform any rotations at all. Further investigation of these potential benefits is recommended.

Conclusion
This investigation showed that the patterns of specialty choice across clerkship blocks varied between institutions with random and non-random scheduling allocation. This finding is important in a little-studied area, as the association of clerkship timing and preference with eventual specialty match has not been explored extensively, but may affect grading, faculty burden and motivation, and availability of patient cases in each clerkship. As clerkship timing has been associated with test achievement, specialty choice, and clinical performance, this investigation posits that clerkship allocation model must also be explored.

References