

# The Structure and Content of the Medical Subinternship

## A National Survey

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**OBJECTIVE:** To describe the educational and administrative structure and content of internal medicine subinternship (SI) programs at medical schools throughout the United States.

**DESIGN:** A cross-sectional mailed survey of internal medicine SI directors at U.S. medical schools.

**MAIN RESULTS:** Responses were received from 100 (80%) of 125 eligible programs. Seventy-five percent of schools require a SI for graduation; 26% of these schools require the completion of a medical SI. Nationally, about 75% of all medical students opt to complete a medical SI. Dedicated SI administrative committees exist at 46% of medical schools. A minority of programs provide students with explicit curricula (31%) or exclusive conference time (36%). In 44% of programs, subinterns are used by hospital departments of medicine as intern substitutes. Subinterns are responsible for sign-out and cross-coverage in about half of the programs, and all patient orders entered by subinterns require cosignature. Subintern evaluation criteria include attending evaluation (100%), resident evaluation (80%), case write-ups (27%), supervised clinical examination (20%), written examination (14%), and oral examination (3%).

**CONCLUSION:** Although most medical schools offer an SI in internal medicine and many require it, the experience often lacks clearly defined curricular goals and often does not provide medical students with house-staff-level responsibilities. In an effort to ease the transition from undergraduate to postgraduate training, further studies are needed to define which educational and structural components of the medicine SI should be developed and emphasized.

**KEY WORDS:** medicine subinternship; acting internship; medical education; curriculum; survey.

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A recent editorial highlighted the changing role of the subinternship (SI) in the medical school curriculum.<sup>1</sup> It has been argued that the SI should be viewed as the culmination of a coordinated 4-year program of study in clinical care, with an aim to prepare fourth-year students for the demanding experience of internship. Ideally, the educational goals of the SI should complement and expand

upon those outlined in the third-year clerkship and ought to uniquely emphasize the knowledge and skills needed to independently treat and manage acutely ill inpatients. To facilitate these goals, it has been recommended that SI programs place fourth-year students in a role that completely replaces the intern, albeit under the supervision of senior house staff. In particular, it has been recommended that subinterns should 1) have a dedicated coordinator of educational activities, 2) be provided with an explicit set of learning objectives, 3) have separate conferences which stress patient management issues, 4) be able to write medical orders that are cosigned by a physician, and 5) participate in supervised cross-coverage.<sup>1</sup>

Despite the valuable and distinctive experience of the SI, it has been neglected by medical educators and researchers as an area needing development and standardization. At an organizational level, the SI currently lacks the clearly defined curricular goals and rigorous evaluation methodologies found in the third-year clerkship.<sup>2-4</sup> Nevertheless, it is unclear to what extent individual medical schools have addressed the unique educational needs of the SI. In an attempt to clarify the structure and requirements of internal medicine SI programs throughout the United States, a survey study was undertaken.

## METHODS

In March 2000, a written survey was mailed to medicine SI directors at all medical schools based in the United States. SI directors were identified from the mailing list of the Clerkship Directors in Internal Medicine and by telephone contact with the departments of education of medical schools listed in the 1998-1999 AAMC Curriculum Directory.<sup>5</sup> Recipients of the mailing were asked to complete the survey if they were responsible for oversight of the medicine SI at their institution, or they were asked to forward the survey to an appropriate faculty substitute. A second mailing was sent in April 2000 to the programs that had not responded.

On review of the literature on the medical SI, no relevant questionnaire was identified. For the purposes of this study, a questionnaire was developed by the author. A preliminary version was evaluated by faculty colleagues, after which it was revised for clarity and content. It was not formally pilot tested. The survey contained 60 items and required less than 5 minutes to complete. It requested descriptive data regarding 4 discrete domains: baseline information, administrative structure, educational content and structure, and evaluative criteria. With the exception of comments, which required free-text responses, the entries were all yes/no, multiple choice, or numeric (see [www.aecom.yu.edu/subinternship/index.htm](http://www.aecom.yu.edu/subinternship/index.htm)).

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The survey first inquired about the existence of any SI rotation at the institution, and, if offered, whether the completion of a SI was required for graduation. Respondents were asked about the fields allowed for completion of this requirement and the fraction of students opting to complete a SI in medicine.

The rest of the survey exclusively explored the details of medical SI programs. Because multiple clinical sites were often affiliated with each medical school, respondents were asked to answer questions based on the integrated, overall experience at their institution. Respondents were asked about the administrative oversight of the rotation and about organized efforts to incorporate student-based teaching into the SI in the form of written curricula and didactics. In order to assess the degree to which programs provided students with the true experience and responsibilities of an intern, respondents were asked about student integration into call schedules, cross coverage and "sign out" responsibilities, ability to write patient orders, and whether students were used by the hospital as intern substitutes. In addition, respondents were asked to indicate all of the criteria used in the evaluation of subintern performance.

## RESULTS

One hundred questionnaires were returned from a potential 125 United States medical schools (80% response rate); these responses represented 102 discrete clinical sites, as 2 medical schools submitted separate surveys for clinical sites that are run independently of each other.

### Baseline Information

A majority of schools offer some form of SI rotation (98%,  $n = 97$ ), while 75% of schools ( $n = 74$ ) require a SI for graduation. Of those schools requiring a SI for graduation, 26% (19 of 74) require the completion of an internal medicine SI, either alone or in combination with a surgical SI. Whether required or not, a medical SI is completed by

**Table 1. Specialties Acceptable for Completion of Required Subinternship**

Field	Number of Schools Allowing for Completion of Required SI in Field (%)
Medicine	74 (100)
Pediatrics	54 (73)
Surgery	43 (58)
Ob/gyn	25 (34)
Family practice	15 (20)
Surgical subspecialty	15 (20)
Emergency medicine	8 (11)
Neurology	2 (3)
ICU	1 (1)
Psychiatry	1 (1)
Ophthalmology	1 (1)

**Table 2. Distribution of Subinternship Curriculum Topics**

Topic	Number of Curricula (%) (N = 30)
Cross coverage/patient management	26 (87)
Physical diagnosis	25 (83)
Evidence-based medicine	20 (67)
How to perform procedures	19 (63)
End-of-life decisions/medical ethics	16 (53)
Communicating bad news	11 (37)
Stress management	2 (7)

about 75% of all fourth-year medical students. The frequency distribution of the specialties acceptable for completion of the required SI is shown in Table 1. The majority of SI rotations last 4 weeks.

### Administration

Forty-seven percent of medical schools have a committee dedicated to the oversight of medical SI content and structure. These committees meet with the following frequency: monthly, 48%; quarterly, 28%; biannually, 12%; and annually, 12%. The average number of clinical sites available for completion of the SI is 4 per medical school. Seventy-five percent of these clinical sites have a dedicated SI site director, the majority of whom are full time attendings. A minority of sites ( $n = 5$ ) use chief residents as site directors.

### Education

Medical students are provided with an explicit, written curriculum in 31% of the medicine SI programs ( $n = 30$ ). The frequency distribution of topics covered in these curricula is shown in Table 2. Thirty-six percent of the programs ( $n = 35$ ) provide students with dedicated didactic sessions, which are separate from house-staff conferences. These sessions average 2 hours per week in total duration.

### Structure

As displayed in Table 3, subinterns are employed either alone or in pairs by hospital departments of medicine as replacements for a necessary intern (i.e., subinterns are used as intern equivalents, as opposed to house-staff "shadows") in 44% of programs ( $n = 43$ ). Other attempts to structure the SI experience as equal to that of the internship include the formal integration of subinterns into call schedules (77%,  $n = 75$ ), the identification of subinterns by nursing staff as responsible for "cross-coverage" (51%,  $n = 50$ ), and the subintern receipt of house-staff "sign-out" while on call (46%,  $n = 45$ ). The median number of overnight calls taken by subinterns during a 4-week block was 6, while that of house staff was 7. Ninety-eight percent ( $n = 96$ ) of the programs had clinical sites that

**Table 3. Structure of Subinternship (N = 98)**

Component	Number of Schools Incorporating Component into SI, n (%)
Students function as intern replacements (not "shadows")	43 (44)
Students receive "sign-out" from housestaff	45 (46)
Students are responsible for "cross-coverage"	50 (51)
Students are formally integrated into call schedules	75 (77)
Students are allowed to enter patient orders	94 (96)

utilized computerized information systems; 95% ( $n = 93$ ) of these sites provided students with their own computer log-on code. Importantly, 96% ( $n = 94$ ) of SI programs allowed subinterns to enter orders for patient care and diagnostic testing. All of these programs required some form of cosignature, either electronic or manual, for activation of these orders.

## Evaluation

The frequency distribution of criteria used for subintern evaluation is shown in Table 4.

## DISCUSSION

This study was the first attempt to collect comprehensive data regarding the composition of medical SI programs at medical schools in the United States. The results of this study demonstrate that, although most medical schools offer the SI in internal medicine and many require it, the SI experience often lacks explicitly defined curricular goals. In addition, there is a great deal of institutional variation with regard to the structural composition of SI programs. While almost all programs provide students with computer access and allow students to enter supervised patient orders, only half provide students with full intern-level responsibility, including cross coverage and participation in patient "sign out." Furthermore, only a small number of programs provide subinterns with didactic sessions that are uniquely targeted to student-level issues.

While the medical internship is a transient experience and not representative of usual clinical practice, it is often physically demanding and marked by a high incidence of emotional distress.<sup>6</sup> Studies have suggested that many undergraduate curricula inadequately prepare medical students for the intense experience of the first postgraduate year.<sup>7,8</sup> Some of the deficiencies that have been noted include inadequate training in the management of inpatient emergencies, the performance of common procedures, and the delivery of bad news. The development and implementation of a SI core curriculum might help medical

educators to deal with these deficiencies and better prepare students for the practical patient-care responsibilities of the hospital setting.

This survey demonstrates that subintern assessment is based almost entirely upon descriptive evaluations by attending and resident physicians. Surprisingly, only 20% of schools required some form of critiqued clinical exercise, such as an observed patient history and physical examination or Mini-CEX, for completion of the SI. While descriptive evaluation is a mainstay of the evaluation of medical student clinical competence,<sup>9</sup> studies have suggested that clinical instructors are limited in their ability to accurately assess the fund of knowledge and noncognitive professional behaviors of medical students.<sup>10,11</sup> Because clinical performance continues to be a primary concern in medical education, structured faculty-observed evaluations of student clinical competency prior to postgraduate training are becoming the norm. The medical SI is a logical venue in which to highlight this activity.

This study has several limitations. First, the survey instrument was not tested for validity or reliability. In addition, the findings regarding curricular topics should be interpreted in light of the fact that the survey instrument provided respondents with a limited choice of topics; no free responses were submitted for this item. Thus, the true spectrum of curricular topics might differ from that reported. Also, because most SI programs utilize an average of three clinical sites, it is possible that the data submitted by the designated school-wide SI director did not accurately reflect the structural and educational nuances of each individual site. For some of the questions, SI directors were asked to provide approximations of the "overall" experience at their institution. Individual variations among clinical sites within an institution are probably not accounted for, and in these cases the results should be interpreted cautiously.

It was assumed that the variables surveyed are important determinants of educational integrity for SI programs. This may be false. While an organized approach to clinical education is appropriate for third-year clerks, it is unclear if enhanced structure in the form of written curricula, exclusive lecture time, and student integration into the house-staff training routine has a meaningful impact on the educational goals of the SI experience.

**Table 4. Criteria Used for Evaluation of Subinterns (N = 98)**

Measure	Number of Schools Using Measure for Final Evaluation, n (%)
Attending evaluation	98 (100)
Resident evaluation	78 (80)
Case write ups	25 (26)
Observed clinical examination/ Mini-CEX	20 (20)
Written examination	13 (13)
Oral examination	3 (3)

Further investigation into this area is needed. In order to define the educational and structural components of the SI that should be developed and emphasized, it will be necessary to determine the true impact of the SI experience on the subsequent performance and skill of PGY-1 interns. In this way, a consensus could be reached among medical educators regarding the optimal role and composition of the SI within the medical school curriculum. An additional area of needed research includes the development of standardized outcome measures and evaluative instruments for the assessment of subintern clinical and procedural competency. Such efforts would help to diminish the quantitative and qualitative disparities described in this report and would help to offer students a coordinated internal medicine education that extends from the third into the fourth year.

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