

**TEACHING SKILL
IMPROVEMENT FOR
GRADUATE MEDICAL
TRAINEES
An Agenda for Research
and Development**

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The medical education literature concerned with the teaching role fulfilled by house officers was reviewed by the authors. Articles were presented in three categories: (1) studies of house officer effort, (2) perceptions of the house officer's teaching role, and (3) assessing and improving house officer teaching skills. House officers are involved in a large amount of teaching, greatly influence students, and fulfill a unique teaching role in medical education that is complementary to the faculty teaching role. An agenda for research and development in the area of research teaching skills was proposed based on three broad research questions: (1) What types of teaching skills are most appropriate for residents? (2) How do faculty and student expectations of resident teaching influence resident teaching? (3) What type of intervention is most successful in improving resident teaching skills?

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Following completion of their medical school education, medical students begin an additional three to seven years of graduate medical education in various specialties and subspecialties of medicine. During this period of residency training, these physicians are referred to as interns, residents, and house officers. The term *intern* is a carryover from the days when graduate medical education consisted primarily of a one-year rotating internship. Even though the internship is no longer a primary means of graduate medical education, intern is often the term used to designate residents and house officers in their first year of training after medical school. In most residency training programs and specialties, the terms *resident* and *house officer* are used interchangeably.

Regardless of what they are called, physicians participating in graduate medical education programs fulfill major roles in the hospitals and medical schools that administer their residency programs. Their primary role is to provide patient care services under the supervision of faculty and senior house officers. Most of their time is spent in this role. A study by the Institute of Medicine (1976) calculated that residents spent 84% of their time in patient care activities. Concurrently house officers are learning more about their chosen specialty via a combination of conferences, library work, and self-study. In addition to these two primary roles, house officers in all medical specialties are expected, perhaps implicitly, to teach medical students and other house officers. This teaching role is an important component of a house officer's daily routine, yet it is also an often unrecognized and unrewarded component.

This article reviews previous studies on house officer teaching, including amount of time spent in teaching activities, perceptions of the teaching role of the house officer, and programs designed to improve and assess resident teaching. Based on this review suggestions are made for further research and development activities related to the teaching role of house officers.

STUDIES OF HOUSE OFFICER EFFORT

Studies of house officer effort in the hospital provide strong support for acknowledging the amount of teaching done by house officers. Studies by the Institute of Medicine on costs of education for health professionals (1974) and Medicare-Medicaid reimbursement policies (1976) included information on house officer teaching among their findings. The 1974 study reported that house staff spent 13 of their 60 hours per week in the hospital in teaching activities with medical students, junior house officers, and other students. This study also reported that residents provided 40% of the contact medical students have with their instructors. The 1976 study found that house officers spent 19% of their total time in teaching activities.

Stefanu et al. (1976) assessed house staff effort at the University of Tennessee College of Medicine. The authors reported that first-, second-, and third-year residents contributed an average of 8.25, 9.25, and 7.00 hours per week respectively to undergraduate medical education.

LaPalio (1981) used diaries to conduct a time study of house staff on a university medical service at the University of Illinois Hospital in Chicago. A work week of approximately 100 hours was reported. Eight to ten hours per week were allocated to teaching activities. In an earlier study at the same hospital, Schumacher (1968) analyzed student clinical activities on a single floor of the university hospital. Schumacher concluded that "the major influence of the resident physicians and interns is on the quantity and distribution of conversations between students and house staff." He also recommended that interns and residents be made aware of the goals of the educational programs for medical students.

Patel and Dauphinee (1985) investigated characteristics of the clinical learning environment in medicine, pediatric, and surgery clerkships at McGill University in Montreal. They determined that residents influence student attitudes and values to a greater extent than faculty and interns because residents spend more time with students.

Greenberg and Jewett (1983) reported similar findings based on logs kept by 119 students in an eight-week third-year pediatric clerkship at Children's Hospital National Medical Center in Washington, D.C. One finding of the study was that students rated night-call and weekend activities as equally important educationally as activities occurring during weekdays. The authors suggested that the benefits of relating to a resident on a one-to-one basis during these times might explain this finding.

Byrne and Cohen (1973) used direct observation and questionnaires to study clinical clerkship activities in medicine and anesthesia at the University of Toronto in 1972. The students overwhelmingly designated residents as the team members most helpful in developing student knowledge and skills. Direct observation of the teams, which consisted of attending faculty, residents, interns, and students, supported the students' contentions that "the resident was the team member upon whom the success of the program primarily rested."

One of the earliest reports of direct observation of medical student teaching was presented by Reichsman et al. (1964). They observed 82 teaching sessions across six specialties over a two-year period at the University of Rochester School of Medicine. In an appendix to the major findings of the study, the authors presented a section titled, "The Role of the House Officer." Among the issues noted within this section was that resident teaching, while usually unscheduled, accounts for a large portion of medical student education. The authors reported that teaching by house officers is "a definite planned part of the curriculum," but that the amount of time individual residents spend teaching varies considerably.

Schwenk et al. (1987) reported the results of analysis of educational contacts between residents and teachers at four family practice residency programs. The 24 first-year residents who participated in the study reported that nearly 25% of their educational contact time over the course of one week was spent with residents serving in the teaching role.

PERCEPTIONS OF THE HOUSE OFFICER'S TEACHING ROLE

Several authors have attempted to identify how residents, students and faculty view the resident's teaching role. Barrow (1965) described the approach he used as a house officer to develop his own teaching skills. In a subsequent report, Barrow (1966) presented medical student opinions of the house officer as a medical educator based on questionnaires completed by graduates of the University of Florida College of Medicine. The students estimated that 31% of the knowledge they gained during their clinical clerkships came from residents (18%) and interns (13%), compared to 25% from attending physicians and 43% from the students' own initiative.

Brown (1970) reported the results of a survey conducted among University of Virginia Hospital house staff in an attempt to assess attitudes toward teaching. The residents reported they spent 20 to 25% of their work week supervising, evaluating, or teaching others. Interns reported spending 10% of their time on these activities. All the residents and interns considered themselves to be teachers, but less than 10% of them had ever received training in teaching. Both residents and interns reported they learned about teaching from their own training and observations of their teachers. More than half the respondents thought the teaching role should be emphasized and training should be provided to improve their teaching effectiveness. More than two-thirds of the respondents indicated a desire for assistance with their teaching activities.

In 1976, Lowery reported a study designed to determine the significance of house staff teaching in a university department of general surgery. All members of the 1975 graduating class of the University of Utah College of Medicine were administered a questionnaire following their completion of the general surgery clerkship. Students indicated that about one-third of the knowledge base they acquired during the general surgery clerkship came from house officer teaching.

As reported by Tonesk (1979), the Association of American Medical Colleges (AAMC) surveyed 450 medical school departments in 1978 to determine faculty practices and experiences evaluating clerks and residents. Tonesk stated that, in general, "residents' teaching skills are not valued on a par with other competencies."

Similarly it was reported that clerkship students are rarely asked to evaluate resident teaching. Three conclusions were drawn by Tonesk: (1) The importance of house officer teaching is not widely translated into a conscious programmatic emphasis; (2) if it is agreed that teaching is an intrinsic component of being a physician, it should be as carefully defined as are clinical responsibilities; and (3) the medical student's perspective is critical in the definition and evaluation of resident teaching.

Tremonti and Biddle (1982) reported a study of resident and faculty teaching behaviors at three community hospitals affiliated with the State University of New York Upstate Medical Center. Over an eight-week period, 32 teaching sessions in a required internal medicine clerkship were observed. Results indicated that in the formal setting, the resident's teaching role was complementary to that of faculty. Residents focused on day-to-day management of a large number of patients, while faculty went into greater in-depth discussion of patients and used problem-solving teaching behaviors more frequently. Residents were judged to "provide a unique contribution to the education of students, and, therefore, the residents' teaching role should be provided for in settings devoid of house staff."

Holden (1985) discussed the quality of surgical clerkships, noting particularly the importance of presenting a professional image to students and the important teaching role played by house officers. "The literature demonstrates unequivocally that surgical house officers, especially the resident in charge of a service, still play a most important role in teaching surgery to medical students."

As part of a special report on the clinical education of medical students, Lawrence (1986) provided a perspective about surgeons as educators. The author discussed the important contributions

that surgeons make to medical education, particularly related to teaching psychomotor skills. His recommendations for improving surgical education included directing more effort toward teaching surgical residents how to teach.

In 1986 Schiffman described house officers as educators, enumerated the benefits of house staff teaching, and suggested strategies for developing and maintaining teaching skills of house officers. Suggested strategies included faculty role modeling of good teaching skills, teaching skills workshops and materials for residents, and evaluation of resident teaching by students, other residents, and faculty.

ASSESSING AND IMPROVING HOUSE OFFICER TEACHING SKILLS

A number of reports have described efforts to improve and assess the teaching skills of house officers. These reports cover a broad spectrum of medical specialties and educational methods. Husted and Hawkins reported in 1963 on a program at the Albany Medical Center and Albany Medical College in which volunteer residents and interns participated in a series of six one-and-a-half-hour seminars on the teaching/learning process. Although no evaluation methodology was described, the authors described this pilot venture as a success that should be repeated.

Brown (1971) described a series of eight 90-minute teaching skills seminars for surgery residents at the University of Virginia. Resident performance on cognitive pre- and posttests showed no significant difference, but 95% of the participants rated the seminars as a valuable experience.

In 1972, Lazerson reported on a program in the Division of Psychiatry of the Boston University School of Medicine that was designed to prepare residents in psychiatry to become better teachers. Developed in conjunction with the School of Education, the program provided residents with a supervised teaching experience in an evening college setting. Lazerson found these experiences to be successful in stimulating the house officer to

consider the learning process for the remainder of his/her training.

Grimes et al. (1975) presented information on an elective in medical education undertaken by Grimes while he was an intern in the Department of Obstetrics and Gynecology at the University of North Carolina School of Medicine. His three-month experience permitted him an opportunity to explore the parameters of clinical instruction, suggest strategies to improve clinical instruction, and develop self-instructional materials for use in obstetrics and gynecology.

In 1976 Meleca and Schimpfhauser reported on the House Staff Training Program implemented at the Ohio State University College of Medicine. A needs-assessment survey of 98 residents in medicine, pediatrics, and surgery led to the development of a training program designed to make house staff more effective clinical teachers. Volunteer participants spent approximately 10 hours over a five-week period in a series of independent and group study activities. Activities included videotaping and microteaching exercises. While no specific outcomes were described, the program results were described by the authors to be "most encouraging."

Doyle and Balsley (1979) reported on a special project at George Washington University Medical Center in which a chief psychiatry resident and her supervisor "adapted traditional clinical supervision to encourage the resident's development as a teacher." In an experience similar to the one undertaken by Grimes, the resident worked specifically on improving the case conferences she was responsible for presenting. Both the house officer and clinical supervisor found the experience enjoyable and useful.

A training program designed to improve resident teaching skills was described by Lawson and Harvill in 1980. Twenty residents from the Department of Internal Medicine and the Department of Family Practice at the East Tennessee State University College of Medicine participated in 13 weekly small-group sessions of one hour each. The microteaching method was used to provide participants an opportunity to practice using

instructional techniques taught during the sessions. Results indicated that participants made significant gains in teaching performance and attitude toward participation in a teaching skills program. The authors recommended that voluntary house officer participation in similar programs should be strongly encouraged.

Maxmen (1980) described an intensive teaching skills program for house officers in the Department of Psychiatric Education at the College of Physicians and Surgeons at Columbia University. Seven-hour workshops on teaching skills were held on Saturdays in the home of a faculty member. Separate sessions were held for each class of residents to allow for different teaching responsibilities and amount of teaching. It was reported that nearly 80% of those residents not on call attended these voluntary workshops. Participants evaluated these experiences favorably.

In 1983 Sheets reported the results of an evaluation of the Family Medicine Faculty Department Program at Michigan State University. Nine of the 14 participants in the nine-month fellowship were house officers, but no specific differences in the performance of faculty and residents in the program were reported. However, the program was evaluated as successful in improving the participants' knowledge and skills as teachers.

Jewett et al. (1982) described a one-year study conducted at Children's Hospital National Medical Center and George Washington University School of Medicine and Health Sciences. Participating in two one-half day workshops on clinical teaching were 27 pediatric house officers, while 26 residents received no training until after the study's completion. The study's results indicate that house officers can learn effective clinical teaching skills in a limited amount of time. These results are supported by the fact that faculty, peers, and students consistently gave higher ratings to the teaching of residents who participated in the workshops than to those who had not. In a subsequent report, Greenberg et al. (1984) presented additional information on how the pediatric residents in the previous report perceived teaching. One of the authors' findings was that house officers have ambivalent feelings about teaching as a primary responsibility and report that medical students make the residents' clinical

responsibilities more difficult. However, the residents also reported that teaching improved their clinical and intellectual skills.

Lewis and Cappelman (1984) briefly described a faculty development program for pediatric residents. Four teaching styles were presented to residents using videotaped examples. Following the viewing of the videotapes, participants were able to appropriately identify characteristics, strengths, and weaknesses of each style.

In another brief report, Camp et al. (1985) described a course on teaching for house officers at the Bowman Gray School of Medicine. Four weekly two-hour sessions were voluntarily participated in by 11 third-year residents from the Department of Internal Medicine. All participants reported that the course was valuable and they had thought about new approaches to teaching. Most of the residents reported feeling less anxious about teaching.

Kates and Lesser (1985) described a workshop used to prepare psychiatry residents for teaching activities in an eight-week student clerkship. Four to five simulated vignettes were used to explore various teaching situations the residents were likely to encounter. No evaluation data were provided.

Schwenk and Whitman (1984) prepared a handbook designed to assist house officers develop their skills as teachers. The principles of teaching and learning were briefly summarized, along with tips and techniques residents could utilize in various teaching formats such as lectures, grand rounds, seminars, journal clubs, teaching rounds, morning report, and bedside teaching. No specific use of the material with residents was described.

Wilkerson et al. (1986) and Edwards et al. (1986) reported on two recent studies of resident teaching skills. Wilkerson et al. reported on observations of internal medicine residents on work rounds at Michael Reese Hospital in Chicago. Following the observations a course on clinical teaching was developed specifically for the residents. Edwards et al. reported on a longitudinal study of a resident teaching skills course at the Louisiana State University School of Medicine in New Orleans that showed

resident self-ratings of their teaching skills and satisfaction with the teaching skills course improved over a two-year period. However, there were not enough data from student ratings for resident teaching skills to be fully interpreted.

AGENDA FOR RESEARCH AND DEVELOPMENT

Several generalizations about resident teaching can be made based on this literature review. It is readily apparent that residents are responsible for a large amount of day-to-day teaching of medical students and other residents. Similarly, it is known that residents greatly influence their students and fulfill a unique teaching role in medical education, one that is complementary to the faculty teaching role. Students enjoy working with residents, often preferring informal, one-on-one contact with house officers to more formal clinical and didactic teaching done by faculty. Most residents would like to be better teachers, but lack the time (due to heavy clinical responsibilities) to complete the faculty development training traditionally offered faculty.

Based on these generalizations, an agenda for research and development has been formulated. This agenda is proposed in the context of the following questions.

(1) What types of teaching skills are most appropriate for residents?

In order to most effectively design and implement programs to improve resident teaching skills, researchers and educators need to know more about the types of teaching skills most frequently used by residents. Do these skills vary from specialty to specialty? Do senior house officers require different teaching skills than interns? Are different teaching skills required for teaching medical students than are needed for teaching other residents? Are different teaching skills better suited for use by residents in the inpatient than in the outpatient setting?

Past research and development efforts in resident teaching skills have focused on various kinds of teaching skills. The respondents to Brown's survey (1970) specifically requested

training in instructional methods, public speaking, and evaluation methods. Authors have documented programs that emphasized basic topics such as preparing lectures, teaching skills for teaching and work rounds and hallway discussions, and teaching psychomotor skills (Camp et al., 1985), delivery methods, discussion/questioning skills, demonstration techniques and use of audiovisual media, lecturing, and planning instruction (Lawson and Harvill, 1980), and listening to students, questioning students, leading discussions, providing feedback, and informing students (Tremonti and Biddle, 1982). Schwenk and Whitman (1984) described in great detail how residents could utilize principles of teaching and learning, prepare lectures, grand rounds, seminars, and journal club presentations, and conduct teaching rounds, morning reports, and bedside teaching. Several reports (Tremonti and Biddle, 1982; Wilkerson et al., 1986) have noted that the resident teaching role is complementary to the role of faculty.

More research is needed to determine which of these skills are most generic across specialties and the type of teaching performed by residents. Needs assessment surveys of residents and medical students and intensive observational studies of resident teaching behavior could help identify those skills and behaviors most needed by resident teachers. The authors propose that resident teachers should not be asked to learn new complex teaching behaviors, but rather to continue to spend time with students and be enthusiastic as teachers and role models.

(2) How do faculty and student expectations of resident teaching influence resident teaching?

There is little evidence in the literature that faculty have been active in encouraging residents to improve as teachers. Tonesk (1979) reported that only 87 of the 319 medical school departments who responded to her survey indicated that they evaluated resident teaching performance directly. One example of what can result from faculty interest in resident teaching is documented by Doyle and Balsley (1979). In this instance a psychiatry faculty provided intensive supervision of the case conferences conducted by a chief resident for an entire academic year. Other than this and other isolated teaching improvement programs for residents,

there is little evidence of concentrated faculty support for development of residents as teachers. Research is needed to determine if heightened faculty expectations of resident teaching skills translates into improved resident teaching and other positive outcomes. Residency program directors and faculty should acknowledge that teaching is an important component of a resident's daily agenda. Clerkship and residency program directors should let house officers know what knowledge, attitudes, and skills students and junior residents are expected to learn during clerkships and resident rotations.

Numerous studies have shown that students greatly value the contributions of residents to their education in clinical clerkships. Students surveyed by Byrne and Cohen (1973) indicated that the resident was the team member who contributed the most to the student's learning in the clinical clerkship. Greenberg and Jewett (1983) noted the students' high assessment of opportunities for one-on-one contact with house officers. Greenberg et al. (1984) reported that residents felt that the presence of medical students made their clinical responsibilities more difficult, yet at the same time the residents indicated that teaching medical students improved their own clinical acumen and intellectual skills.

Despite these and other reports of how students value the teaching provided by residents, there have been few efforts to let residents know how students feel about them as teachers. Tonesk (1979) reported that the "medical student's vantage point is critical to an adequate evaluation of resident instruction, especially since the supervisor's opportunity to observe the teaching is limited." Just as it is imperative that the faculty expectations of resident teaching be communicated to residents, the student expectations and evaluations of resident teaching must be shared directly with residents. The effects of the combination of student and faculty evaluation of resident teaching should be studied to assess changes in resident teaching behavior and effectiveness.

A combination of faculty and student assessment of resident teaching effectiveness would appear to be the most effective strategy for motivating improved resident teaching. Faculty have little or no direct contact with residents who are teaching medical

students and junior residents. However, faculty do have some power and authority over residents that can be channeled to motivate them to improve their teaching. Conversely, students have the most contact with residents as teachers, but have no formal means of influencing them to be better teachers. Faculty must acknowledge and reward resident teaching as a responsibility of similar importance as patient care and other clinical responsibilities. A combination of student and faculty assessment of resident teaching plus resident self-assessment of teaching should provide a comprehensive assessment of resident teaching that could be used for teaching improvement and feedback purposes.

(3) What type of intervention is most successful in improving resident teaching skills?

Many different types of educational interventions have been used in programs designed to improve resident teaching skills. These interventions are summarized in Table 1. Most of the reports have shown varying degrees of success for each of the types of interventions used. Further research is needed to determine which types of intervention are most successful in terms of cost effectiveness, efficiency, and eventual adoption by other residency programs and medical schools, but it appears that a minimalist approach utilizing a two- to three-hour workshop may be optimal due to the high level of participation and benefits gained within a short period of time. This approach would guarantee a basic level of teaching-skills training for all house officers. One-on-one consultation and additional group sessions could be provided at the request of interested residents.

Studies that compare outcomes of different types of educational methods for improving resident teaching need to be designed and implemented. Most of the research reported in the literature is based on resident and learner satisfaction as measures of the positive outcomes of improved resident teaching. Additional measures such as improved cognitive performance by residents and learners, patient satisfaction, and improved quality of care should be considered as other outcomes to assess resident teaching skill improvement activities.

TABLE 1
Summary of Reports on Teaching-Skills
Improvement Programs for House Officers

<u>YEAR</u>	<u>AUTHOR(S)</u>	<u>SPECIALTY</u>	<u>TYPE</u>
1963	Husted and Hawkins	Various	Six 1 1/2-hour seminars
1971	Brown	Surgery	Eight 1 1/2-hour seminars
1972	Lazerson	Psychiatry	Supervised teaching experience in evening college
1975	Grimes et al.	Obstetrics-Gynecology	3-month elective in medical education
1976	Meleca & Schimpfhauser	Medicine, Surgery	10 hours of independent and group activities
1979	Doyle & Balsley	Psychiatry	Individual experience to improve case conference
1980	Lawson & Harvill	Medicine, Family Practice	Thirteen 1-hour sessions
1980	Maxmen	Psychiatry	7-hour teaching skill workshop on Saturday
1982	Jewett et al.	Pediatrics	Two 1/2-day workshops
1983	Sheets	Family Practice	9-month fellowship
1984	Lewis & Kappelman	Pediatrics	Videotape examples of 4 teaching styles
1985	Camp et al.	Internal Medicine	Four 2-hour sessions
1985	Kates & Lesser	Psychiatry	Workshop, 4 to 5 vignettes
1986	Edwards et al.	Various	Half-day workshop
1986	Wilkerson et al.	Internal Medicine	6-hour course

There are a number of similarities between the teaching role of house officers and graduate teaching assistants. A large body of educational literature already exists for programs designed to prepare graduate teaching assistants for their teaching role. Some of the lessons learned in the development of graduate teaching assistant teaching skills could be applied to the house officer. Faculty and administrators responsible for developing the teaching skills of residents should explore collaborative efforts with educators and researchers who have extensive experience with graduate teaching assistant programs. This is an area and issue that appears to have been generally ignored by past programs for residents.

In summary: House officers play a major role in the education of medical students and other house officers. This conclusion is

supported by various reports of house officer efforts, studies of perceptions of the house officer's teaching role, and outcomes of programs designed to assess and improve the teaching skills of residents. Based on those reports in the literature, an agenda for research and development of research teaching skills such as the one proposed in this article is sorely needed.

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