

# Changing Habits of Practice

## Transforming Internal Medicine Residency Education in Ambulatory Settings

Judith L. Bowen, MD,<sup>1</sup> Stephen M. Salerno, MD, MPH,<sup>2,3</sup> John K. Chamberlain, MD,<sup>4</sup> Elizabeth Eckstrom, MD, MPH,<sup>5,6</sup> Helen L. Chen, MD,<sup>7</sup> Suzanne Brandenburg, MD<sup>8</sup>

<sup>1</sup>Division of General Internal Medicine & Geriatrics, Department of Medicine, Oregon Health & Science University, Portland, OR, USA; <sup>2</sup>USUHS, Tripler Army Medical Center, Honolulu, HI, USA; <sup>3</sup>Internal Medicine Residency, Tripler Army Medical Center, Honolulu, HI, USA; <sup>4</sup>Department of Medicine and Pediatrics, University of Rochester School of Medicine and Dentistry, Rochester, NY, USA; <sup>5</sup>Department of Internal Medicine, Legacy Health System, Portland, OR, USA; <sup>6</sup>Department of Medicine, Oregon Health & Science University, Portland, OR, USA; <sup>7</sup>University of California, San Francisco Veterans Affairs Medical Center, San Francisco, CA, USA; <sup>8</sup>Division of General Internal Medicine, University of Colorado Health Sciences Center, Denver, CO, USA.

**PURPOSE:** The majority of health care, both for acute and chronic conditions, is delivered in the ambulatory setting. Despite repeated proposals for change, the majority of internal medicine residency training still occurs in the inpatient setting. Substantial changes in ambulatory education are needed to correct the current imbalance. To assist educators and policy makers in this process, this paper reviews the literature on ambulatory education and makes recommendations for change.

**METHODS:** The authors searched the Medline, Psychlit, and ERIC databases from 2000 to 2004 for studies that focused specifically on curriculum, teaching, and evaluation of internal medicine residents in the ambulatory setting to update previous reviews. Studies had to contain primary data and were reviewed for methodological rigor and relevance.

**RESULTS:** Fifty-five studies met criteria for review. Thirty-five of the studies focused on specific curricular areas and 11 on ambulatory teaching methods. Five involved evaluating performance and 4 focused on structural issues. No study evaluated the overall effectiveness of ambulatory training or investigated the effects of current resident continuity clinic microsystems on education.

**CONCLUSION:** This updated review continues to identify key deficiencies in ambulatory training curriculum and faculty skills. The authors make several recommendations: (1) Make training in the ambulatory setting a priority. (2) Address systems problems in practice environments. (3) Create learning experiences appropriate to the resident's level of development. (4) Teach and evaluate in the examination room. (5) Expand subspecialty-based training to the ambulatory setting. (6) Make faculty development a priority. (7) Create and fund multiinstitutional educational research consortia.

**KEY WORDS:** ambulatory; graduate medical education; curriculum; faculty development; internal medicine.

DOI: 10.1111/j.1525-1497.2005.0248.x

J GEN INTERN MED 2005; 20:1181-1187.

Over the past 2 decades, the majority of health care delivery has shifted to ambulatory settings. Many illnesses previously treated in the hospital are successfully managed in outpatient practices. Yet, internal medicine residency training is still primarily hospital-based with care of hospitalized patients taking priority over training in ambulatory settings. For residency program accreditation, only 33% of a resident's total educational experience must be in the outpatient setting.<sup>1</sup>

Thus residents infrequently have the opportunity to develop the rich and rewarding continuity relationships with patients characteristic of ambulatory practice or the skills necessary to perform effectively in the outpatient setting.<sup>2</sup>

Learning in the ambulatory setting is primarily experiential. Although supplemented by conferences and independent study, continuity clinics, ambulatory block rotations, and subspecialty outpatient practices are the primary venues for this learning. Analysis of a typical first year of residency reveals a significant disparity between inpatient and continuity clinic training exposure. A first year resident spends about as much time in the hospital during the first month of training as he/she will spend in the continuity clinic setting during the entire first year (see Fig. 1). This attenuated experience may result in residents' self-perception of incompetence in clinic and lead to dissatisfaction before mastery can be achieved.<sup>3-8</sup>

Ambulatory practice differs from the care of hospitalized patients in several fundamental ways: (1) Patients are typically less acutely ill and their problem lists are populated with chronic problems needing periodic review. (2) The level of uncertainty is greater, from diagnostic accuracy to therapeutic compliance. Clinical decisions must often be made quickly and success may only be seen with longitudinal visits. (3) Patient contacts are marked by relative brevity and irregularity at a hectic pace, but characteristically become continuous relationships between patients and doctors over time.

What, then, is the ideal model for internal medicine resident training in the ambulatory setting that prepares residents for independent practice? What is the evidence for best educational practices in the ambulatory setting? As part of the Society of General Internal Medicine's (SGIM) Task Force for Residency Reform, we reviewed the published medical literature and consulted with experienced ambulatory-based physician educators in an effort to address these questions.

## METHODS

### Theoretical Model for Learning in Ambulatory Settings

We used an experiential learning model to place the literature review in the context of a theoretical model. Kolb describes a

Received for publication July 14, 2005

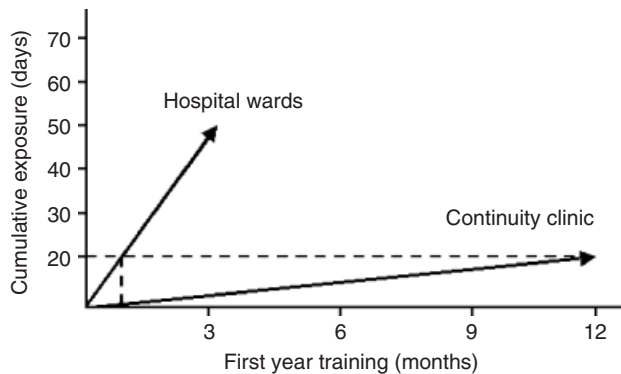
and in revised form July 26, 2005

Accepted for publication July 26, 2005

*The authors have no conflicts of interest to report.*

*Address correspondence and requests for reprints to Dr. Bowen: Division of General Internal Medicine & Geriatrics, Department of Medicine, Oregon Health & Science University, 3181 SW Sam Jackson Park Road, L-475, Portland, OR 97239-3098 (e-mail: bowenj@ohsu.edu).*

*See editorial by Holly Humphrey, p. 1189*



**FIGURE 1.** Comparison of cumulative exposure (days) between continuity clinic and hospital-based wards over a typical first year of internal medicine residency.

continuous process of learning based on concrete experiences followed by active reflection that leads to building and revising conceptual approaches and subsequent application of concepts to new experiences.<sup>9</sup> This process is the core of clinical-based education where experience with patients followed by active reflection and feedback leads to improved performance, competence, and confidence.<sup>9,10</sup> Experience is necessary for the development of diagnostic expertise<sup>11-13</sup> and practice skills unique to ambulatory settings.<sup>14</sup>

## Literature Search

We searched Medline, PsychLit, and ERIC databases using the following search terms: ambulatory care or outpatients or outpatient clinics or preceptorship (ambulatory location); medical education or teaching or teaching hospitals or learning or curriculum (medical education); internship/residency or house-staff or residents (residents); and internal medicine (discipline). Each cluster of search terms was combined independently with the other clusters and limited to English language and human subjects. We limited our search to January 2000 through December 2004, relying on 2 previously published reviews of the literature on ambulatory education<sup>15,16</sup> for studies published prior to 2000. Titles and abstracts, when available, were reviewed. We included all manuscripts relevant to internal medicine residency training in ambulatory settings that studied or observed some aspect of training and presented results. Publications that did not include primary data, such as editorials, program descriptions, theoretical models, or opinions were excluded. Review articles and any studies more relevant to other subgroups of the Residency Reform initiative (e.g., evidence-based medicine studies) were also excluded. At least 1 author reviewed each of the remaining studies in detail. All authors discussed the results of this preliminary review and reached consensus in excluding any additional studies based on lack of methodological rigor or relevance to our questions. In preparing the synthesis reported below, we observed this existing literature regarding training in ambulatory settings to be heterogeneous in scope and depth. Therefore, some sections are described in greater depth where greater detail in the reviewed literature was available. Further, innovative programs that have been undertaken by several institutions, but not yet reported in the literature are not discussed here. Finally, our preliminary conclusions and recommendations were presented and discussed at the national annual meeting of SGIM, inevitably influencing the ideas we present here.

## RESULTS

Ninety-three studies met our preliminary inclusion criteria. Thirty-eight studies were excluded after review of complete manuscripts, leaving 55 studies. Consistent with prior reviews, the majority of studies were completed in single institutions using quasi-experimental designs. Most addressed curricular content germane to the ambulatory setting (35 studies). A smaller number explored teaching methods (11), methods of evaluating performance (5), or the structure of ambulatory education (4). Due to the heterogeneous nature of these studies, results could not be combined.

### Ambulatory Medicine Curricular Content

We grouped studies in this category into several curricular topics areas: screening and prevention (9 studies), behavioral medicine and communication (8), diagnostic and procedural skills (7), geriatrics and end-of-life care (6), women's health (3), and other curricular content (2). Overall, we found deficiencies in knowledge and performance for both residents and faculty in a variety of curricular areas.

**Screening and Prevention.** Several studies evaluated resident knowledge, attitudes and practices in health screening and prevention using surveys, questionnaire responses to clinical vignettes, chart reviews, and patient exit interviews.<sup>17-25</sup> Residents' knowledge of screening guidelines varied widely across studies. Residents' attitudes about health screening (e.g., pap smears) were generally more favorable than their attitudes about preventive behaviors (e.g., physical exercise). In general, residents lacked confidence in counseling skills regarding prevention, and perceived their performances in screening and prevention to be better than found on chart review. Educational programs tended to improve performance, although benefits were modest for some activities (e.g., screening for domestic violence,<sup>21</sup>) and feedback using performance report cards failed to result in improvement in screening or chronic disease management.<sup>24</sup> Greater intensity of ambulatory experience,<sup>18</sup> chart prompts, and faculty particularly dedicated to preventive care improved resident performance in other studies.<sup>20</sup>

Thus, the literature suggests room for improvement in residents' confidence and competence in delivering health screening and preventive services.

**Behavioral Medicine and Communication.** Several studies addressed teaching and learning behavioral medicine and communication skills. Results of 2 national surveys revealed that an average of 99 hours per resident is devoted to behavioral medicine or psychiatry training in internal medicine programs and 79% of this training is experiential.<sup>26,27</sup> Both internists and psychiatrists did the teaching. The majority of program directors rated this training as important and thought more training was needed.<sup>26</sup>

Four studies addressed the doctor-patient relationship. One study showed that older patients had longer visits with their resident providers and were more satisfied but received less health education and counseling, asked fewer questions, and were less likely to be asked to make behavior changes.<sup>28</sup> In another study, patient satisfaction with resident practices compared to faculty practices were mixed.<sup>29</sup> Two studies examined challenging doctor-patient relationships. When identified by their resident providers as "problematic" or "difficult", patients were more likely to have low social support,<sup>30</sup> an in-

creased number of psychiatric diagnoses,<sup>31</sup> and to describe their resident providers as less capable.<sup>30</sup> Anxiety and depression were common patient problems in the studied residents' practices, but not always recognized and diagnosed.

Two studies surveyed training programs on their curriculum related to substance abuse<sup>32</sup> and health care for addicted, incarcerated persons.<sup>33</sup> The majority of programs taught about substance abuse and violence; a smaller number offered clinical experiences with prisoners.

Residents' continuity practices may have a high prevalence of patients with low social support and psychiatric comorbidities such as anxiety and depression. Although most program directors agreed that learning behavioral medicine was important, lack of sufficient training may impair residents' abilities to care for the psychosocially challenging patients in their practices.

**Diagnostic and Procedural Skills.** We found 7 studies that focused on diagnostic or procedural skills. Two studies surveyed residents' perceptions of their preparation to perform common procedures.<sup>34,35</sup> Confidence was highest for inpatient procedures. Time and lack of faculty procedural expertise in the ambulatory setting were cited as barriers. Although numbers of procedures performed were small, another study confirmed faculty expertise as a barrier, showing that internal medicine faculty consistently performed and supervised fewer procedures, and felt less confident and placed less importance on learning ambulatory procedures than family practitioners.<sup>36</sup>

Four studies assessed resident performance with diagnostic tests. In the first, residents' abilities to select the best radiology diagnostic test in specific circumstances ranged from 13% to 100% correct.<sup>37</sup> In the second study, only 3% of resident physicians passed a baseline cognitive test of urinalysis findings. Improvement occurred with 1–1 mentoring but not with didactic or computer-based training.<sup>38</sup> In a third study, a brief multifaceted intervention improved residents' pap smear sample adequacy rates by 21%.<sup>39</sup> In the fourth study, residents detected 96% of abnormal ECGs, determined 36% to 80% of correct diagnoses, and discovered 38% of technical ECG abnormalities.<sup>40</sup>

This literature suggests that resident confidence to perform and faculty competence to teach procedures is variable, potentially impeding resident preparation for practice.

**Geriatrics and End-of-life Care.** Compared to prior reviews, our review found a new emphasis on teaching geriatrics and end-of-life-care. Again, faculty competence was variable. Using focus groups and structured interviews with academic leaders from 49 medical schools, Rubin found deficiencies in geriatrics teaching knowledge and skills, suggesting a significant need for faculty development in geriatrics.<sup>41</sup> Survey results from residents and faculty at 32 internal medicine programs revealed uniform requirements for some didactics in end-of-life care, ethics, and pain management, but faculty knowledge in these areas varied greatly.<sup>42</sup> In 1 program, 30% of residents had no experience with dying patients in their continuity practices and perceived the majority of their faculty to have suboptimal expertise for teaching in this area.<sup>43</sup> Another program implemented a longitudinal elective utilizing community-based home hospice agencies and faculty patients, resulting in an 8.2% improvement in tested knowledge in end-of-life care, as well as high levels of resident, faculty, and patient-family satisfaction.<sup>44</sup> End-of-life curricula have been devel-

oped, implemented, and participant satisfaction evaluated with positive results,<sup>45</sup> including increased patient satisfaction correlating with having discussed advance directives with their resident physicians.<sup>46</sup> Resident competencies, however, were not measured.

As population demographics shift, internal medicine residents are more likely to provide care for older adults, and will face end-of-life care decisions with their patients. Program directors believe that geriatrics and end-of-life curricula are important, but faculty appear inadequately prepared to teach these topics.

**Women's Health.** Three studies addressed training in women's health. Resident competency appears influenced by continuity clinic site, adequacies of the curriculum, and faculty confidence in teaching women's health. In 1 study, residents with clinic at the Veteran's Affairs medical center had lower knowledge of women's health issues and less comfort performing procedures than residents at the University or community clinic sites.<sup>47</sup> A survey of residents in 1 program revealed 41% of residents with knowledge shortfalls in women's health, but only 74% of these residents perceiving the inadequacy.<sup>48</sup> In another survey, all faculty felt women's health skills were important, but internal medicine faculty were substantially less confident than family medicine faculty regarding several women's health skills.<sup>49</sup>

This literature suggests that women's health curricula, resident performance, and faculty competence are highly variable, potentially leaving many residents ill-prepared to address the unique needs of women in their future practices.

**Other Curricular Areas.** Following participation in an elective rotation on gay and lesbian health at a single institution, residents reported improved preparedness in addressing the health needs of their gay and lesbian patients, but improved comfort with gay and lesbian patients was not observed.<sup>50</sup> A survey of residents' knowledge and attitudes regarding obesity suggests that internal medicine residents are ill equipped to address this emerging epidemic.<sup>51</sup>

## Teaching Methods

Educators use a variety of teaching methods to promote learning in ambulatory settings. We identified 11 studies. Although content varied, this literature supports experiential learning through direct practice, role modeling and consistent relationships between residents and teachers.

Faculty role modeling of antibiotic prescribing practices appears, over time, to influence residents' prescribing practices, even when the faculty's habits were characterized as inappropriate.<sup>52</sup> In another study, faculty outperformed residents as teachers of a guideline-consistent hypertension protocol.<sup>53</sup> Assignment to a community-based musculoskeletal medicine clinic improved residents' opportunity to learn and practice joint injections.<sup>54</sup> Opportunity to practice joint aspiration and injection skills on manikins was a superior teaching method when compared to lectures alone or case-based instruction.<sup>55</sup>

Faculty and residents do not always agree on the learning agenda in continuity practices. Laidley et al.<sup>56</sup> found only 40% agreement between a resident's educational priority and faculty's perceived educational need. Higher agreement was noted when resident-faculty pairs were stable over time,

suggesting resident continuity with preceptors may improve the preceptor's effectiveness in targeting teaching.

The effect of feedback on practice behaviors is less clear. In a single institution study, almost all residents found patient feedback regarding communication, electronic medical record feedback on disease management, and feedback from faculty useful, but only half felt the 3-part profiles would influence their practice styles.<sup>57</sup> In another study, feedback did not improve resident performance.<sup>24</sup>

Conferences continue to support experiential learning. Case-based teaching is a common method of instruction, including using the Internet to post cases and reading materials.<sup>58</sup> Results from a national survey of 404 internal medicine departments reveals a 24% prevalence of an outpatient "morning report" type conference,<sup>59</sup> although 1 program using ambulatory morning report 5 times weekly as part of a block rotation failed to show improved outcomes on the ABIM certifying examination.<sup>60</sup>

Finally, 1 study supported prior findings that patients continue to express preference for bedside discussions of their cases, although patient satisfaction did not differ by location of case discussions.<sup>61</sup> A small minority of residents felt loss of autonomy and some felt awkward.

Experience with patients including direct care, and faculty role modeling remain the primary teaching method in ambulatory settings. Didactic and case-based faculty or resident-lead conferences are common but the impact on learning is unknown. As with prior studies, patients prefer exam room teaching.

## Evaluation of Performance

We identified 5 studies using direct observation methodology. A study of the feasibility of using the mini-Clinical Evaluation Exercise (CEX) to evaluate internal medicine residents' performances in multiple settings, including ambulatory clinics, revealed higher fidelity and lower costs than use of standardized patients. A minimum of ten observations per resident was required to produce reliable results in order to discriminate between levels of performance.<sup>62</sup>

Three studies used standardized patients (SPs) to evaluate residents' performances. One demonstrated a positive association between resident nonverbal communication skills and patient satisfaction.<sup>63</sup> Another documented improved resident performance with unannounced SPs.<sup>64</sup> Another institution documented wide variations in resident performance including making incorrect recommendations to patients on a domestic violence observed-structured-clinical-evaluation (OSCE).<sup>65</sup> A fourth study suggested clinical vignettes using computerized case scenarios may offer an alternative to standardized patients in assessing quality of care.<sup>66</sup>

The literature continues to support the use of mini-CEX for evaluation in the ambulatory setting. Although results are mixed and content dependent, support for use of more expensive methods of direct observation is currently lacking.

## Program Structure

Community-based teachers and subspecialty-trained internists continue to play a significant role as teachers in the ambulatory setting. In 1 collaboration between an internal medicine residency program and a federally qualified health

center, resident and patient satisfaction improved, but the grant did not offset the hospital's financial investment.<sup>67</sup> A national survey of general internal medicine teaching units showed that general internist volunteers outside of the university environment do a significant portion of internal medicine teaching.<sup>68</sup>

One study described a 3-year experience integrating ambulatory subspecialty education into continuity clinics. In the specialty areas where large volumes of residents' patients were referred (and residents attended the clinics), in-training examination scores improved. In non-participating specialty areas, in-training examination scores declined, although differences in both directions were small and baseline learner performance was not reported.<sup>69</sup>

Evaluating preceptor-resident and preceptor-patient contact time, and resident charting errors, 1 study showed no significant differences in clinical errors or preceptor-resident contact time at 2 different preceptor-resident ratios (1:3 vs 1:5 to 6). However, increased didactic and preceptor-patient contact time was noted for the lower preceptor-resident ratio. Differences in teaching effectiveness or satisfaction were not reported.<sup>70</sup>

## DISCUSSION

Although we can learn something of the priorities and concerns of residency programs from reviewing trends in published studies, this review highlights, for the most part, local rather than global concerns. Most studies are completed at single institutions, a trend identified from prior reviews. Further, the literature we reviewed is replete with "needs assessments" identifying significant curricular or instructional deficiencies in multiple content areas relevant to teaching and learning in the ambulatory setting, but provides little guidance for how to respond to these shortcomings. Internal medicine educators continue to create innovative programs to address important educational problems, but the heterogeneity of the published studies, and the lack of methodological rigor and multi-center designs significantly limits our ability to draw broad conclusions from this literature.

National surveys do reveal that program directors value behavioral medicine training but few hours are dedicated to this training, and faculty lack skills and knowledge in geriatrics and end-of-life care that hampers their teaching abilities in these areas. Smaller studies raise concerns about outpatient teachers' abilities to teach ambulatory procedural skills. Although specific recommendations for evaluation of skills and competency in performing procedures are outside the scope of this review, these findings may help focus future faculty development efforts.

Several studies consistently found that residents often lack confidence and competence in addressing many common ambulatory health issues. One explanation might be that residents simply do not have enough experience in the ambulatory setting to master these skills, or to develop expertise in delivering such care. While programs are required to provide 33% of training in ambulatory settings, only approximately 13% of the required 33 months of clinical training occurs in the continuity practice setting. It is difficult to develop practice competence with so little exposure.

Should *all* internal medicine residents have increased clinical training in ambulatory settings? Some would argue

that residents might benefit from training tracks tailored to their career plans, so that residents bound for careers as hospitalists would focus on hospital-based training. Reporting on training track discussions is beyond the scope of this report. We do believe, however, that the core of internal medicine training at the residency level should include a more robust exposure to continuity practice regardless of the resident's future career choice. The move toward providing more primary and subspecialty care in outpatient settings rather than inpatient settings and shorter lengths of stay in hospitals suggest that continuity clinic may be an increasingly important venue for internal medicine training. The call for improved skills and demonstrated competency in systems-based practice requires an appreciation of the entire health care delivery system as experienced from the patient's perspective. Residents planning careers in primary care, hospital medicine, or subspecialty practice will benefit from education that reflects the current health care environment, including more ambulatory training.

Based on our review of the literature within the framework of experiential learning and consultation with experienced ambulatory-based physician educators, we make the following recommendations:

### **Make Training in the Ambulatory Setting a Priority**

If patient care experience with reflection is essential for the development of mastery in the ambulatory setting, training time in continuity clinics must be increased beyond 13%. This will require a significant cultural shift in internal medicine. The opportunity to fully integrate residents into their own continuity practices in the absence of competing hospital-based service demands is often absent. Clear expectations, rigorous evaluation and feedback, and experiences uninterrupted by coverage requirements in the hospital will be needed to increase residents' perceptions that ambulatory-based training is valued, valuable, and can be mastered. Further research should address the benefit of immersing residents in their continuity clinics similar to their early hospital ward rotations. Demonstrating value should also include appointing a faculty member with clear responsibility and authority for resident ambulatory training and ambulatory faculty development who reports to the program director, and increasing the Residency Review Committee (RRC) continuity clinic requirement to at least 2 clinics per week during noncall months.

### **Create Learning Experiences and Expectations Appropriate to the Resident's Level of Development**

Given their limited exposure in the ambulatory setting, residents often face patients with complex medical issues early in internship that are beyond their level of development. In the time-constrained ambulatory environment, the impact of this developmental mismatch on learning is unknown. A new model that takes into consideration the developmental level of the resident while supporting patient-centered care should be studied. Further research should explore the relationship between residents' perceived clinical competence in ambulatory settings, their attitudes toward ambulatory practice, patient complexity, and developmental models for supervision that promote learning and self-efficacy.

### **Structure Continuity Clinics for Success**

Learning from experience, residents will acquire habits of practice from the care delivery model in which they are immersed. The current medical literature fails to inform educators of practice model elements that influence residents' practice habits. Theoretically, if residents learn to practice in highly functional environments that deliver high quality, patient-centered care, they will carry those habits of practice into their futures. The structure, function, and shared values within the practice setting have previously been identified as important features of positive learning environments.<sup>71-73</sup> Possible features of the ideal practice include: promoting long-term relationships with patients, developing normative distributions of patient complexity and psychosocial challenge in residents' panels, creating long-term relationships with one's support staff, delegating patient care responsibilities to other team members, designing highly functional space, developing efficient systems of care for chronic disease management, and promoting a patient-centered work ethic. These ideal practices will likely include interdisciplinary teams that support residents' care of their complex patients, including social workers, psychologists or psychiatrists, nurses, pharmacists, and others. Ultimately, such practice environments may be positive settings for learning about health systems, management of chronic conditions, quality improvement, and engender resident investment in the success of the practice.

### **Expand Subspecialty-Based Training to the Ambulatory Setting**

The outpatient clinic is not solely the domain of the generalist. Although the predominant model for learning subspecialty content areas of internal medicine is the hospital-based consult service, some programs assign residents to subspecialty clinics, which may be an ideal location for learning to manage many chronic conditions. Furthermore, many patients admitted to the hospital from subspecialty clinics have known diagnoses and articulated management plans. Increasing training opportunities for residents in subspecialty outpatient clinics may provide residents increased experience in evaluating undiagnosed symptoms and acute exacerbations of chronic diseases.

### **Teach and Evaluate in the Examination Room**

The growing body of evidence that the mini-CEX is a reliable and valid measure of residents' observed performance should accelerate inclusion of this evaluation method into the daily activities of teaching in continuity clinics.<sup>74,75</sup> Patients have again indicated their desire that faculty spend time with them at the bedside (in the examination room) during teaching encounters. Making examination room teaching a regular habit should increase the fidelity of the evaluations, and may improve satisfaction, optimize faculty-resident ratios, and increase billings. Providing evaluation and feedback on a focused portion of the resident-patient encounter allows integration of the mini-CEX without disrupting patient flow.

### **Make Faculty Development a Priority**

Evident in many of the studies is a lack of faculty expertise (or confidence) in teaching ambulatory medicine. Improving the independent practice abilities of internal medicine residents will

require improved faculty skills. Department and division chiefs should support protected time for faculty development on a periodic basis to sustain this effort. Teaching excellence should be measured and valued as much as clinical productivity. Faculty development should address core teaching skills, the core curricular content for internal medicine (including but not limited to the deficiencies identified here), and mentoring skills.

## Create and Fund Multi-Institutional Educational Research Consortia

While important, the predominance of local "needs assessment" reports in the current literature review fails to advance the field of medical education in any significant way. Residents' continuity practices can serve as "research labs" in addressing important educational questions and discovering best educational practices. More rigorous research study designs and a stronger link between educational process, educational outcomes, and patient outcomes are needed.<sup>76</sup> Studies should be designed and conducted with clear interventions that can be adapted to multiple institutions.

In addition to increasing the number of studies published in the medical literature, multiple venues for systematic sharing of best practices (e.g., workshops at regional and national meetings, and Web-based repositories and publications) are needed.

## LIMITATIONS

Our study has limitations. Although our intention was to be comprehensive, we may have failed to identify or overlooked important contributions to the literature. There were few methodologically rigorous studies across multiple institutions with detailed enough methods to result in widespread generalizability. Thus, some of our recommendations are based on discussions with experts and knowledge of learning theories, and may be less well supported by empirical evidence until further research is conducted. While studies reported here suggest strong interest in the areas of screening and prevention, behavioral medicine and communication, procedural skills, and end-of-life care, many more unpublished curricular advances likely exist and knowledge of these advances could have shaped our recommendations differently. Finally, this literature review does nothing to help determine how best to implement these suggestions. Each residency program has its own strengths and challenges. Financial pressures may limit available resources, including faculty time or clinical space. Many faculty face significant clinical productivity pressures; rewards for educational innovation and excellence may be lacking. Faculty may not perceive the need for self-improvement. Educators should interpret our recommendations based on individual needs.

From community-based teachers to academic leaders, many internists have devoted their lives to improving teaching and learning in ambulatory settings. The theory-based recommendations suggested here need scientific validation in outpatient teaching settings with a focus on outcome-based assessments, followed by an ongoing national dialogue that leads to meaningful transformation of ambulatory training in internal medicine that will result in improved competence and confidence for delivering high quality, patient-centered care.

## DISCLAIMER

The opinions or assertions contained herein are the private views of the authors and are not to be construed as official or as reflecting those of the Department of the Army or the Department of Defense.

## REFERENCES

1. **Internal Medicine Residency Program Requirements.** [http://www.acgme.org/downloads/RRC\\_progReq/140pr703.pdf](http://www.acgme.org/downloads/RRC_progReq/140pr703.pdf)
2. **Whitcomb ME, Cohen JJ.** The future of primary care medicine. *New Engl J Med.* 2004;351:710-2.
3. **Cantor JC, Baker LC, Hughes RG.** Preparedness for practice: young physicians' views of their professional education. *JAMA.* 1993;270:1035-40.
4. **Wiest FC, Ferris TG, Gokhale M, Campbell EG, Weissman JS, Blumenthal D.** Preparedness of internal medicine and family practice residents for treating common conditions. *JAMA.* 2002;288:2609-14.
5. **Blumenthal D, Gokhale M, Campbell EG, Weissman JS.** Preparedness for clinical practice: reports of graduating residents at academic health centers. *JAMA.* 2001;286:1027-34.
6. **Zandbelt LC, Smets EM, Oort FJ, Godfried MH, de Haes HC.** Satisfaction with the outpatient encounter. A comparison of patient's and physician's views. *J Gen Int Med.* 2004;19:1088-95.
7. **Barnett DR, Bass PF 3rd, Griffith CH 3rd, Candill TS, Wilson JF.** Determinants of resident satisfaction with patients in their continuity clinic. *J Gen Intern Med.* 2004;19:456-9.
8. **Hoellein AR, Feddock CA, Griffith CH 3rd, et al.** Are continuity clinic patients less satisfied when the resident is postcall? *J Gen Intern Med.* 2004;19:562-5.
9. **Kolb DA.** *Experiential Learning. Experience as the Source of Learning and Development.* Englewood Cliffs, NJ: Prentice Hall; 1984.
10. **Smith CS, Irby DM.** Experience and reflection in ambulatory settings. *Acad Med.* 1997;72:32-5.
11. **Gruppen LD.** Implications of cognitive research for ambulatory care education. *Acad Med.* 1997;72:117-20.
12. **Schmidt HG, Norman GR, Boshuizen HPA.** A cognitive perspective on medical expertise: theory and implications. *Acad Med.* 1990;65:611-21.
13. **Bordage G.** Elaborated knowledge: a key to successful diagnostic thinking. *Acad Med.* 1994;69:883-5.
14. **Bowen JL, Carline JD.** Learning in the social context of ambulatory care clinics. *Acad Med.* 1997;72:187-90.
15. **Irby D.** Teaching and learning in ambulatory care settings: a thematic review of the literature. *Acad Med.* 1995;70:898-931.
16. **Bowen JL, Irby DM.** Assessing quality and costs of education in the ambulatory setting: a review of the literature. *Acad Med.* 2002;77:621-80.
17. **Barrison AF, Smith C, Oviedo J, Heeren T, Schroy PC III.** Colorectal cancer screening and familial risk: a survey of IM residents' knowledge and practice patterns. *Am J Gastroenterol.* 2003;98:1410-6.
18. **Borum ML.** A comparison of smoking cessation efforts in African Americans by resident physicians in a traditional and primary care internal medicine residency. *J Natl Med Assoc.* 2000;92:131-5.
19. **Delnevo CD, Hausman AJ.** Injury prevention counseling among residents of internal medicine. *Am J Prev Med.* 2000;19:63-5.
20. **Delnevo CD, Steinberg MD, Abatemarco DJ, Hausman AJ.** Correlates of clinical preventive practices among internal medicine residents. *Prev Med.* 2003;36:645-51.
21. **Knight RA, Remington PL.** Training internal medicine residents to screen for domestic violence. *J Women's Health Gender-based Med.* 2000;9:167-74.
22. **Rogers LQ, Bailey JE, Gutin B, et al.** Teaching resident physicians to provide exercise counseling: a needs assessment. *Acad Med.* 2002;77:841.
23. **Zack DL, DiBaise JK, Guigley EM, Roy HK.** Colorectal cancer screening compliance by medicine residents: perceived and actual. *Am. J Gastroenterology.* 2001;96:3004-8.
24. **Kogan JR, Reynolds EE, Shea JA.** Effectiveness of report cards based on chart audit of residents' adherence to practice guidelines on practice performance: a randomized controlled trial. *Teach Learn Med.* 2003;15:25-30.
25. **Sharma VK, Corder FA, Raufman JP, Sharma P, Fennerty MB, Howden CW.** Survey of internal medicine residents' use of the fecal occult blood test and their understanding of colorectal cancer screening and surveillance. *Am J Gastroenterol.* 2000;95:2068-73.

26. **Chin HP, Guillermo G, Prakken S, Eisendrath S.** Psychiatric training in primary care medicine residency programs. A national survey. *Psychosomatics*. 2000;41:412-7.
27. **Gaufberg EH, Joseph RC, Pels RJ, Wyshak G, Wieman D, Nadelson CC.** Psychosocial training in U.S. internal medicine and family practice residency programs. *Acad Med*. 2001;76:738-42.
28. **Callahan EJ, Bertakis KD, Azari R, Robbins JA, Helms LJ, Chang DW.** The influence of patient age on primary care resident physician-patient interactions. *J Am Geriatric Soc*. 2000;48:30-5.
29. **Yancy WS Jr, Macpherson DS, Hanusa BH, et al.** Patient satisfaction in resident and attending ambulatory care clinics. *J Gen Intern Med*. 2001;16:755-62.
30. **Boutin-Foster C, Charlson ME.** Problematic resident-patient relationships: the patient's perspective. *J Gen Intern Med*. 2001;16:750-4.
31. **Didden DG, Philbrick JT, Schorling JB.** Anxiety and depression in an internal medicine residency continuity clinic: difficult diagnoses. *Int J Psychol Med*. 2001;31:155-67.
32. **Issacson JH, Fleming M, Kraus M, Kahn R, Mundt M.** A national survey of training in substance use disorders in residency programs. *J Stud Alcohol*. 2000;61:912-5.
33. **Kraus ML, Isaacson JH, Kahn R, Mundt MP, Manwell LB.** Medical education about the care of addicted incarcerated persons: a national survey of residency programs. *Substance Abuse*. 2000;22:97-104.
34. **Hicks CM, Gonzalez R, Morton MT, Gibbons RV, Wigton RS, Anderson RJ.** Procedural experience and comfort level in internal medicine trainees. *J Gen Intern Med*. 2000;15:716-22.
35. **Wickstrom GC, Kolar MM, Keyserling TC, et al.** Confidence of graduating internal medicine residents to perform ambulatory procedures. *J Gen Intern Med*. 2000;15:361-5.
36. **Wickstrom GC, Kelley DK, Keyserling TC, et al.** Confidence of academic general internists and family physicians to teach ambulatory procedures. *J Gen Intern Med*. 2000;15:353-60.
37. **Taragin BH, Feng L, Ruzal-Shapiro C.** Online radiology appropriateness survey: results and conclusions from an academic internal medicine residency. *Acad Radiol*. 2003;10:781-5.
38. **Canaris GJ, Flach SD, Tape TG, Stierwalt KM, Haggstrom DA, Wigton RS.** Can internal medicine residents master microscopic urinalysis? Results of an evaluation and teaching intervention. *Acad Med*. 2003;78:525-9.
39. **Watkins RS, Moran WP.** The impact of targeted resident education and feedback on pap smear adequacy rates. *J Gen Intern Med*. 2004;19:545-8.
40. **Salerno SM, Alguire PC, Waxman HS.** Competency in interpretation of 12-lead electrocardiograms: a summary and appraisal of published evidence. *Ann Intern Med*. 2003;138:751-60.
41. **Rubin CD, Stieglitz H, Vicioso B, Kirk L.** Development of geriatrics-oriented faculty in general internal medicine. *Annals Intern Med*. 2003;139:615-20.
42. **Mullan PB, Weissman DE, Ambuel B, von Gunten C.** End-of-life care education in internal medicine residency programs: an interinstitutional study. *J Palliative Med*. 2002;5:487-96.
43. **Schwartz CE, Goulet JL, Gorski V, Selwyn PA.** Medical residents' perceptions of end-of-life care training in a large urban teaching hospital. *J Palliative Med*. 2003;6:37-44.
44. **Liao S, Amin A, Rucker L.** An innovative, longitudinal program to teach residents about end-of-life care. *Acad Med*. 2004;79:752-7.
45. **Weissman DE, Mullan PB, Ambuel B, von Gunten C.** End-of-life curriculum reform: outcomes and impact in a follow-up study of internal medicine residency programs. *J Palliative Med*. 2002;5:497-506.
46. **Tierney WM, Dexter PR, Gramelspacher GP, Perkins AJ, Zhou XH, Wolinsky FD.** The effect of discussions about advance directives on patients' satisfaction with primary care. *J Gen Intern Med*. 2001;16:32-40.
47. **Orsetti KE, Frohna JG, Gruppen LD, Valle J.** Impact of a veteran's affairs continuity clinic on resident competencies in women's health. *J Gen Intern Med*. 2003;18:419-22.
48. **Pursley HG, Kwolek DS, Griffith CH, Wilson JF.** Women's health issues and residents' knowledge. *J Kentucky Med Assoc*. 2002;100:238-44.
49. **Dixon JG, Bogner BA, Keyserling TC, et al.** Teaching women's health skills: confidence, attitudes and practice patterns of academic general physicians. *J Gen Intern Med*. 2003;18:411-8.
50. **McGarry KA, Clarke JG, Cyr MG, Landau C.** Evaluating a lesbian and gay health care curriculum. *Teach Learn Med*. 2002;14:244-8.
51. **Block JP, DeSalvo KB, Fisher WP.** Are physicians equipped to address the obesity epidemic? Knowledge and attitudes of internal medicine residents. *Preventive Med*. 2003;36:669-75.
52. **Mincey BA, Parkulo MA.** Antibiotic prescribing practices in a teaching clinic: comparison of resident and staff physicians. *Southern Med J*. 2001;94:365-9.
53. **Denton GD, Smith J, Faust J, Holmboe E.** Comparing the efficacy of staff versus housestaff instruction in an intervention to improve hypertension management. *Acad Med*. 2002;77:34-9.
54. **Houston TK, Connors RL, Cutler N, Nidiry MA.** A primary care musculoskeletal clinic for residents. Successes and sustainability. *J Gen Intern Med*. 2004;19:524-9.
55. **Vogelgesang SA, Karplus TM, Kreiter CD.** An instructional program to facilitate teaching joint/soft tissue injection and aspiration. *J Gen Intern Med*. 2002;17:441-5.
56. **Laidley TL, Braddock CH III, Fihn SD.** Did I answer your question? Attending physicians' recognition of residents' perceived learning needs in ambulatory settings. *J Gen Intern Med*. 2000;15:46-50.
57. **Callahan M, Fein O, Battleman D.** A practice profiling system for residents. *Acad Med*. 2002;77:34-9.
58. **Embi PJ, Bowen JL, Singer E.** A web-based curriculum to improve residents' education in outpatient medicine. *Acad Med*. 2001;76:545.
59. **Spickard A III, Ryan SP, Muldowney JA III, Farnham L.** Outpatient morning report: a new conference for internal medicine residency programs. *J Gen Intern Med*. 2000;15:822-4.
60. **Wenderoth S, Pelzman F, Demopoulos B.** Ambulatory morning report: can it prepare residents for the American Board of Internal Medicine examination? *J Gen Intern Med*. 2002;17:207-9.
61. **Anderson RJ, Cyran E, Schilling L, et al.** Outpatient case presentations in the conference room versus exam room: results from two randomized controlled trials. *Am J Med*. 2002;113:657-62.
62. **Norcini JJ, Blank LL, Duffy FD, Fortna GS.** The mini CEX: a method for assessing clinical skills. *Ann Intern Med*. 2003;138:476-81.
63. **Griffith CH III, Wilson JF, Langer S, Haist SA.** Housestaff nonverbal communication skills and standardized patient satisfaction. *J Gen Intern Med*. 2003;18:170-4.
64. **Wilk AI, Jensen NM.** Investigation of a brief teaching encounter using standardized patients: teaching residents alcohol screening and intervention. *J Gen Intern Med*. 2002;17:356-60.
65. **Varjavand N, Cohen DG, Novack DH.** An assessment of residents' abilities to detect and manage domestic violence. *J Gen Intern Med*. 2002;17:465-8.
66. **Dresselhaus TR, Peabody JW, Luck J, Bertenthal D.** An evaluation of vignettes in predicting variation in the quality of preventive care. *J Gen Intern Med*. 2004;19:1013-8.
67. **Mazur EM, Cleary JP, Pols KB, et al.** Collaboration between an internal medicine residency program and a federally qualified health center: Norwalk hospital and the Norwalk community health center. *Acad Med*. 2001;76:1159-64.
68. **Nelson HD, Cooney TG, Kroenke K, Friedman RH.** Contributions of general internal medicine teaching units: a national survey. *J Gen Intern Med*. 2000;15:277-83.
69. **Randall DC, Strong J, Gibbons R.** A longitudinal subspecialty experience for internal medicine residents. *Military Med*. 2001;166:40-3.
70. **Murden RA, Pintz EE.** Housestaff-faculty ratios in ambulatory clinics and patient care and education. *Acad Med*. 2003;78:224.
71. **Young BL, Graham RP, Shipengrover J, James PA.** Components of learning in ambulatory settings: a qualitative analysis. *Acad Med*. 1998;73(suppl):S60-3.
72. **Zayas LE, James PA, Shipengrover JA, Schwartz DG, Osborne JW, Graham RP.** Exploring instructional quality indicators in ambulatory medical settings: an ethnographic approach. *Fam Med*. 1999;31:635-40.
73. **Smith CS, Morris M, Hill W, et al.** Cultural consensus analysis as a tool for clinic improvements. *J Gen Intern Med*. 2004;19:514-8.
74. **Holmboe ES, Huot S, Chung J, Norcini J, Hawkins RE.** Construct validity of the miniclinical evaluation exercise (mini CEX). *Acad Med*. 2003;78:826-30.
75. **Durning SJ, Cation LJ, Markert RJ, Pangaro LN.** Assessing the reliability and validity of the mini-clinical evaluation exercise for internal medicine residency training. *Acad Med*. 2002;77:900-4.
76. **Chen FM, Bauchner H, Burstin H.** A call for outcomes research in medical education. *Acad Med*. 2004;79:955-60.