2013 | 11:1

ACADEMIC INTERNAL MEDICINE INSIGHT

By the Numbers

10

Free modules in the AAIM-ACP High Value Conscious Care Curriculum
Page 18

50%

Decline in the proportion of inpatient medical rounds conducted at bedside
Page 4

7,031

AAIM members as of March 27
Page 3

Also in This Issue

AAIM Board Chair Report: Building Strong Governance Through Integration

It has been my privilege to serve as your fiscal year (FY) 2013 AAIM Board of Directors Chair. Serving as APDIM Past President and on the AAIM Board for the past three years has been a tremendous experience. It has allowed me to directly participate in the growth and development of an alliance strengthened by its five founding organizations—APM, APDIM, ASP, CDIM, and AIM.

The AAIM Board of Directors is a balanced governing body with equal representation from the founding groups through their respective councils, plus several alliance-wide committee chairs. The councils and committees focus on the myriad functional areas (accreditation, advocacy, education, research, etc.) needed to provide you the very best member experience possible and also support you in your daily work with students, residents, fellows, and faculty.

Engaging Alliance Stakeholders

AAIM is quickly becoming the recognized voice for academic internal medicine because of willingness on the part of your peers and colleagues to serve as volunteer leaders. Each of the five founding member organizations of the alliance has enjoyed strong collaborative relationships with our key stakeholders in the past. As an alliance, we have begun to move those relationships to the next level. Lines of communication are open, our advice is often sought, and requests to partner on efforts that affect the future of academic medicine are frequent.

- Internal Medicine Education Redesign Advisory Board. Organized by AAIM, this board is composed of representatives from AAIM, the Accreditation Council for Graduate Medical Education, the American Board of Internal Medicine (ABIM), the American College of Physicians (ACP), the Society for General Internal Medicine, and Society for Hospital Medicine (SHM).
- Integrating Geriatrics Steering Committee is composed of representatives from ASP and several internal medicine specialty societies including the American Geriatrics Society, American Society for Clinical Oncology, and Infectious Diseases Society of America.
- AAIM participates in the ABIM Liaison Committee for Recertification.
- AAIM sends representatives to high-level discussions at the Institute of Medicine and the Medicare Payment Advisory Commission.
- The successful Quality and Safety Educators Academy is a joint AAIM-SHM educational offering.
- AAIM has reciprocal membership on ACP's advocacy and education committees.
- Representatives from APM, APDIM, and CDIM are part of the Association of American Medical Colleges Council for Academic Societies.
- ASP has a seat at the ACP Council for Specialty Societies.
- AAIM, ASP, ABIM, and ACGME recently convened a subspecialty medicine summit to discuss the impact of milestones and NAS on faculty leading specialty medicine fellowship programs.

Fiscal Strength

Even in these uncertain times, when departments have had to make tough budget decisions regarding professional membership dues, travel, and continuing medical education expense requests, AAIM membership renewal and meetings registrations remain strong. The AAIM Finance Committee manages the healthy reserves of our consolidated entity.

Expanding the Membership

Did you know that AAIM now has over 7,000 members? I welcome all the new members—you now have a wealth of resources at your fingertips: great publications, online member communities, educational programs, and a network of clinical and administrative professionals just an email away when you need help.

In FY 2012, the alliance board approved the roll-out of the consolidated invoice—a single invoice for each department, with the option of enrolling any faculty member or administrator from the department who meets the criteria for membership. Although we consolidated the enrollment and renewal process, AAIM has maintained the opportunity for members to remain connected to their original member group. More than 90% of the FY 2012 members renewed in FY2013. An added value is you can now belong to more than one group if your professional responsibilities have you multi-tasking!

You may see lots of new faces at upcoming conferences, workshops and seminars. Don't forget to say hello and welcome anyone you see with a new member ribbon on their badge. Even though many professional societies and associations suffered a decline in membership during the most recent market downturn, the alliance organizations' membership has remained steady across the groups. The new enrollment process has provided the opportunity for many others to join. Figure 1 offers a look at how we are trending.

Network and Learn

Our annual conferences, precourses, workshops, and seminars provide excellent opportunities for networking, professional development, and vetting best practices. There are many offerings throughout the year that are designed to fit your needs and budgets. Program planning committees across all groups encourage you to register, participate (yes, step up to the microphone and ask questions!), and then submit your feedback through the program evaluation process. AAIM offers executive leadership training, hot topic updates through seminars and workshops, and views and advice

from nationally ranked faculty; all of which to ensure you have the most current information available.

Program participation is diverse! Residency program directors, chief residents, division chiefs, clerkship administrators, and chairs of medicine all attend alliance programs. In addition to the learning experience, it is a great way to connect with colleagues face-to-face and share best practices.

The AAIM founding organizations are proud to recognize the achievements of members. Several service and achievement awards are presented each year (usually at one of the annual meetings) to well-deserving faculty and administrators. I encourage you to respond to future calls for nominations. We appreciate learning about faculty and administrators' contributions to the profession. All award criteria can be found at www.im.org.

Developing New Strategies for the Future

AAIM is a dynamic, growing organization. The AAIM Board of Directors convened a group of organizational leaders to develop a strategic plan for the newly integrated alliance. Key areas of focus include education, research, membership, and advocacy. The board is currently working to finalize the 2013-2016 plan and resource allocation for the strategic initiatives. Look for details in future issues of *Insight* and on AAIM Connect as more information is available.

Connect. Learn. Collaborate

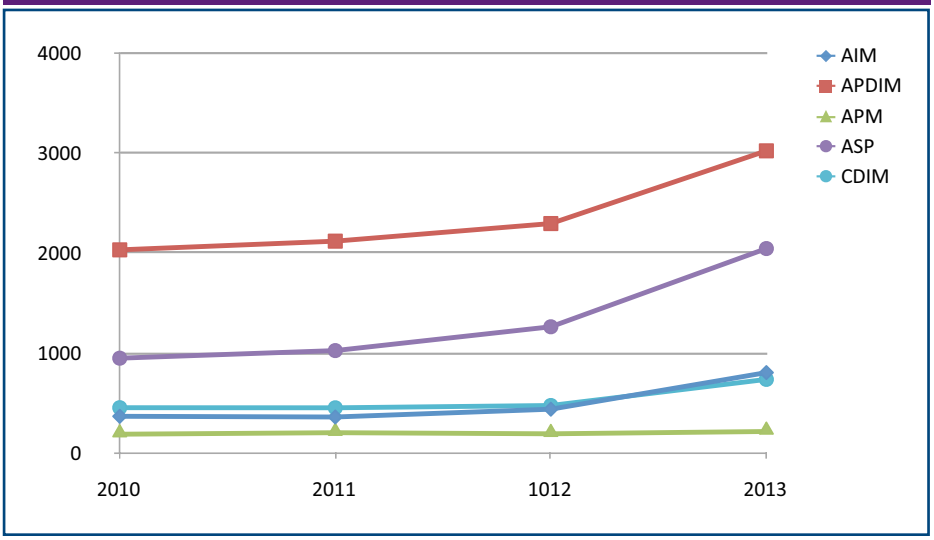
Share your ideas. Join a group discussion on AAIM Connect. Develop an abstract for presentation at an upcoming educational program, create a poster, or share best practices by submitting an article or paper for publication. Get involved!

I look forward to seeing you at an upcoming AAIM event. Visit www.im.org to learn more about the alliance and its founding organizations.

Sincerely,

Lisa M. Bellini, MD
Chair, AAIM Board of Directors

FIGURE 1. Association Membership 2010-2013



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MiPLAN: Bedside Attending in the New Era

The time-honored tradition of bedside teaching on attending rounds has faded over the past 50 years, with the proportion of inpatient medicine rounds conducted at the bedside declining from 75% in the 1960s to between 15% and 25% at present (1). The evidence shows that conducting rounds at the bedside is preferred by rounding participants, including patients (2) and providers (3,4); does not produce excess anxiety in patients (2,5); does not necessarily take more time than conference room rounding (4); and may provide an opportunity to improve care and teaching (6,7). As medicine, the training environment, residents, and ward attendings have changed in the current era, notable champions of bedside teaching have emphasized the value of retaining clinical skills, of not losing part of the ritual of the careful physical examination, and of the need to find a "new normal" (8–10).

Through deconstructing the activities of highly effective attending physicians and with a basis in principles of adult learning, we have constructed a model to supporting bedside attending rounds (11). Activities supporting effective bedside rounds, in which the patient is present and integrally involved, fall into three categories: preparation undertaken before going to the bedside (M), key things for the attending to remember during the resident's bedside presentation (i's), and an algorithm for potential teaching topics once the presentation is complete (PLAN). Our aim is to present the basics of the model (**Figure 1)** and to discuss key barriers and solutions to bedside rounding (**Figure 2)**.

Meeting

An initial meeting among team members is key to effective inpatient attending in any setting, particularly if the aim is to round at the bedside. The meeting should occur as early as possible during the rotation, preferably on the first day. A meeting provides an opportunity for all team members to introduce themselves and share some of their interests and experiences. It not only humanizes team members but also sharpens the targets for future teaching. Educational goals and objectives can be developed, expectations—in both directions—made clear, learning climate addressed, and the details of how rounds will occur made plain.

The meeting also provides an opportunity for the attending to anticipate issues that may come up during bedside rounds and address them beforehand. Examples of such issues include sensitive patient care concerns, the presence of family members, the talkative patient, how to address potential errors, and language or cultural barriers.

The "i"s

Introduction

The first actions on entering the patient's room should include an introduction between the patient and team members, a brief word to ensure the patient's physical comfort, and a brief description of what will take place. In preparation, the arrangement of team members should be deliberate; in particular consider whether there is an opportunity for the attending to sit and how to ensure that the patient is physically triangulated between the presenter and the attending. This arrangement allows the attending's attention to be directed toward the patient and presenter simultaneously.

In the Moment and Interruptions

Listening carefully to the resident's presentation—or being in the moment—and avoiding interruptions requires focused attention and accomplishes two key goals. First, efficiency improves if unnecessary attending questions are avoided. Second, allowing the resident to finish his or her presentation prior to attending comment enhances learner morale. It is key for residents to have a well-understood format and time expectation on which to base their presentations. Adhering to a "contract" with the presenter not only allows them uninterrupted time to complete their presentation but supports the concept of their independence as an adult learner.

Inspection

One of the greatest teaching opportunities that bedside rounding provides is careful inspection. During the presentation, the attending can observe the nod of the patient's head when the history of present illness is portrayed accurately (or not), the presence of periodic apnea (whether obstructive or of the Cheyne-Stokes variety), elevated neck veins, the presence of medical devices, and countless other things. Done well, such observation is not a distraction or interruption from the presentation, but a part of the team's collective effort—inspecting the purpuric leg rash during the presentation accomplishes three simultaneous tasks: confirms the accuracy of the clinical finding so that patient care is proceeding correctly, assesses the clinical skills of the resident, and teaches other team members.

Independent Thought

Resident presentations should end with an assessment and plan that reflects independent thought based on their consideration of all the clinical information. It enhances their position as an adult learner but also sets the stage for the teaching that follows.

PLAN

Once the presentation is complete and the team's assessment and plan communicated, the proverbial spotlight shifts to the attending. This scrutiny can be uncomfortable for less experienced faculty. "PLAN" is an approach to selecting what to teach about.

Patient

The substantial majority of teaching topics derive from the patient. If a particular diagnosis needs consideration, it can be the teaching topic. For example, if pulmonary embolism is a clinical concern that has not yet been sufficiently pursued, the attending may need only ask, "Did you consider pulmonary embolism in your differential diagnosis?" to make the teaching point, advance patient care, and gently provide feedback. This time is also where physical examination findings can be highlighted.

Learner

If there are no evident patient care teaching points, the attending can ask the learner to identify what might be the best target for teaching: "Great job. Were there any decisions you struggled with last night?" An indirect route to learner-derived topics is through interactive questioning. Provided the ground rules were set at the initial meeting, interactive questioning can identify the learning "gap" or limit of their understanding so that the attending or other team members can add to it.

Attending

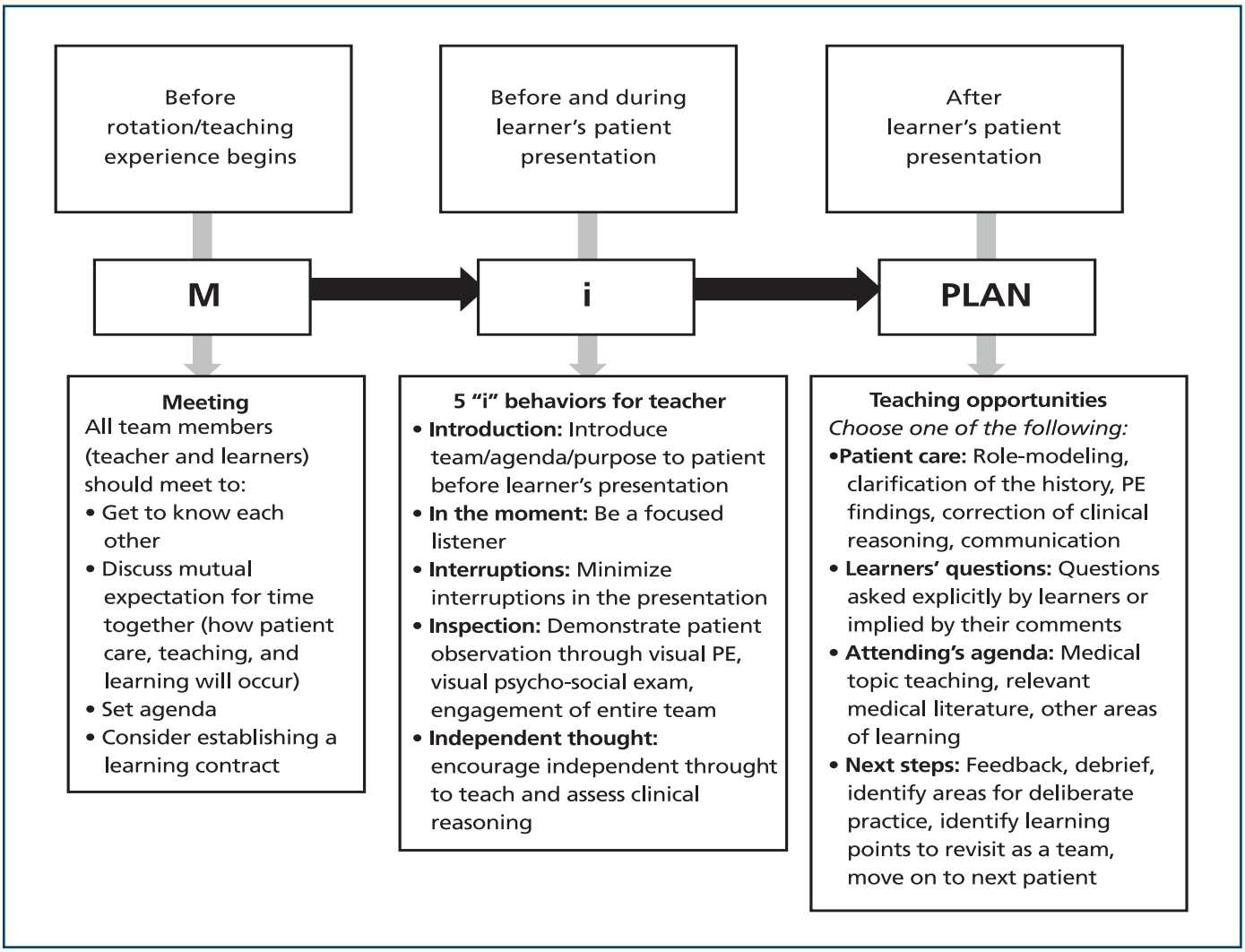
Absent patient care or learner-generated questions, the attending may identify his or her own teaching topics, such as alternate clinical presentations of the same suspected illness, pertinent literature, or pathophysiology. The main limitation of attending-derived teaching is that it is sometimes difficult to assess whether these "pearls" are of value to the learners.

Next Steps

If there are no patient, learner, or attending teaching topics, the best use of time in some cases may be moving to the next patient. Next steps also includes identifying next learning topics for the team, ensuring the plans for the day

continued on page 13

FIGURE 1. MiPLAN Model for Clinical Teaching in the Inpatient Setting



The Individualized Learning Pathways Curriculum: A Novel Curriculum Empowering Residents to Pursue Self-Directed Educational Goals

Background

Over the past several years, educational leaders in internal medicine have increasingly advocated that residency training be redesigned (1–3). Furthermore, academic leaders and recent graduates have raised concerns about whether current training is relevant to the varied roles and various practice settings of internal medicine in the 21st century (4–8). Unfortunately, regulations limiting resident duty hours and patient load have had the unintended consequence of worsening the situation as programs struggle to address the service needs of the hospital with decreasing resources (9). Proposed changes in the organization and funding of residency training, coupled with the competing priorities of safeguarding resident supervision, sleep, and well-being have left many internal medicine program directors discouraged.

Underlying this dilemma is the recognition that being a good internist requires much more than just a satisfactory knowledge base in internal medicine. The term "competency" is used broadly to incorporate the domains of knowledge, skills, and attitudes, but internal medicine residents also require mentorship, guidance, and support (10,11). We report the implementation of a novel two-year curriculum that allows internal medicine residents greater flexibility in individualizing their educational goals, pursuing career-specific paths, and gaining a greater exposure to areas of interest in order to facilitate training for various practice settings of the future while providing robust mentorship. The curriculum—called the Individualized Learning Pathway (ILP)—is designed as an adjunct to traditional internal medicine residency training. The ILP curriculum fosters active learning in which the resident identifies self-directed learning goals, is exposed to specific skill sets for professional development, and is encouraged to pursue research and mentorship with core faculty.

Methods

The ILP curriculum provides a choice of five pathways: ambulatory medicine, hospital-based medicine, social medicine, research medicine, and traditional categorical medicine. Residents select one pathway with the guidance of the program toward the end of the postgraduate year (PGY)-1. The ILP curriculum begins at the start of the PGY-2 year and continues through the rest of residency (**Figure 1**).

Each pathway has a unique curriculum designed to expose residents to specific skill sets relevant to their area of interest. However, the structure of the curriculum is similar across the pathways. ILP rotations lasting two to four weeks are spaced throughout the PGY-2 and PGY-3 years. These rotations may include didactic lectures, small group discussions, clinical experiences, site visits, webinars, research time, assigned reading, and written portfolios or logs. Curricula involve lessons on leadership and change, advocacy, critical thinking, and quality assurance/quality improvement (QA/QI) in addition to topics specific to each pathway. For example, the social medicine pathway asks residents to participate in a poverty simulation experience. Residents are given a persona of a homeless individual with a chronic disease and then asked to utilize public transportation with only a few dollars in change, eat at a soup kitchen, go to a physician's appointment, and then line up for a bed at one of the local shelters. A weblog captures their reflections and provides opportunities for future discussions. The curricula are designed to expose the resident to experiences or opportunities not normally encountered in the traditional curriculum rather than to provide mastery or even competency in these areas.

Additionally, residents are asked to participate in a longitudinal project aimed at engaging and empowering them in an activity of interest as well as "putting theory into practice." Depending on the pathway, a resident project may involve practice improvement or redesign, QA/QI, research, community partnerships or outreach, health care advocacy, or health care disparities research. Residents meet periodically with a pathway director to review progress, maintain momentum, and identify learning opportunities. Residents are also closely linked with a mentor whose duties include assisting with the longitudinal project, career counseling, review of educational goals, promotion of self-assessment and reflection, support networking at both the local and national levels, assistance with scholarly activity, personal and professional development, and job or fellowship application assistance. A symposium is held at the end of the academic year during which each resident enrolled in a pathway presents ILP project results and lessons learned. Additionally, residents are encouraged to present their projects at local or national meetings. Often, these projects result in a grand rounds presentation that all our senior residents are mandated to complete.

Last, pathway residents self-identify a unique clinical experience related to their pathway that provides a longitudinal or continuity experience in addition to the continuity clinic. These experiences range from participating in nontraditional general medicine clinics, such as a mobile medical unit for migrant farm workers, a shelter-based homeless health care clinic, a human immunodeficiency virus patient clinic, or a hospital discharge follow-up clinic. For

example, residents in the hospital-based medicine pathway participate in the Post-Admission Transfer of Care after Hospitalization (PATCH) Clinic, where they engage in a practice-based learning exercise. In the PATCH Clinic, residents see patients in hospital discharge follow-up that they have cared for on the inpatient wards. They ascertain medication adherence, understanding of their diagnosis and treatment plan, and awareness of follow-up clinic appointments or studies. The resident reflects on discharge practice and identifies areas for improvement. Conversely, residents may choose to expand traditional general medicine ambulatory experience. These additional clinical experiences are designed and implemented midway through the PGY-2 year and continue for the remaining 18 months of residency training.

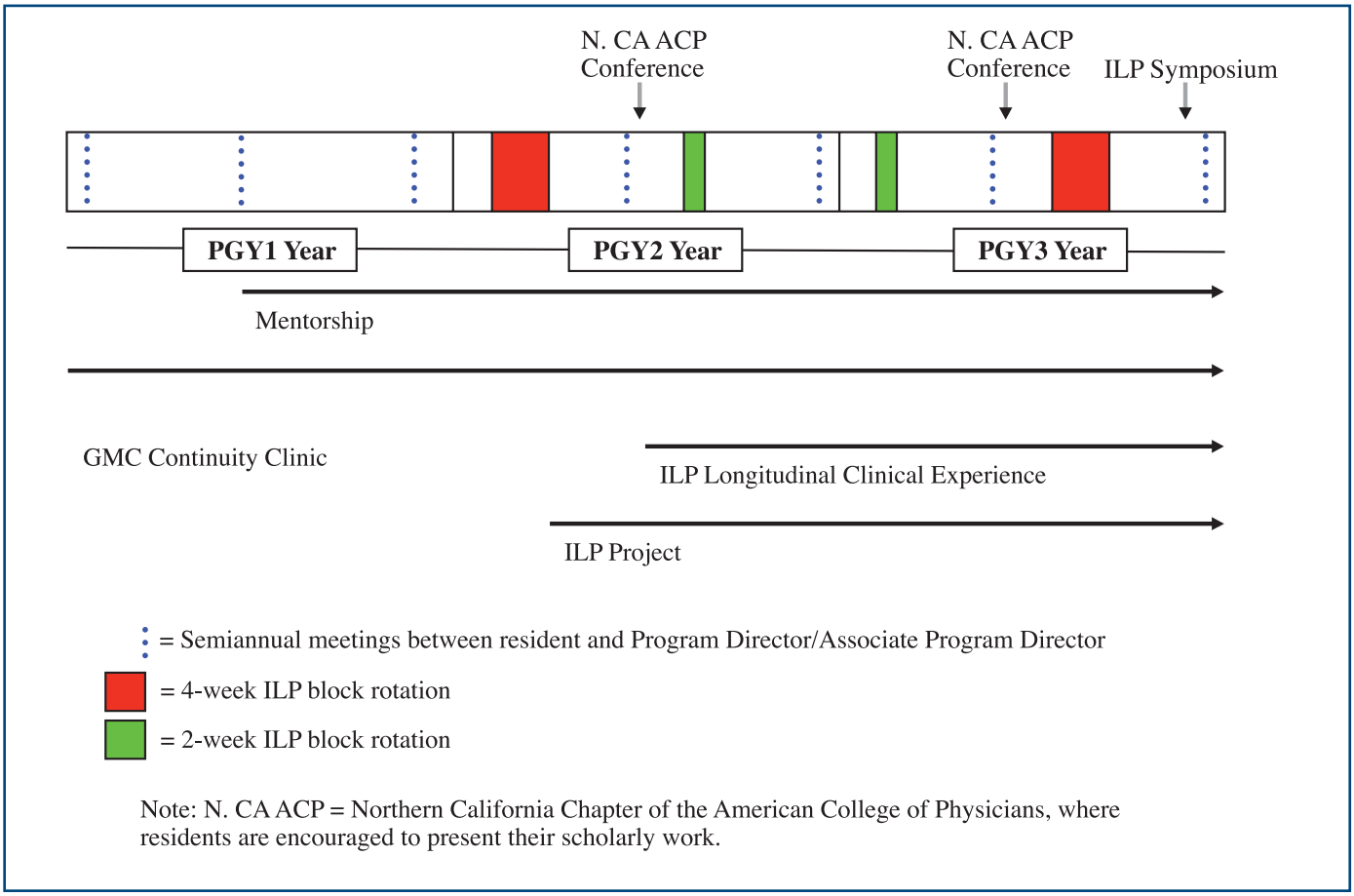
Results

We implemented the ILP curriculum at Santa Clara Valley Medical Center (SCVMC) in July 2008. **Figure 2** provides a small sample of the longitudinal projects residents have pursued during the ILP curriculum. Residents have uniformly praised the curriculum, citing more comfort, skill, and confidence in implementing change, identifying stakeholders, and building coalitions for change. Additionally, residents cite a greater understanding and commitment toward a specific career path after completion of the curriculum. They describe that the ILP curriculum creates the opportunity to refine or hypothesis-test potential career opportunities. It also provides greater exposure to all aspects of potential jobs—academia, research, and administration—in addition to clinical care and fosters a greater commitment to that career. Residents describe greater knowledge and skills regarding the different elements of a chosen path and are more aware, comfortable, and poised for pursuing that career after residency.

Discussion

The environment of internal medicine training is increasingly driven by the service needs and financial pressures of teaching institutions (12). At a time when many program directors in internal medicine are struggling to find a balance between educational demands and work hour limits, we present a curriculum that affords flexibility within a structured learning process. The novel ILP curriculum is designed to empower residents to discover their passion, pursue educational goals, and discover resources for continued professional development. It follows the paradigm shift advocated by APDIM by emphasizing education over

FIGURE 1. Elements and Timeline for the ILP Curriculum



Note: N. CA ACP = Northern California Chapter of the American College of Physicians, where residents are encouraged to present their scholarly work.

service and assigning residents to clinical rotations based on educational needs rather than those of the hospital or medical faculty (1).

Residents in the ILP curriculum are still expected to participate in the basic core curriculum of the medicine residency program. However, ILP creates an opportunity for both resident and program personnel to more fully assess professional goals, align mentorship, and enhance learning through novel experiences or unique opportunities not readily encountered in the traditional curriculum. In short, the ILP curriculum facilitates a dialogue between teacher and learner about professional growth and development. Consequently, we see residents gain not only comfort and insight in a chosen path, but also knowledge and skills that lead toward success in career pursuits.

ILP is a novel curriculum that is designed to engage residents and faculty in meaningful dialogue about learning goals and opportunities. This curriculum creates a framework from which to build an educational experience cooperatively designed by both the resident and the program to achieve professional development. As William Yeats once said, "education is not filling a bucket, but lighting a fire." In our experience, the ILP curriculum has lit a fire in both the learner and the teacher.

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FIGURE 2. Sample ILP Projects and Career Path Followed for Residents Enrolled in a Specific Pathway

Pathway	ILP Project and Description	Future Employment
Ambulatory	Group visits for education and completion of advanced directives – The resident collaborated with a community organization and organized group visits for her primary care practice to educate and assist patients with completing their advanced directives.	Palliative Care Fellowship
Ambulatory	Osteoporosis evaluation and treatment care manager protocol – The resident created an evidence-based medicine protocol for care managers to follow to aid in the screening, treatment, and prevention of osteoporosis.	Primary Care – Underserved Setting
Ambulatory	Patient self-management action plan template for the electronic medical record (EMR) – The resident designed and created a self-management plan template for EMR providers to document and track patient action plans for self-improvement/behavioral health change.	Primary Care – HMO Setting
Hospital-Based	Reduction in catheter-related blood stream infections using a standardized central line kit – The resident created a standardized kit for central line catheter placement and worked with central supply and hospital administration to have it stocked on appropriate wards.	Hospitalist – HMO Setting
Hospital-Based	Code Blue education and training at SCVMC – The resident studied resident adequacy of training, supervision, and feedback and the potential effectiveness of possible teaching strategies to improve Code Blue education.	Pulmonary and Critical Care Fellowship
Hospital-Based	A randomized controlled trial of alternative bowel preparations for inpatient colonoscopy – The resident is studying the effectiveness and efficiency of 2-liter versus 4-liter Go-Lytely preparations for inpatient colonoscopy after already having obtained Institutional Review Board approval.	GI Fellowship
Social Medicine	The importance of social networks when engaging migrant farm workers in health care – The resident studied the barriers to accessing a mobile free clinic for migrant farm workers and discovered the importance of social networks in facilitating access. This work was presented at the annual Society of General Internal Medicine meeting in 2010.	Primary Care – Underserved Setting
Social Medicine	HIV and the homeless: the effects of housing status on HIV disease progression and health care access	HIV/Primary Care Practice – Academic Setting
Social Medicine	An exploration of homeless persons' experiences and views on death and dying – The resident is gathering information via a written survey and additional qualitative data via focus groups to ascertain homeless persons' perspectives on end of life issues.	Palliative Care Fellowship
Research Medicine	Pulmonary hypertension in a safety-net hospital – The resident's research led to the creation of a clinic using the chronic care model for patients with pulmonary hypertension.	Hospitalist – Pursuing Pulmonary and Critical Care Medicine Fellowship

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Implementation and Evaluation of a Longitudinal Quality Improvement Curriculum in Continuity Clinic

Quality improvement (QI) initiatives are important to implement, teach, and measure. But how? This article describes a QI curriculum that met Accreditation Council for Graduate Medical Education (ACGME) requirements, was successfully implemented in continuity clinics in a variety of settings—a large academic medical center, a community hospital setting, and a Veterans Administration (VA) medical center—and involved residents in all years of an internal medicine residency program and a medicine-pediatrics residency program. The curriculum was rich in QI concepts and evidence-based strategies but was not difficult to implement or evaluate.

Background

In 2009, ACGME increased its focus on educational outcomes and specifically applied QI to the internal medicine continuity clinic: "Each resident's longitudinal continuity experience…must include evaluation of performance data for each resident's continuity panel of patients relating to both chronic disease management and preventive health care," and "residents must receive faculty guidance for developing a data-based action plan and evaluate this plan twice a year" (1). In July 2013, ACGME will transition to a new accreditation system, a key element of which is measuring and reporting outcomes in terms of educational milestones, including the milestones specific to QI (2):

- Appreciate the responsibility to assess and improve care collectively for a panel of patients.
- Perform or review audit of a panel of patients using standardized, disease-specific, and evidence-based criteria.
- Reflect on audit compared with local or national benchmarks and explore possible explanations for deficiencies, including doctor-, system-, and patient-related factors.
- Identify areas in resident's own practice and local system that can be changed to improve effect of the processes and outcomes of care.
- Engage in a quality improvement intervention.

Description

The QI curriculum in continuity clinics of the internal medicine residency program and internal medicine/pediatrics residency program at University of Pittsburgh Medical Center (UPMC) is structured to teach the plan-do-check-act (PDCA) QI method (3) through four pre-clinic conferences scheduled throughout the year, one for each PDCA phase. The QI director facilitates the conferences. Interns and residents learn and apply QI through deliberate practice, implementing patient-, physician-, and system-directed solutions with their own patient panels at four clinic sites: UPMC Montefiore, UPMC Shadyside, the Pittsburgh VA Medical Center, and a community-based office practice.

QI topics are related to QI priorities selected by the division of general internal medicine. During each training year, one topic is addressed by interns and one is addressed by all other residents. The curriculum for interns focuses on preventive health (e.g., increasing flu shot rates); the curriculum for senior residents focuses on chronic disease management (e.g., improving hypertension management or increasing medication adherence). Both curricula incorporate key strategies reported to improve competency in practice-based learning (4-8). All curricular materials are available online (9).

During the "plan" phase of the PDCA method, residents conduct a root cause analysis using QI tools, such as baseline and benchmark data for hypertension control rates (**Figure 1**) and a cause-and-effect diagram (**Figure 2**).

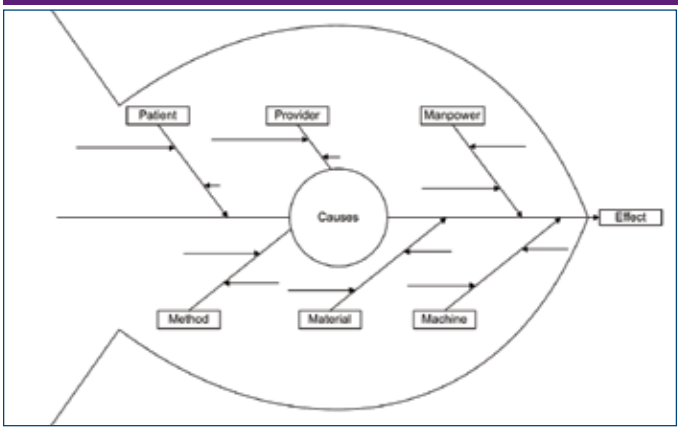
FIGURE 1. Planning for a Quality Improvement (QI) Project Based on Local Baseline Data and Benchmark Data for Hypertension Control Rates (12)

Patients Seen by Our Residents from July 2011 to June 2012				NCQA Benchmarks in Medicaid Patients in 2010		NCQA Benchmarks in Medicare Patients in 2010	
Target	All Patients	Black Patients	White Patients	Average	90th Percentile	Average	90th Percentile
Blood pressure <140/90 mmHg in patients with diabetes	60%	62%	72%	60%	76%	62%	75%
Blood pressure <140/90 mmHg in patients without diabetes	78%	62%	78%	56%	68%	62%	74%

During the "do" phase, residents select solutions that address root causes and are based on evidence from the literature, such as the *Seventh Report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure* (JNC-7 guidelines) (10) used in our hypertension management project (**Figure 3**). Residents choose three interventions for their own QI plan. The physician- and patient-focused solutions are self-directed interventions. The system-focused solution does not require them to create new systems but instead requires them to identify interdisciplinary team members and system resources at a particular clinic site and to offer recommendations to improve the systems that have been implemented as components of the site's QI program. Residents submit individual QI plans to their faculty preceptors for review and approval.

During the "check" phase, residents compare pre-curriculum (baseline) and post-curriculum data and begin to reflect on lessons learned using a QI tool such as a force field analysis.

FIGURE 2. Cause-and-Effect Diagram



During the "act" phase, residents attend a clinical conference in which they summarize their recommendations for continuous improvement. Recommendations are subsequently communicated to clinic leaders.

After residents write an individual reflection they receive written feedback from their preceptors. Resident performance is deemed satisfactory if he or she is able to at least partially implement an individual QI plan and to reflect on the QI process in his or her own practice.

All residents are requested to complete pre- and post-curriculum surveys, which are de-identified and analyzed. Quality outcome data for resident patient panels are collected and reported quarterly to residents as an ongoing component of the division's QI program; data relevant to the QI curriculum (e.g., flu shot rates and blood pressure readings) are monitored for improvement.

Results

Each year, we collect outcome data about residents and their patients at the three continuity clinic sites for the internal medicine residency program. For 2011-2012, rates for completing both the QI plan and the QI reflection form were 96% of 48 interns and 93% of 95 residents. **Figure 4** shows the intervention success rates. For the curriculum regarding flu shots (preventive medicine), results at the three sites showed improvements in the interns' knowledge and confidence scores as well as in flu shot rates, which reached the 90th percentile of benchmarks outlined in the Healthcare Effectiveness Data and Information Set of the National Committee for Quality Assurance (12). For the curriculum regarding hypertension (chronic disease management), results at the three sites showed improvements in the resident knowledge and confidence scores and in the QI implementation rates of guidelines and system-based interventions outlined in the JNC-7 report (10). Results in the sites at UPMC Montefiore and UPMC Shadyside, based on a cohort of 290 patients, showed improvement in the percentage of patients with blood

FIGURE 3. Quality Improvement (QI) Interventions Based on the *Seventh Report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure*

Patient-Level Interventions	Physician-Level Interventions	System-Level Interventions
Review results of home blood pressure monitoring	Start/adjust medications	Order ambulatory blood pressure monitoring
Follow advice about sodium restriction	Repeat office blood pressure measurement	Arrange office visit with nurse for blood pressure check
Follow advice about medications	Set blood pressure target/goal with patient	Refer to interdisciplinary team member (e.g., social worker, pharmacist, case manager, nurse educator, nutritionist)
Follow the dietary approach to stop hypertension (DASH) diet	Counsel sodium restriction	Utilize office systems/staff to receive and respond to patient's home blood pressure readings.
Follow advice about weight loss, exercise, and lifestyle changes	Counsel medication adherence	Utilize EMR software and links to provide pt education materials
	Counsel DASH diet	
	Counsel weight loss, exercise, and lifestyle changes	

pressure readings below the target. Identifiable patient data were not available from the Pittsburgh VA Medical Center.

Discussion

We believe that QI content can be incorporated in the continuity clinic curriculum of any program, large or small. However, the choice of outcomes to measure will depend on the program's size and available resources. Programs with limited resources can measure the simpler types of patient outcome data, such as pre- and post-curriculum blood pressure outcomes and flu shot rates, with minimal clerical assistance. They may not be able to measure complex patient outcomes (such as medication adherence) that require time-consuming and resource-intensive data collection methods. Educational outcomes can be aggregated from the resident QI plans and reflection forms and from results of pre- and post-curriculum surveys, all of which generate useful data for competency assessment and program evaluation. Moreover, programs can use results from annual ACGME residency program surveys (13) to demonstrate improvement (**Figure 5**). Together, these steps will ensure that QI is a primary focus and outcome of teaching.

FIGURE 4. Rates of Self-Reported Success with the Quality Improvement (QI) Action Plan in 2011–2012

Group	Learner-Focused QI Intervention	Patient-Focused QI Intervention	System-Focused QI Intervention
Interns	98%	93%	83%
Residents	100%	94%	81%

FIGURE 5. Comparison of Responses about Quality Improvement (QI) in the Accreditation Council for Graduate Medical Education (ACGME) Residency Program Surveys in 2009 and 2011

Responses	2009	2011
Received formal training regarding QI	85.7%	100%
Received formal training regarding prevention of health problems	95.2%	100%
Received QI data regarding your patient panel	N/A	97.8%
Participated in a QI project in the ambulatory setting	29.7%	95.3%

Visit Insight online to view a reflection form and force field analysis tool at www.im.org!

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are clearly understood by the patient and team, and even that feedback to learners can be provided.

Summary

In the era of limited duty hours, bedside attending rounds may have a greater role than ever to ensure safe patient care and advance medical education. Our model provides a structure that we hope will demystify bedside rounding and encourage more medical educators to adopt this approach.

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FIGURE 2. Barriers and Solutions

Commonly Cited Barriers	Potential Solutions
Takes too much time / efficiency	Adopt a specific method; ensure that your meeting covers logistics of presentations and rounding; practice; observe bedside-rounding colleagues for further tips; ask them to observe you and provide feedback.
Patient discomfort	Data show that patients do not find bedside rounding anxiety-provoking and most studies show they prefer it. A brief introduction, however, is necessary before beginning.
Learner discomfort	Data suggest that there is indeed a learning curve for residents—hence the need to have a method that is well communicated and well understood before entering the room.
Attending lack of confidence	Recent data suggest attendings lack confidence in their physical diagnosis skills—we need to practice (12). Most of the high-value teaching points derive from our skills as practicing clinicians—what we think and why.
Isolation patients	Contact precautions: suggest just the presenter, supervising intern/resident, and attending. Respiratory isolation: suggest not presenting at the bedside.
Talkative patient	Attending may need to model advanced communication skills—how to maintain control of an interaction. We have found that touching the patient, for example on the shoulder, and motioning for them to stop, followed by a diplomatic comment that we value their concerns but need to make sure we complete our communication effectively, usually works quite well. May need to schedule a time to return to complete the conversation of interest to the patient.
Can we communicate with one another as physicians in the presence of the patient?	Definitely so, provided it is briefly explained to the patient up front—that we will end with a translation into understandable terms. In our experience, depending on the patient's educational level, they understand a fair amount and can provide corrective input.
Family members present	Resident, in preparation for rounds, should ask the patient, in confidence, whether they want their family members to hear their confidential medical information.

In Search of the Holy Grail: How to Ensure a Perfect Progress Note

The daily progress note is the foundation of inpatient physician documentation and communication. Limitations in duty hours necessitate a reliance on written communication far more now than in recent eras. With the advent of the electronic medical record (EMR) came the hope that many challenges intrinsic to documentation would be eradicated. Instead, the EMR has created as many problems as it has solved. Seventy percent of physicians use the cut-and-paste function almost exclusively when writing notes (1). This behavior has been shown to cause an average of one documentation error per note (1) and leads to propagation of outdated and often erroneous information (2). Template notes often include extraneous information that can be found elsewhere in the EMR, which makes notes cumbersome to navigate. In teaching hospitals, housestaff write the majority of progress notes and are trained in an era in which cut-and-paste may be viewed as an accepted norm. Housestaff often have misconceptions regarding the content and purpose of typed progress notes. These misconceptions include "longer is better"; a note that reads like a daily diary is an appropriate progress note format; and the assessment can be inferred from the plan. Electronic billing and a litigious medical climate have forced us to examine the ways in which we teach learners to write progress notes. Although the traditional subjective, objective, assessment, and plan (SOAP) format has offered a consistent method for decades, a marked decline in progress note quality has occurred. The achievement of consistently well-done progress notes requires a publicized framework, frequent housestaff feedback, and a plan for implementation.

In response to these challenges, we have developed a framework for succinct, effective progress notes: SOAP 2.0 (SSOOAP). This format upholds the traditional progress note format, but incorporates several key changes to facilitate effective written communication.

Summary Statement

This addition to the standard SOAP format synthesizes the reason for the admission by defining three to five key pieces of data that drive the clinical decision. Its benefit is twofold. First, a well-done summary statement allows any reader (e.g., consultant, cross-covering intern, or attending picking up a service) to become quickly familiar with the patient. The summary statement is most appropriately located up front: it places the rest of the information in context.

Second, the summary statement allows the reader to assess the learner's clinical reasoning. A learner with a firm grasp on which data are essential will reflect that understanding in a clear summary statement. The summary statement may be copied forward but must be updated daily. For example, a summary statement on hospital day one might read: "50 yo male with AIDS admitted with confusion without focal neurologic deficits." After testing, it becomes: "50 yo male with AIDS admitted with confusion secondary to PML as seen on MRI."

Subjective

The subjective should begin with a summary of the patient's course on the day the note is written. As opposed to a summary such as "patient is resting comfortably today," brief pertinent positives and negatives as defined by the reason for admission and active problems are essential. A patient admitted with pneumonia who is ready for discharge can be summarized as "patient is resting comfortably today. He denies shortness of breath, cough, or fever." In more complicated patients, this subjective section of the progress note may need to be organized by problem.

- "Pneumonia: No shortness of breath, no hemoptysis. Productive cough is persistent but significantly improving."
- "GI Bleeding: No further hematemesis or BRBPR."

Objective 1: 24-Hour Events

This addition to the standard SOAP format allows the reader to be quickly updated on important recent events early in the note, rather than being surprised with this information upon reaching the plan. For example, if a scan done overnight showed a pulmonary embolism, this vital information should be presented up front and included with relevant subjective data. Again, in complicated patients, this section may need to be organized by problem.

- "Pneumonia. . . Blood cultures grew gram-positive rods, identification is pending. No changes to antibiotics have been made. Patient's dyspnea has mildly improved."
- "GI Bleeding. . . GI rounded late last night and recommended EGD; night float placed these orders."

Objective 2: Vitals, Pertinent Physical Exam, and New Data

Although it is clear that this information is essential to every progress note, it may be less clear to housestaff which data are superfluous. In the era of the EMR, an intern in doubt most often includes more data, which minimizes critical thinking. Specifically, the physical examination needs to be focused, pertinent, and updated daily from admission. A full cranial nerve examination done on admission for a patient admitted with congestive heart failure is generally not necessary on hospital day 4. Many EMRs allow for a "check box" format: such a template can help with brevity but often

empowers housestaff to ignore pertinent findings that may not be listed.

Furthermore, cutting and pasting complete imaging data detracts from both the writer's and the reader's ability to focus on the most important facts. A chest X-ray to assess for an infiltrate can be summarized as "CXR shows no evidence of pneumonia," rather than copying an entire report.

Assessment

The assessment is the most important part of the note. Rather than repeating the summary statement, it should consist of a problem list in decreasing order of importance with assessment incorporated into each active problem. An appropriate assessment lists the differential in order of likelihood and explains reasons for which the ranking was chosen. It discusses pieces of data that may not fit a working diagnosis and why. A paragraph rather than bullet format encourages housestaff to convey their clinical reasoning. It is not necessary to include all inactive problems (such as hyperlipidemia) in a daily problem list.

Plan

As with the assessment, each problem requires a separate plan. A plan should continue a specific commitment; rather than listing that an antibiotic will be started, a well-developed plan explains the indication, duration, and reason for antibiotic choice as well as how response to treatment will be monitored. Rather than "to consider," which avoids commitment, housestaff should be encouraged to use "if/then" statements, such as "if patient does not defervesce within 24 hours, a CT of the abdomen will be ordered to evaluate for abscess." For issues that remain unresolved, the plan for additional work-up to answer these questions should be explained.

To achieve succinct, well-organized progress notes at a program level, several steps are crucial. First, physicians must partner with billers to develop templates that facilitate both efficient coding and optimal physician documentation. Programs must also set high expectations for progress note format and quality, and then publicize and enforce them. We recommend distributing checklists of progress note "do and don'ts" and encourage all attendings to use the checklists to go over one progress note per learner per week.

It is clear that changing the culture of poor physician documentation is a tremendous challenge. When employed by program leadership in a consistent, concerted way, SOAP 2.0 can engender significant improvement in daily progress notes, to the benefit of housestaff, attending physicians, and (most important) our patients.

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High-Value, Cost-Conscious Care: Less Is More

With the election over, the country must continue to be attentive to the rising costs of health care. Growing from $253 billion in 1980 to $714 billion in 1990, health care costs reached $2.6 trillion in 2010. This spending is not sustainable without drastic changes (1). Approximately 30% of these expenses, more than $700 billion every year, are spent on care that is potentially avoidable and would not negatively affect the quality of care if eliminated, so-called "wasted care." Graduate medical education strongly influences the ultimate practice patterns of its learners and provides a pivotal opportunity to imprint them with cost-consciousness and resource stewardship skills (2, 3).

Few resources, however, are available for training programs to teach residents about cost-effective care (3). In fact, previous attempts have not been effective in changing behavior (2, 4, 5). To address this need, the American College of Physicians (ACP) and AAIM have launched a 10-part curriculum on high-value, cost-conscious care. A broad range of contributors served on the curriculum development group, including program directors, faculty, department chairs, residents, and staff, with the intent to create an educational program to empower internal medicine residents and faculty to explicitly integrate the concept of health care value into their clinical practice. The free, online curriculum was launched July 2012 at www.highvaluecarecurriculum.org and to date has been downloaded by more than 5,200 users.

FIGURE 1. Five-Step Framework: High-Value, Cost-Conscious Care

Step 1	Understand the benefits, harms, and relative costs of the interventions that you are considering
Step 2	Decrease or eliminate the use of interventions that provide no benefits and/or may be harmful
Step 3	Choose interventions and care settings that maximize benefits, minimize harms, and reduce costs (using comparative-effectiveness and cost-effectiveness data)
Step 4	Customize a care plan with the patient that incorporates their values and addresses their concerns
Step 5	Identify system-level opportunities to improve outcomes, minimize harms, and reduce health care waste

One important first step in high-value, cost-conscious care is to consider costs as not just the price of the test but including all the downstream costs, benefits, and potential harms to each intervention. A high-cost intervention may provide good value because it is highly beneficial, whereas a low-cost intervention may have little or no value if it provides little benefit or increases downstream costs. The curriculum does not focus exclusively on reducing cost, but instead teaches residents to consider value by balancing benefits with harms and costs. A five-step framework (**Figure 1**) highlights the steps for developing the skills to practice high-value, cost-conscious care.

The curriculum currently includes 10 modules (**Figure 2**). When presented in order, they provide a robust immersion into the issues around value and cost in health care, each using important clinical examples within internal medicine to engage the participants. Many modules can be presented independently because each model reintroduces the framework. Each module also includes a facilitator guide to help prepare faculty to lead the discussion. Interactive learning tools are suggested in the guides to encourage group participation and active learning strategies with important references to help update and orient the teaching faculty. Sessions include a variety of exercises including think-pair-share topics, small group work, completing worksheets, and even newer tools such as wicked questions, talking sticks, and wiki discussion boards.

Programs are encouraged to implement the curriculum with the goal of motivating residents and faculty to eliminate health care waste and improve patient outcomes. Most physicians, including medical educators, agree that they are important issues; faculty have been reluctant to teach these concepts because they themselves have received little training in this area. This curriculum strives to overcome these obstacles by serving as an important tool to teach both faculty and residents. Additional available resources are included as references within the curriculum (**Figure 3**). Future plans for this effort include systematically evaluating resident knowledge and attitudes about high-value, cost-conscious care using the subscore on the Internal Medicine In-Training Examination, program directors surveys, resident surveys, and a curriculum user survey.

FIGURE 2. 10 Modules within High-Value, Cost-Conscious Care Curriculum

1. Introduction to health care value	6. Screening and prevention
2. Health care waste, costs, and over-ordering of tests	7. Balancing benefits with harms and costs
3. Health insurance	8. High-value medication prescribing
4. Health care costs and payment models	9. Overcoming barriers to high-value, cost-conscious care
5. Biostatistical concepts you need to know	10. Local quality improvement project

Experience with the curriculum so far has resulted in a few lessons learned. First, learners are highly enthusiastic about the topic; almost 20% of users who have downloaded the curriculum are residents and students. The working group behind the development of the content continues to be heavily engaged in improvement with ongoing contributions, including adding sample bills from hospitals and outpatient practices to use in the sessions, new high value quality improvement worksheets and a new module on high value consultation and referral. In addition, the group is developing additional tools to help program directors evaluate the effects of the curriculum on their program and resident competence in high value care based on reporting milestones. An updated version of the curriculum that incorporates user feedback and the new module will be released in July 2013. Finally, the curriculum is "ready-made" with lots of practical tips and tools for promoting active learning. Current users find it to be a high-value, cost-conscious (free) resource. View the curriculum at www.highvaluecarecurriculum.org.

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FIGURE 3. Available Resources to Augment High-Value, Cost-Conscious Care Curriculum

Resource	Description	URL
High-Value, Cost-Conscious Care Curriculum	Ten modules, each with a facilitator guide, covering a broad range of high-value, cost-conscious care, including an introduction to health care value, costs of screening and prevention strategies, balancing harms and costs, and health insurance and payment models	www.highvaluecarecurriculum.org
Faculty Development Video	Video (34 minutes) of the faculty development workshop for teaching high-value, cost-conscious care	www.highvaluecarecurriculum.org
High-Value Resident Evaluation Forms	High-value educational prescription form, high-value presentation form	www.highvaluecarecurriculum.org
Choosing Wisely	National campaign to promote conversations between physicians and patients in choosing care that is evidence based, free from harm, and truly necessary as supported by organizations representing medical specialists	www.choosingwisely.org
Healthcare Blue Book	Healthcare Blue Book is a free consumer guide to help patients understand fair prices for health care services in their areas.	www.healthcarebluebook.com
Consumer Reports Wikipedia	Wikipedia and *Consumer Reports* have started a health article review project based on the references from this curriculum. As an optional assignment, residents can read and comment on articles. The website includes an instructional video for this 20-minute process.	http://en.wikipedia.org/wiki/Wikipedia:Health_Article_Review_Project

No More Noon Conferences: Implementing Team-Based Learning in Residency Education

Teaching and evaluating medical knowledge during residency training is increasingly challenging. Some of the challenges include new Accreditation Council for Graduate Medical Education (ACGME) milestones and duty hour regulation, competing patient care responsibilities, distractions from smartphones and other technologies, and poor learning efficiency during didactic teaching. With a night float system and residents at multiple clinical sites, it is a challenge to create a consistent core curriculum.

We first chose to embrace technology by offering all clinical sites a web-based video feed of noon conferences and grand rounds. Although it limited us to a single teaching conference at a time--instead of one at each location--we were hampered by technical glitches, difficulties with communication, and loss of resident interaction and camaraderie.

Team-based learning (TBL) is relatively new in health sciences education, having first been reported in 1999 (1). Based on conversations with other program directors and experiences at APDIM meetings, using TBL as part of the core internal medicine residency curriculum remains uncommon but there is growing interest in its use. In January 2010, we piloted TBL during the ambulatory medicine block month. In July 2011, we fully implemented TBL into the core internal medicine curriculum. In this article, we discuss each component of TBL and our recommendations for successful implementation.

TBL Structure

We designed a TBL curriculum using seven core design elements **(Figure 1)** (1). To ensure an equal allocation of resources through team formation, we assigned eight residents each to seven different teams, with each team consisting of roughly equal numbers of residents based on postgraduate year (PGY) status, sex, personality, and medical knowledge.

FIGURE 1. Core Design Elements of Team-Based Learning (1)

- Team formation
- Readiness assurance
- Immediate feedback
- Sequencing of in-class problem solving
- Four S's
  - Significant problem
  - Same problem
  - Specific choice
  - Simultaneous reporting
- Incentive structure
- Peer review

Teams remain the same throughout the entire academic year. Each TBL session lasts two to two-and-a-half hours and is held weekly during our Wednesday Academic Afternoon. All residents are required to attend except when on vacation, night float, working in the intensive care unit (ICU), or actively admitting patients on the ward services. Residents who cannot attend the weekly TBL session are still required to complete the pre-session reading assignments and the Individual Readiness Assurance Test (IRAT).

To establish readiness assurance for learning and application of knowledge for the topic of the week, residents are required to complete pre-session reading assignments. All readings (articles, textbook chapters, slides, or videos) are provided to residents at least one week in advance through an online storage service application accessible by computers, tablets, or smartphones. IRAT and group readiness assurance tests (GRAT) are administered promptly at the start of each Academic Afternoon. IRAT allows us to hold each resident accountable for the pre-session reading assignments, while GRAT holds each resident accountable to the other residents on their team. Both scores are used to provide an objective measure of medical knowledge. Test questions are written by faculty based on the content of the pre-session readings or compiled from a set of previously published board-style questions.

Each IRAT/GRAT contains 10 questions. To simulate the timing of the board examination, residents have 20 minutes to complete IRAT questions. They have another 20 minutes to complete the same 10 questions that comprise the GRAT. We use the Immediate Feedback Assessment Technique (2) ("scratch-off cards") to provide residents with immediate feedback on their responses. Once IRAT and GRAT are complete, the faculty leader discusses and clarifies any questions to ensure that all residents understand the knowledge objectives.

Following assessment and clarification of knowledge, residents work in teams to apply topic knowledge to clinical scenario cases (also known as "applications"). These cases, which are created by faculty using the "Four S System," consist of significant complex scenarios with specific choice questions that do not always have a single correct answer. Following intra-team discussion of the same cases and simultaneous reporting of answer choices, faculty lead an inter-team discussion of the cases and questions and encourage residents to defend their answers through sequencing of in-class problem solving. For example, during a session on pneumonia, residents engaged in a constructive debate about whether the patient in the scenario should have been admitted to ICU or the medicine ward when both options would have been reasonable.

We help ensure that pre-session readings are completed and that residents participate actively in intra-team and inter-team discussions through clear disclosure of the incentive structure. Resident IRAT and GRAT scores count toward their medical knowledge competency evaluation. A prize is given to the team with the highest cumulative GRAT score over a six-month period. Resident professionalism and interpersonal and communication skills are evaluated through faculty observation each week and through a bi-yearly peer review evaluation that each resident completes for each other resident on the team. Although peer review is the least-liked component of TBL, it is an essential component of TBL success when resident teams work together longitudinally. This process helps ensure individual resident accountability to the team.

TBL Implementation

For successful implementation of TBL into the core internal medicine residency curriculum, we recommend:

- **Use all core design elements of TBL.** Although some elements may be difficult to implement, eliminating any element undermines the potential success of TBL.
- **Be flexible.** Feel free to make changes if things are not going well; however, resist resident requests to change because the work is too "difficult." TBL should be challenging, and most of our residents believe that they are learning more compared with noon conferences or standard lecture formats.
- **Start small.** Implement TBL into part of the curriculum (e.g., ambulatory block) at first. TBL success on a small level will help achieve resident buy-in, which is necessary for successful TBL implementation into the core curriculum.
- **Schedule enough time.** We recommend no fewer than two hours for a TBL session. If more time is available, flexibility is useful if the residents are engaged in fruitful discussions.
- **Encourage the use of technology.** We design clinical cases so that residents have to reference the literature to answer the questions. As we walk around the room, it is rewarding to see residents researching information related to the medical topic on their devices rather than texting or playing games, as they might do during lectures.
- **Develop faculty and publish.** Recruiting faculty to develop and teach TBL curricula is challenging since most of us were not taught this way. Although time-consuming at first, creating new curricula can lead to new publishable scholarly activities for clinician educators and achieve buy-in from skeptical faculty.
- **Have fun!** Lectures, even the best ones, are boring. TBL is refreshing and enjoyable. If you enjoy watching your residents solve complex problems through active learning and teamwork, then the residents will feed off the positive faculty energy.

Conclusion

The benefits of TBL far outweigh the challenges. So far, our residents are more actively engaged in learning, are happier with the format—although it requires more work on their part compared with attending noon conference lectures—and are more social with each other. Because we are still in the first year of our full implementation process, we do not yet know the impact of TBL on resident examination scores. However, preliminary data suggest that the collaborative learning environment created by TBL helps residents work more effectively with others to solve complex problems and to provide better patient care. Additional resources can be found through the Team-Based Learning Collaborative (3).

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Introducing the PEBLE: A Novel Instrument to Teach and Assess Resident EBM Skills

The Accreditation Council for Graduate Medical Education (ACGME) requires that internal medicine residents demonstrate the ability to "locate, appraise, and assimilate evidence from scientific studies related to their patients' health problems" (1). Furthermore, programs must "assess resident performance in application of evidence to patient care." Few tools exist to teach evidence-based medicine (EBM) skills—for example, patient/intervention/comparison/outcome (PICO) questions, critically appraised topics, and journal clubs are prevalent (2,3). However, none of these tools both teach and assess EBM skills in actual patient care settings. Commonly cited barriers to implementing EBM in daily practice include lack of time, attitude, or motivation by residents or attendings (4). To meet this ACGME requirement, we developed a novel instrument that can both teach and assess resident EBM skills in a clinical encounter setting.

Methods

The tool was developed at a large tertiary-care, community-based hospital that hosts five accredited residency programs. A group of core internal medicine faculty, under the leadership of the internal medicine and transitional year program directors, met to address the requirement for teaching and assessing EBM skills. The goal was to develop an instrument that is succinct yet thorough, easy to administer and track, and useful for multiple programs. Key steps in the EBM process (formulating a clinical question, literature search, application of evidence to patient care) were identified using standard EBM resources while retaining focus on ACGME-specific requirements.

The instrument developed is the Practice/Evidence Based Learning Exercise (PEBLE), a two-page worksheet that documents the clinical scenario, the question to be answered, the search strategy, the answer to the clinical question based on the resident's research, the validity of the evidence reviewed, its applicability to the clinical scenario, and a reflection on how the exercise will affect their future patient care. The instrument is available for download as an online-only feature of *Academic Internal Medicine Insight* at http://www.im.org/Publications/Insight.

Residents record the amount of time spent and their overall satisfaction with the exercise. The PEBLE was implemented in academic year (AY) 2008-2009 and continues to date. All postgraduate year (PGY)-1 residents in the categorical internal medicine, preliminary, and transitional year programs were required to complete PEBLE on each of three inpatient general medicine ward rotations and present findings during teaching rounds for discussion and feedback. The attending physicians completed the rating portion of the worksheet following the presentation and returned the completed document to the internal medicine residency office for inclusion in the resident file.

Results

At present, we have compiled and reviewed the PEBLEs from 37 PGY-1 residents. In all, 83 PEBLEs were completed and turned in to the program office for a 75% completion rate. Upon review, residents initiated more than one-half (60%) of the study topics. Most of the clinical scenarios regarded a specific patient care situation (99%). Of the 83 PEBLEs, 61 focused on therapy, 11 on diagnosis, three on prognosis, and eight on other topics. Sixty-two (75%) of PEBLEs had correctly formulated PICO questions.

Residents used multiple search methods including Ovid (84%); Pubmed/Medline (24%); Medical Librarian (5%); and other sources such as Google Scholar, online resources, textbooks, or local experts (27%). Residents read, on average, 4.1 articles per PEBLE. Information on types of articles read was included on 82 of 83 PEBLEs. Of these analyses, 62 reviewed at least one original research article, 30 reviewed at least one meta-analysis, and 57 read at least one review article. Validity assessment was completed in 78 (94%) of the PEBLEs. In only four of the 83 PEBLEs did residents feel that the evidence was not applicable to his or her specific scenario. Residents reported an average of 140 minutes completing each PEBLE, with a mean satisfaction score of 7.1 on a scale of 1 "extremely dissatisfied" to 9 "extremely satisfied" (range 4–9).

Discussion

Based on this initial study, the PEBLE instrument was easy to implement from a program standpoint, with an overall compliance rate of 75% in its first year. It successfully documents resident EBM skills and application to actual patient care as required by ACGME. From a resident standpoint, the instrument was well accepted and allowed residents to practice attaining, analyzing, and applying evidence to actual patient scenarios with direct attending oversight. Other observed benefits of PEBLE implementation include a tendency for residents to read original research, attain a better understanding of the nuances of the medical discovery process,

FIGURE 1. Characteristics of AY 2008–09 Submitted PEBLEs (n=83)

PEBLE Focus	Search Tool	Articles
Therapy 61	OVID 70	4.1 per PEBLE
Diagnosis 11	PubMed 20	Original 62
Prognosis 3	Librarian 4	Meta-analysis 30
Other 8	Other 22	
	(> 1 tool used)	

and enhance curiosity in resident-led research projects. Using this tool addresses several of the barriers identified in previous studies. For example, residents are required to complete a PEBLE during a busy inpatient ward rotation, demonstrating that EBM can be accomplished despite time constraints. Attending physicians are required to participate in the process and role model use of EBM in patient care.

Based on the success of PEBLE implementation, its use has now been extended into our ambulatory setting. Furthermore, its use in both internal medicine and transitional year programs demonstrates that it is generalizable to other residency programs. Further work is planned to refine the tool and assess for correlations with other measures of residency performance.

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Download the Practice/Evidence-Based Learning Exercise from Insight online at www.im.org

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Using Mobile Tablets in Medical Education

Mobile computing has found its way into society over the past several years. According to the Pew Internet and Life Project, 80% of Internet users (59% of adults) search for health information online (1). In medical education, mobile tablets such as the iPad have become part of medical schools and residency education. Medical schools have begun to integrate entire curricula onto the iPad (2,3); residency programs have engaged in similar projects, including a focus on utilization outcomes from integrating iPads (4) and other mobile devices (5) into their curricula. Reducing work hours for residents has increased pressure to make educational experiences more efficient, which can be achieved through the use of handheld devices that provide immediate Internet access and helpful applications (apps).

At the 2012 APDIM Spring Meeting, we hosted a workshop describing the use of iPads in internal medicine residency education. We highlighted clinical scenarios where apps might help in teaching and learning scenarios and participants contributed their own thoughts and reflections regarding apps that aid in resident education.

One reason to concentrate on the use of apps is the focus on "just-in-time" learning (6) as differentiated from "just-in-case" learning. Just-in-time learning allows learners to comprehend material as it is needed for direct patient care activities. Apps can quickly provide helpful information to residents at the point of care and should be considered as helpful aids in the provision of patient care. Some apps can directly improve medical knowledge, while others can aid in communication with patients or other health care providers.

Figure 1 provides a list of potentially helpful apps in resident education, whether used by attendings or residents. It is by no means a comprehensive list, especially because new apps are created almost daily. Also, these apps are available on the iPad specifically; other mobile tablet options may have slight variations or entirely different apps to consider.

We specifically omitted apps that link a mobile computer to electronic medical records, because these vary widely across platforms. One helpful compendium is the website iMedicalapps.com, which reviews apps on a regular basis. This site has the added advantage of organizing information by platform, and thus is not specific to the iPad. Other helpful learning venues on mobile tablets include #FOAMed (Free Open Access Medical Education) (7) on Twitter. This summary does not include learning opportunities gained through social networking.

FIGURE 1. Educational Apps

Application	Function
ePSS (electronic Preventive Services Selector)	Designed to help primary care clinicians identify screening counseling and preventive medicine services appropriate to patients
ICD-9 On the Go	Easily accessible coding and billing information
STD2010	Summary of Centers for Disease Control and Prevention guidelines for diagnosis and management of sexually transmitted infections
iMurmur2	Audio files with visual information covering common heart murmurs
ARUP	List of helpful laboratory tests, with reference links to relative PubMed articles describing the clinical utility of tests
4DollarRx	List of inexpensive medications currently covered by Walmart and Kroger pharmacies
MedCalcPro	Clinical decision tools used in medicine (e.g., CHADS2 score) accompanied by references
iTunesU	Links to academic podcasts (e.g., Univ. of Arizona Grand Rounds series)
Heart Failure Trials	Searches common trials for patients with congestive heart failure, organized in several formats for applicability to individual patients
AppShopper	Finds apps by different categories, including health and medicine
Doximity	Health Insurance Portability and Accountability Act–compliant app where physicians can communicate direct patient care questions with each other; a "physician-specific Social Media app"
Stanford25	Compilation of physical examination maneuvers helpful for internal medicine physicians
Medscape	Several components, including news, reference, and educational materials
Mendeley	Saves PDFs of articles of interest
CDC	Several components, including health articles, "disease of the week," the MMWR, podcasts, an image library, and links to social media accounts

In summary, the iPad and other mobile tablets have begun to have a huge impact in society, and have definitely made their way into the medical education arena. As medical education continues to evolve, it will become ever more important for educators to integrate tools such as the iPad and other mobile tablet devices into the education of their residents.

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AAIM, ABIM, ACGME, and Subspecialty Societies Launch Subspecialty Milestones

AAIM and the American Board of Internal Medicine (ABIM) co-hosted a summit February 11-12 in Alexandria, VA, to bring subspecialty societies to a common understanding in regard to fellowship milestones. Representatives from ABIM, the Accreditation Council for Graduate Medical Education, and AAIM presented updates on their own efforts in preparation for the launch of the Next Accreditation System (NAS), while everyone acquired a common vocabulary and understanding through an overview of competency-based medical education. Presentations from subspecialties already immersed in milestone development and pilot projects—American Association for the Study of Liver Disease, American College of Cardiology, and the American Geriatrics Society—provided information about the collaborative process, barriers, and implementation plans as well as offered a broad range of approaches and resource utilization. Subspecialty based small group discussions helped generate commonalities in several competencies. AAIM will remain at the forefront of this work, uniting the academic internal medicine community as it prepares for NAS.

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