

## Practice Management Residency Curricula: A Systematic Literature Review

David E. Kolva, MD; Kathleen A. Barzee, MPH; Christopher P. Morley, MA

**Background and Objectives:** *Family medicine's professional organizations have reaffirmed the importance of practice management (PM), and three of the Accreditation Council on Graduate Medical Education's (ACGME) six recommended core competencies include skills related to PM. In the process of integrating the appropriate ACGME competencies into our family medicine residency's PM curriculum, we conducted a systematic review of the literature regarding the implementation of outcomes-based teaching and assessment methods in other PM-related curricula. **Methods:** We performed a systematic search of Medline/PubMed, supplemented by Web-published curricular resources, author contact, and bibliographic examination. **Results:** We located 33 PM-related publications of varying depth and quality and divided them into three categories—those addressing traditional PM topics in a specific residency program (14 articles), those with aggregate data about multiple PM programs (10 articles), and those describing curricula targeting one or more of the three PM-related ACGME competencies (nine articles). Few studies address outcomes of curricular innovations. **Conclusions:** There are few studies on the outcomes of PM-related curricula. Training programs that develop PM curricular materials should evaluate them and publish the results of those evaluations.*

(Fam Med 2009;41(6):411-19.)

For 40 years, family medicine residency programs have provided training in practice management (PM). Indeed, family medicine was the first specialty to require PM residency training, prompted in part by surveys in the 1970s of residency program directors (PDs) and graduates. Recently, the specialty reaffirmed the importance of PM<sup>1</sup> through its inclusion of PM as a main component of TransforMED's New Model of Care,<sup>2</sup> while the Residency Review Committee (RRC) for family medicine presently requires 100 hours of "Management of Health Systems" instruction.<sup>3</sup> More broadly, three of the six required core competencies specified by the Accreditation Council for Graduate Medical Education's (ACGME) Outcome Project,<sup>4</sup> which apply to all medical specialties, include skills that are tightly linked to traditional PM topics and teaching methodology.

While there is no standardized national PM curriculum around which family medicine residencies can design their own program's PM (or "business of medi-

cine") curriculum, residencies may use the American Academy of Family Physicians (AAFP) recommended PM curriculum content lists,<sup>5</sup> or other sources including the "From Residency to Reality" series,<sup>6</sup> the TransforMED model,<sup>2</sup> or the RRC requirements.

Nonetheless, maintaining an up-to-date PM curriculum that is adapted to a complex and changeable set of environmental factors (eg, legal and regulatory pressures, financial reimbursement) and that provides new family physicians with the most appropriate PM skill set is a challenge for most family medicine residency programs. Indeed, despite family medicine's status as an early adopter of PM training in residency, surveys of family medicine program directors and graduates over the last 2 decades have consistently shown that PM is under-taught and that PM curriculum design and execution is inconsistent across programs.<sup>7-9</sup>

One of the most significant drivers of curricular change across all graduate medical education (GME) has been the ACGME Outcome Project's phased introduction<sup>10</sup> of the requirement that all medical residencies show evidence they provide residents with outcomes-based training for each of six core competencies. In response to this requirement, our residency program at the St Joseph's Hospital Health Center in Syracuse,

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From the Department of Family Medicine, SUNY Upstate Medical University and St. Joseph's Hospital Health Center Family Medicine Residency Program, Syracuse, NY.

NY, began a change in the style and content of our PM curriculum in early 2006. Our goal was to redesign the curriculum to reach RRC compliance in competency-based PM education by ensuring it integrated training in the appropriate ACGME competencies and by implementing outcomes-oriented learning objectives and assessment methods. To help guide our efforts, part of our work included performing a systematic literature review to glean best practices in these areas within the context of PM-specific curricula. To our knowledge, ours is the first review to focus on outcomes-based assessment in PM literature.

In this article we discuss the findings of our literature review, how others may add to our work, and how the sharing of data on a national level can provide residency programs with information that may help them reach RRC compliance in their PM curricula. Our primary goal was to determine which assessment tools provided objective outcomes evidence, particularly for long-term behavioral outcomes or evidence based on external measures and secondarily to determine which design features were characteristic of PM-related curricula.

## Methods

### Search Strategies

We searched the Ovid MEDLINE database in December 2007 using search strings with combinations of the keywords listed in Table 1. Broad terms such as “internship and residency,” which returned hundreds of results, were combined in strings with more specific terms such as “practice management, medical.” A second search was conducted in February 2008 with the PubMed database using Medical Subject Heading (MeSH) terms determined to be equivalent to those applied in our MEDLINE search. Other MeSH terms were added to refine existing search strings and to develop additional ones. Table 1 lists the MeSH terms that were combined in the various search strings.

We undertook an additional PubMed search in May 2008 targeting the three ACGME competencies most closely linked to PM: practice-based learning and improvement (PBLI), professionalism, and systems-based practice (SBP). We were unable to identify MeSH terms for these three competencies and so integrated them as non-MeSH terms. PBLI and SBP, unlike professionalism, proved to be overly broad terms and were thus limited to their occurrence in combination with the MeSH term “internship and residency.”

To ensure new publications were captured, our PubMed search queries were saved and rerun weekly through July 2008. New results were reviewed and articles meeting the eligibility criteria were incorporated into the literature review.

MEDLINE and PubMed searches were supplemented by manually examining the references and bibliography lists of included articles. Also, to capture content published only in abstract form, material only present at conferences, and unpublished work, we (1) searched PubMed for each author’s body of work to capture any articles we may have missed and (2) contacted authors to ask for other outcomes-based evaluation data about their program. Finally, we manually searched the Family Medicine Digital Resources Library (FMDRL) and reference document lists under professionalism, PBLI, and SBP in the competencies section of the ACGME Outcome Project Web site.

### Article Selection Process

To be included in our review, articles had to be published after 1990 in English, have a summary abstract, target US-based residency programs, and focus on a residency program’s recurring PM curriculum, the methods used in teaching such a curriculum, or on significant or multiple topics in such a curriculum. Articles also had to address the means of assessing the curriculum or teaching methodology, with some exceptions made for recent or model program implementations. Curricula described in articles from Search 3 that dealt with PBLI, professionalism, and/or SBP—topics that don’t fall into traditional PM curricula but that our program included in its’ PM curriculum—also had to

Table 1

### Ovid MEDLINE Database Search Results

<i>Search 1 (December 2007 Ovid MEDLINE): Keywords</i>	<i>Search 2 (February 2008 PubMed): MeSH Terms*</i>
<ul style="list-style-type: none"> <li>• “family practice”</li> <li>• “practice management, medical”</li> <li>• “internship and residency”</li> <li>• “residency”</li> <li>• “curriculum”</li> <li>• “practice management”</li> <li>• “medical”</li> <li>• “practice management instruction”</li> <li>• “practice management curriculum”</li> <li>• “management curriculum”</li> </ul>	<ul style="list-style-type: none"> <li>• “Competency-based Education”</li> <li>• “Curriculum”</li> <li>• “Educational Measurement”</li> <li>• “Education, Medical, Graduate”</li> <li>• “Evaluation Studies as Topic”</li> <li>• “Family Practice”</li> <li>• “Guideline Adherence”</li> <li>• “Internship and Residency”</li> <li>• “Internship and Residency/Standards”</li> <li>• “Models, Educational”</li> <li>• “Outcome Assessment (Health Care)”</li> <li>• “Physicians, Family”</li> <li>• “Practice Management, Medical”</li> <li>• “Program Development”</li> <li>• “Program Evaluation”</li> <li>• “Professional Competence”</li> <li>• “Teaching”</li> </ul>
<i>Search 3 (May 2008 PubMed): Search Strings*</i>	
<ul style="list-style-type: none"> <li>• (Practice-based learning OR systems-based practice) AND “Internship and Residency” [Mesh]</li> <li>• Professionalism AND (“Family Practice” [Mesh] OR “Practice Management, Medical” [Mesh] OR “Internship and Residency” [Mesh])</li> </ul>	

\* All terms were exploded

be flexible enough, with reasonable modifications, to incorporate into a PM-specific curriculum in family medicine.

With few articles specific to family medicine appearing in our results, non-family medicine articles were included when the nature of the described program seemed adaptable, with reasonable modifications, to family medicine curricula. For all citations, two investigators independently determined an article's focus by examining the title and, if the focus couldn't be determined by the title alone, reviewed the abstract. Articles were selected for detailed examination if they met the inclusion criteria or if they could not be excluded based on their abstract alone.

## Results

### Qualitative Review of the Literature

All but one of the publications we reviewed were journal articles found through our PubMed and MED-

LINE searches; there was one curriculum published only in FMDRL.<sup>11</sup> Articles fell into three categories (Table 2): those that addressed traditional PM topics in a specific residency program, those with aggregate data about multiple PM programs, and those describing curricula targeting one or more of the three PM-related ACGME competencies (PBLI, professionalism, and SBP). Tables 3–5 list our findings for each article category.

### Assessment and Outcome Measures

With one exception,<sup>12</sup> neither the PM nor ACGME competency-focused curricula articles reported long-term outcome measures, and inquiries to authors provided no additional data. None of the articles with survey data (Table 4) discussed outcome assessment patterns of their survey populations (typically program directors, residents, or graduates), and although one article provided graduate survey data specific to a single

Table 2  
Summary of Articles

Article Category	Total	Number by Medical Specialty					
		Specialty	#	Publication Year (citation)			
Individual Residency Program's PM Curriculum	14	Pathology/Lab	3	2007, <sup>21</sup> 2004, <sup>16</sup> 1997 <sup>12</sup>			
		Family medicine	2	2007, <sup>11</sup> 2003 <sup>22</sup>			
		Pediatrics	1	2006 <sup>19</sup>			
		Internal med/peds	2	2004, <sup>34</sup> 2000 <sup>23</sup>			
		Internal medicine	1	2001 <sup>13</sup>			
		Radiology	2	2004, <sup>14</sup> 2000 <sup>18</sup>			
		Psychiatry	1	2002 <sup>17</sup>			
		Orthodontics	1	2001 <sup>15</sup>			
		Primary care	1	2000 <sup>20</sup>			
PM Curriculum in Aggregate (survey summary articles)	10	Family medicine	3	2006, <sup>38</sup> 2001, <sup>8</sup> 1999 <sup>9</sup>			
		Otolaryngology	1	2005 <sup>33</sup>			
		Surgery	1	2005 <sup>39</sup>			
		Primary care	1	2001 <sup>40</sup>			
		OB-GYN	1	1999 <sup>41</sup>			
		Generalist fields	1	1999 <sup>42</sup>			
		Physicians in admin	1	1997 <sup>43</sup>			
		Not specified	1	1997 <sup>44</sup>			
ACGME Competencies (PBLI, SBP, Professionalism)	9	Competency: SBP		PBLI	SBP and PBLI	Professionalism	
		Internal medicine	3	2005, <sup>32</sup> 2005 <sup>27</sup>		2005 <sup>26</sup>	
		Mixed	2	2007, <sup>30</sup> 2007 <sup>31</sup>			
		Dermatology	1				2007 <sup>24</sup>
		Radiology	1	2006 <sup>25</sup>			
		Family medicine	1		2003 <sup>28</sup>		
		Emergency medicine	1	2002 <sup>29</sup>			
Competency totals: 6			1	1	1		

PM—practice management, ACGME—Accreditation Council for Graduate Medical Education, PBLI—practice-based learning and improvement, SBP—systems-based practice

residency program, that data didn't address behavioral outcomes.<sup>7</sup>

Tools authors reported using were administered to residents who were participating in the curriculum or shortly after finishing it and prior to completing their residency. Sims and Darcy's program is the one exception due to their use of American Board of Pathology examination performance as a longer-term outcome,

as well as their plans for five or more annual graduate surveys.<sup>12</sup> We found no curricula that incorporated long-term behavioral or external outcomes into their assessment of resident learning, although Kravet et al<sup>13</sup> describe their ability to track resident outcomes (as behavior changes in coding and length of stay) before and after curriculum completion.

Table 3

## Articles Focused on a Specific Residency Program's PM Curriculum

Year and Author	Medical Specialty	Curriculum Design Features	Evaluation Results
		Format and PGY Year(s)	
2007 Hemmer et al	Pathology and lab. med.	Six 10-hour sessions over 1 year or 1-month dedicated. Senior residents and fellows.	Pre/posttest scores over 2 years of course showed improvement in participant knowledge of L&M issues. Formal follow-up survey of course participants not yet performed.
2007 Thompson and Seymer	Family medicine	Longitudinal; seminars in PGY-1, independent and group learning in remaining years	None
2006 Babitch	Pediatrics	Longitudinal; nine mandatory topics, each covered in a single session	Pre/posttest for each lecture showed an overall improvement, with an average increase between the tests of 20% to 40%.
2004 Crites and Schuster	Internal medicine and pediatrics	Exploratory, 1-year-long series of 30-minute monthly seminars for PGYs 1-4	Pre/post knowledge test showed improvement in mean correct score from 74% to 91%. Skill survey showed improvement from 2.62 to 3.65 (5-point Likert).
2004 Horowitz et al	Pathology	12 seminars held in alternate months over 2 years. Attendees from PGYs 1-6+	Overall knowledge increase of 1.5 (5-point scale), overall evaluation scores for the other questions averaged 4.66.
2004 Chan	Radiology	Longitudinal; monthly 1-hour seminars	None
2003 Bayard et al	Family medicine	Monthly sessions in PGY-2 (1/2 days) and PGY-3 (1 hour)	Statistics from SA knowledge survey showed significant improvement from pretest (start of year 2) to posttest (start of year 3).
2002 Yu-Chin	Psychiatry	Four topics/eight sessions/6-months; one vignette per topic. PGYs 3 or 4.	The four surveys showed a consistent SA improvement of above average or greater for knowledge, skills, and approaches.
2001 Kravet et al	Internal medicine	1-year educational intervention of monthly conferences; housestaff and medical student attendees	Cumulative survey summary results (5-point Likert) for resident and non-resident participants combined showed 79% rated their reimbursement understanding improved, and all indicated an improvement in their attitude toward practicing cost-effectively.
2001 Sinclair and Grady	Orthodontics	Longitudinal over a 3-year residency	None
2000 Colenda et al	Primary care	Monthly sessions during PGY-1	56% of residents did better on the posttest (65% of this group improved by 5% to 10%). Scores for 16% remained the same, and 28% had lower scores.
2000 Callahan et al	Internal medicine, pediatrics	2-week+ block rotation in PGY-3 *Since publication, the insurance company withdrew support (the residency program has continued the block in a 1-week format)	Over a 2-year period, residents' average scores increased from 38% to 76%.
2000 Mirowitz	Radiology	5-week educational intervention of 19 seminars. PGYs 1-4, fellows.	On 5-point scale, average SA knowledge for all post-seminar surveys combined increased from 2.39 to 3.49 with an average increase in interest and importance of .46 and .34, respectively.
1997 Sims and Darcy	Pathology	4-5 year mentor-based longitudinal program; 2-month rotation in final residency year	Six residents had taken the ABP exam and passed the AP and CP portions; the highest score for three of them was on the CP's management section.

SA—self-assessed

Table 4

## Articles Containing Survey Data Related to Practice Management Curriculum

Article	Specialty and Survey Population	Authors' Conclusion
2006 Taylor et al	Family medicine; Directors, residents and recent graduates	"Family medicine practice management curricula appear to be effective in establishing confidence regarding practice management skills in residents and recent graduates."
2006 Ringdahl et al	Family medicine; University of Missouri FM residency graduates	There has been an increase in the perceived need for more PM training by more recent graduates.
2005 Lusco et al	Surgery; program directors in general surgery	70% of PDs said their current trainees received inadequate PM training. Almost 40% of PDs were neutral or against the idea of including this training in the core competencies.
2005 Patel et al	Otolaryngology; otolaryngology residency program chairpersons, directors, and graduates	75% of graduates rated their PM training as poor or fair. The seminar format, use of external experts, and experiential learning were preferred.
2001 Shearer and Toedt	Family medicine; family physicians were randomly sampled.	"The morale and career satisfaction of family physicians seems to have eroded in recent years, and discontent is common."
2001 DeWitt et al	Primary care; primary care residency graduates	13% of respondents desired more business skills training. 16% acquired business/administrative skills after residency. "A continuous quality improvement process may decrease the mismatch between training experience and practice needs."
1999 Williford et al	OB-GYN; residency and medical school program executives, current and former residents	"There were no formal management programs at 87% of responding institutions... Residency programs should establish formal practice management instruction programs and make participation mandatory. Instructional help should come from extra-departmental organizations and individuals."
1999 Osborn et al	Generalist fields; generalist residency program directors, academic deans of undergraduate medical programs	A crowded curriculum and inadequate funding were the two most commonly cited barriers to curriculum change among both deans and directors.
1999 Rose et al	Family medicine; family medicine residency directors	"Active learning strategies seem to be important curricular components, although further study is needed about the most-effective methods to prepare physicians for post-residency practice."
1997 Meyer et al	Multiple; medical school deans; managed care practitioners, administrators, educators, and residents; a national sample of physicians and medical directors.	"The focus groups identified a core set of competencies for managed care practice. ... medical directors and staff physicians differed with respect to the relative levels of importance of these competencies" ... a core curriculum and its sequencing can be identified...and...findings may provide a useful starting point for making decisions about curricular reform.
1997 Frank	Physicians in administration; Society of Physicians in Administration	"...most medical schools and residency training programs don't offer courses in management... Routine follow-up surveys will help the programs reshape and refocus [PM] courses as necessary... In addition, it will develop a mechanism for the GME departments to stay in contact with its graduates, assessing their career development and satisfaction throughout the surveys."

Of the 14 PM curricular articles, two did not include an assessment,<sup>14,15</sup> six used one outcome assessment tool,<sup>13,16-20</sup> and four used three or more tools.<sup>11,21-23</sup> A checklist was the most commonly used tool, used by nine of the 12 program reporting assessment methods, followed by a multiple-choice questionnaire (used in eight programs).

One of the nine ACGME competency-focused curricula did not address assessment,<sup>24</sup> while seven used one outcome assessment tool,<sup>25-31</sup> and the remaining programs used three.<sup>32</sup> The portfolio was the most commonly used tool in this category (used by six of the eight programs reporting assessment methods.)

### Curricular Design

Table 6 describes some common curriculum practices identified in our review. The curricula reviewed generally de-emphasized didactics through the use of hands-on projects and the case-related method (discussion and case vignettes). Hands-on projects were included in five PM curricula, three of which were individually oriented<sup>11,12,15</sup> and two team-oriented.<sup>21,22</sup> One ACGME competency-focused curricula used solo-only projects<sup>29</sup> while five used team projects.<sup>25-28,30</sup> Active learning strategies such as these were found to be important curricular components by a family medicine PM survey in 1999,<sup>9</sup> a finding that was echoed in an otolaryngology survey in 2005.<sup>33</sup>

Table 5  
Articles Describing ACGME Competency-specific Curricula

Year and Author	Medical Specialty	Curriculum Design Features	Tools Used to Evaluate Residents	Evaluation Results
		Format	Tool Description	
2007 Turley et al	IM/Peds Ophthalmology Otolaryngology Pediatrics	5-day rotation through 26 areas. PGYs 2–4 participated in the program's first year.	50-item pre/posttest	25 residents participated in first year of program. There was a 14.8% increase in pre- to posttest knowledge scores, and the program received high evaluations.
2007 Bercovitch and Long	Dermatology	2 hour seminars and group discussions held bimonthly	Residents were not individually evaluated.	None
2007 Kerfoot et al	Surgery Medicine OB-GYN ER medicine	9-week randomized, controlled, crossover educational trial. Participants were year 2 and 3 medical students and PGY 1–5 residents.	26-item, validated online test (before, between, and after the modules).	Test results showed a significant improvement after completion of the first module. The increase in learning from pretest to posttest for US health care system topics was 22%.
2006 Panek et al	Radiology	Sessions over a semester at regularly scheduled radiology meetings	Documentation of project participation	Not quantified
2005 Voss et al	Internal medicine	Three teams of residents that play CHESS (a session requires about 90 minutes). PGYs 1–3 from 19 US residency programs.	SA learning survey	Evaluations were completed by 94% of CHESS's 72 resident and faculty participants. 98% of this group reported an increase in health economics knowledge.
2005 David and Reich	Internal medicine	Longitudinal; multi-format curriculum with three 90-minute workshops during a resident's 3-year tenure	10-question pre/posttest SA learning surveys for each workshop Senior-led session: 25-question test and evaluation of the resident's workshop performance	Mean comfort level from SA learning survey increased for 11 of the 13 course topics; mean pre/posttest results increased from 2.79 to 3.51 (5-point Likert). Mean correct scores on the objective test were lowest for those not attending workshops and highest for those who attended more than once.
2005 Allen et al	Internal medicine	Longitudinal; 8-week block in PGY-3 (companion to a PGY-2 seminar series)	Committee evaluation of resident project presentation	Not quantified
2003 Coleman et al	Family medicine	Seven QI-based, 1-hour monthly sessions core conference series; PGYs 1–3	Panel evaluates teams on: –project content and presentation –literature review –chart audit data	Main learner outcome, improved clinical care for patients at the site, was not assessed at the individual resident level.
2002 Doezema et al	Emergency medicine	Readings and discussions precede development of projects that are completed during residency period.	Projects are evaluated via: –written report –oral presentation –feedback from community members	None

SA—self-assessed

Discussion and case vignettes were used in all PM curricula except one,<sup>11</sup> four of which used discussion only.<sup>15,19,22,34</sup> Of the ACGME competency-focused curricula, two did not mention discussion as a specific methodology; however, one of these<sup>31</sup> was a Web-based independent study program, and the second curriculum<sup>26</sup> was a vignette-centered (simulation) computer program. Vignettes were used in three other ACGME competency curricula.<sup>24,25,28</sup>

The use of adjunct lecturers—external experts and/or internal (extra-departmental) organizational staff—was noted in 10 of the 14 PM curricula<sup>13-16,18,19,21-23,34</sup> and in three of the nine ACGME competency-focused curricula (the single professionalism curriculum<sup>24</sup> and two SBP curricula<sup>27,30</sup>). Five PM curriculum articles described faculty champion roles (a faculty responsible for and empowered to provide an effective curriculum)

Table 6

## Suggestions for a National Competency-based PM Curriculum

<b>Curriculum Overview:</b> The curriculum should be designed around the needs of the adult learner, include annual outcomes assessment to support continuous curriculum improvement, and be taught by faculty champions and external experts who use comfortable, innovative teaching methods and objective assessment tools to prove competency.	
<b>Curricula Design Features</b>	
<i>Case-related Method</i> Didactic sessions should be founded on the adult-learner concept, with information learners deem relevant to their immediate needs and taught using the case-related method. Equal time should be devoted to the presentation of PM concepts and the small-group discussions that are essential for learning how to apply PM theory and techniques.	
<i>Hands-on Projects</i> Longitudinal hands-on projects using a case-based hypothesis—founded on the resident’s workplace observations and activities—should supplement the seminar format. Project topics should be explored for validity and usefulness, have a high experiential learning potential, and allow residents to develop the teamwork and consensus-building skills that will allow them to work effectively in their future practice with allied professionals.	
<i>External Experts</i> Local sources for experts include large financial planning firms, a Medical Group Management Association (MGMA) chapter, or a law firm specializing in health care law. Guest speakers’ discussions must be guided toward curriculum outcomes goals and avoid commercial bias. Hospital-based personnel expert in insurance coding, billing, and CQI are also important adjuncts for seminar and individual resident instruction.	
<i>Faculty Champions</i> Since individual resident learning progresses at differing rates and their attendance at didactic sessions is sometimes incomplete, a faculty champion passionate and meticulous in the pursuit of excellence can help ensure resident skill-building and curriculum value.	
<b>Outcomes Assessment</b>	
<b>Short-term (During Residency)</b>	<b>Long-term (After Residency)</b>
<i>Portfolios</i> Use of the portfolio in a way consistent with ACGME recommendations for a 360° evaluation, as described by Lee et al <sup>45</sup> is a viable option. Each resident maintains a portfolio of their work containing the results of a longitudinal service project workbook, written final examination answers for PM readings, written results of the three literature projects, and a narrative of each PM seminar’s learning points.	<i>Longitudinal Career Surveys</i> * Should assess graduates’ incorporation of the skills into their future medical practice. * Results should be compared to the graduate’s level of competency at the time of graduation.
<i>Multiple Choice Questions</i> Written examinations with short essay answers can best assess immediate knowledge recall of the main PM teaching concepts. Since PM topics rarely appear in Family Medicine Board Recertification examinations, there is no current need to create multiple-choice questions.	
<i>Objective Structured Clinical Examinations (OSCEs)</i> This is a rich area for future development. Potentially, the use of a “mock practice” could be enriched by merging it with a CHES-like program that includes changeable simulations for patient panels/payer mix, expense categories/overhead ratios, plus simulated employees with changeable real-life dilemmas.	
<i>Checklists</i> For hands-on projects, a project-appropriate, validated assessment tool such as that created by Leenstra et al <sup>46</sup> for assessing quality improvement proposals should be used to certify competence acquisition.	

within their curricula.<sup>12,14,15,22,34</sup> Faculty champions were not discussed in ACGME competency-focused articles.

## Discussion

We found little information about the use of long-term, externally based measures of behavior or performance or measures of success in achieving the three ACGME competency-based outcomes. It is possible that some residency program may have implemented such tools or curricula, but they have not published their work in forms accessible in the databases we searched. Further, while we were able to discern a number of common practices in use in PM-related curriculum, we

were limited in our ability to conclude that any commonly used assessment tool or teaching practice is the best tool or practice.

Though the practices identified in our review may not be supported by published outcomes data, we believe they nonetheless can aid in formulating a national, standardized and objective, outcomes-based family medicine PM curriculum that satisfies several ACGME competencies and the Preparing the Personal Physician for Practice (P4) essential skills.<sup>1</sup> A standardized curriculum such as the one outlined in Table 6 may assist PDs of smaller programs in making the PM instruction changes necessary to meet the RRC requirements. The process of expanding upon the ideas in Table 6 and

finalizing the national curriculum is yet to be defined. What is certain, however, based on the results of our review, is that the process must rely extensively upon the very small body of published work that currently exists around outcomes assessment and competency-based PM curricula.

### Limitations

A key limitation of our review is the subjectivity involved in determining whether the curricula described in a given article could be adapted to family medicine PM curricula “with reasonable modifications.” We encountered this issue in reviewing PM-related curricula published in the family medicine literature and in the literature of other specialties, and it was due in part to the variability in traditional PM curriculum. It was also due to the fact that some curricula are designed to specifically address the ACGME competencies PBLI, professionalism, and/or SBP while others weave them into a traditional PM curricula.

### Conclusions

It is imperative that family medicine residency programs that implement PM curricula publish their curriculum content and evaluations if the specialty is to establish proven methods of instruction based on assessed outcomes. Although some programs have done this,<sup>35</sup> we urge others to also publish their work both in resources like FMDRL and in the peer-reviewed medical literature. The results could be used, as suggested earlier, to develop a standardized curriculum in PM.

A standardized national curriculum could be achieved and would not limit the innovative curriculum work that many programs, including those in our literature review, are producing. Rather, our suggested national curriculum would complement independent residency initiatives and create a means for identification and dissemination of the best innovations. As Leach has predicted, it will take nothing less than a community that is “committed to discerning and obeying the truth about the effectiveness of educational interventions” if good is to be derived from the ACGME Outcome Project.<sup>37</sup>

*Acknowledgments:* This project was partially supported by funding from HRSA grant D54HP05462.

Some of the information presented in this article, along with curricular information and pilot outcomes data, was presented as “Competency-based Practice Management Curriculum With Assessment and Validation Tools” at the Society of Teachers of Family Medicine 2008 Annual Spring Conference in Baltimore.

We would also like to acknowledge several study authors who offered additional information about their work, including Leland A. Babitch, MD, MBA; Max Bayard, MD; Gerald E. Crites, MD, MEd; and Oliver Fein, MD.

*Corresponding Author:* Address correspondence to Mr Morley, Upstate Medical University, 200 Madison Irving Medical Center, 750 East Adams Street, Syracuse, NY 13210. 315-464-6960. morleycp@upstate.edu.

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