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Developing a Policy-Relevant Research Agenda for the Patient-Centered Medical Home: A Focus on Outcomes

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BACKGROUND: The Patient-Centered Medical Home (PCMH) is a widely endorsed model of delivery system reform that emphasizes primary care. Pilot demonstration projects are underway in many states, sponsored by Medicare, Medicaid, major health plans and multi-payer coalitions.

METHODS: In this paper we consider the development of a long-term policy-relevant research agenda on outcomes of the PCMH. We provide an overview of potential measures of PCMH impact, identify measurement challenges and recommend areas for further study. Although the PCMH should not be expected to solve every problem in the health care system, developing a research agenda for measuring outcomes of delivery system innovations such as the PCMH should be considered in the context of the larger effort to improve the US health care system, with the ultimate goal to improve population health.

RESULTS: As a framework for our discussion, we have chosen the Institute of Medicine's six specific aims for 21st century health care: (1) safe, (2) effective, (3) patient-centered, (4) timely, (5) efficient and (6) equitable. In addition, we include potential areas of PCMH outcomes that do not easily fall under this framework and consider unintended consequences.

CONCLUSION: Multi-stakeholder involvement will be essential in developing a long-term policy-relevant research agenda for outcomes of the PCMH.

KEY WORDS: patient-centered medical home; outcomes; primary care; physician practice; health reform (or payment reform).

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The patient-centered medical home (PCMH) is a widely discussed delivery system innovation that emphasizes primary care in concert with other elements such as patient-centered care, new model practice, and payment reform¹ (see Table 1). Building on prior work by the primary care specialty societies, the PCMH model was jointly approved in 2007 and

has gained wide endorsement by providers, purchasers, payers, and consumer groups.² Pilot demonstration projects are underway in many states, sponsored by Medicare, Medicaid, major health plans, and multipayer coalitions.

In this paper we consider the development of a long-term policy-relevant research agenda on the potential outcomes of the PCMH. We provide an overview of potential measures of PCMH impact, identify some measurement challenges, and recommend areas for further study. We do not confine the discussion to any current pilot or demonstration projects. As a framework for our discussion, we have chosen the Institute of Medicine's (IOM's) six specific aims for 21st century health care: (1) safe, (2) effective, (3) patient-centered, (4) timely, (5) efficient, and (6) equitable.³ In addition, we include potential areas of PCMH impact that do not easily fall under this framework and we consider unintended consequences. In choosing to use the IOM six-aims framework, it is not our intent to suggest that the PCMH model alone can solve all of the current problems in the US health care system. Many aspects of the delivery system lie beyond the control of the primary care practice and therefore are unlikely to change as a result of PCMH implementation alone. Nonetheless, we think it is valuable to consider the long-term policy-relevant research agenda on PCMH outcomes in the context of the aims of the overall health care system.

HEALTH CARE THAT IS EFFECTIVE

Consistent with the IOM aim to improve health care effectiveness, an explicit goal of the PCMH is "the attainment of optimal, patient-centered outcomes."² The development of clinical outcomes measures relevant to primary care practice has been the focus of numerous recent efforts aimed at practice certification, public reporting, and pay for performance programs.^{4,5} Over time, the reliability and precision of measures has improved, for example, by replacing single evidence-based process measures with measures of adherence to guidelines that incorporate multiple processes, e.g., from "proportion of 2-year-olds with an MMR vaccine" to "proportion of 5-year-olds with all recommended immunizations." Nonetheless, clinical performance metrics for primary care remain limited in scope compared to, for example, the set of 146 quality of care indicators used by the National Health Service of the UK.⁶ The PCMH was built on a foundation of

Table 1. Joint Principles of the Patient-Centered Medical Home (PCMH) and PCMH Cornerstones

Joint principles of the PCMH ^a	PCMH cornerstones ^b
<ol style="list-style-type: none"> 1. Personal physician: Each patient has an ongoing relationship with a personal physician who provides first contact, continuous, and comprehensive care 2. Physician-directed medical practice: The personal physician leads a team of individuals at the practice level who collectively take responsibility for the ongoing care of patients 3. Whole person orientation: The personal physician is responsible for providing for all the patient's health care needs or taking responsibility for appropriately arranging care with other qualified professionals. This includes care for all stages of life, acute care, chronic care, preventive services, and end of life care 4. Care is coordinated and/or integrated: Coordination and integration across the care continuum, including chronic illness care and prevention, facilitated by information technology 5. Quality and safety: Emphasis on quality and safety including use of evidence-based decision support, performance feedback to physicians, active engagement in quality improvement activities, and focus on patient experience 6. Enhanced access: Timely access to care and improved methods of communication between patient and the health care team 7. Payment reform* <p>*Payment reform: Calls for a payment structure that combines fee-for-service, pay-for performance, and a separate payment for care coordination and integration. Explicitly intended to compensate for care coordination, care management, and medical consultation outside the traditional face-to-face visit. Includes for financial recognition of case-mix differences, the adoption and use of clinical information technology for quality improvement, savings from reduced hospitalizations, and the achievement of quality targets</p>	<ol style="list-style-type: none"> 1. Primary care: Comprehensive, first contact, acute, chronic, and preventive care across the lifespan, by a team of individuals led by the patient's personal physician. Includes care coordination across multiple settings and providers 2. Patient-centered care: Active engagement of consumers and patients at all levels of care delivery, ranging from shared decision-making to practice improvement; making the consumer central to the health care system by expanding access and improving options for provider-patient interactions 3. New model practice: Incorporating innovations emerging from the relatively recent era of continuous quality improvement, patient-safety, transparency, and accountability such as evidence-based processes of care including population-based care management facilitated by patient registries, performance measurement and improvement, point-of-care decision support, and clinical information technology 4. Payment reform*

^aJoint Principles of the Patient Centered Medical Home | Patient Centered Primary Care Collaborative. Available at: <http://www.pcpcc.net/content/joint-principles-patient-centered-medical-home>. Accessed August 28, 2009

^bRittenhouse DR, Shortell SM. The patient-centered medical home: will it stand the test of health reform? *JAMA*. 2009;301(19):2038-4

research on the effectiveness of primary care; a comprehensive set of outcome measures would ideally include a variety of types of health conditions, including mental health conditions, and measurement of patient-experienced health improvement and outcomes.⁷

There are several challenges to measuring PCMH "effectiveness." One challenge is the burden of data collection through paper medical record abstraction. Coordinated implementation of clinical information technology in US medical practices could substantially improve data collection for outcomes studies. In addition, some practice-level measures, such as cervical cancer screening and use of asthma controller medications, can be collected through paid claims and supplemented with laboratory or pharmacy data. The use of these data would be facilitated by the development of large multipayer administrative databases that aggregate data across public and private payers.⁸ The National Quality Forum is developing a set of national voluntary consensus standards for ambulatory care using clinically enriched administrative data.⁹

Another challenge is that some outcomes, such as mortality rates or new events such as stroke or renal failure, may be too far removed temporally from the primary care process for them to be attributed to a particular practice. This can be addressed by measuring intermediate outcomes, such as blood pressure control, or evidence-based processes such as treatment intensification for high-risk patients in poor control of CVD risk-factors.¹⁰ A fourth challenge, the lack of power in individual practice panels to detect differences in major primary care sensitive health system events such as hospitalizations, emergency department visits, or re-hospitalization for patients

recently discharged, can be met by examining these outcomes at the level of health system or community.

HEALTH CARE THAT IS PATIENT-CENTERED

Patient-centeredness is a cornerstone of the PCMH.¹ An explicit goal is "to assure that patients get the indicated care when and where they need and want it in a culturally and linguistically appropriate manner."² Additional emphasis is placed on the "robust partnership between physicians, patients, and the patient's family," with active participation by patients and families in health care decision-making and quality improvement activities within the practice.² "Expanded access" provides patients with alternate means of interacting with the medical practice, such as by phone, e-mail, or through interactive websites.²

Measuring patient-centeredness as a PCMH outcome requires patient surveys that directly assess the extent to which patients' needs, wants, and desires are met, their concerns are addressed, and they feel adequately engaged and able to provide input into both their personal health care decisions and the practice organization. The quality of the patient-physician relationship, particularly patient-physician trust, is an important part of the patient experience.¹¹⁻¹³ Although the Consumer Assessment of Healthcare Providers and Systems (CAHPS) Clinician and Group Survey is a standardized survey that has been widely adopted to measure patient experience, it does not capture adequately all aspects of patient-centeredness. Other measurement tools include the Ambulatory Care Experiences Survey (ACES), the Primary Care Assessment Survey (PCAS), Ambulatory Health Literacy,

the Patient Assessment of Chronic Illness Care (PACIC), the Patient Assessment of Culturally Competent Care, and the Patient Outcomes Survey.^{14–18} A recent systematic review discusses the large number of patient experience measures used in Europe.¹⁹ Further work is needed to understand how well these existing tools can be adapted to measure patient-centeredness in the context of the PCMH and the optimal way to administer such surveys on a recurring basis. There are questions of when people should be surveyed (at a fixed point in time or after a visit), who should be surveyed (all patients, heavy users, ages), who should administer the survey (the physician practice or an external source), and how many are needed.

HEALTH CARE THAT IS TIMELY

Implementation of the PCMH, by focusing on increasing quality, coordination, and integration of care in addition to enhanced access, should result in fewer waits and delays, improving the timeliness of care in accordance with the IOM aims. In recent years innovative scheduling systems such as “advanced access” have led to the development of practice-level metrics of timeliness, including demand and capacity, panel size, third next available appointment, future open capacity, and continuity of care.^{20,21} Other measures may be equally important, including time to phone triage (time left on hold and time until called back) and cycle times (time from showing up to leaving the office visit). As patient care interactions shift to interactive websites and e-mail, measures of time to response for these types of interactions are also needed. Waits and delays in receipt of indicated care could also be measured, for example, time to receipt of colon cancer screening after patient’s 50th birthday, time to patient receipt of test results, and time to medication adjustment (e.g., for patients with hyperlipidemia). Although some of these measures might be available using claims databases, most would require new data collection from practices or patients.²²

To the extent that the PCMH is able to meet its goals of integrating and coordinating care with specialists and other aspects of the health care system, other wait times should also decrease. Declines might be seen, for example, in time to follow-up after emergency department visit or hospitalization, time to receipt of discharge summary by the primary care physician, time to physical therapy appointment, social services evaluation, or home health visit.

There are several well-established hospital initiatives to decrease wait times and delays for receipt of interventions that could substantially alter the course of illness (e.g., “door-to-balloon time” for heart attack patients requiring angioplasty). In the outpatient arena such measures do not exist and would be much more complicated to measure. For example, time to first antibiotic dose after a positive chest x-ray for community-acquired pneumonia includes the time for a radiologist (who is often located at an independent facility), to track down the appropriate provider with the x-ray results, the time for the provider to notify the patient of the results and prescribe the antibiotic, the time for the pharmacist to fill the prescription, and the time for the patient to receive the medication. While these measurements might be possible in a large integrated health system, measurement in the more fragmented setting of small community-based primary care practices and

independent laboratories and radiology practices is much more challenging.

HEALTH CARE THAT IS EFFICIENT

The PCMH model requires increased investment in primary care practices through payment reforms.² Meanwhile, long-term cost savings may accrue to the health care system (not necessarily the primary care practice) through, for example, decreased redundancies, decreased overuse of inappropriate services, decreased medical errors, decreased ED visits and hospitalizations, decreased rehospitalizations for patients recently discharged, prevention of costly complications, and appropriate use of palliative care at the end of life. A broader range of other potential efficiencies should also be considered. If team-based care is expanded, an appropriate shift in certain tasks from physicians to other team members or automated systems may result. If access is enhanced by phone and e-mail, in-person visits for routine questions might decrease. As wait times in the medical practice decline, patients should miss less time from work or school. As patients with chronic and complex conditions develop continuous relationships with personal physicians, the relative proportion of contacts with the personal physician should rise and the number of redundant tests should decline. As care becomes more coordinated and integrated, wait times for specialty consultation should decrease and the proportion of patient contacts during which the patient’s medical records are unavailable to the treating provider should decline.

Hussey et al. provided a recent thorough review of available measures of health care efficiency.²³ They argue that although health care efficiency is of considerable interest to payers and purchasers in particular, the concept has not been well-defined and that, in contrast to most quality measures, there is little convergence around a consensus set of efficiency measures. Existing measures have been subjected to few rigorous evaluations to evaluate reliability, validity, and sensitivity to methods used. They argue that “almost all of the [265] purported efficiency measures reviewed would be classified as ‘cost of care’ measures..., not true ‘efficiency measures.’”²³ To evaluate the PCMH, it will be important to include both cost and non-cost measures of efficiency and to include the perspective of the patient as well as the providers.

HEALTH CARE THAT IS SAFE

Health care safety has been identified as one of the most urgent of the six aims in the IOM framework and is a core principle of the PCMH.² To date, measures of safety in ambulatory care have been limited to prescribing errors and medication safety, two areas where the PMCH could be expected to have an impact.^{24,25} Beyond this, the IOM has described the knowledge of the kind and magnitude of errors and the development of safety systems in ambulatory care settings, as “rudimentary.”²⁶ Much work remains to be done to develop safety measures for ambulatory care and, further, to determine the potential impact of the PCMH on safety.²⁷

HEALTH CARE THAT IS EQUITABLE

Disparities in health and health care are well-documented.²⁸ As the PCMH model is more widely adopted, it will be important to consider its potential impact on health care equity. To the extent possible, data on personal characteristics, such as gender, race, ethnicity, and socioeconomic status, should be collected to allow for stratified analysis on all of the other outcome measures so that disparities can be measured and documented over time.

MEASURING THE IMPACT OF THE PCMH: COMMUNITY LEVEL

Although it is critical to measure the impact of the PCMH at the level of the practice, for several reasons it is also important to measure the impact on the population level as the PCMH moves beyond demonstration projects to be more widely adopted. First, some outcomes are difficult to assess at the level of the practice due to insufficient sample size or challenges attributing an outcome to a single practice when a patient may see multiple providers.^{29–31} Other outcomes (e.g., reductions in sexually transmitted diseases) are simply easier to measure at the population level because of available public health data. As the PCMH becomes the standard model of primary care in a community, there may be changes in practice patterns across the continuum of care that can only be assessed by measurement at the community level (e.g., reduction in risk behaviors or increase in the proportion of the population with an identified primary care provider). Finally, the PCMH model explicitly calls for providers to work together in the community context and across individual practice boundaries. For example, “appropriately arranging care with other qualified professionals” and coordinating and integrating care “across all elements of the complex health care system...and the patient’s community.”²

Population effects can be assessed at the level of the community, state, region, or country. Logically, it makes sense to focus on the community, as that is where one would expect to first see the effects of the PCMH on population health. Also, studying the population impact of the PCMH at the community level offers the best opportunity for understanding the processes by which the PCMH can impact population health. For example, community level outcomes can be correlated with the degree of adoption of the model within the community—both longitudinally within the same community and cross-sectionally among communities. Community level impacts are also meaningful to employers who draw their workforce from the community.

Challenges to Measuring the Impact of the PCMH at the Community Level

One of the challenges in community level measurement is defining the community. Traditional boundaries such as the metropolitan statistical area may be too large for assessing the impact of the PCMH on communities and do not include rural communities. Political boundaries such as towns, cities or counties may not correspond to actual communities as defined by use of primary care. Hospital service areas may be an

appropriate definition of a community in areas where most primary care patients use a single hospital. Another approach to identifying geographically defined communities is through the use of claims data to define an area within which most people obtain most of their primary care.³²

A second challenge is to measure the extent of adoption of the PCMH within a community and track it over time. Counting the proportion of primary care practices in a community that meet an agreed-upon definition of a PCMH would provide a simple but incomplete measure. Because the PCMH is multifaceted, it would be more informative to measure the degree to which practices, and practice networks, adopt key components of the PCMH and to aggregate these measures over the community they serve. This approach would also allow for the study of the adoption threshold at which PCMH has measurable community level impacts. A third fundamental challenge is choosing community-based measures that are therefore likely to be sensitive to adoption of the PCMH. A substantial body of literature exists demonstrating a link between the level of primary care in an area and a variety of health outcomes including lower rates of cause-specific and total adult mortality,^{33–35} infant mortality, low birth weight,³⁶ lower health care costs,³⁷ better self-reported health,³⁸ and reduced health disparities.^{39,40} It is hoped that the generalized adoption of the PCMH model, by improving the quality of community primary care, will improve many of the same outcomes. Three broad categories of community level outcomes that could be affected by dissemination of the PCMH model are: (1) enhanced preventive services leading to improved vaccination and screening, risk factor reduction, and disease prevention; (2) better management of chronic diseases leading to lower rates of emergency visits and hospitalizations and less lost productivity due to fewer sick days; (3) improved structures and processes resulting in increased access, efficiency, and equitability. Examples of outcomes in each of these three broad areas are provided in Table 2.

Practice Networks and Employee Groups

While this section has focused on the geographically defined (population-based) community, it should be acknowledged that measuring outcomes in large integrated health systems such as Kaiser Permanente⁴¹ or Geisinger Health System,⁴² and in accountable care organizations,⁴³ may provide some of the same benefits as community level measures for assessing PCMH-related outcomes. While most practice-level measures can be applied to networks and health systems, additional measures related to integration, communication and shared information systems are inherently more important for networks and systems than for discrete practices. Employee groups of large employers are another type of non-population-based “community” for which outcomes related to the PCMH can potentially be measured via claims, employment data, and employee surveys.

UNINTENDED CONSEQUENCES OF THE PCMH

Whenever implementing change, one must consider unintended consequences.^{44–46} “Short-term” unintended consequences

Table 2. Framework and Examples of Available Community-Based Measures Relevant to Assessing the Impact of the PCMH

General area	Specific area	Examples of population measures potentially sensitive to the adoption of the PCMH	Sources of data or survey instruments
Health promotion and disease prevention	Vaccination and screening	Vaccination rates at time of entry into kindergarten; Percent of adults >65 vaccinated for pneumococcus; Mammograms; Pap smears	State and county health departments; CHIS, CMS, NIS
	Risk behaviors and risk factors	Tobacco use; Alcohol and drug abuse; Risky sexual behaviors; Obesity; Hypertension	BRFSS; CHIS, NHIS; YRBSS
	Preventable conditions	Incident of sexually transmitted infections (STIs); Incidence of teenage pregnancies; Violence related mortality; Low birth weight neonates and infant mortality	State and county public health departments; NVSS
Chronic disease management	Avoidable complications	Emergency visits and hospitalizations for primary care sensitive (PCS) conditions (e.g., diabetes, chronic lung disease and congestive heart failure); Early readmissions for PCS conditions	HCUP, NHDS
	Mortality	Mortality from tobacco related diseases; Mortality post-stroke	NVSS
Efficiency and access	Communication	Use and sharing of electronic medical records by practices, hospitals and pharmacies	None found
	Coordination and continuity of care	% of visits with PCP; % of specialist visits preceded by a PCP visit; % of all visits to same PCP; % of patients discharge from hospitalization for PCS seen by PCP within 2 weeks	CMS, CTS/CQI
	Costs	Lost work days; Procedures; Avoidable emergency visits and hospitalizations	CMS; CNS; CTS/CQI, HCUP, MEPS, MarketScan
	Access	% with identified PCP; % with a primary care visit in past 12 months;	CHIS, CNS, CTS/CQI
	Equity	Number of prenatal visits Surveys which collect data on race, ethnicity, language, income and/or education	BRFSS, HCUP, NDUH, NIS, NVSS, YRBSS

Acronyms for measures (sources):

- BRFSS = Behavioral Risk Factor Surveillance System (NCHS, CDC)
- CHIS = California Health Interview Survey (State of California)
- CMS = Center for Medicare and Medicaid Services administrative data (HHS)
- CTS/CQI = Community Tracking Study Household Survey/ Community Quality Index
- HCUP= Healthcare Cost and Utilization Project (AHRQ)
- MEPS = Medical Expenditure Panel Survey (AHRQ)
- NHIS = National Health Interview Survey (CDC)
- NHDS = National Hospital Discharge Survey (CDC)
- NIS = National Immunization Survey (NCHS, CDC)
- NVSS = National Vital Statistics System (NCHS, CDC)
- NSDUH = National Survey on Drug Use and Health (SAMHSA)
- YRBSS = Youth Risk Behavior Surveillance System (CDC)

Acronyms of sources:

- AHRQ = Agency for Healthcare Research and Quality
- CDC = Center for Disease Control
- HHS = US Department of Health and Human Services
- NCHS = National Center for Health Statistics
- SAMHSA = Substance Abuse and Mental Health Services Administration

may result from changing care processes and business models. These unintended consequences are important in light of early research demonstrating that practice transformation to the PCMH model may take several years.⁴⁷

“Long-term” unintended consequences of the PCMH may reflect problems with the PCMH model itself. For example, increased reliance on technologies to improve efficiency might ultimately result in less human interaction and lower patient satisfaction. Increased attention on chronic care management might divert resources from delivering high quality care for

acute illness. In an attempt to deliver all “recommended” preventive services to all patients to meet outcomes goals, practices might lose sight of patient preferences. Incentives to reduce “overuse” might result in withholding diagnostic procedures and treatments when they are indicated. Because only a small proportion of activities can be measured, there is a danger that unmeasured activities will be neglected to the detriment of patients. In addition, several studies looking at unintended consequences of quality improvement efforts demonstrate a negative impact on disparities.⁴⁸

Table 3. Developing a Long-Term Policy-Relevant Research Agenda for PCMH Outcomes: Exemplar Research Questions**Identifying a Core Set of Measures of PCMH Outcomes**

- What are the best measures of clinical effectiveness that are sensitive to the PCMH model; measurable at the level of the practice or community; and feasible to collect?
- Which clinical processes are most closely related to health outcomes and therefore should be measured to determine effectiveness?
- What are the evidence-based measures of patient safety in the ambulatory care setting that are sensitive to the PCMH model?
- What are the best measures of patient-centeredness, above and beyond patient satisfaction or experience?
- What are the best measures of “timeliness” that can be measured at the level of the practice and community? How is timeliness linked to health outcomes, patient experience, and efficiency?
- How is efficiency best defined and measured with regard to the PCMH?
- What is the best set of measures to determine that health care delivered under the PCMH model is equitable—that is it does not differ in quality based on personal characteristics such as gender, ethnicity, geographic location, and socioeconomic status?
- What are other measures that should be considered in evaluating the outcomes of the PCMH that go beyond the IOM framework, for example, measures of workforce supply or provider satisfaction?
- What is the impact of non visit-based care on the six IOM aims?
- What are the best measures of unintended consequences of the PCMH model that would allow for early recognition of problems with model specifications?
- How large a set of core outcome measures can reasonably be collected and which measures should be included as high-value, core measures?
- How does choice of PCMH outcomes measures depend on the perspective of purchasers, payers, communities, providers, or patients?

Identifying the Level at Which to Measure

- How can the patients of a medical practice be identified for the purposes of measuring PCMH outcomes?
- To what extent do individual physicians need to be linked to particular practices for the purposes of measuring practice-level outcomes? How can this best be accomplished?
- How can a population-based community be defined for the purposes of measuring PCMH outcomes?
- Which outcomes measures are best assessed at the level of the practice and which are best measured at the level of the community?
- How can the extent of adoption of the PCMH model within a community be measured?
- What is the level of adoption of the PCMH model that is necessary to produce changes in community health outcomes?

Additional Questions

- When measuring its relationship to health care outcomes, to what extent does the PCMH model function as an integrated whole, rather than simply as a collection of components such as team-based care, advanced access scheduling, and chronic disease registries?
- In what ways can evaluation efforts be affected by “gaming” of performance measures by practices and providers?
- What is the best method for case-mix adjustment and how is patient preference included in outcomes calculations?
- What are the sample size challenges faced when trying to measure practice-level PCMH outcomes in very small physician practices? How are these challenges best addressed?
- How can “appropriateness” best be defined and measured to detect overuse of inappropriate or unnecessary interventions, as well as underuse of necessary treatments?
- Do the outcomes measurement issues and priorities differ among the major categories of physician practices (e.g., large integrated delivery systems, solo physician practices, FQHCs) or within different types of communities (for example, chronically underserved communities)?
- How do concepts such as “integration,” “continuity,” “patient-physician relationship,” “comprehensiveness,” “patient trust,” and “care transitions within and between care settings” relate to the measurement of PCMH outcomes?
- What is the role of specialist and hospital practices in ensuring positive patient outcomes from the PCMH (e.g., timely communication, etc.)
- Who will be responsible for collecting data, evaluating impacts, and tracking changes over time at the level of the practice and the community?
- What will be the intended or unintended connection between outcomes measurement and other efforts such as practice accreditation or certification, public reporting, and/or pay for performance? To what extent can these ongoing measurement activities be harnessed to yield outcomes for evaluating the impact of the PCMH?
- What uses of outcome measures will be most effective in promoting high performing medical homes (e.g., practitioner feedback, public reporting, pay for performance)?

One important unintended consequence to consider is “overuse,” or the provision of services to those not likely to benefit. This requires defining and measuring the “appropriateness” of interventions. This is especially important for a patient with multiple co-morbidities or near the end of life.⁴⁹ The NCQA’s Back Pain Recognition Program addresses overuse by recognizing use of best practices for the management of uncomplicated low back pain.⁵⁰ The National Priorities Partnership, a collaborative of 28 major national organizations representing a broad range of stakeholders, has identified “overuse” as one of six national priorities and has identified several primary care-related areas of concentration, including inappropriate antibiotic use, routine use of laboratory panels (e.g., SMA 20), and routine preoperative chest x-rays.⁵¹

In addition to these potential unintended consequences, transformation of the delivery system to the PCMH model could

result in increased stress and decreased work satisfaction for providers as roles change, new technologies are implemented, new workflow patterns are established, and new patient-provider relationships are formed. This could have a critical impact on the already limited supply of adult primary care physicians. The potential negative impacts of measurement and reporting burdens shouldered by practices must also be considered.

DEVELOPING A RESEARCH AGENDA: AREAS FOR FUTURE STUDY

The Patient-Centered Medical Home has gained considerable traction in the US and is an important component of federal health reform efforts. This paper presents an overview of issues important to the development of a long-term policy-relevant

research agenda on PCMH outcomes. In addition to this discussion, we have included a set of exemplar research questions for a policy-relevant research agenda in this area (see Table 3).

Although the PCMH model should not be expected to solve every problem in the health care system, developing a research agenda for measuring outcomes of delivery system innovations such as the PCMH should be considered in the context of the larger effort to improve the US health care system, with the ultimate goal to improve population health. The Commonwealth Fund has convened the evaluators of current PCMH demonstration projects to define best measures for use in those projects; additional leadership will be needed to determine the best set of PCMH outcomes indicators over the longer term. Much can be learned from leaders in the field of ambulatory care measurement and reporting, including organizations such as the Agency for Healthcare Research and Quality, The Commonwealth Fund, the Robert Wood Johnson Foundation, the National Quality Forum, and the National Priorities Partnership. Large organized health systems that have demonstrated leadership in both the implementation of the PCMH model and measurement of outcomes include, for example, the Veterans Administration, Kaiser Permanente, and Geisinger Health System. State agencies, health plans, and purchaser coalitions all have vested interests in the outcomes of the PCMH and have experience to offer in measuring these outcomes, as do practicing physicians and patients. Multi-stakeholder involvement will be essential in developing a long-term policy-relevant research agenda for outcomes of the PCMH.

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