ORIGINAL RESEARCH

After-Hours Care and its Coordination with Primary Care in the U.S.

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BACKGROUND: Despite expectations that medical homes provide “24×7 coverage” there is little to guide primary care practices in developing sustainable models for accessible and coordinated after-hours care.

OBJECTIVE: To identify and describe models of after-hours care in the U.S. that are delivered in primary care sites or coordinated with a patient's usual primary care provider.

DESIGN: Qualitative analysis of data from in-depth telephone interviews.

SETTING: Primary care practices in 16 states and the organizations they partner with to provide after-hours coverage.

PARTICIPANTS: Forty-four primary care physicians, practice managers, nurses and health plan representatives from 28 organizations.

APPROACH: Analyses examined after-hours care models, facilitators, barriers and lessons learned.

RESULTS: Based on 28 organizations interviewed, five broad models of after-hours care were identified, ranging in the extent to which they provide continuity and patient access. Key themes included: 1) The feasibility of a model varies for many reasons, including patient preferences and needs, the local health care market supply, and financial compensation; 2) A shared electronic health record and systematic notification procedures were extremely helpful in maintaining information continuity between providers; and 3) after-hours care is best implemented as part of a larger practice approach to access and continuity.

CONCLUSION: After-hours care coordinated with a patient's usual primary care provider is facilitated by consideration of patient demand, provider capacity, a shared electronic health record, systematic notification procedures and a broader practice approach to improving primary care access and continuity. Payer support is important to increasing patients' access to after-hours care.

KEY WORDS: after-hours care ; coordination; primary care.

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BACKGROUND

Access to after-hours care coordinated with one's usual primary care provider (PCP) is poor in the U.S. compared to other Western industrialized nations. “After-hours care” refers to care for medical problems arising between 5 p.m. and 8 a.m., and on weekends and holidays, that could be appropriately managed by the patient's primary care physician/team. In an international survey, only 29 % of U.S. physicians said their practice had arrangements for ensuring after-hours care for patients other than automated phone referral to the emergency department (ED), and only 30 % of patients described getting care on nights and weekends as “very” or “somewhat easy.”^{1,2}

Yet, continuity of primary care, including care received outside usual business hours, is associated with improved patient outcomes and lower ED use for non-urgent problems.^{3–8} The high—and growing—rates of ED use for non-urgent, after-hours care contributes to fragmentation of patients' care, inefficient use of resources and higher spending since ED visits cost more than primary care visits.^{9,10} Health problems developing outside of normal business hours are a leading cause of ED visits, with almost 65 % of all ED visits (regardless of severity) occurring between 5 p.m. and 8 a.m. or on weekends.^{10,11} And many acute complaints seen in the ED, including stomach and abdominal pain, fever, cough, and headache, comprising over 15 % of ED visit volume, are commonly managed by PCPs. Among persons with a usual PCP, those who also used the ED were more likely to report that their PCP's office was “not open when they could go.”¹²

Offering after-hours access to select primary care services, including telephone access and expanded clinic hours, could potentially eliminate many costly ED visits while improving continuity.^{3–7} And while access to after-hours care is important to patients, physicians providing 24×7 care struggle to avoid exhaustion. Problems ensuring access and continuity have stimulated patient-centered medical home (PCMH) initiatives and recently the *Comprehensive Primary Care Initiative*¹³ under the ACA to include “24-hour access to care” as a goal. For example, the National Committee for Quality Assurance's Medical Home Measurement tool refers to “providing urgent phone response within a specific time, with clinician support available 24 hours a day, 7 days a week” as part of its qualification criteria.¹⁴ Yet, little information is available to providers on developing sustainable models of after-hours care.

The published literature on after-hours care suggests that it includes the following characteristics: Safe and timely triage;^{15,16} accessibility for patients;^{1,2} continuity and coordination with a patient's usual PCP (either offered by patient's PCP or linked to PCP via information transfer when clinically necessary, e.g. before follow up with the PCP is required);^{1,2,8,16} avoids PCP burnout (i.e. exhaustion as a result of prolonged stress or frustration);^{17–19} maximizes quality for patients (including patient satisfaction);¹⁶ and is financially sustainable (has persevered over time despite financial challenges of current payment system).⁵

The objectives of this study were to identify promising after-hours care models in the U.S. that are either delivered in primary care sites or coordinated with a patient's usual PCP. Through in-depth interviews of practices and organizations providing after-hours care, we present a typology of models and selected examples. We then identify challenges, facilitators, lessons learned and implications for the design of sustainable after-hours-care.

METHODS

Study Design and Participants

This was a qualitative study based on in-depth interviews of persons providing or managing programs of after-hours care that were coordinated with patients' usual primary care provider. In several cases the after-hours care practitioner and the primary care practitioner were one and the same individual/practice. We purposively selected practices/organizations to include a range of characteristics in terms of size (small, medium and large practices), ownership type, geography, rural/urban and suburban settings, and types of primary care delivered (family medicine, internal medicine and pediatrics practices) see Table 1.

We included numerous safeguards against researcher bias and site bias²⁰ in our design and participant identification. For example, to help avoid researcher bias, our two senior co-investigators were an emergency medicine physician and a preventive medicine physician/health services researcher, who brought different clinical backgrounds to the project. Next, we engaged from the beginning of the study, a steering committee of neutral experts in the U.S. on the topics of primary care, chronic care, after-hours care and qualitative research who helped us to identify potential organizations which whom we should speak. These experts (listed in our acknowledgement section) also reviewed both our study design and the interview protocols. In terms of potential bias stemming from the effects of the site, we purposively selected practices/ organizations to include a range of characteristics.

We identified respondent organizations through Internet searches, references from health plans and PCMH managers, and recommendations from U.S. experts on after-hours care with a particular focus on identifying those that seemed to

Table 1. Participant Practice Characteristics

Characteristic	Frequency
Total number of Respondents*	44
Total Number of Practices	21
Type of PC practice:	
Adult and Pediatrics (Combined Family Practice, Internal Medicine & Pediatrics)	15
Pediatrics Only	3
Adults Only (General Internal Medicine)	3
Practice Size	
Solo-2	6
3–5	5
6–10	3
11–50	3
50+	4
Setting	
Urban	8
Suburban	8
Rural	5
Ownership:	
Independent physician owned practice	13
Practice owned by larger system (includes three FQHCs)	8
Uses EMR	
Shared (same EHR) across practices or the system	8
Single EHR within a practice used for both daytime and after-hours care	5
Single site EHR but has a portal or provider database for information sharing	3
No EHR	5
Uses 24-hr nurse triage line as part of their after-hours care arrangement	8
Part of a PCMH Initiative	13
Additional compensation for 24/7 availability	
Fee For Service (Practice bills for E&M after-hours codes, but might not receive the extra payment)	7
Capitation (Either an HMO or a PCMH that receives per-member-per month payment in addition to FFS)	3
Has Urgent Care Facility Designation**	5
No additional payment for after-hours care	6
Uses a particular Urgent Care facility for its after-hours care	8
Primary Care Office Has Extended Hours	
None	5
Weekday extended hours	5
Weekend extended hours	1
Weekend and weekday extended hours	10

*Of the 44 respondents, 33 were from primary care practices, 9 worked at health plans or as PCMH program managers, and 2 worked at free-standing urgent care centers

**Urgent Care Facility Designation qualifies the facility for payment rates above the after-hours E&M but below rates for ED care

coordinate after-hours care with the patient's usual primary care provider. Participants completed an emailed questionnaire describing their size, staffing, payer mix and operating hours. During a screening call, we identified practices/organizations that had a mechanism for communication with the patient's usual PCP about after-hours care delivered, including in-person, telephone, fax or electronic communications e.g. via electronic health record (EHR) or secure email.

We then interviewed a person knowledgeable about care delivery at each practice/organization/community health clinic/urgent care center/after-hours clinic, typically the lead physician. In some cases we did a second interview with a practice manager or nurse practitioner if the initial respondent felt that they could add further insights or fill in missing information.

Data Collection

Using semi-structured interview protocols, (available in online appendix) we asked participants to describe their: 1) after-hours-care model, 2) motivation for their arrangement, 3) process for exchanging information between the after-hours and usual provider, 4) after-hours staffing and resource needs, 5) model sustainability, 6) barriers and facilitators of after-hours care and its coordination with primary care, and 7) lessons learned.

The two senior researchers conducted the telephone interviews between January and July of 2011. Interviews lasted on average one hour. Two research assistants trained in transcription and coding for qualitative data took verbatim notes during every interview. We continued conducting interviews with new practices until we had reached saturation of themes and repetition of descriptions of after-hours care models.²⁰

Data Analysis

Each interview transcript was reviewed by the senior researcher/research assistant dyad and coded based on protocol item topic. Content analysis of the verbatim transcripts initially was based on inductive coding²⁰ by the senior researchers. They then met as a team with the research assistants periodically to review codes and identify key themes and models. The research assistants applied codes to the units of text based on both our protocol questions and themes. Transcripts were coded with ATLAS.ti data analytic software.²¹

RESULTS

We completed a total of 44 interviews in 28 different organizations across 16 different states. Practice characteristics are described in Table 1. Five models of after-hours care coordinated with primary care were identified: 1) Same PCP, all the time; 2) PCP plus practice partners; usually limited extended hours and 24–7 phone coverage; 3) PCP plus small, local cross-coverage network, usually 24–7 phone coverage, sometimes extended hours as well; 4) PCP plus large cross-coverage network (may be part of larger system), may have multiple sites with extended hours, may

own an urgent care center or after-hours clinic; 5) PCP plus a contractual relationship with urgent care center or after-hours clinic. Each of these models' characteristics, after-hours strategy and communication supports are summarized in Table 2 which also provides selected illustrative examples. Three of the respondents worked in federally qualified community health centers and their CHCs were most like Model 3 (in two cases) and Model 5 (in one case).

While not a separate model unto itself, an important facilitator of after-hours care across models, in particular for pediatrics, was telephone nurse triage. While any on-call coverage arrangements may be supplemented by nurse triage lines that refer to the covering physician per protocol, some organizations used this more than others. For example, in Plattsburgh, N.Y., four pediatric practices, consisting of 14 pediatricians, are part of the NY Adirondack Region Medical Home Pilot. The practices share on-call responsibilities and use a third-party nurse call center in Cleveland to triage after-hours calls. The cost is covered through the medical home pilot payments. Nurses at the call center are given access to the patients' EHR and talk directly to parents. If needed, the nurse then pages the on-call physician for the practices. This has decreased pediatricians' call burden. The nurse triage line creates an "alert" via a secure website (not the patient's EHR) that gets forwarded to the patient's usual pediatrician. The pediatric staff can then learn in the morning about calls that didn't require physician attention during the night.

Challenges

Challenges to sustainable after-hours care models in the U.S. include a range of factors. First, while evaluation and management (E&M) billing codes for after-hours care exist, many respondents said they weren't reimbursed. A solo-practice PCP noted, "There are codes for after-hours care.... We code for them regularly and never get compensated." Additional challenges to starting an after-hours clinic or extended hours included the reluctance of some providers to work irregular schedules and the difficulty of determining adequate staffing levels. Some practices initially overstaffed and did not have enough patients presenting after hours to justify their investment.

Obtaining buy in from community PCPs to collaborate on after-hours care was an initial challenge. A PCMH manager noted, "There were some trust issues that had to be overcome." People were concerned about losing patients to a more accessible colleague.

Providers reported challenges in encouraging some patients to use after-hours services rather than the ED for non-urgent care. A respondent in an integrated delivery system (IDS) said, "We're having a much harder time pulling the Medicaid population in to primary care offices. They have a multigen-

Table 2. Characteristics of Illustrative After-Hours Primary Care Models

Selected illustrative examples	Practice characteristics	After-hours strategy	Communication between after-hours & usual PCP	Payment for extended hours visits
Model 1: Same Primary Care Physician (PCP) all the time				
Solo-2 physician practices (pediatric family practice & internal medicine)	PCP sees patient in office and when hospitalized Physicians feel this level of access & continuity "is absolutely the right thing to do." Some serve geographically confined pop. Predominately paid fee-for-service (FFS) Limitation: risks provider burnout	No or limited formal after hours. Physician available for own patients by phone 24/7 and will open office outside of traditional hours as needed. No cross coverage.	Same physician all the time with clerical or clinical support staff Heavy emphasis on interpersonal continuity of care	Small practices reported more difficulty obtaining extra payment for after-hours visit than larger practices
Model 2: PCP plus practice partners, usually limited late hours and 24-7 phone coverage				
Docs on Call, (Grand Junction, CO) (Family Practice & pediatrics)	Suburban Three private practices ranging from 6-17 physicians with 3 mid-levels per practice Mostly FFS Will see patients from outside their three core practices, but only if patient has regular PCP. Relative geographic confinement of population may make this model more feasible than for practices in other areas Limitation: Risk of less interpersonal continuity	Initially, ten physicians worked an extra shift one day a week to staff Docs on Call after hours. With time, quality of life issues resulted in a transition to staffing their after-hours clinic with 3 employed physicians, 1PA & 1NP dedicated to after-hours After-hours care in same building as daytime practice Three affiliated practices also use Docs on Call for patients whose problems arise after hours, until 10 pm M-F & 9 pm weekends	Shared EHR for patients within the three-practice system. For patients coming for after-hours care but who have external PCPs, note uploaded to Colorado's shared data repository, QHN, or faxed if out-of-state patient Rare voice contact between after-hours & usual PCP for complex patients	Negotiated with insurers for a unique code to be applied to services provided in after-hours clinic, resulting in higher payments for after-hours care than daytime E&M visit.
Alexandria Primary Care (VA)	Independent practices ranging from 4 to 8 PCPs some include midlevel providers (NP, PA)	Some providers offer extended hours by, for example, employing one more physician than space can accommodate and staggering shifts	Shared EHR	Some receive after-hours E&M payments
Seaport Family Practice (ME)	Same day access	Some also provide after-hours care for other practices	Some have patient web-based portal	
Family Medicine at Greenhill (DE)	Heavy emphasis on interpersonal community		Rare voice contact between after-hours care and daytime PC when needed for complex patients	
Model 3: PCP plus small local cross-coverage network				
Adirondack Region Medical Home Pilot (Plattsburgh pod, NY)	27 rural participating practices ranging from single physician private practices to community health centers Same day access Limitation: Risk of less interpersonal continuity	Approach varies: Groups of 2-14 providers cross-cover each other's panels. Pediatric practices supplemented with nurse triage phone service. Some practices offer limited extended hours Urgent care sites open after-hours Usually 24x7 phone coverage	Urgent care sites share an EHR with some practices, but not all PC practices are on the same EHR. Others fax standard form to PCP office Phone/in-person contact when needed (for complex patients & patients requiring ED or hospitalization)	Multi-payer medical home pilot.

Table 2. (continued)

Selected illustrative examples	Practice characteristics	After-hours strategy	Communication between after-hours & usual PCP	Payment for extended hours visits
Model 4: PCP plus large cross-coverage network (owns urgent care centers)				
Geisinger Health System (PA)	Suburban, integrated delivery system and insurer, approximately 60 community practices and 10 hospitals and clinics. Largely FFS Same day access Ability to leverage physician partners and the health plan. Limitation: Risk of less interpersonal continuity	Four components: Extended hours at some practices After-hours clinics staffed by mid-levels and co-located in physician practices with access to patient records Owned urgent care centers Retail and worksite clinics (during day)	Shared EHR for Geisinger practices. For external PCPs, fax or mail visit note depending on preference Rare voice contact for complex patients	Varies: urgent care clinics bill urgent care rates, after-hours clinics co-located with hospitals get additional payment from facility fee
Model 5: PCP plus quasi-exclusive relationship (contractual arrangement) with a third party urgent care center or after-hours clinic				
NorthBay Primary Care (CA)	22 primary care providers (adult and pediatric) across 4 practices Mostly FFS Same day access Limitation: Risk of less interpersonal continuity	PC practices share call & EHR PC practices have contractual relationship with two independent after-hours providers (Vacaville & Fairfield) If a patient needs care after hours, they call the PC office first and the provider on-call (one pediatric & one adult provider) with access to EHR from home, counsels patient by phone & if patients needs to be seen refers them to contracted after-hours care or to ED if an emergency	Documentation faxed back to PCP by after-hours provider, as specified in contract The PC EHR is linked to the ED's EHR. Rare voice contact between after-hours care and PC when needed for complex patients	Standard E&M visit rate except for Medi-Cal patients, with whom extra after-hours billing code can be applied

erational aversion to calling primary care offices because they have been told over and over, "There's no room for you."

Complicating these challenges is competition from some EDs that aggressively market non-emergency services to attract consumers. A North Carolina community clinic respondent noted, "We have hospitals advertising their EDs, so there is the tension of hospital EDs wanting to take in some of those [non-urgent] patients when things are slow."

Major Themes of After-Hours-Care Programs & Lessons Learned

Feasibility. Several factors affect the design and feasibility of after-hours models, including gaining primary care clinician buy-in, assessing patient needs and preferences to ensure scheduling and staffing meet demand, consideration of location and practice size and financial sustainability. Figure 1 highlights lessons learned based on feedback from participants and analysis of the themes described in the subsequent text.

Clinician Buy-In. To obtain primary care physician buy-in for collaboration with other after-hours care providers and to

maintain patient continuity of care when the after-hours provider was different from the patient's usual primary care provider, after-hours care providers made a point of: 1) Returning patients to their usual PCP for follow-up and ongoing care; 2) Not providing prescription refills except to help patient get through weekend; 3) Communicating with the patient's PCP about any after-hours care provided; and 4) Not providing routine primary care in the after-hours setting (unless it was same site as the usual primary care practice).

Scheduling and staffing to meet patients' needs is a key to developing sustainable after-hours models. For example, elderly Medicare patients may not value late evening office-hours, while working adults do; families may not value access that conflicts with other activities (dinner, etc.) but may prefer weekends or early morning hours. Similarly, more complex patients value continuity more than others. Respondents felt that older patients with chronic conditions and pediatric patients with special needs placed greater value on after-hours continuity than did young healthy working professionals.

Likewise, the use of after-hours nurse triage phone-lines varied by age. Respondents noted the general pediatric population is more amenable to nurse triage of night-time calls because they are often about routine issues and, in the

FEASIBILITY**CLINICIAN BUY-IN**

- Ensure physicians have vested interest in staffing after-hours care (ex. ownership or incentives)
- To engage PCPs to participate in after-hours care with a second party (e.g. after-hours clinic) they need to know that patients will be encouraged to maintain continuity with their usual PCP

SCHEDULING & STAFFING

- Offering extended hours as part of after-hours care requires planning and needs assessment of:
 - Hours of greatest patient demand
 - Staffing and skills required for scope of service
 - Staffing mix ex. pediatric vs. adult practitioners, MD vs. NP
- Strict triage criteria so the after-hours clinic handles things appropriate to its level of staffing & refers to ED for problems they are not staffed to address (ex. complex laceration)
- Nurse triage phone line is an important tool, particularly for pediatrics
- Flexibility in 24x7 staffing and schedules, e.g. staggered shifts
- When first offering extended hours, having walk-in visits from 4 to 5PM helps ensure volume for evening hours, due to "spill-over" from regular office hours

FINANCIAL SUSTAINABILITY

- Ability to carry initial financial losses while after-hours program starts up; or, to decrease downstream costs for ex. by being part of an Integrated Delivery System or paid by capitation.
- Minimize overhead by using existing space for extended hours, and shared supplies with PCP
- Additional payment for extended hours visits enables practice to pay staff for after-hours care
- Having an existing administrative infrastructure to handle after-hours care billing
- Having a person advocate for the after-hours provider to insurers to capture reimbursement for after-hours care (in current FFS environment)

COMMUNICATION

- Clear expectations for after-hours & on-call providers on communication with patient's usual PCP
- Platform for information exchange between after-hours & daytime PC provider (e.g. Shared EHR)
- Measure whether communication is sent from the after-hours provider to the daytime PCP
- Outreach to patients by usual PC practice about:
 - When and how to seek after-hours care
 - Encourage patient to carry PCP's card to after-hours provider
 - After-hours providers should ask patient "Who is your usual PCP?"

ACCESS & CONTINUITY

- Participation in a PCMH initiative provides some additional resources and an overall framework for improving access, continuity and coordination of care for patients
- Email, patient portal & same-day access to primary care help decrease need for AHC

Figure 1. Lessons learned: facilitators of providing after-hours care.

rare cases when they were truly urgent, required triage to an ED. On the other hand, adults with multiple chronic conditions often require the attention of a clinician who knows them well. A PCMH director said, "When we talked to adult docs about 'would you like to have nurse triage [for after-hours care]?' they felt if it warranted a call from a patient, they wanted to know right away. That's in contrast to pediatricians where a mild fever after receipt of an immunization during the day is a common reason for night time calls."

Inquiring about patients' preferences for extended hours helps ensure that when those hours are staffed, an appropriate volume of patients will present. For example, the New Bern Ridge Community Health Center in North Carolina noted patients had a high ED visit rate for non-urgent issues in the early morning Mondays through Fridays. A phone survey determined that families using the ED at those times were primarily working parents whose children needed a doctor's note to return to school. Rather than making all pediatrics sites open early, the

community health center hired an additional nurse practitioner to do walk-in appointments at one site from 7–8:30 a.m. weekdays. This simple staffing adjustment led to a drop in non-urgent ED visits. Additionally, educating patients about a practice's extended-hours and procedures for obtaining after-hours care helped maximize patient access.

In rural areas, where Models 1 and 2 were common, populations and provider bases were relatively fixed. Rural providers needed to consider whether the local population and provider workforce could support after-hours access not just to providers but also to other services, such as pharmacy and laboratory services. In rural Oklahoma for example, the lack of pharmacies open at night forced some PCPs with extended hours to send patients to the nearest ED solely to obtain medications.

In areas where small, independent practices are the norm, on-call arrangements can be challenging because physicians in smaller groups must either take call more often to ensure continuous coverage or develop relationships with other practices. To overcome this challenge, some health plans support small practices' efforts to cooperate to provide 24×7-coverage. But, to do this effectively, a Michigan PCMH manager noted that "you can't impose requirements on physicians and practices; you have to develop them collaboratively. Our guidelines are the product of two years of collaboration with physician contacts and leaders... a flexible approach is key."

While small independent primary care practices have fewer resources, staggered shifts can help meet staff needs for scheduling flexibility and allow them to provide extended hours without paying overtime. Staggered shifts also help maximize use of limited office space.

Financial Sustainability. The financial sustainability of after-hours models varies by practice size, ability to obtain higher payment for after-hours care, payer mix and type, population socioeconomic status and whether the practice is part of a system bearing the costs for ED and hospital utilization. Offering extended hours was not considered a profitable endeavor for small independent primary care practices but is pursued to improve patient access and continuity. Providers felt that extended hours reduced ED visits and hospitalizations but most lacked the resources to track this empirically. An internist whose practice offers extended weekend hours noted, "We've kept the ER visits down because say on a Friday afternoon I am on the fence about admitting a patient, I know that I have a doctor the next day who can follow up."

Medium-sized, independent practices, such as Docs on Call in Grand Junction, Colo.,²² noted that early on, having 10 committed physicians willing to take on an extra shift one day a week and obtaining additional reimbursement from insurers for after-hours care were necessary to

maintain their "above or break-even" financial status. As the main provider serving a defined geographic area, Docs on Call has negotiating leverage with insurers who want to include their practice in their regional networks.

From the perspective of after-hours and urgent care providers employed by integrated delivery systems (e.g. GroupHealth) that bear risk or that have their own health plans, after-hours services led to lower downstream costs for the system as a whole and limited ED use to patients with potentially serious medical problems. A Geisinger executive noted, "While I think the urgent care center can be cash-flow positive, it has also mitigated the cost for the health plan, [because of more effective use of the] ED."

On the other hand, for hospitals still responding to fee-for-service incentives, system-owned urgent care centers also generate downstream referrals for the hospital and its employed specialists. A respondent from a hospital-owned urgent care center in Greenville, S.C., said, "Breaking even is not the goal of our urgent care center. We are doing our job; the downstream revenue has made up the losses from us." Hospitals providing after-hours visits can also secure facility fees, increasing their revenue from after-hours care.

A national health plan respondent believed efforts to financially support primary care providers' business models, encourage medical homes, and reward reduction of preventable ED visits, already address the practice adjustments required to provide 24×7 coverage, including arrangements for after-hours care. But some PCMH respondents noted the additional per-member per-month payment did not cover the costs of providing such 24×7 coverage.

Some health plans want to avoid "piecemeal" payment for after-hours care. An exception to this is geographically isolated practices where patients either "won't get care or will have to go to the ED unless the practice is directly compensated for after-hours visits. Some of those practices will be paid extra, but that's not the direction plans prefer."

Communication. A shared EHR greatly facilitated informational continuity between after-hours and usual daytime providers. Capturing the experience of many, a Denver Health physician said, "The most critical piece of setting up after-hours care is information exchange in real time." When a shared EHR was available, some after-hours providers could simply post their notes to the EHR with an alert to the inbox of the patient's usual PCP (assuming it was not necessary to speak directly about the patient's after-hours need.) Some EHRs show these communications in the sender's account until they are acknowledged by the intended recipient, so if the usual PCP does not "accept" the sender's notification then the encounter will not disappear from the after-hours provider's EHR screen. When a shared EHR was unavailable, having at least "read-only" access to charts facilitated after-hours care.

When electronic data exchange was not available, after-hours providers faxed a note to the usual PCP if they had a formal arrangement (unless after-hours and usual providers were part of the same practice, in which case a note or oral communication was standard). Respondents also noted that PCPs should encourage patients to carry their PCP's contact information to facilitate coordination of care when they seek care from other providers.

In all cases, notification of the patient's usual PCP was left to the after-hours provider to follow up. In no cases, with the exception of the shared EHRs described previously, were feedback loops set up to confirm information receipt by the PCP. Respondents believed that such a double check would be impractical because most non-urgent, after-hours issues did not require that level of monitoring. If the after-hours issue was clinically urgent or needed follow up, respondents believed their communication system was sufficient.

Systematic Notification & Triage Processes facilitated continuity between after-hours care and a patient's usual PCP, especially if the patient required ED care. But, as a group practice respondent noted, "patience and persistence were required to establish a notification process to ensure that the correct PCP was notified when a patient went to the ED."

Clear expectations for after-hours providers, including physicians sharing on-call responsibility, about communication to patient's usual PCP were also important. As a Maine physician noted, "We're expected to let the doc know the next day, but we do that with variable success. So you need clear expectations, and you need to measure it."

Access and Continuity. Many respondents noted that for after-hours care to be coordinated with a patient's usual PCP, it needs to be part of a larger practice focus to improve access and continuity. After-hours efforts that were being successfully implemented as part of PCMH initiatives involved ongoing collaboration with physician practice leaders, practice staff and, in some cases, the health plan (e.g. multi-payer PCMH in Michigan). At GroupHealth, an increased emphasis on continuity with a patient's primary care team and virtual access for patients (via phone, email, portal) has greatly reduced the need for both after-hours and ED care.

Many practice respondents, including those not in PCMHs, noted the strong relationship between same-day access or open-access scheduling²³ and ability to manage after-hours care. For example a practice that offers same-day appointments noted that it "drastically reduced the need for urgent care." A New Jersey family practitioner said, "Having extended hours makes patients comfortable in knowing they can reach you, and they then are less likely to call at inappropriate times."

The presence of an after-hours clinic linked with the PC office had the additional benefit of making overnight telephone coverage more manageable for physicians. A

pediatrician noted: "People know they have somebody they can go to between 6 and 10 p.m. Late-night call is much less grueling now [for pediatricians], because patients try to get seen before 10 p.m."

Creating on-call coverage through shared call among small practices, for example through "virtual panels" as part of PCMH efforts, can be challenging. Health plan efforts to organize practices to share call may or may not resonate with on-the-ground call-sharing arrangements that practices had established prior to becoming part of a PCMH initiative. In NY, getting several small pediatric practices together to share an outside nurse triage phone line for after-hours care worked well but took extensive effort by the plan manager.

DISCUSSION

In sum, five models of after-hours care coordinated with a patient's regular primary care provider were identified; they ranged from solo practitioners available around-the-clock to contractual relationships between primary care practices and after-hours clinics (or urgent care centers) to provide after-hours care and communicate back to the PCP about that care. Extended primary care office hours, physician call-sharing, health information technology and nurse triage phone lines are tools to support these models.

Three key themes were common to current models that coordinate after-hours care with a patient's usual PCP: After-hours care systems must incorporate feasible and sustainable designs that meet local population needs; A shared EHR and systematic notification procedures between the after-hours provider and daytime PCP are extremely helpful; and 24×7 access is best implemented as part of a larger practice approach to access and continuity.

For small practices especially, efforts to improve the design of after-hours care and its coordination with one's usual PCP in the U.S. can be informed by other countries' experiences.^{16,24-27} For example, small practices in the Netherlands, U.K. and Denmark, have been particularly active in sharing coverage and identifying how nurse telephone triage may be efficiently and safely deployed and supported by an on-call physician.²⁵⁻²⁷

While it may be challenging for formerly autonomous small practices to work together to share call or telephone triage, when practices share resources²⁸ they are more likely to routinely track and manage patient information and to provide after-hours care.²⁹ Efforts to encourage small practices to create "virtual panels" for after-hours care need to take into account providers' real-world working relationships. With persistence and ongoing input from on-the-ground providers, some health plans have effectively supported such activities.

Respondents who were in a PCMH believed that current initiatives undervalue the resources required for 24×7 coverage. The GroupHealth experience further supports this: having already made significant infrastructure investments, including shared electronic health records, substantial additional resources were required to hire more clinicians and decrease physician patient panel size to support a system that effectively decreases both provider burnout and demands for after-hours care.¹⁹

Supporting after-hours care by small independent practices that are not participating in PCMH initiatives may pose the greatest challenge for payers and policymakers. However, given that more than 70 % of office visits are to practices with five or fewer physicians,³⁰ support for small practices to offer after-hours care has the potential to benefit a large proportion of patients. Planning grants from payers or foundations can help support small practices' efforts to design after-hours programs.

Some predict that after-hours care in most countries will continue to move toward larger organizations or virtual practice networks.¹⁶ Electronic health records will be crucial to informational continuity in these arrangements and after-hours care providers need to be part of this loop. Systematic notification processes are also important to ensure that a patient's usual clinician is prompted to review notes from after-hours care. Web-based secure data repositories open to on-call and after-hours care providers could help fill the gap prior to greater adoption of interoperable EHRs.

Future research could include understanding how to make such tools more clinically accessible and relevant to health care providers and patients. Future research could also include comparisons of the various models of care with respect to quantifiable outcomes such as ED attendance for minor complaints, overall resource use, and patient satisfaction. Enhanced payment for after-hours care, whatever form it takes, also requires additional attention.

Patients' willingness to trade continuity for immediate access varies by population and urgency of after-hours needs.³¹ Open-access or same-day care has been identified as a means for improving patient access while also emphasizing interpersonal continuity (assuming patient demand is not in excess of provider supply).²³

While qualitative research can uncover details about respondents' experiences, identify hypotheses for further investigation, and permit triangulation of themes from various perspectives, our study has limitations. Given the sample size, our findings do not represent all after-hours care arrangements. Another limitation is that we did not assess patient experiences with each of these models. Still, lessons from real-world models can help inform practices struggling to provide after-hours care.

Ultimately, identifying sustainable models to accommodate both provider quality of life and patient access and

continuity to after-hours care may require a larger and better distributed primary care workforce, and payment reforms to reward providers for after-hours care. Improved efficiency and support for daytime primary care will likely help decrease the after-hours-care burden.

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