Panel Workload Assessment in US Primary Care: Accounting for Non–Face-to-Face Panel Management Activities

Brian Arndt, MD, Wen-Jan Tuan, MS, MPH, Jennifer White, BA, and Jessica Schumacher, PhD

Purpose: **An understanding of primary care provider (PCP) workload is an important consideration in establishing optimal PCP panel size. However, no widely acceptable measure of PCP workload exists that incorporates the effort involved with both non–face-to-face patient care activities and face-to-face encounters. Accounting for this gap is critical given the increase in non–face-to-face PCP activities that has accompanied electronic health records (EHRs) (eg, electronic messaging). Our goal was to provide a comprehensive assessment of perceived PCP workload, accounting for aspects of both face-to-face and non–face-to-face encounters.**

Methods: **Internal medicine, family medicine, and pediatric PCPs completed a self-administered survey about the perceived workload involved with face-to-face and non–face-to-face panel management activities as well as the perceived challenge associated with caring for patients with particular biomedical, demographic, and psychosocial characteristics (n = 185). Survey results were combined with EHR data at the individual patient and PCP service levels to assess PCP panel workload, accounting for face-to-face and non–face-to-face utilization.**

Results: **Of the multiple face-to-face and non–face-to-face activities associated with routine primary care, PCPs considered hospital admissions, obstetric care, hospital discharges, and new patient preventive health visits to be greater workload than non–face-to-face activities such as telephone calls, electronic communication, generating letters, and medication refills. Total workload within PCP panels at the individual patient level varied by overall health status, and the total workload of non–face-to-face panel management activities associated with routine primary care was greater than the total workload associated with face-to-face encounters regardless of health status.**

Conclusions: **We used PCP survey results coupled with EHR data to assess PCP workload associated with both face-to-face as well as non–face-to-face panel management activities in primary care. The non–face-to-face workload was an important contributor to overall PCP workload for all patients regardless of overall health status. This is an important consideration for PCP workload assessment given the changing nature of primary care that requires more non–face-to-face effort, resulting in an overall increase in PCP workload. (J Am Board Fam Med 2014;27:530–537.)**

Keywords: **Measures, Primary Health Care, Workload**

Case mix among primary care provider (PCP) panels can vary substantially. Accordingly, the effort required of a PCP for routine management of a particular group of patients varies depending on the characteristics of the patients in the panel and the utilization patterns in terms of both the volume and type of activities the panel demands. The face-to-face PCP workload associated with managing a panel, as measured by work relative value units (wRVUs) (Centers for Medicare and Medicaid Ser-

This article was externally peer reviewed.
Submitted 14 August 2013; revised 21 January 2014; accepted 20 March 2014.
From the Department of Family Medicine (BA, W-JT, JW) and the Department of Population Health Sciences (JS), University of Wisconsin, Madison.

Funding: none.
Conflict of interest: none declared.
Corresponding author: Brian Arndt, MD, Department of Family Medicine, University of Wisconsin, 1100 Delaplaine Ct., Madison, WI 53715-1896 (E-mail: brian.arndt@fammed.wisc.edu).

J Am Board Fam Med: first published as 10.3122/jabfm.2014.04.130236 on 7 July 2014. Downloaded from http://www.jabfm.org/ on 16 October 2026 by guest. Protected by copyright.

vices Resource–based Relative Value Scale), is captured well by age- and sex-based weighting for children, but other weighting methods are necessary for adults.[1] According to Chung and colleagues,[1] panel weights vary 1.9- to 2.6-fold depending on whether age- and sex-based or condition-based weighting is used, respectively. However, non–face-to-face work in primary care, such as electronic communication, telephone calls, and communication of results through letters and other means, is an increasing demand on PCPs. These non–face-to-face activities historically have not generated RVUs and therefore generally are not reflected in total workload analyses at the PCP service level.

There have been other efforts to assess workload in primary care. In a recent study of Ontario's community health centers,[2] a consistent association was noted between smaller PCP panel sizes, greater proportions of patients living in poor neighborhoods, and multimorbidity. The authors inferred that patients who live in low socioeconomic areas on average generate greater workload, indicating the importance of considering measures of personal and neighborhood poverty when assessing workload in primary care and panel size targets. Katerndal and colleagues[3] proposed a method for estimating the complexity of face-to-face encounters in ambulatory care using elements of history, physical examination, testing, diagnoses, patient demographics, medications and other therapies, procedures performed, and disposition, but non–face-to-face effort was not considered in this analysis.

There are multiple comorbidity indices available that use data from insurance claims and electronic health record (EHR) systems to predict future use, costs, mortality, or quality of life, including the Chronic Disease Score,[4,5] Adjusted Clinical Groups System,[6] Charlson Index,[7] Cumulative Index Illness Rating Scale,[8,9] Duke Severity of Illness Checklist,[10–12] and others.[13] However, these indices do not account for the non-RVU-generating activities of non–face-to-face panel management routinely performed in primary care, nor do they account for other important patient characteristics, including demographics or certain social characteristics such as poverty or under- or uninsured status, that may be associated with more non–face-to-face patient management in primary care.

A better understanding of non–face-to-face panel management activities affecting primary care workload is critical. For example, a systematic review of electronic communication between patients and clinicians concluded there is mutual benefit to both patients and providers, but the workload implications for clinicians are substantial.[14] The Centers for Medicare and Medicaid Services recently announced reimbursement for some (though not all) non–face-to-face services,[15] an explicit acknowledgment of the increased workload and implied value of these services in primary care. A comprehensive assessment of both face-to-face and non–face-to face activities could identify PCPs with a higher workload relative to their peers, which may help to predict, and therefore prevent, clinician burnout. Panel-based primary care compensation could be more fairly distributed based on total work performed, not just work producing RVUs. Quality measures could be reconsidered by accounting for the effort put forth by a PCP rather than assessing specific outcome measures that do not consider the process involved to achieve the outcome. Clinic schedulers could allocate PCP schedules and nursing support differently to accommodate time for non–face-to-face panel management activities.

This study describes the assessment of PCP estimates of workload associated with both routine face-to-face and non–face-to-face activities common in primary care as well as the relative rankings of various challenging patient characteristics. Total workload at the PCP level is calculated by coupling resource use from EHR data at the patient encounter level with clinician estimates of both face-to-face and non–face-to-face workload associated with multiple primary care activities.

Methods

Setting and Patient Sample

This research was conducted in the primary care departments of family medicine, internal medicine, and pediatrics at University of Wisconsin (UW) Medical Foundation, which is one of the largest multispecialty medical groups in Wisconsin and includes more than 1200 faculty physicians who provide care at approximately 45 UW Health clinical practice locations and 62 clinical outreach locations throughout Wisconsin. Patients included in the study (n = 105,288) had at least one primary care encounter during a 3-year period between July 1, 2010, and June 30, 2013 and their PCP was

J Am Board Fam Med: first published as 10.3122/jabfm.2014.04.130236 on 7 July 2014. Downloaded from http://www.jabfm.org/ on 16 October 2026 by guest. Protected by copyright.

located at one of the UW Health clinics in Dane County in south-central Wisconsin. A 3-year period was selected because it is used by the participating system and corresponds to the time frame during which patients are considered to be currently managed if they have one or more visits to primary care. Patients' EHRs, demographics, and billing data were extracted from the participating system's enterprise data warehouse for analysis. This research was determined to be exempt by the UW Health Sciences Institutional Review Board.

Clinician Survey

A 2-question survey was sent to the 271 UW Health PCPs to better understand PCP workload. The survey incorporated concepts of the National Aeronautics and Space Administration Task Load Index (NASA-TLX), which is a validated tool that has been used in the primary care clinical setting as a measure of workload by assessing perceived intensity and stress experienced by clinicians while providing medical services.[16,17] This index also served as a framework for human factors research involving physician estimates of the mental demands of their work in other specialties.[18,19]

In one survey question, clinicians assessed the perceived workload associated with various face-to-face and non–face-to-face encounters considering the 6 NASA-TLX domains of mental demand, physical demand, temporal demand, performance, effort, and frustration. Respondents were asked to assign a value to 16 different patient care activities, assuming the workload associated with an office visit for level 3 evaluation and management of an established patient (code 99213) had a relative weight of 1.0. For example, an encounter with a weight of 0.5 means the task requires half (50%) of the overall workload compared with a 99213 office visit, whereas an encounter that has a weight of 2.0 would represent twice (200%) the overall workload of a 99213 office visit. Face-to-face encounters in the survey included new and established patient office visits, preventive health visits, and, if applicable to the survey respondent, maternity care, emergency and urgent care, hospital care, and skilled nursing facility visits. Non–face-to-face encounters included electronic and written patient communication, telephone calls, medication refills, placing orders, and supervising nurse-only visits.

In the other survey question, clinicians assessed the challenge associated with various biomedical, demographic, and psychosocial patient characteristics considering the same 6 NASA-TLX domains. Clinicians could rate each condition from 0 (not challenging) to 100 (very challenging). For reference, clinicians were asked to consider a healthy child or adult to whom only routine uncomplicated preventive care was provided as "not challenging." The patient characteristics included in the survey were influenced by a framework proposed by Rosen and colleagues[20] that includes health status, demographics, health behavior, psychosocial issues, and social environment. Before distributing the survey, faculty members in a focus group format were asked to review these biomedical, demographic, and psychosocial characteristics associated with challenging patients. As a result, a total of 31 patient characteristics were assessed in the survey.

Assessing Total System-based wRVUs and PCP Site-based Workload

wRVUs were accounted for at the UW Health system level, which included both ambulatory and all available inpatient data for all patients with a PCP located at one of the UW Health clinics in Dane County in south-central Wisconsin. An assessment of workload at the PCP site was calculated for both face-to-face and non–face-to-face activities. This was done to identify what proportion of PCP workload comprised non–face-to-face compared with face-to-face activities. The PCP site-based workload scores were derived from the individual workload value associated with each activity type in the clinician survey and was multiplied by the number of each of those activities that occurred over the 3-year study period. The distribution of workload scores was assessed among the 9 health status levels assigned by 3M's Clinical Risk Group (CRG) software (3M Health Information Systems, Salt Lake City, UT) to compare the workload results generated from the clinician survey against a validated diagnosis-based risk adjustment system. The software assigns each patient to 1 of 9 mutually exclusive hierarchical health statuses, ranging from healthy to catastrophic, based on patient demographic information and diagnostic and procedure codes in the EHR.

Data Analysis

Initial analysis consisted of descriptive characteristics of the PCP survey respondents. Individual encounter-level workload weights representing the

J Am Board Fam Med: first published as 10.3122/jabfm.2014.04.130236 on 7 July 2014. Downloaded from http://www.jabfm.org/ on 16 October 2026 by guest. Protected by copyright.

average overall workload score for each encounter type were generated. Accompanying standard deviations for these weights also were computed. A patient's overall workload score during the study period then was acquired by summing workload weights from all encounters or visits rendered during the study period. Survey-generated workload scores were compared with average wRVUs where applicable (for face-to-face encounters).

To validate the workload results generated from the survey against a validated diagnosis-based risk adjustment system, we compared the distribution of the average overall, face-to-face, and non–face-to-face workload scores by the 9 health status levels assigned by 3M's CRG software. Average PCP survey-generated workload scores then were compared with system-wide clinician wRVUs for each CRG-generated level of patient health status. Finally, average scores for "challenging characteristics" with accompanying standard deviations were calculated. Statistical analyses were performed using SAS/Base software version 9.3 (SAS, Inc., Cary, NC).

Table 1. Characteristics of Primary Care Provider (PCP) Survey Respondents (n = 185)

PCP Characteristics	Survey Response
Primary care specialty (%)	
Family medicine	65%
General internal medicine	23%
Pediatrics	12%
Sex	
Male	42%
Female	58%
Years in practice (%)	
1–4	25%
5–9	12%
10–14	17%
15–19	11%
≥20	35%
Mean clinical full time equivalent	
Family medicine	0.6
General internal medicine	0.7
Pediatrics	0.8
Mean panel size (n)	
Family medicine	1078
General internal medicine	1219
Pediatrics	1331

Results

Of the 271 PCPs surveyed, 185 completed the survey, including 120 family medicine clinicians (65% of respondents), 42 general internal medicine clinicians (23% of respondents), and 23 general pediatrics clinicians (12% of respondents), for an overall response rate of 68% (Table 1). The majority of PCP respondents had been practicing for ≥10 years, were on average ≥0.6 clinical full-time equivalents, and had a panel size of >1000 patients. Most UW Health patients are insured (66% commercial, 12% Medicare, and 11% Medicaid coverage), 58% are female, 24% are younger than age 18, and 88% are younger than age 65.

Encounter Workload

Table 2 provides the summary of PCP-determined workload values by encounter type. Hospital admissions received the highest PCP survey-generated workload score (3.20), indicating the highest perceived overall workload, whereas the non–face-to-face activity of supervising a nurse-only visit had the lowest rating (0.32). For comparison, the wRVU (or range) according to the resource-based relative value scale for each face-to-face encounter is listed. For example, the wRVU range for a hospital admission is 1.92 to 3.86, depending on the level of service, and the mean PCP survey-generated workload score for a hospital admission is 3.20. The majority of survey-generated scores were within 0.5 of the associated wRVU value or range, with the exception of obstetric care (wRVU, 14.37; survey-generated workload, 2.86), hospital discharge (wRVU, 1.28–1.90; survey-generated workload, 2.80), and level 3 new patient to practice office visit (wRVU, 1.42; survey-generated workload, 2.08).

System-based and PCP Site-based Work Assessment

The average workload created by all primary care panel patients categorized by each CRG health status was calculated and is summarized in Table 3. Total workload within PCP panels at the individual patient level varied by overall health status; higher average wRVU and/or PCP survey-generated workload scores were associated with increased severity of health status. Although each individual face-to-face encounter type is associated with higher workload compared with each individual non–face-to-face activity according to PCP survey results (Table 2), the total survey-generated workload of non–face-

J Am Board Fam Med: first published as 10.3122/jabfm.2014.04.130236 on 7 July 2014. Downloaded from http://www.jabfm.org/ on 16 October 2026 by guest. Protected by copyright.

Table 2. Work Relative Value Units (wRVUs) and Mean Primary Care Provider (PCP) Survey-Generated Workload by Type of Encounter

Encounter	Sample Size (n)	wRVU (If Applicable)	PCP Survey-Generated Workload, Mean (SD)
Face-to-Face			
Hospital care			
Admission	142	1.92–3.86	3.20 (0.94)
Discharge	137	1.28–1.90	2.80 (1.04)
Rounds	132	0.76–2.00	2.14 (0.90)
Obstetric care			
Inpatient (labor management)	75	14.37*	2.86 (1.25)
Outpatient	85	0.97	1.03 (0.55)
Preventive health visit			
New patient, age 40–64	185	2.33	2.51 (0.82)
Established patient, age 40–64	185	1.90	1.82 (0.71)
Emergency department consult	132	0.45–3.80	2.38 (1.12)
Off-site facility, established patient (skilled nursing facility)	136	0.76–2.35	2.21 (0.88)
Office visit (level 3)			
New patient	184	1.42	2.08 (0.69)
Established patient	(Reference)	0.97	1.00
Non–Face-to-Face			
Telephone call (incoming and outgoing)	185	N/A	0.63 (0.49)
MyChart messaging/E-visit (incoming and outgoing)	184	N/A	0.59 (0.53)
Letter generation	185	N/A	0.45 (0.54)
Orders only	184	N/A	0.41 (0.38)
Medication refill	185	N/A	0.35 (0.45)
Allied health/nurse only visit	169	N/A	0.32 (0.40)

*Includes the delivery wRVU component of the normal spontaneous vaginal delivery global package wRVU.
SD, standard deviation.

to-face panel management activities associated with routine primary care was greater than the average survey-generated workload associated with face-to-face encounters across all levels of CRG health status.

Patient Characteristic Assessment

Table 4 shows the 31 patient characteristics ranked by primary care clinicians as the most challenging (ranked number 1), to the least challenging (ranked number 31). Chronic pain/fibromyalgia/myofascial pain was ranked as the most challenging, with an average score of 79.3, whereas hypertension was ranked as the least challenging patient characteristic, with an average score of 36.8.

Discussion

We were able to combine PCP perception of workload associated with non–face-to-face encounters with the wRVUs associated with face-to-face encounters to calculate a total workload score at the primary care service level for each primary care panel member. Our PCPs indicated the workload required for non–face-to-face activities ranges from 32% to 63% of an office visit for level 3 evaluation and management of an established patient (code 99213). In addition, there was high agreement between wRVUs and PCP survey-generated workload scores where available, suggesting PCPs are able to objectively assess workload. The total PCP site-based non–face-to-face workload was higher than the total PCP site-based face-to-face workload at all CRG health status levels. This is a particularly critical finding given that the scope and frequency of non–face-to-face encounters will likely continue to increase with the proposed Centers for Medicare and Medicaid Services recommendation that complex care management include provider availability

J Am Board Fam Med: first published as 10.3122/jabfm.2014.04.130236 on 7 July 2014. Downloaded from http://www.jabfm.org/ on 16 October 2026 by guest. Protected by copyright.

Table 3. Total System-based Work Relative Value Units (wRVUs) and Primary Care Provider (PCP) Site-based Workload by Patient Clinical Risk Group (CRG) Status (N = 105,288)

CRG Status (in Order of Severity)	Total System-Based wRVUs	PCP Site-Based Workload		
		Face-to-Face Encounters	Non–Face-to-Face Encounters	Total Encounters (Face-to-Face and Non–Face-to-Face)
Healthy	21.1 (27.3)	6.3 (5.3)	6.6 (9.4)	12.9 (13.1)
History of significant acute disease	49.1 (58.8)	9.2 (7.5)	11.4 (15.7)	20.6 (21.1)
Single minor chronic disease	44.5 (50.6)	11.2 (9.3)	15.1 (17.3)	26.3 (24.4)
Minor chronic diseases in multiple organ systems	56.4 (73.7)	12.3 (9.2)	18.2 (17.4)	30.5 (25.3)
Significant chronic disease	53.7 (66.7)	10.1 (8.5)	17.8 (21.4)	27.9 (27.7)
Significant chronic diseases in multiple organ systems	102.8 (91.7)	20.0 (17.3)	36.8 (34.9)	56.8 (46.7)
Dominant chronic disease in ≥3 organ systems	301.2 (38.5)	30.4 (6.2)	103.0 (31.5)	133.4 (25.3)
Dominant/metastatic malignancy	93.7 (107.7)	11.3 (6.3)	20.0 (23.1)	31.3 (27.1)
Catastrophic	185.1 (217.2)	12.1 (12.5)	24.0 (31.9)	36.2 (40.3)

Data are presented as mean (standard deviation).

24 hours a day, 7 days a week,[21] which may result in tremendous strain on primary care clinicians. As a result, we believe it is important to include non–face-to-face activities in addition to face-to-face activities when assessing workload in primary care because primary care clinicians engage in significant non–face-to-face work that adds value (eg, communicating medication information, medical information exchange)[14] to patients, clinicians, and the broader health care system.

There are many similarities between the workload results from the PCP survey compared with established wRVUs for many encounter types. However, the workload associated with hospital discharge, for example, was rated by clinicians as 2.80 compared with the range of wRVUs of 1.28 to 1.90 for hospital discharge. This may reflect increased effort clinicians are putting into hospital discharges as pressure increases to reduce the risk of readmissions. There seems to be a trend toward more patient education, care coordination, and other administrative work associated with the day of discharge. In addition, the survey response to this question likely depends on the scope of a clinician's practice. For example, the discharge of a healthy term newborn by a pediatrician is likely less complicated than the discharge of an elderly adult with multiple comorbidities. The hospital discharge workload ratings were 2.90 compared with 2.58 for family medicine and pediatrics, respectively.

This workload assessment method may be an appropriate tool to identify "high users" at the PCP service level who may not be identified through other means. Identifying individual patients who use significant non-RVU-producing health care resources at the primary care site could allow for different management strategies. For example, this method could be used to identify groups of patients, such as those who have frequent contacts with the PCP office, who could be candidates for more proactive care. One patient in our practice who had 173 telephone encounters during the 3-year study period could be contacted during a planned weekly telephone call to reduce the number to 156 telephone calls. With respect to resident training, this workload assessment method could be used to create fair workload balance for clinicians, in contrast to simple panel calculations.

As shifts continue toward compensating PCPs for managing patient panels appropriately versus fee-for-service or productivity-based compensation models, it is becoming increasingly important to understand all aspects of primary care panel management. For example, this workload assessment method could contribute to a more complete picture when negotiating bundled payments or capitation for certain primary care populations that could be used as financial support for primary care compensation. Similarly, it might justify the need for additional staff or clinicians better than the usual wRVU-generating billing data that is frequently used in assessments of workload at the primary care level.

Although we assessed PCPs regarding the challenge associated with caring for certain biomedical,

J Am Board Fam Med: first published as 10.3122/jabfm.2014.04.130236 on 7 July 2014. Downloaded from http://www.jabfm.org/ on 16 October 2026 by guest. Protected by copyright.

Table 4. Patient Characteristics: Average Survey-Based "Challenge" Score (N = 105,288)

Patient Characteristics	Sample Size (n)	Average Score (SD)
Chronic pain/fibromyalgia/myofascial pain	183	79.3 (17.2)
Alcohol or drug overuse/abuse	185	75.5 (17.3)
Somatization disorder	179	73.9 (20.0)
Unspecified psychiatric condition/ personality disorder	184	73.2 (20.1)
Total prescription medication count >10	180	72.6 (21.1)
Chronic opioid/stimulant use (ADD/ADHD)	185	72.2 (20.0)
Homelessness	174	69.8 (22.9)
Bipolar	182	68.5 (20.8)
Dementia/cognitive impairment	179	66.7 (18.5)
Schizophrenia	165	65.9 (21.7)
Eating disorder	172	65.1 (22.3)
Uninsured/underinsured/lack of resources	184	64.4 (22.7)
Case management support (eg, community-based care manager)	177	64.0 (23.0)
Social disruption	178	63.5 (21.5)
Autism	164	63.1 (21.3)
Interpreter needed	184	62.4 (23.2)
Cerebral palsy/global developmental delay/genetic syndrome	176	61.4 (22.3)
Congestive heart failure/congenital heart disease	183	61.3 (18.9)
Medicare, <65 years old (on disability or has renal failure)	172	60.9 (20.9)
Transplant	172	58.8 (24.5)
Depression/anxiety	185	57.8 (21.4)
Diabetes (type 1 or type 2)	183	57.0 (20.4)
Cancer (current or history of cancer excluding nonmelanoma skin cancer)	177	56.4 (19.9)
Gender identity/transgendered	146	53.3 (26.6)
Chronic kidney disease	183	52.2 (20.7)
Asthma/COPD/cystic fibrosis	185	50.6 (18.5)
Literacy problems	176	50.0 (22.2)
Learning disability	178	49.1 (21.6)
>5 No-shows or patient cancellations within 3 years	183	48.0 (25.9)
Obesity	185	47.3 (21.2)
Hypertension	184	36.8 (19.4)

ADD, attention deficit disorder; ADHD, attention deficit/hyperactivity disorder; COPD, chronic obstructive pulmonary disease; SD, standard deviation.

demographic, and psychosocial patient characteristics, we did not use these survey results to assess the effect of these characteristics on workload at the PCP service level. Since there are associations with workload and overall health status, however, we presume that once these characteristics are taken into consideration when assigning an overall health status, as incorporated in risk adjustment programs such as CRG, the effect on workload may be even greater. We plan to study differences in workload by individual PCP and clinic site by incorporating the challenging patient characteristic scores our PCPs described in Table 4. This is an important next step as we consider the effect of challenging patient characteristics on total PCP workload and how it may affect PCP panel size targets.

Limitations

We used EHR data to assess PCP workload by accounting for both face-to-face and non–face-to-face encounters routinely performed in primary care. However, some of our patients are hospitalized in local hospitals that are not connected to our enterprise reporting database. As a result, our workload score may represent an underestimate of the all-system utilization portion for patients who visit hospitals or providers outside our system. One of the important points of this workload assessment method is accounting for non–face-to-face activities. These generally occur at the PCP site, and therefore the PCP service level, so they would be captured by our enterprise reporting database.

With a 68% survey response rate, we would have liked increased participation to help inform our PCP workload assessment method. However, there was a balanced survey response rate among all primary care specialties including family medicine (120 of 174, 69%), general internal medicine (42 of 61, 69%), and pediatrics (23 of 36, 64%). As a result, the PCP assessment of workload is likely applicable across primary care specialties. However, if unique patient characteristics are to be considered in addition to PCP workload for panel size adjustments in the future, as suggested by Chung and colleagues,[1] it would be necessary to consider the results from each primary care specialty separately since the results of the mostly adult specialties of family medicine and internal medicine were more similar than those from pediatrics. Unfortunately, some of these patient characteristics are difficult to obtain from the EHR since they often are not entered in discrete data fields. Future EHR system developments should create discrete data entry fields to capture these characteristics. In addition, this study took place in a single large group

J Am Board Fam Med: first published as 10.3122/jabfm.2014.04.130236 on 7 July 2014. Downloaded from http://www.jabfm.org/ on 16 October 2026 by guest. Protected by copyright.

practice in Wisconsin and requires replication and validation in other settings.

Conclusions

We used PCP survey results coupled with EHR data to assess PCP workload associated with both face-to-face as well as non–face-to-face panel management activities in primary care. The non–face-to-face workload was significant for all patients regardless of overall health status. This is an important consideration for PCP workload assessment given the changing nature of primary care, which requires more non–face-to-face activities that may account for an overall increase in PCP workload.

References

1. Chung S, Eaton LJ, Luft HS. Standardizing primary care physician panels: is age and sex good enough? Am J Manag Care 2012;18(7):e262–8.
2. Muldoon L, Rayner J, Dahrouge S. Patient poverty and workload in primary care: study of prescription drug benefit recipients in community health centres. Can Fam Physician 2013;59:384–90.
3. Katerndahl DA, Wood R, Jaén CR. A method for estimating relative complexity of ambulatory care. Ann Fam Med 2010;8:341–7.
4. Von Korff M, Wagner EH, Saunders K. A chronic disease score from automated pharmacy data. J Clin Epidemiol 1992;45:197–203.
5. Clark DO, Von Korff M, Saunders K, Baluch WM, Simon GE. A chronic disease score with empirically derived weights. Med Care 1995;33:783–95.
6. Starfield B, Weiner J, Mumford L, Steinwachs D. Ambulatory care groups: a categorization of diagnoses for research and management. Health Serv Res 1991;26:53–74.
7. Charlson ME, Pompei P, Ales KL, MacKenzie CR. A new method of classifying prognostic comorbidity in longitudinal studies: development and validation. J Chronic Dis 1987;40:373–83.
8. Linn BS, Linn MW, Gurel L. Cumulative illness rating scale. J Am Geriatr Soc 1968;16:622–6.
9. Miller MD, Paradis CF, Houck PR, et al. Rating chronic medical illness burden in geropsychiatric practice and research: application of the Cumulative Illness Rating Scale. Psychiatry Res 1992;41:237–48.
10. Parkerson GR Jr, Broadhead WE, Tse CK. The Duke Severity of Illness Checklist (DUSOI) for measurement of severity and comorbidity. J Clin Epidemiol 1993;46:379–93.
11. Parkerson GR Jr, Harrell FE Jr, Hammond WE, Wang XQ. Characteristics of adult primary care patients as predictors of future health services charges. Med Care 2001;39:1170–81.
12. Parkerson GR Jr, Michener JL, Wu LR, et al. Associations among family support, family stress, and personal functional health status. J Clin Epidemiol 1989;42:217–29.
13. Huntley AL, Johnson R, Purdy S, Valderas JM, Salisbury C. Measures of multimorbidity and morbidity burden for use in primary care and community settings: a systematic review and guide. Ann Fam Med 2012;10:134–41.
14. Ye J, Rust G, Fry-Johnson Y, Strothers H. E-mail in patient-provider communication: a systematic review. Patient Educ Couns 2010;80:266–73.
15. Schneider ME. Medicare finalizes plan for non-face-to-face payments. Family Practice News. Practice trends. Available from: http://www.familypracticenews.com/news/practice-trends/single-article/medicare-finalizes-plan-for-non-face-to-face-payments/2aeafe0585c7156dcf23891d010cd12f.html. Accessed January 9, 2014.
16. Hart S, Staveland L. Development of NASA-TLX (Task Load Index): results of empirical and theoretical research. In: Hancock P, Meshkati N, eds. Human mental workload. Amsterdam: Elsevier Science Publishers B.V.;1988:139–83.
17. Horner RD, Szaflarski JP, Jacobson CJ, et al. Clinical work intensity among physician specialties: how might we assess it? What do we find? Med Care 2011;49:108–13.
18. Byrne AJ, Oliver M, Bodger O, et al. Novel method of measuring the mental workload of anaesthetists during clinical practice. Br J Anaesth 2010;105:767–71.
19. Yurko YY, Scerbo MW, Prabhu AS, Acker CE, Stefanidis D. Higher mental workload is associated with poorer laparoscopic performance as measured by the NASA-TLX tool. Simul Healthc 2010;5:267–71.
20. Rosen AK, Reid R, Broemeling AM, Rakovski CC. Applying a risk-adjustment framework to primary care: can we improve on existing measures? Ann Fam Med 2003;1:44–51.
21. Bindman AB, Blum JD, Kronick R. Medicare payment for chronic care delivered in a patient-centered medical home. JAMA 2013;310:1125–6.

J Am Board Fam Med: first published as 10.3122/jabfm.2014.04.130236 on 7 July 2014. Downloaded from http://www.jabfm.org/ on 16 October 2026 by guest. Protected by copyright.