Elements of the Patient-Centered Medical Home in Family Practices in Virginia

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ABSTRACT

PURPOSE The patient-centered medical home (PCMH) is a widely accepted theory of a practice model to improve quality of care, patient satisfaction, and access to primary care services. This study explores existing elements of the PCMH and characteristics of family practices in Virginia.

METHOD We developed and administered a survey questionnaire to capture information on practice characteristics and PCMH elements. We randomly sampled 700 family medicine offices in Virginia from a population of practices derived from the Virginia Board of Medicine Practitioner Information Database. We used a mixed-mode survey, allowing practices in the sample to respond by mail or Internet or at a regional family medicine conference.

RESULTS The survey resulted in a response rate of 56%, with 342 office locations participating in the study. Most practices reported continuity-of-care processes (87%) and clinical guidelines (77%). Fewer reported use of patient surveys (48%), electronic medical record for internal coordination (38%), community linkages for care (31%), and clinical performance measurement (28%). A small number reported patient registries for multiple diseases (19%). Very few practices exhibited all elements outlined in the PCMH model (1%). Practice size (number of physicians) is significantly related to PCMH model alignment.

CONCLUSIONS Most family practices in Virginia exhibit some elements of the PCMH model. Full implementation of the PCMH model is low. Baseline information on practice characteristics, prevalence of PCMH, and challenges of small practices should be considered in guiding efforts, evaluating progress, and developing policies for care model reform.

Conflicts of Interest: none reported

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INTRODUCTION

There has been a growing movement in the last several years to transform family practices to improve access, quality of care, and business functionality. A new model of practice was proposed in 2004 under the Future of Family Medicine[1] project to align family medicine with the needs of the population and to meet the goals proposed by the Institute of Medicine to provide care that is patient-centered, safe, timely, and equitable.[2] The new model was designed to meet these goals by emphasizing team-based, proactive care supported by effective office systems, technology, and a culture of improvement.[1]

The medical home has now gained recognition as a promising solution for primary care practices to deliver accessible, high-quality care.[3] The patient-centered medical home (PCMH)[4] consists of 7 core features agreed upon by multiple medical societies representing primary care physicians. The core features of the PCMH, Table 1, are comprised of elements representing either services provided to patients or characteristics of the practice. PCMH core features are thought to improve access, quality, patient satisfaction, and care coordination.[5]

The model is now a central theme in both federal and state legislation,

Table 1. Core Features and Corresponding Elements of the Patient-Centered Medical Home[4]

Core Feature	Elements
Personal physician	Each patient has a personal physician that provides first-contact, continuous, and comprehensive care
Physician-led team	Physician-directed medical practice with a multidisciplinary team of individuals who care for patients
Whole-person orientation	Care for all stages of life, acute care, chronic care, preventative services, and end-of-life care
Coordinated care	Care that is facilitated by registries, information technology, health information exchange, and culturally and linguistically appropriate services
Quality and safety	Physician-patient partnerships, evidence-based medicine, quality improvement, patient participation in care, practice participation in voluntary recognition process
Alternative scheduling arrangements	Patient access to care through open scheduling, expanded hours, and various methods for communication between patients and their physician or care team
Payment reform	Alignment of financial incentives to support coordination of care, alternative scheduling arrangements, use of new technologies, and improved quality of care

From the Joint Principles of the Patient-Centered Medical Home, 2007.[4]

including a Medicare Demonstration Project[6] under the Tax Relief and Health Care Act of 2006 and a recognition program from the National Committee of Quality Assurance (NCQA).[7] Despite excitement about the PCMH, there is little information on the degree of practice alignment to PCMH core features. Two previous studies addressed structural components of the PCMH in practices of various specialties. A study conducted by Rittenhouse et al focused on large group practices (those with 20 or more physicians).[8] Another study in Massachusetts focused on practices with 2 or more physicians.[9] No studies addressed PCMH components in family practices of all sizes.

The goal of our study was to understand the model of care and characteristics of family practices in Virginia. We conducted a survey of practices that resulted in information on most PCMH core features. Certain features and characteristics could not be captured through a practice survey, such as payment reform and patient perception on whether they participated in medical care decision making. We report on characteristics of family practices in Virginia and describe practices' alignment to 6 of the 7 core features of the PCMH.

METHODS

We used a cross-sectional research design to obtain practice information on characteristics, model of care, and patient services. The Institutional Review Board at Virginia Commonwealth University approved the study.

Survey Methods

Primary data were collected through a survey that included 45 questions based, in part, on the National

Survey of Physician Organizations.[10] (Our survey questionnaire can be found as a Supplemental Appendix, available at http://www.annfammed.org/cgi/content/full/7/4/301/DC1.) This questionnaire consisted of questions on the use of ancillary care clinicians, patient registries, patient self-management, scheduling arrangements, clinical guidelines, patient surveys, electronic medical record (EMR), continuity of care, community linkages, translation services, performance measurement, teamwork programs, and other practice characteristics. The questionnaire was pretested for clarity and understanding with 8 physicians and 1 family medicine nurse-practitioner. Survey questions were revised based on input received during the pretest.

Population Database

Our study population comprised all Virginia family practices that had at least 1 physician practicing family medicine and that were not a free clinic or pure urgent care center. No complete list of family practices in Virginia existed before this study. We used the Virginia Board of Medicine Practitioner Information Database[11] to collect information on all certified family medicine physicians in the state of Virginia (n = 3,896) (Figure 1). We removed physicians not working in family medicine, such as hospitalists, emergency room physicians, and sports medicine specialists. We then collapsed physician information into a list of 1,045 unique office locations. The population database was updated during administration of the questionnaire as new information became available that indicated the practice was not family medicine or was not currently operational. This process resulted in 916 unique family practice locations in Virginia.

Recruitment of Practices

The survey was undertaken August 2007 through January 2008, with questionnaires distributed to a randomly selected sample[12] of 700 practices in Virginia. We asked physicians to respond to the survey because they are in the best position to provide information on practice characteristics and patient services.

We used mixed-mode methods[13] to administer the questionnaire: the mail, the Internet, and at the 2007 Virginia Academy of Family Physicians (VAFP) annual meeting. The objective was to obtain 1 completed

questionnaire from each practice in the sample. During the VAFP meeting 32 questionnaires were received from unique practice locations that fell within our sample of 700 practices. The questionnaire was then mailed to the remaining 668 practices in the sample with a cover letter including instructions to complete the questionnaire for that office location and return it by mail or over the Internet. Twenty-one practices submitted their questionnaires online. Another 289 practices completed and returned the hard copy of the questionnaire. The sample was adjusted based on information that indicated the practice was not family medicine or was not operational, which reduced the sample to 612 practices, for a 56% response rate, with 342 unique office locations participating in the study.

Measurement of PCMH Features

Elements Associated with PCMH Core Features

To measure the personal physician feature, we asked a yes-or-no question on whether the practice has specific processes to ensure continuity of care so that most of the time patients receive care from their personal physician. To measure the physician-directed medical team feature, we asked practices whether they use nurses, nurse-practitioners, physician's assistants, medical assistants, mental health specialists, and patient educators and whether they offered programs for improving employee morale and teamwork. Our measurement of the whole-person orientation feature consisted of 2 questions on the types of patients seen and types of care provided. The measurement assessing the care coordination and integration feature consisted of multiple questions on whether the practice uses a patient registry for specific diseases, uses an EMR, provides community linkages for care, and provides linguistic services for non-English speaking patients. Our measurement of the enhanced access to care feature was based on a question asking whether the practice provides alternative scheduling arrangements, such as scheduled evening or weekend visits. The measurement to assess the quality and safety feature consisted of questions on whether the practice uses clinical guidelines, patient satisfaction surveys, performance measurement for clinical activities, and performance feedback to physicians.

Composite Measures of PCMH

PCMH core features were measured in this study with 14 elements representing infrastructure or services that support a PCMH model. Practices could score 1 point per element, resulting in a PCMH element index for each practice that ranged from 0 to 14. Multiple elements contained yes-or-no questions, such as whether the practice offered programs for employee morale

and teamwork. Several elements required the measurement of multiple components, such as the numerous functions possible in an EMR. Practices were awarded 1 point if they responded yes to 50% or more of components for each element. A more stringent threshold, 100%, was applied to the elements representing type of care, patients seen, and patient surveys. We also calculated an index for PCMH core features that ranged from 0 to 6. Practices could score 1 point per PCMH core feature if they exhibited all elements contained in a feature.

Data Analysis

We used standard descriptive statistics to summarize sample characteristics and frequency distributions to determine the number and percentage of practices that used PCMH elements. Regression analyses were conducted to examine the relationship between practice

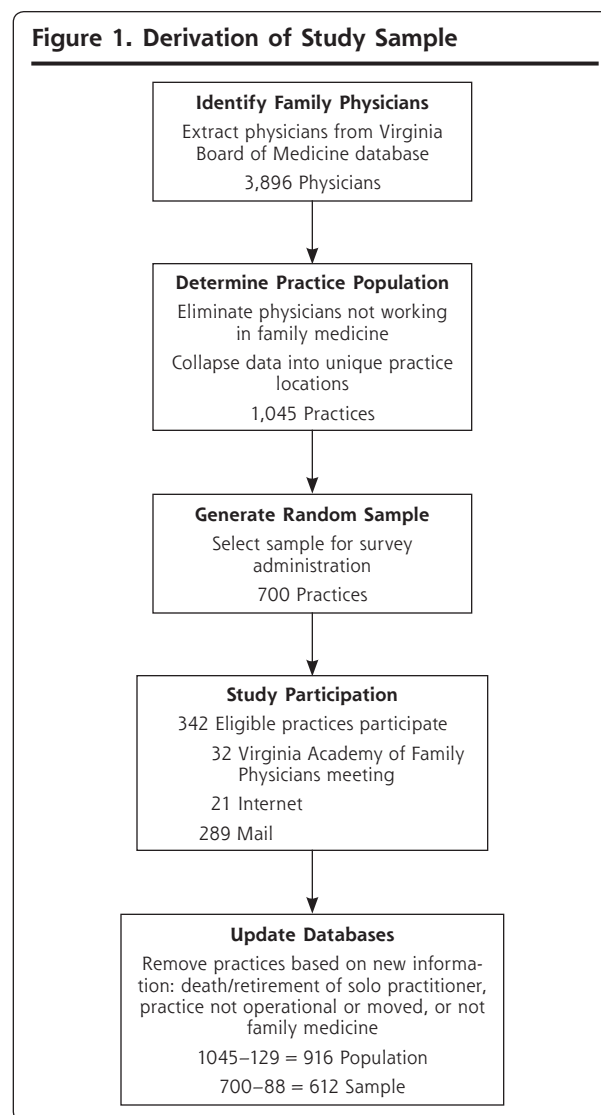### Figure 1. Derivation of Study Sample

Identify Family Physicians
Extract physicians from Virginia Board of Medicine database
3,896 Physicians

Determine Practice Population
Eliminate physicians not working in family medicine
Collapse data into unique practice locations
1,045 Practices

Generate Random Sample
Select sample for survey administration
700 Practices

Study Participation
342 Eligible practices participate
32 Virginia Academy of Family Physicians meeting
21 Internet
289 Mail

Update Databases
Remove practices based on new information: death/retirement of solo practitioner, practice not operational or moved, or not family medicine
1045–129 = 916 Population
700–88 = 612 Sample

Table 2. Comparison of Sample With Population Characteristics

Variable	Sample (n = 342[a]) No. (%)	Population (N = 916) No. (%)	Pearson χ^2 (Asym Sign)
Geographic characteristics			
Rural	282 (82.9)	773 (84.4)	0.386 (.584)
Urban	58 (17.1)	143 (15.6)	
Virginia region			
Northwestern	53 (15.6)	153 (16.7)	2.084 (.720)
Northern	68 (20.0)	202 (22.1)	
Southwestern	62 (18.2)	169 (18.4)	
Central	76 (22.4)	174 (19.0)	
Eastern	81 (23.8)	218 (23.8)	
Government insurance[b]			
Accepts Medicare	315 (92.6)	820 (89.5)	2.602 (.107)
Accepts Medicaid	249 (73.7)	665 (72.6)	0.032 (.858)

Asym sign = asymptotic significance (2-sided).

[a] Two cases without geographic information.

[b] Practice has Medicare/Medicaid-participating clinician who either accepts new patients or continues to care for existing Medicare and Medicaid patients.

size and the existence of PCMH elements and core features.

RESULTS

Sample-Population Comparison
We compared family practices in the sample (n = 342) with the population (N = 916). Responding practices did not differ significantly from the population based on region, rural or urban location, and acceptance of Medicare and Medicaid (Table 2).

Organizational Characteristics
Practices, generally, were single specialty, private, for-profit, and not owned by an outside entity (Table 3). Most practices in the sample were small (less than 20 physicians).

Elements of the PCMH
Table 4 displays the number and percentage of practices that reported each PCMH element and the index scores for core features.

Personal Physician
A high percentage of family practices, 87.4%, reported processes to ensure continuity of care so that most of the time patients received care from their personal physician.

Physician-Directed Medical Team
Most practices (86.8%) used at least 1 ancillary care clinician, whereas 34.8% of practices used 3 or more. More than 60% used nurses, and almost 50% used medical assistants. Patient educators, physician's assistants,

and mental health specialists were used to a lesser extent. More than one-half, 52.9%, of practices reported programs for employee morale and teamwork.

Whole-Person Orientation
A high percentage of practices, 74.3%, had implemented whole-person orientation as it relates to age of patients and types of care provided. Almost all family practices reported the provision of chronic, acute, and preventative care. Approximately 75% of practices reported treating patients of all age-groups.

Care Coordination and Integration
Less than 5% of practices reported patient registries, community linkages for care, an EMR, and provision of linguistic services. Patient registries were used by 33.4% of practices. Diabetes and asthma were the top 2 conditions for patient registries. Few practices reported registries for depression, coronary artery disease, and congestive heart failure. Approximately 30% of family practices reported community linkages for care. Less than 40% reported an EMR. Nearly one-half,

Table 3. Organizational Characteristics of Participating Family Practices (N = 342)

Characteristics	No. (%)
Specialty	
Single specialty	246 (71.9)
Multispecialty—primary care only (family medicine, internal medicine, pediatrics)	48 (14.0)
Multispecialty—primary care and specialty care	48 (14.0)
Type	
Private practice	280 (81.8)
Nonprofit federally or state funded	22 (6.5)
Nonprofit privately funded	19 (5.6)
Academic	12 (3.5)
Urgent care plus primary care	9 (2.9)
Ownership	
Not owned by outside entity	190 (55.6)
Hospital	54 (15.8)
Health plan	53 (15.5)
Other	45 (13.2)
Location	
Not primary care shortage area	263 (76.9)
Primary care shortage area	79 (23.1)
Number of physicians	
1	90 (26.4)
2-9	218 (63.9)
10-49	34 (10.0)

Table 4. Measured Elements and Core Features of the Patient-Centered Medical Home (N = 342)

Elements	Response No. (%)	Practices Awarded Point No. (%)
Elements of personal physician		299 (87.4)[a]
Continuity of care	299 (87.4)	299 (87.4), 1 point if yes
Elements of medical team		80 (23.4)[a]
Ancillary care clinicians		119 (34.8), 1 point if yes to 3 or more questions
Nurse(s)	214 (62.6)	
Medical assistant(s)	169 (49.4)	
Nurse-practitioner(s)	149 (43.6)	
Patient educator(s)	80 (23.4)	
Physician's assistants	67 (19.6)	
Mental health specialist(s)	30 (8.8)	
Offer programs for employee morale/teamwork	181 (52.9)	181 (52.9), 1 point for yes
Elements of whole-person orientation		254 (74.3)[a]
Patient types seen		260 (76.0), 1 point if yes to all
Adults	342 (100.0)	
Children	316 (92.4)	
Infants	260 (76.0)	
Type of care provided		327 (95.6), 1 point if yes to all
Preventive	339 (99.1)	
Acute	336 (98.2)	
Chronic illness	333 (97.4)	
Elements of care coordination and integration		12 (3.5)[a]
Existence of patient registry		66 (19.3), 1 point if yes to 3 or more questions
Diabetes	97 (28.2)	
Asthma	73 (21.1)	
Congestive heart failure	64 (18.5)	
Coronary artery disease	64 (18.5)	
Depression	58 (16.7)	
Other	36 (10.6)	
Electronic medical record (EMR) components—internal coordination		135 (39.5), 1 point for yes to 3 out of 6 questions
Problem list	133 (38.9)	
Ambulatory visits	134 (39.2)	
Medication lists	134 (39.2)	
Laboratory findings	127 (37.1)	
Medication-ordering reminders, drug interaction	107 (31.3)	
Radiology findings	118 (34.5)	
EMR components—external coordination		97 (28.4), 1 point for 2 out of 3 questions,
Services by other specialists	109 (31.9)	
Inpatient stays	91 (26.6)	
Emergency room visits	83 (24.3)	
Community linkages for care	107 (31.3)	107 (31.3), 1 point for yes
Linguistic services	168 (49.1)	168 (49.1), 1 point for yes
Elements of enhanced access		124 (36.3)[a]
Alternative scheduling arrangements		124 (36.3), 1 point if yes to 3 or more questions
Rapid access	299 (87.4)	
Scheduled evenings or weekend visits	134 (39.2)	
Telephone consultations	134 (39.2)	
On-call evenings or weekends	116 (33.9)	
E-mail consultations	43 (12.6)	
Group visits	34 (9.9)	
Elements of quality and safety		60 (17.5)[a]
Clinical guidelines		223 (65.2), 1 point if yes to 2 or more questions
Use of clinical guidelines	263 (76.9)	
Physician training on clinical guidelines	227 (66.4)	
EMR with problem-specific clinical guidelines	64 (18.7)	

Table 4 continues

Table 4. Measured Elements and Core Features of the Patient-Centered Medical Home (N = 342)
(continued)

Elements	Response No. (%)	Practices Awarded Point No. (%)
Elements of quality and safety (continued)		
Patient satisfaction surveys		133 (38.9), 1 point for yes to both questions
Administers surveys	163 (47.7)	
Initiates changes based on surveys	136 (39.8)	
Performance measurement and monitoring		97 (28.4), 1 point if yes to 2 or more questions
Tracks clinician use of evidence-based guidelines	80 (23.4)	
Tracks results of quality improvement projects	81 (23.7)	
Tracks clinical outcomes	80 (23.4)	
Provides written performance reports to physicians	99 (28.9)	

49.1%, of practices reported the provision of linguistic services to facilitate communication with patients.

Enhanced Access

More than 96% reported at least 1 alternative scheduling option. Approximately 36% of practices implemented 3 or more strategies to enhance access to care. Almost 90% reported rapid access techniques for patients to obtain care on short notice, and approximately 40% reported scheduled evenings or weekend visits. Few practices reported group visits and e-mail consultations.

Quality and Safety

Only 17.5% of practices reported implementation of clinical guidelines, patient satisfaction surveys, and performance measurement. Most practices (nearly 77%) reported using clinical guidelines and training physicians in the use of guidelines (approximately 66%). Less than 20% of practices reported an EMR with problem-specific clinical guidelines. Almost 50% of practices reported administering patient satisfaction surveys; the majority of those practices (70%) made improvements based on feedback obtained from patients. A review of performance measurement activities shows that less than 25% of practices reviewed data on results of clinical quality improvement projects, clinician use of evidence-based practices, or outcomes data.

Practice Alignment With the PCMH Model

Elements of the PCMH Model

Of the 342 participating practices, 1.2% reported all 14 elements of the PCHM model. Almost all practices, 97.9%, possess 3 or more elements of the PCMH model; 49.2% possess at least one-half.

Core Features of the PCMH Model

We also measured the alignment of participating practices with the 6 practice level features of the PCMH.

Only 1.2% reported all 6 features of the PCHM. The majority of practices, 78.4%, reported 2 or more, and 42.2% reported 3 or more core features.

Practice Size and PCMH Alignment

We conducted regression analyses to investigate the relationship between practice size and PCMH alignment while controlling for area and practice characteristics. The indices for total PCMH elements and total PCMH core features were used as dependent variables with practice size (number of physicians) and several geographic and practice characteristics as explanatory variables. We found that size was significantly related to both total PCMH elements ($P = .000$) and total PCMH core features ($P = .000$). Further analyses showed that size is not significantly related to personal physician ($P = .299$) or enhanced access ($P = .122$), but it is significantly related to quality and safety ($P = .011$), whole-person orientation ($P = .007$), medical team ($P = .000$), and coordination of care ($P = .009$).

DISCUSSION

These results indicate that most family practices are aligned with the PCMH model in the areas of whole-person orientation and personal physician. Practices are challenged with other aspects of the PCMH model, particularly areas that require considerable financial and knowledge resources, such as EMRs and performance measurement for clinical activities. Increased attention is needed to transform family practice in the areas of quality and safety, coordination of care, team-based care, and enhanced access to care.

The infrequent prevalence of the PCMH elements in family practices is an important consideration for policy makers and payer organizations in establishing programs and reimbursement methods centered on this model. The present reimbursement system rewards the number of patients seen, so practices naturally

structure themselves to see a large number of patients. Practices are not paid for many elements of the PCMH model, which is reflected in this study by the low prevalence of certain PCMH elements. The NCQA recently revised their practice recognition program to incorporate elements of the PCMH.[7] The NCQA program focuses heavily on EMR functionality for communication, quality, and care management. Our results indicate that most practices in Virginia would require considerable transformation to meet all requirements of the NCQA recognition program.

The Rittenhouse study of PCMH infrastructure in large group practices showed that very large organizational size was strongly associated with greater alignment with the PCMH model.[8] The Massachusetts study showed that larger practices were more aligned with the PCMH model than smaller practices.[9] Our results support the findings from these studies. It is clear that many small practices are not aligned with the PCMH model. Either small practices do not have the resources to implement the PCMH model, or certain elements do not make sense for a small practice. Because small practices represent an important component of our health care delivery system, policy makers need to consider the challenges small practices face and should develop specific policies for supporting small practices in developing efficient and effective models of care.

The Rittenhouse study found a higher prevalence of EMRs, patient registries, quality measurement, and performance feedback to physicians.[8] Because our study included practices of all sizes, it is not surprising that our results show a lower prevalence of most PCMH elements than the Rittenhouse findings. The Massachusetts study, which looked at capabilities of practices that contribute clinical performance data to a statewide quality initiative, found a much higher prevalence of several PCMH elements—EMR capabilities, assistance for patient self-management, and clinical performance measurement.[9] This finding indicates that states focusing on improving quality in primary care practices may have better success at supporting structural components to enhance quality of care. The moderately low existence of PCMH elements reported in our study suggests that additional support from state and national organizations is needed for practice transformation.

Several study limitations should be considered when evaluating our results. A cross-sectional study allows us to capture information on practices at only one point in time. The lack of existing data on family practices in Virginia limits our ability to make detailed comparisons of the sample with the population. As a result, our sample may be unrepresentative on some unmeasured aspects of the practice. The use of a survey instrument to recruit practices may have generated a self-selected sample, thus limiting generalizability. The survey instrument may also have introduced bias resulting from the objectivity of individual survey respondents and variability in interpretation of question wording. Another design limitation is that we collected information from practices in Virginia only, not from all family practices in the United States. We were not able to measure all aspects of the PCMH model. A structured survey of practices cannot capture important information regarding patient perceptions, team cohesiveness, and the appropriateness of elements for a specific practice. These topics should be addressed in future research along with the efficiency and effectiveness of the PCMH model.

This baseline study of the prevalence of PCMH elements among Virginia family practices informs policy makers by indicating what elements need to be reimbursed and supported. Policy makers and medical associations need to understand the number of PCMH elements in practices, the elements and core features that require attention, and strategies to achieve the PCMH model and its potential outcomes, an effort that will take considerable resources and coordination among clinicians, payers, and purchasers of service. It has been estimated that to move a practice from an NCQA-uncertified state to a high-level designation would cost approximately $100,000 per clinician.[14]

There is clearly a need to evaluate and disseminate such innovations among family practices. The TransforMED program[15] is a major initiative to accomplish this goal on a national level. State chapters and local health care systems can work together to support care model redesign by means of communities of practice[16] that focus on solving shared problems. These efforts can be greatly enhanced by collaboration with payers and employers. The National Business Coalition on Health[17] and the Patient-Centered Primary Care Collaborative[18] are promoting demonstration projects and disseminating successful models. Innovation in family medicine residency education can also make major contributions. Finally, partnerships between academic units of family medicine and community practices may have much to offer in designing, implementing, evaluating, and promoting better care models.

Academy of Family Physicians (VAFP) Annual Meeting, Virginia Beach, Virginia, on July 25, 2008.

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