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Congruence between Staff and Lead Physician's Ability to Adapt to Change in a Pediatric Medical Home Project

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Abstract

Objective: In the era of continuous quality improvement, practices must be ready to implement new ideas and processes. Alignment between staff and practice leadership is crucial to implementation. This study assesses the level of congruence that physician leaders and staff report about their ability to adapt to change.

Methods: Survey data were collected from staff working in 20 Florida pediatric practices and a physician leader from each practice. Both surveys assessed adaptive reserve which measures the ability of the practice to adapt to change by asking questions about their willingness to make changes, problem solving skills, communication, and general team dynamics. Overall, 170 staff members completed the staff survey with a response rate of 42.6% and twenty lead physicians completed the physician leader survey for a response rate of 100%. Descriptive, bivariate, and multivariate analyses were conducted.

Results: Among all staff, 30% were in high levels of agreement with their lead physician while 23.5% were in low levels of agreement with their lead physician. Practices with older staff were found to be the most aligned. Practices with one to three physicians were associated with decreased odds of congruence (Odds ratio=0.16). Staff ages 41 to 50 were associated with increased odds of congruence versus their younger counterparts (OR=5.77).

Conclusions: Adaptive reserve inventory and alignment should be seen as an investment and a priority by practices, medical home facilitators, and policymakers. A team approach is essential for patient-centered medical home implementation. Staff should be considered stakeholders in the medical home transformation and their feedback should be sought throughout the process and acted on in a timely manner.

Keywords: Medical home; Pediatrics; CHIPRA; Staff; Survey; Adaptive reserve

Introduction

Medical home is a philosophy and model of health care that has been in existence since the 1960s when the American Academy of Pediatrics first began to describe a centralized place for a child's medical records [1,2]. It has evolved and is now described as a highly sought-out model of care that is accessible, coordinated, comprehensive, family-centered, compassionate, culturally competent, and continuous [3,5]. Recently, the medical home model has been touted as a way to transform primary care in the United States, with the aims of reducing costs and improving quality. Medical home projects are underway in almost every state, in several federal agencies, and endorsed by the Affordable Care Act [6,7]. As more projects are undertaken, more evidence emerges; however, most of the literature is focused on adults with limited evidence in pediatrics. Further, Homer's 2008 systematic review of medical literature noted that none of the 33 studies reviewed evaluated medical home in a comprehensive manner [8].

Transforming to a medical home is challenging as it involves changes that occur at the patient, provider, and health system level. A practice's environment can be described in many ways including shared values, mission, standards, and adaptive reserve [9,10]. Adaptive reserve is described as a "practice's capacity for organizational learning and development" [11]. Practices with high levels of adaptive reserve are characterized by having healthy relationships, strong leadership, and shared vision [11]. Interviews conducted with staff at 36 family practices

that participated in a national medical home transformation project noted that adaptive reserve was present in successful transformations and referred to it as a "practice's most precious resource… and [it] must be supported and strengthened" [11].

To our knowledge, no studies of adaptive reserve in pediatric primary care practices exist. The current study addresses this gap in the literature. Our study uses data from 20 pediatric practices participating in the Florida Pediatric Medical Home Demonstration Project to 1) describe adaptive reserve, 2) evaluate adaptive reserve congruence between staff and lead physician, and 3) estimate the association between adaptive reserve congruence and medical homeness. We hypothesize that greater adaptive reserve congruence between the staff and lead physician will be associated with greater medical homeness.

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Sample and Methods

Sample

Florida's Pediatric Medical Home Demonstration project is a funded component of the state's Children's Health Insurance Program Reauthorization (CHIPRA) grant. The five-year Pediatric Medical Home Demonstration project began in July 2011 with the recruitment of 20 practices from around the state. Practices received no enhanced payment to participate, but were given incentives such as discounted prices to several online learning modules offered by the American Academy of Pediatrics (AAP) and earned credit toward Part 4 Maintenance of Certification. There are two parts to the Pediatric Medical Home Demonstration project: 1) a facilitated quality improvement intervention led by the AAP's Quality Improvement Innovation Network(Q*u*IIN) [12] and 2) a four-year independent, multi-stakeholder evaluation of the aforementioned intervention. The four-year evaluation includes annual surveys with the practice staff, its three-person core project team, the lead physician, and parents whose children receive care at the practices; on-site interviews; and analysis of practice-level results of several CHIPRA measures [13].

Staff and lead physician surveys conducted at baseline were used for this study. In year one of the evaluation, between October and November 2011, staff at each of the 20 practices were given a packet. All staff, regardless of position, were included. The packet included the survey, instructions for submission, and a return envelope. A personal identifier, chosen by the respondent, was to be entered on the cover of the survey to track the responses longitudinally. No incentives were given. It was requested that staff mail back the survey within 14 days. Reminders were sent via email at two, four, and six weeks. Flyers were posted in common areas of the practices to encourage staff participation. Overall, 170 surveys were completed (response rate of 42.6%).

Lead physician surveys were collected between August and September 2011. Surveys were emailed to the 20 lead physicians. Surveys could be completed electronically or printed and returned by mail or fax. Again, no incentives were given. Overall, 20 lead physicians completed the survey (response rate 100%).

Two supplemental datasets were used in this study 1) data from the practice's original project application (which was submitted by the lead physician) and 2) data from the core project team's annual survey. Items on the application asked about the practice's characteristics such as estimated caseload and ownership. Items on the core clinical team survey asked about the medical home characteristics of the practice. This study was approved by the Institutional Review Board at the University of Florida (#80-2011).

Survey measures

Congruence between staff and lead physician adaptive reserve is the primary outcome in this study. Adaptive reserve was measured with the 23-item scale from the Trans for MED Practice Environment Checklist [14]. Topics covered include willingness to change, problem solving, communication, and team dynamics. Items were scored using a five-point Likert scale. Total adaptive reserve was transformed to a 100 point scale where 100 indicates the highest level of adaptive reserve. Congruence between staff and lead physician adaptive reserve was calculated by subtracting the mean staff reported adaptive reserve score from the lead physician reported adaptive reserve score and taking the absolute value. Non-zero differences indicate incongruence while a zero difference indicate the staff and lead physician reported

the same adaptive reserve score. Congruence scores were also separated into high and low levels using the 50th percentile of the distribution of scores as the cutoff. Congruence was categorized as high-high, low-high, high-low, and low-low (staff-lead physician, respectively).

Degree of medical homeness was assessed by the Medical Home Index (MHI) [15]. The MHI includes six domains: Organizational Capacity, Chronic Condition Management, Care Coordination, Community Outreach, Data Management, and Quality Improvement. Domains were scored from 1 to 8, with higher scores indicating that the practice had more characteristics of a patient-centered medical home. Total medical home score encompassed the scores on all six domains and ranged from 0 to 100, where 100 signified that a practice reported achieving every element of the medical home model.

Finally, several staff and practice level characteristics were included in the analyses. Staff characteristics gleaned from the staff surveys included age, gender, years worked in the practice, race, and position (clinical or non-clinical). Clinical position was defined as physicians, social workers, nurses, and physician assistants while non-clinical was defined as staff in areas such as finance, billing, office management, administrative assistants, and medical recordkeeping. Practice characteristics, collected from the original application,included self-reported percentage of pediatric patients enrolled in Medicaid or Florida's Children's Health Insurance Program (CHIP), percentage of pediatric patients enrolled in Medicaid or Florida's CHIP with special healthcare needs, practice size, practice location, practice region, and number of full time equivalent employees.

Analyses

Summary statistics were produced to describe the staff characteristics, practice characteristics, and item-level congruence scores.

Congruence between the total adaptive reserve score of the staff and lead physician was tested using Cohen's kappa to measure the rate of inter-observer agreement. Agreement ranged from 0 (poor), 0.01-0.20 (slight), 0.21-0.40 (fair), 0.41-0.60 (moderate), 0.61-0.80 (substantial), 0.81-0.99 (almost perfect), to 1 (perfect) [16]. Bivariate tests (z-scores) were conducted to determine if the level of agreement (high and low) statistically varied between the lead physician and the staff.

Logistic regression was performed to determine associations between high-high congruence and the aforementioned staff and practice characteristics. A binary dependent variable was constructed and equals one when the agreement was high-high, and zero otherwise. A second multivariate regression was performed to determine the association between medical homeness and congruence. The aforementioned staff and practice characteristics were also included in this model. An ordinary least squares regression was estimated with total MHI score as the dependent variable.

To account for any unobserved effect common to staff working at the same practice, the standard errors estimated in all the models were controlled for by clustering at the practice level. This approach is consistently used in other patient-centered medical home evaluations [14,17]. All analyses were conducted using Stata [18].

Results

Sample characteristics

Staff in the sample was primarily female (86.5%), White non-Hispanic (57.3%), and had been working in the practice for less than

five years (63.2%) (Table 1). The staff was equally distributed in age, and the number of non-clinical staff (80) was more than the number of clinical staff (69).

Practice characteristics

Table 2 shows that most of the practices in the sample were large practices and that most were in urban areas. Mean percentage of pediatric patients in the practices that were enrolled in Medicaid or Florida's CHIP was 58.7%, and the mean percentage of those patients who had special healthcare needs was 31.3%. The mean number of full time equivalent employees in the practices was 15. Mean MHI scores by domain are presented in Figure 1. Mean total MHI score is 39.83 out of 100 (standard deviation (SD) 15.04), and across the practices, ranged from 14.29 to 80.

Congruence

Mean staff-reported adaptive reserve was 63.41 (SD=0.18; Median=66.30), while mean lead-physician reported adaptive reserve was higher at 68.34 (SD=0.08; Median=69.57). Table 3 presents the mean congruence scores for the 23 items in the adaptive reserve scale. Items are ranked from least to most congruence. "Most people in this practice are willing to change how they do things in response to feedback from other," had the least congruence (0.14). "People in this practice operate as a real team," "After trying something new, we take time to think about how it worked," and "People are aware of how their actions affect others in this practice," were the three items with the most congruence (0.01).

Congruence kappa values

	Frequency	Percent
Age	**152**	
Age 20-30	38	25.0%
Age 31-40	36	23.7%
Age 41-50	40	26.3%
Age 50+	38	25.0%
Gender	**156**	
Male	21	13.5%
Female	135	86.5%
Race	**150**	
White	86	57.3%
Black	21	14.0%
Hispanic	32	21.3%
Asian	7	4.7%
Other Race	4	2.7%
Position at Practice	**149**	
Nurse- RN, LPN	24	16.1%
Social Worker	1	0.7%
Clinician-PA, ARNP, MD, DO	44	29.5%
Administrative-Secretary, Finance, Records, Office Manager	43	28.9%
Other Position	37	24.8%
Clinical Staff Positions	69	46.3%
Non-Clinical Staff Positions	80	53.7%
Number of Years worked at Practice	**152**	
Worked 0-5 years	96	63.2%
Worked 6-10 years	24	15.8%
Worked 11-15 years	14	9.2%
Worked 16-20 years	11	7.2%
Worked 20+ years	7	4.6%

Table 1: Staff characteristics.

| Variable	Frequency	Percent
Practice Size		
Solo	5	25%
Small Practice	6	30%
Large Practice	9	45%
Practice Location		
Urban	13	65%
Suburban	7	35%
Practice Region		
North	5	25%
Central	8	40%
South	7	35%
	Mean	**Standard Deviation**
Percent of pediatric patients enrolled in Medicaid/CHIP	58.70	22.27
Percent Pediatric patients enrolled in Medicaid/CHIP that have special health care needs	31.34	20.20
Number of Full Time Employees	15	13

Table 2: Practice Characteristics.
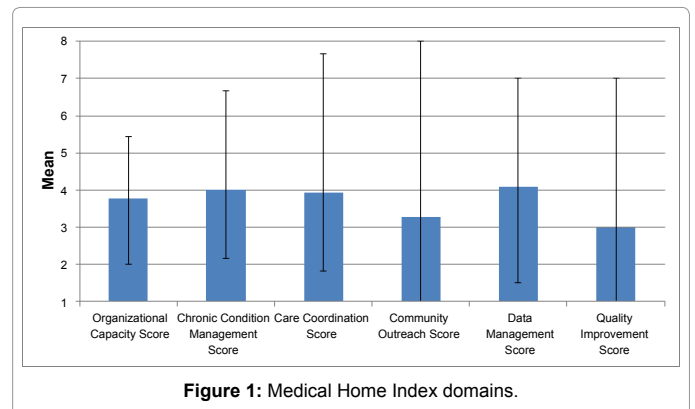
Figure 1: Medical Home Index domains.

Figure 2 presents the kappa value as well as the distributions across the dichotomized levels of agreement (high and low). Thirty percent of the staff members were in high levels of agreement with their lead physician and 23.5% were in low levels of agreement with their lead physician. Agreement was mixed for 46.4% of the staff (17.6% High-Low and 28.8% Low-High). The kappa value was 0.08 (Z=1.05; Probability>Z=0.15).

Multivariate results

Table 4 presents the results of the logistic regression where the binary agreement variable (1=high-high, and 0=otherwise) is the dependent variable. Results suggest that staff aged 41 to 50, as opposed to the referent group (aged 20 to 30), are associated with almost six times the odds of being in the high-high agreement category (Odds ratio=5.78). Small and large sized practices, as opposed to solo practices, are significantly less likely to be associated with high-high agreement (Odds ratios=0.161 and 0.039, respectively).

Table 5 shows the results of the ordinary least squared regression where the dependent variable is the total MHI score. Three variables were found to be significantly associated with the MHI score. Non-clinical positions are associated with a 3.128 decrease in the MHI total score. A one unit increase in the number of full time employees is associated with a 0.358 increase in the MHI total score. A one percentage point increase in the percent of patients enrolled in Medicaid or CHIP that has a special health care need is associated with a 0.550 increase in the MHI total score.

Rank	Item Description	Mean Score
1	Most people in this practice are willing to change how they do things in response to feedback from others.	0.14
2	People in this practice have the information that they need to do their jobs well	0.13
3	Leadership in this practice creates an environment where things can be accomplished.	0.12
4	Difficult problems are solved through face-to-face discussions in this practice.	0.11
5	People in our practice actively seek new ways to improve how we do things.	0.10
6	Leadership strongly supports practice change efforts.	0.08
7	The practice leadership makes sure that we have the time and space necessary to discuss changes to improve care.	0.08
8	People at all levels of this office openly talk about what is and isn't working.	0.08
9	Practice leadership promotes an environment that is an enjoyable place to work.	0.07
10	Mistakes have led to positive changes here.	0.06
11	This practice encourages everyone (front office staff, clinical staff, nurses, and clinicians) to share ideas.	0.06
12	Most of the people who work in our practice seem to enjoy their work.	0.05
13	We regularly take time to reflect on how we do things.	0.04
14	This practice learns from its mistakes.	0.03
15	This practice is a place of joy and hope.	0.03
16	I have many opportunities to grow in my work.	0.03
17	It is hard to get things to change in our practice.	0.03
18	When we experience a problem in the practice we make a serious effort to figure out what's really going on.	0.02
19	I can rely on the other people in this practice to do their jobs well.	0.02
20	We regularly take time to consider ways to improve how we do things.	0.02
21	People in this practice operate as a real team.	0.01
22	After trying something new, we take time to think about how it worked.	0.01
23	People are aware of how their actions affect others in this practice.	0.01

Note: Mean Score is calculated by first subtracting staff adaptive reserve score from practice adaptive reserve score for each item. Then for each item that difference is averaged and put in absolute values. Finally the items are ranked from least congruence to most congruence, where a larger mean score means the difference between practice and staff adaptive reserve scores is greatest, i.e. least congruent

Table 3: Rank of the 23 Items of the Adaptive Reserve.

Discussion

Results from our descriptive and multivariate analyses extend the pediatric medical home literature in several ways. Taking an inventory of adaptive reserve is an important first step in developing strategies to improve needed alignment. Results from our adaptive reserve item level congruence analyses point to several areas where the practices could focus their efforts on improving alignment between staff and lead physician. For example, incongruence was noted for the statement "Difficult problems are solved through face-to-face discussions." Setting aside a time to routinely meet face-to-face with the staff likely allows for reflection, problem solving, planning, and information sharing. This may seem difficult given the competing demands on time, but could reap benefits in the short and long term [19,20]. Strategies for the individual items will vary in duration and intensity. However, these human interactions should be considered investments, just as is purchasing an electronic medical record system.

Congruence across all practices in our study was slight (kappa=0.08). This points to needed adjustments at the practice level and to groups of practices seeking to transform themselves to a medical home. Medical home facilitators should be trained to measure and address adaptive reserve by including this topic in their curriculum. For example, AHRQ created a guide on developing and running a practice facilitator program in 2011 [21]. Although the term adaptive reserve is not mentioned specifically, the guide notes that facilitators should be trained in "concepts and strategies for empowering staff and building organizational capacity." Likewise, the NCQA recently introduce its NCQA PCMH Content Expert Certification [22]. It is unclear if that certification program emphasizes the human infrastructure that is needed to become a medical home, but this may be another platform to ensure that the issue is addressed.

Our multivariate findings suggest more alignment between staff and lead physician with older staff and less alignment in practices with more than one physician.

The latter finding is somewhat expected since aligning staff and physician adaptive reserve should be easier when there is only one physician in the practice. When there is more than one physician in a practice these physicians might have different management styles, personalities, and practice patterns all of which could affect adaptive reserve. In a multi-physician practice, subtle challenges might also emerge, through ownership or title for example, where only one physician is the lead physician. Practices with multiple physicians may also have to implement strategies to align themselves before working on staff alignment. Older staff might be better aligned with their lead physician because they understand the importance of, and need for, change. Older staff may also be more perceptive to their leaders' style and understand the benefits that can come from alignment.

Although not statistically significant, results from our multivariate model suggest that greater differences between staff and lead physician adaptive reserve scores were associated with a decrease in the total MHI score. Our hypothesis was not confirmed, however, it is possible that longitudinal data might yield different results. Future research should investigate how adaptive reserve congruence changes as practices journey through the medical home transformation process.

Limitations exist in our study that merit mentioning. Our response rate for the staff survey was 42.6%, which is comparable to other surveys of health care workers [23]. Unfortunately, we do not have any information about the non-responders. The lead physician's adaptive reserve score may not be representative of the organization's adaptive reserve. In a large group practice the lead physician may be able to influence the local practice environment but there may be

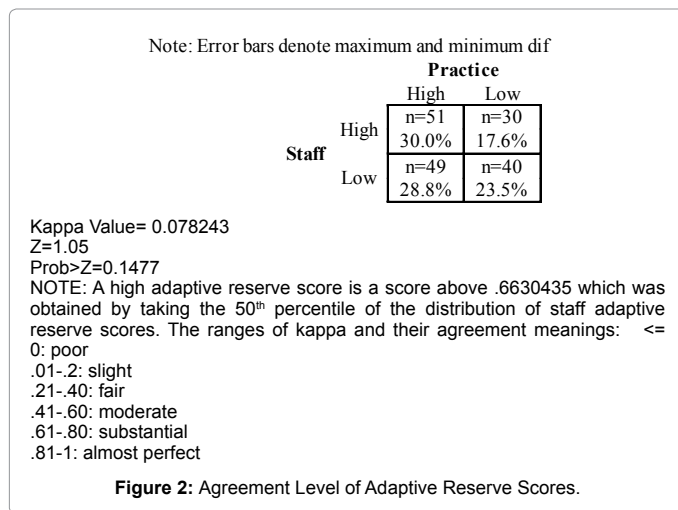|	Odds Ratio
	High-High Agreement
Years Worked in Practice	
6-10 years	1.174
	(0.645)
11-15 years	2.742
	(1.692)
16-20 years	3.043
	(2.532)
20+ years	1.644
	(1.318)
Age	
30 to 40 years old	1.596
	(0.862)
41 to 50 years old	5.777***
	(4.015)
50+ years old	0.961
	(0.654)
Race	
Black	0.470
	(0.408)
Hispanic	3.126
	(1.939)
Asian	4.432
	(6.015)
Other race categories	0.196
	(0.254)
Clinic Position	
Non-clinician	2.784
	(1.508)
Sex	
Male	1.192
	(0.657)
Practice Size	
Small (3 or less)	0.161**
	(0.139)
Large practice (more than 3)	0.039***
	(0.0423)
Practice Region	
Suburban	0.220
	(0.207)
North	2.655
	(2.480)
South	1.225
	(1.213
Number of Full time Employees	1.050
	(0.054)
% of patients enrolled in Medicaid/CHIP	1.018
	(0.023)
% of patients enrolled in Medicaid/CHIP that have special healthcare needs	0.994
	(0.023)
Number of Observations	169

Note: **=significant at the 5% level, ***=significant at the 1% level. Practice and Staff Adaptive Reserve Score is the dependent variable and is a categorical variable that takes a value of 1 when there is high agreement (Practice and Staff both have high adaptive reserve scores) and 0 when there is low agreement (Practice has high adaptive reserve score and Staff has low adaptive reserve score, vice versa, and Practice and Staff both have low adaptive reserve). Reference groups are: 20 to 30 years old, White, non-Hispanic, clinical staff, 0 to 5 years of experience, solo practice, urban, and central Florida

Table 4: Logistic regression.

	Total MHI Score
Adaptive Reserve Congruence Score	-0.288
	(0.888)
Years Worked in Practice	
6-10 years	-1.094
	(1.394)
11-15 years	-1.631
	(1.313)
16-20 years	(-4.074)
	(2.709)
20+ years	-7.077
	(4.419)
Age	
30 to 40 years old	-0.525
	(0.928)
41 to 50 years old	1.335
	(1.408)
50+ years old	3.097
	(2.033)
Race	
Black	-0.022
	(1.366)
Hispanic	-1.979
	(1.715)
Asian	0.338
	(1.613)
Other race categories	4.866
	(4.446)
Clinic Position	
Non-clinician	-3.128**
	(1.498)
Sex	
Male	-1.525
	(0.795)
Practice Size	
Small (3 or less)	-9.906
	(7.697)
Large practice (more than 3)	-8.233
	(8.022)
Practice Region	
Suburban	0.432
	(3.723)
North	0.634
	(2.430)
South	-6.171
	(5.293)
Number of Full time Employees	0.358***
	(0.135)
% of patients enrolled in Medicaid/CHIP	0.031
	(0.129)
% of patients enrolled in Medicaid/CHIP that have special healthcare needs	0.550***
	(0.061)
R-Squared	0.877
Root MSE	5.630
Number of Observations	169

Note: **=significant at the 5% level, ***=significant at the 1% level. Total MHI Score is the dependent variable and it is out of 80. Practice and Staff Adaptive Reserve Score is a categorical variable that takes a value of 1 when there is high agreement (Practice and Staff both have high adaptive reserve scores) and 0 when there is low agreement (Practice has high adaptive reserve score and Staff has low adaptive reserve score, vice versa, and practice and staff both have low adaptive reserve). Reference groups are: 20 to 30 years old, White, non-Hispanic, clinical staff, 0 to 5 years of experience, solo practice, urban, and central Florida

Table 5: Ordinary Least Squares Regression.

Note: Error bars denote maximum and minimum dif

		Practice	
		High	Low
Staff	High	n=51 30.0%	n=30 17.6%
	Low	n=49 28.8%	n=40 23.5%

Kappa Value= 0.078243
Z=1.05
Prob>Z=0.1477
NOTE: A high adaptive reserve score is a score above .6630435 which was obtained by taking the 50th percentile of the distribution of staff adaptive reserve scores. The ranges of kappa and their agreement meanings: <= 0: poor
.01-.2: slight
.21-.40: fair
.41-.60: moderate
.61-.80: substantial
.81-1: almost perfect

Figure 2: Agreement Level of Adaptive Reserve Scores.

organizational barriers that affect the staff's perspectives of the global environment. For example, the local practice might be a joyful place to work but the overall organization might be struggling financially and this could cause the staff to be stressed. In this case interventions to align the staff and lead physician at the local level might not improve adaptive reserve of the staff. Finally, the MHI was filled out by the core project team and the staff had no input in this measure. Perhaps the staff have different perspectives on whether or not the practice is a medical home.

Despite these limitations our results emphasize the importance of assessing professional experiences in medical home evaluations. Policy makers and health care planners should ensure that professional experiences are assessed and that staff are considered important stakeholders in these projects. Adaptive reserve inventories may inform more appropriately tailored integration of the PCMH model, or at least, they may help forewarn system administrators of potential barriers in its implementation. Practices that do not employ facilitators or participate in a formal facilitation program can still benefit from improving alignment of staff. Disregarding this important concept might affect the long term sustainability of the medical home.

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