


A Cross-Sectional Analysis of Primary Care Practice Characteristics and Healthcare Professionals' Behavioral Responses to Change

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Abstract

The recent decade brought major changes to primary care practices. Previous research on change has focused on change processes, and change implementations rather than studying employee's feelings, perceptions, and attitudes toward change. The objective of this cross-sectional study was to examine the relationship between healthcare professionals' behavioral responses to change and practice characteristics. Our study, which builds upon Conner's theory, addresses an extensive coverage of individual behaviors, feelings, and attitudes toward change. We analyzed survey responses of healthcare professionals ($n = 1279$) from 154 primary care practices in Virginia. Healthcare professionals included physicians, advanced practice clinicians, clinical support staff, and administrative staff. The Change Diagnostic Index[®] (CDI) was used to measure behavioral responses in 7 domains: anxiety, frustration, delayed development, rejection of environment, refusal to participate, withdrawal, and global reaction. We used descriptive statistics and multivariate regression analysis. Our findings indicate that professionals had a significantly lower aptitude for change if they work in larger practices (≥ 16 clinicians) compared to solo practices ($P < .05$) and at hospital-owned practices compared to independent practices ($P < .05$). Being part of an accountable care organization was associated with significantly lower anxiety ($P < .05$). Understanding healthcare professionals' responses to change can help healthcare leaders design and implement successful change management strategies for future transformation.

Keywords

healthcare leadership, primary care, organizational change, behavioral responses to change, practice transformation, cross-sectional analyses, Change Diagnostic Index

What do we already know about this topic

- Primary care practices are going through major changes. Previous research on change has focused on change processes, and change implementations rather than studying employee's feelings, perceptions, and attitudes toward change.

How does your research contribute to the field?

- We examined the employees' behavioral responses to change in 7 domains: anxiety, frustration, delayed development, rejection of environment, refusal to participate, withdrawal, and global reaction. To the best of our knowledge, this is the first study that assessed the employee responses to change in primary care practices. Understanding healthcare professionals' response to change can help healthcare leaders design and implement successful change management strategies for future transformation.

What are your research's implications toward theory, practice, or policy?

- Our findings are important, because higher scores of change diagnostic index (eg, anxiety, frustration) may give early signals to leaders and primary care practices to prevent unprecedented consequences of major change efforts such as decreased morale, productivity, and motivation, or increased conflict, absenteeism, and turnover. Primary care practice leaders and policymakers should consider individual symptoms and behavioral responses to change when designing future change interventions to prevent undesirable consequences.



Introduction

The United States healthcare industry is undergoing a tremendous change related to access, quality, and cost. Over the last decade, transformation efforts focused on the triple aim of improving the patient experience, including quality and satisfaction; improving the health of populations; and reducing the per capita cost of healthcare.¹ Recently, improving work satisfaction for healthcare professionals has been recognized as an additional aim that needs to be considered in transformation efforts.² Primary care organizations, such as physician practices and outpatient clinics, are identified as critical components of the healthcare delivery system in improving access to care, advancing disease prevention, chronic illness care, and strengthening population health. These organizations are central to health reform efforts since primary care is often a patient's first point of entry to care that provides greater access to healthcare services, preventive care, management of chronic illnesses, and coordination of care.³

The recent decade brought major changes to primary care practices. Among the change efforts include implementation of electronic health records (EHR), transformation to new care delivery models such as patient-centered medical home (PCMH) or accountable care organizations (ACO), and compliance with various regulatory and payment reforms.⁴⁻⁷ Additional complicating factors such as the lack of financial resources, time constraints, physician burnout, practice culture barriers, and high employee turnover create more burden on the practices.⁸⁻¹³ Managing an organizational transition is challenging because change requires the involvement of organization members. The foundation of this study, which builds upon Conner's theory,¹⁴ addresses an extensive coverage of individual behaviors, feelings, and attitudes toward change.

Conner¹⁴ structures the dynamics of human change in 8 patterns: (1) nature-of-change helps explain why major change is not easy to assimilate, (2) process-of-change describes the process itself along with the key elements and flow of events that are involved in change, (3) roles-of-change focuses on the groups of individuals who are the target of the change, (4) resistance-to-change describes the natural emotional reactions to change, (5) commitment-to-change is the vital bond between people and the change goals, (6) culture-and-change represents a set of beliefs, behaviors, and assumptions that people share among themselves, (7) synergy-and-change is obtained by

teamwork that generates synergy and enables organizations to achieve the change objectives, and (8) resilience controls the increasing tolerance to future shock.¹⁴ Conner's model helps to explain the perceptions, behaviors, and attitudes of healthcare professionals experiencing change implemented in primary care.

Previous research on change has focused on change processes,¹⁵ and change implementations¹⁶ rather than studying employee's feelings, perceptions, and attitudes toward change. There is a profound need to understand more about why it is difficult for people to change, why individuals develop a resistance toward change, and how the individuals express their feelings while going through a change.^{17,18} This study aimed to assess the relationship between healthcare professionals' behavioral responses to change implemented in primary care practices and practice characteristics.

Method

This study is part of a larger project, Heart of Virginia Healthcare (HVH), which was funded by the Agency for Healthcare Research and Quality under the EvidenceNOW initiative. The aims of the HVH initiative were to disseminate evidence-based cardiovascular care and implement practice transformation strategies to improve operational efficiencies in primary care.¹⁹ The HVH initiative represented major change in participating primary care practices. Our study was approved by the Institutional Review Board (IRB) of George Mason University in 2016.

Data Sources and Study Sample

This cross-sectional study analyzed survey responses of healthcare professionals (n=1279) from 154 small to medium-sized primary care practices in Virginia. Data was collected by the HVH through the 2 survey instruments. The first survey was conducted in 2016 and 2017 that measured practice characteristics such as practice ownership, practice size, whether the practice serves in a medically underserved area.²⁰ The practice survey was filled out by either the physician leader or practice manager, and the response rate was 93%. The second survey was conducted in late 2018 that assessed healthcare professionals' behavioral responses to change by using the Change Diagnostic Index (CDI)[®].^{11,21} The member survey was filled out by

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Table 1. Individual Symptoms of Loss and the Organizational Equivalents.

Individual symptoms	Organizational equivalents
Anxiety (apprehension)	Decreased morale
Frustration	Decreased productivity
Delayed development	Decreased motivation
Rejection of the environment	Increased conflict
Refusal to participate	Increased absenteeism
Withdrawal	Increased turnover
Global	A measure of the collective readiness for or to change

Source. Grady, Victoria M., and James D. Grady. (2013). *The Pivot Point: Success in Organizational Change*. Morgan James Publishing.²²

healthcare professionals, including physicians, nurse practitioners, physician assistants, registered nurses, practice managers, and non-administrative staff. The member survey was calculated based on the practice size, the number of staff worked at the practice, and the response rate was 76%. Both surveys were administered online and through the mail. The sample for this study consisted of 1279 healthcare professionals working in 154 small to medium-sized primary care practices in Virginia.

Measures

Our outcome measure was the Change Diagnostic Index (CDI)[®], organized in 7 domains: (1) Anxiety, (2) Frustration, (3) Delayed Development, (4) Rejection of the Environment, (5) Refusal to Participate, (6) Withdrawal, and (7) Global (Table 1). Higher CDI scores on a five-point Likert scale (5=strongly agree to 1=strongly disagree) indicate a lower aptitude for change among healthcare professionals. Anxiety refers to an emotional response by an employee toward change that leads to a decrease in morale (enthusiasm, confidence, or loyalty). Frustration leads to a decrease in productivity by the employee as an impact of change and results in a loss of interest in work. Delayed development means a response to change that leads to diminished motivation within the organizational environment. Rejection of the environment refers to increased conflict by the employee when required to complete a task or interact with a colleague. Refusal to participate often leads to absenteeism at work and it should be noted that absenteeism can be either mentally or physically absent. Withdrawal refers to an increased risk of turnover within the organization. Finally, global is a collective measure of employees' reaction to organizational change.¹⁷ The examples of the CDI survey questions are displayed in Appendix.

Our independent variables included practice size (the number of clinicians who worked at the practice: solo, 2 to 5 clinicians, 6 to 10 clinicians, 11 to 15 clinicians, and ≥ 16 clinicians), practice ownership (independent, hospital-owned, federally qualified health center), practice designation as a

patient-centered medical home (PCMH), and part of an accountable care organization (ACO), whether the practice was located in a medically underserved area, and changes in practice (0-1 changes and 2-3 changes). We chose these measures based on previous research.^{20,23}

Analysis

We performed descriptive statistics to assess the distribution of the 7 measured CDI[®] responses by characteristics of primary care practices. *T-tests* and one-way analysis of variance were performed to examine any significant differences in the average scores of the 7 continuous measures across the various levels of the practice characteristics. In addition, multivariate regression analyses were conducted to assess associations between the 7 domains of CDI and practice characteristics. Results were considered statistically significant at a 0.05 level of significance.

The reliability testing of the CDI was completed and demonstrated high internal consistency and reliability for the assessment of loss of effectiveness.¹¹ A test/retest of the index (on individuals in the pre-implementation stage) using Wilcoxon Signed Rank Test²⁴ resulted in no significant difference between the first test and the second test. Internal consistency reliability testing resulted in a Cronbach's²⁵ Alpha between 85 and 91 on all 7 domains in the CDI. Content validity is demonstrated based on the development of the index from well-established constructs in the fields of employee morale and work preferences, anxiety, stress, frustration, and depression. Face validity was established through multiple reviews by experts in social psychology and organizational behavior.

Results

The results of the analysis are presented by practice size, practice ownership, whether the practice is recognized as a PCMH, practice is part of an ACO, whether the practice is located in a medically underserved area, and the number of changes in the practice. Table 2 presents the distribution of the 6 CDI[®] measures of healthcare professionals' responses to change across several practice characteristics, while Table 3 displays the multivariate associations between the 7 CDI domains and practice characteristics.

Practice Size

On average, healthcare professionals reported significantly higher scores for all CDI[®] measures with increasing practice size, except for those in practices with 11 to 15 clinicians (Table 2). Specifically, the highest average CDI[®] measures were observed among healthcare professionals in practices with 16 or more practicing clinicians, while healthcare professionals working in solo practices had the lowest average scores for all CDI[®] measures. Multivariate analyses revealed

Table 2. Practice Characteristics and the 7 Change Diagnostic Index or CDI Domains of Healthcare Professionals' Reaction to Change.

	The change diagnostic index domains						
	Anxiety mean (SD)*	Frustration mean (SD)*	Retarded development mean (SD)*	Rejection of environment mean (SD)*	Refusal to participate mean (SD)*	Withdrawal mean (SD)*	Global mean (SD)*
Practice characteristics							
Practice size							
Solo	2.29 (0.77)	1.65 (0.66)	1.82 (0.62)	1.70 (0.57)	1.60 (0.56)	1.55 (0.59)	2.01 (0.69)
2-5 clinicians	2.50 (0.86)	1.81 (0.71)	1.96 (0.71)	1.96 (0.77)	1.74 (0.68)	1.72 (0.73)	2.19 (0.78)
6-10 clinicians	2.54 (0.80)	1.86 (0.71)	2.08 (0.69)	2.07 (0.74)	1.77 (0.65)	1.70 (0.69)	2.19 (0.69)
11-15 clinicians	2.30 (0.76)	1.74 (0.68)	2.01 (0.82)	1.86 (0.75)	1.65 (0.71)	1.64 (0.66)	2.03 (0.69)
≥16 clinicians	2.72 (0.85)	2.03 (0.73)	2.27 (0.73)	2.17 (0.77)	1.93 (0.74)	1.90 (0.75)	2.43 (0.81)
P-value*	.006	.002	.001	.001	.049	.065	.006
Practice ownership‡							
Independent	2.43 (.81)	1.72 (0.69)	1.93 (0.69)	1.91 (0.72)	1.67 (0.63)	1.64 (0.68)	2.00 (0.65)
Hospital-owned	2.59 (0.86)	1.91 (0.74)	2.07 (0.74)	2.04 (0.78)	1.82 (0.71)	1.78 (0.75)	2.33 (0.81)
FQHC	2.35 (0.82)	1.72 (0.66)	1.95 (0.72)	1.90 (0.77)	1.66 (0.68)	1.62 (0.67)	2.06 (0.76)
P-value*	.001	.000	.015	.013	.001	.003	.000
PCMH§							
Yes	2.50 (0.84)	1.84 (0.71)	2.01 (0.72)	1.97 (0.75)	1.75 (0.68)	1.71 (0.70)	2.20 (0.76)
No	2.50 (0.85)	1.79 (0.72)	1.99 (0.73)	2.00 (0.78)	1.75 (0.69)	1.71 (0.74)	2.14 (0.75)
P-value*	.927	.339	.682	.479	.993	.879	.159
Part of an ACO‡							
Yes	2.50 (0.85)	1.83 (0.73)	2.01 (0.75)	1.97 (0.77)	1.74 (0.70)	1.71 (0.75)	2.19 (0.77)
No	2.51 (0.82)	1.82 (0.67)	1.99 (0.67)	2.00 (0.74)	1.74 (0.65)	1.70 (0.66)	2.18 (0.73)
P-value*	.814	.908	.682	.631	.945	.866	.822
MUA†							
Yes	2.40 (0.81)	1.76 (0.67)	1.98 (0.72)	1.92 (0.74)	1.71 (0.66)	1.66 (0.68)	2.09 (0.70)
No	2.54 (0.85)	1.83 (0.74)	2.02 (0.74)	2.00 (0.78)	1.76 (0.70)	1.72 (0.76)	2.19 (0.76)
Do not know	2.55 (0.86)	1.90 (0.67)	2.00 (0.67)	1.99 (0.74)	1.77 (0.66)	1.74 (0.65)	2.32 (0.82)
P-value*	.026	.078	.708	.286	.406	.317	.003
Changes in practice							
0-1 changes	2.47 (0.80)	1.78 (0.70)	1.98 (0.73)	1.97 (0.76)	1.72 (0.69)	1.68 (0.70)	2.16 (0.78)
2-3 changes	2.71 (0.85)	1.94 (0.69)	2.09 (0.66)	2.05 (0.68)	1.80 (0.63)	1.83 (0.76)	2.36 (0.76)
P-value*	.002	.011	.077	.209	.191	.021	.005

*T-tests and one-way analysis of variance were performed to examine significant differences in the average scores of the domains of the Change Diagnostic Index of healthcare professionals' responses to change by practice characteristics. P-value entries highlighted in bold indicate statistically significant findings at a P-value ≤ .05.

‡Independent = physician-owned practice; FQHC = federally qualified health center.

§PCMH = patient-centered medical home.

‡ACO = accountable care organization.

†MUA = medically underserved areas.

that healthcare professionals working in practices with at least 16 clinicians had significantly increased average scores ($P < .05$) for all of the CDI domains, indicating a lower aptitude for change, relative to those who worked in solo practices (Table 3). In addition, higher anxiety scores among healthcare professionals were significantly associated with practices that had a size of 6 to 10 clinicians compared to solo ones, while delayed development significantly increased in healthcare professionals who worked in practices of 6 to 10 and 11 to 15 clinicians relative to solo ones. Increased levels of rejection of environment were observed among healthcare professionals even in those practices with 2 to 5 clinicians compared to solo practices.

Practice Ownership

The study assessed CDI[®] scores across different types of ownership including independently owned practices, health system-owned practices, and federally qualified health centers (FQHC). Findings revealed statistically significant differences

in the average scores among healthcare professionals for all CDI[®] measures across the different types of practice ownership. The healthcare professionals who worked at health system-owned practices had significantly higher CDI[®] measures, indicating a lower aptitude for change, than those who were employed at independent practices or at the FQHCs (Table 2). In addition, in the multivariate analyses (Table 3), we observe a similar pattern of a significantly lower aptitude for change in healthcare professionals who worked in hospital-owned practices, but not in FQHC, compared to independent practices.

PCMH and ACO

The study assessed differences in CDI[®] scores based on whether the practice was certified as a PCMH or participated in an ACO (Table 2). No significant differences were found in the average CDI[®] scores of healthcare professionals employed at PCMH accredited practices versus those who worked at non-PCMH ones; and between those who worked at practices that were part of an ACO and those that were not.

Table 3. Multivariate Regression Analysis Assessing Associations between Practice Characteristics and the 7 Change Diagnostic Index or CDI Domains of Healthcare Professionals' Reaction to Change.

	The change diagnostic index domains						
	Anxiety β^* , P-value	Frustration β^* , P-value	Delayed development β^* , P-value	Rejection of environment β^* , P-value	Refusal to participate β^* , P-value	Withdrawal β^* , P-value	Global β^* , P-value
Practice characteristics							
Practice size							
Solo	Reference	Reference	Reference	Reference	Reference	Reference	Reference
2-5 clinicians	0.23, 0.079	0.15, 0.160	0.09, 0.373	0.24, 0.042	0.13, 0.223	0.16, 0.153	0.09, 0.406
6-10 clinicians	0.29, 0.030	0.22, 0.052	0.27, 0.020	0.39, 0.001	0.18, 0.088	0.17, 0.137	0.14, 0.247
11-15 clinicians	0.18, 0.276	0.22, 0.106	0.28, 0.045	0.26, 0.087	0.19, 0.144	0.19, 0.165	0.11, 0.445
≥ 16 clinicians	0.22, 0.009	0.47, 0.012	0.54, 0.004	0.62, 0.002	0.49, 0.005	0.45, 0.015	0.61, 0.002
Practice ownership [‡]							
Independent	Reference	Reference	Reference	Reference	Reference	Reference	Reference
Hospital-owned	0.25, 0.002	0.24, 0.000	0.26, 0.000	0.25, 0.000	0.24, 0.000	0.21, 0.002	0.38, 0.000
FQHC	0.01, 0.976	0.02, 0.807	0.11, 0.237	0.09, 0.312	0.05, 0.599	0.03, 0.774	0.09, 0.343
PCMH [§]							
Yes	Reference	Reference	Reference	Reference	Reference	Reference	Reference
No	-0.001, 0.891	0.001, 0.980	0.04, 0.554	0.07, 0.237	0.04, 0.466	0.03, 0.614	-0.01, 0.808
Part of an ACO [‡]							
No	Reference	Reference	Reference	Reference	Reference	Reference	Reference
Yes	-0.17, 0.021	-0.08, 0.181	-0.09, 0.127	-0.13, 0.055	-0.11, 0.078	-0.08, 0.183	-0.13, 0.048
MUA [†]							
Yes	Reference	Reference	Reference	Reference	Reference	Reference	Reference
No	0.18, 0.035	0.08, 0.249	0.10, 0.158	0.14, 0.057	0.29, 0.211	0.09, 0.188	0.11, 0.153
Do not know	0.04, 0.674	0.07, 0.352	-0.03, 0.745	-0.01, 0.924	-0.01, 0.930	0.03, 0.726	0.08, 0.371

* β (beta) denotes the multivariate regression coefficients associated with the practice characteristics in predicting responses to change for the 7 domains of the Change Diagnostic Index among healthcare professionals. P-value entries highlighted in bold indicate statistically significant findings at a P-value $\leq .05$.

[‡]Independent = physician-owned practice; FQHC = federally qualified health center.

[§]PCMH = patient-centered medical home.

[‡]ACO = accountable care organization.

[†]MUA = medically underserved areas.

In the multivariate analyses (Table 3), being part of an ACO was associated with significantly lower levels of anxiety and global among healthcare professionals ($P < .05$).

Medically Underserved Area

The study assessed differences in CDI[®] scores between practices located in medically underserved areas (MUA), which are geographic areas in the U.S. with physician shortages, and practices not located in a designated underserved area. Findings revealed that healthcare professionals working at practices located in medically underserved areas had significantly lower anxiety scores on average compared to those whose practices were not located in a designated underserved area (see Table 2). Indeed, in the multivariate analyses (Table 3), we found that healthcare professionals had significantly higher levels of anxiety ($P < .05$) if they worked in practices that were not located in MUA areas relative to those who worked in designated underserved area practices.

Changes in the Practice

Overall, in practices that implemented more than 1 change, healthcare professionals experienced significantly higher average scores for anxiety, frustration, and withdrawal relative to those who worked at practices that experienced no changes

or 1 change. We did not include the variable changes in the practice in the multivariate regression models due to the large percentage of missing data associated with this variable.

Discussion

We found healthcare professionals' behavioral responses to change generally decreased as the practice size increased, indicating a lower aptitude for change. Of particular interest is the higher anxiety levels experienced by healthcare professionals in larger practices. The finding indicates that individuals working in larger primary care practices experience greater stress related to additional layers for decision-making, and/or more communication problems during major change efforts. The symptomatic response identified by the CDI[®] means that high levels of anxiety could lead to decreased morale. Previous research on the development of the CDI[®] established decreased morale to be related to the effectiveness of organizational leadership.¹⁷ This study finding also identifies decreasing change ability based on high levels of anxiety, frustration, rejection of the environment, delayed development, refusal to participate and withdrawal as the numbers of clinicians at the practice increased.

We also found substantial variation in behavioral responses to change by practice ownership. The healthcare professionals who worked at the hospital-owned practices

had a higher level of negative behavioral responses to change compared to those who worked at the independent practices or at FQHCs. The finding indicates that healthcare professionals who work at hospital-owned practices may be under more pressure while going through change compared to counterparts who work at independent practices. Similar to our findings, previous research revealed hospital-owned practices had a lower level of organizational change capacity score (ability to change) compared to independently owned practices.²³ Further, higher CDI scores (ie, anxiety, frustration) among healthcare professionals who work at the hospital-owned practices could be the result of bureaucracy, additional layers of process approval, and varying leadership priorities within the organization.⁶ This finding also highlights the risks involved with hospital ownership of primary care practices.²⁶ Overall, future studies should investigate the reasons for the negative response toward change among healthcare professionals working in hospital-owned practices.

Another finding was healthcare professionals who worked at practices located in medically underserved areas had lower anxiety scores compared to those whose practices were not located in an underserved area. Our finding of a lower level of anxiety in medically underserved areas may indicate increased autonomy, leadership support for the change, and/or lower levels of external pressure in those practices. We also found healthcare professionals who work at a practice that is part of an ACO had lower levels of anxiety, indicating a higher aptitude for change. Another study found practices that were part of an ACO had a higher change capacity score.²³ These findings suggest that being part of an ACO provides an advantage to practices during the transformation efforts.

Limitations

Our study has several limitations. First, the cross-sectional study design limited the data collection and analysis by

focusing only at one point in time. We were not able to analyze the relationship between the overall change implementation and responses to change by healthcare professionals. Second, this study analyzed self-reported survey data, and responses to the survey questions might be biased. Third, the association between practice ownership and the CDI outcomes may be causally driven by other reasons such as centralized organizational structure or priority of the practice. Fourth, the study analyzed data from practices in Virginia, which cannot be generalizable.

Implications for Practice and Policy

This study contributes to the literature by examining the symptomatic behavioral response to change in primary care. The findings suggest primary care practice change/transition success should be based on a data-driven, proactive change mitigation strategy. The primary focus of this strategy should be a well-defined policy related to the change process, and recognition of human factors that are often overlooked. Understanding the dynamic factors associated with change in primary care practice will support healthcare leaders and policymakers design and implement more successful change management strategies.

Conclusion

Our findings are important, because higher CDI scores may give early signals to leaders and primary care practices to prevent unprecedented consequences of major change efforts such as decreased morale, productivity, and motivation, or increased conflict, absenteeism, and turnover. Primary care practice leaders and policymakers should consider individual symptoms and behavioral responses to change when designing future change interventions to prevent undesirable consequences.

Appendix.

Examples of the CDI^a Questions.

Anxiety	“When my employment organization goes through change, I frequently feel tense or nervous.”
Frustration	“I believe the future at my place of employment is hopeless.”
Delayed development	I feel fear when my work colleagues react negatively to my ideas.”
Rejection of the environment	“I communicate infrequently with individuals at my place of employment and often feel disconnected.”
Refusal to participate	“I would rather call-in sick than deal with another day of controversy at my place of employment.”
Withdrawal	“I do not like the work I have to perform at my employment organization, and I am regularly investigating other career opportunities.”
Global	“It is disruptive to me that so many changes are occurring at my place of employment.”

^aThe Change Diagnostic Index[®] (CDI) identifies the human behaviors, attitudes, and perceptions that exist beneath the surface in individuals confronting or experiencing change. The CDI measures the collective individual readiness/response to change. Based on the measurement of specific symptoms, the CDI defines real-time data that will support the collection, aggregation, and presentation of the human data within the organization.

Declaration of Conflicting Interests

The author(s) declared the following potential conflicts of interest with respect to the research, authorship, and/or publication of this article: T. Soylu, D. Goldberg, and P. Kitsantas report no conflict of interest. V. Grady and J. Grady report proprietary interest in the Change Diagnostic Index[®] instrument.

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