



A Project to Enhance Physician Resilience and Mitigate the Risk of Burnout

IN PARTNERSHIP WITH



Acknowledgments



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neurozone[®]
THE SCIENCE OF BRAIN PERFORMANCE

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An Exploratory Study

Overview

Physician well-being is equally important to patients as well as to the physicians themselves. Indeed, it is crucial to the functioning of our entire system of healthcare delivery. However, physicians work in a profession subject to high levels of stress and are at risk for experiencing the phenomenon of burnout. This inherent risk is likely to be further magnified by the isolation of rural healthcare settings where solutions like wellness programs may be impractical to deliver.

This project ultimately aims to create a unique solution that allows physicians to enhance their personal resilience and more effectively mitigate the risk factors for burnout on an ongoing basis. Of particular interest is to identify informed, systematic improvement opportunities to reduce physician burnout in medical and health institutions.

This initial exploratory study set out to test the Neurozone Brain Performance Diagnostic on physicians, explore any correlations between the assessment and Mayo Clinic's Well-Being Index, and determine whether coaching and facilitated group sessions implemented by It's Elation, Inc., could lead to a decrease in indicators that lead to physician burnout. This was a collaboration between St. Vincent Healthcare (part of SCL Health), It's Elation, Inc., Rocky Mountain College, and Neurozone (Pty) Ltd.

Research Questions

1. What aspects of the ten key drivers that contribute to optimization of performance (as defined by Neurozone) are shown to be strongest when measured in physicians?
2. What aspects of the ten key drivers that contribute to optimization of performance (as defined by Neurozone) are shown to be weakest when measured in physicians?
3. Can the Neurozone content, supported by It's Elation, Inc. coaching and Master Your Mindset™ facilitated group sessions, improve the ten key drivers that contribute to optimization of performance?
4. Will improvement of the ten key drivers that contribute to optimization of performance lead to a decreased risk of physician burnout?

Population

The target population for this study was a group of physicians at St. Vincent Healthcare & SCL Health in Montana. For this initial exploratory study we invited 20 participants. All 20 participants were volunteers, and were identified and recruited by SCL Health in Montana. All participants signed a voluntary consent form (Appendix D).

Of the participants who completed both the baseline survey and post-intervention survey measures, 33.3% identified themselves as female, and 66.7% identified themselves as male. The ages ranged from 32 to 64 years old, and the majority (60%) were in the 40-49 years old group. Ethnicity and other demographic information was not asked in this initial pilot study. Of the 20 initial study participants, 15 (66.7%) completed the entire study and follow-up survey.

Specialties reported by the participants that completed the entire study included the following: family medicine, radiology, anesthesia, internal medicine, pediatrics, surgery subspecialty, palliative care, and hematology-oncology.

Methods

Once all participants had been identified, It's Elation, Inc. (Elation) then contacted each participant with an introductory email that included the link to their Neurozone® Brain Performance Diagnostic (BPD), the 9-item Mayo Well Being Index (WBI; see Appendix A), and supplemental questions aimed at assessing physicians' perceptions to systemic burnout issues in their parent organization (Appendix B). Participants were asked to complete this task within one week.

During the 90-day intervention period there were 4 facilitated sessions, measuring out to once every 30 days (Day 0= Initial meeting; Day 30 = Meeting 2; Day 60 = Meeting 3; Day 90 = Meeting 4). These sessions were completed in groups, with an Elation coach facilitating each group session. Group meetings were scheduled through discussion with physicians to accommodate the most readily available open time in their schedule. All group sessions lasted 60 minutes.

In between these facilitated sessions there were private, one-on-one coaching sessions, also facilitated by Elation. The Rocky Mountain College researcher was not privy to these one-on-one coaching sessions, as they were intended to be private and confidential. Hence, the focus of this write-up will be on the Survey Results and Facilitated Group Sessions.

Upon the completion of the final facilitated group sessions, the physicians once again retook the WBI, the BPD, and answered the supplemental organization questions. The quantitative data from the pre- and post-assessments was analyzed by Dr. Pertuit of Rocky Mountain College, in collaboration with analytics and graphics from Neurozone to determine if there were any changes in scores resulting from all intervention activities.

SURVEY RESULTS: Overview

Well-Being Index Overview

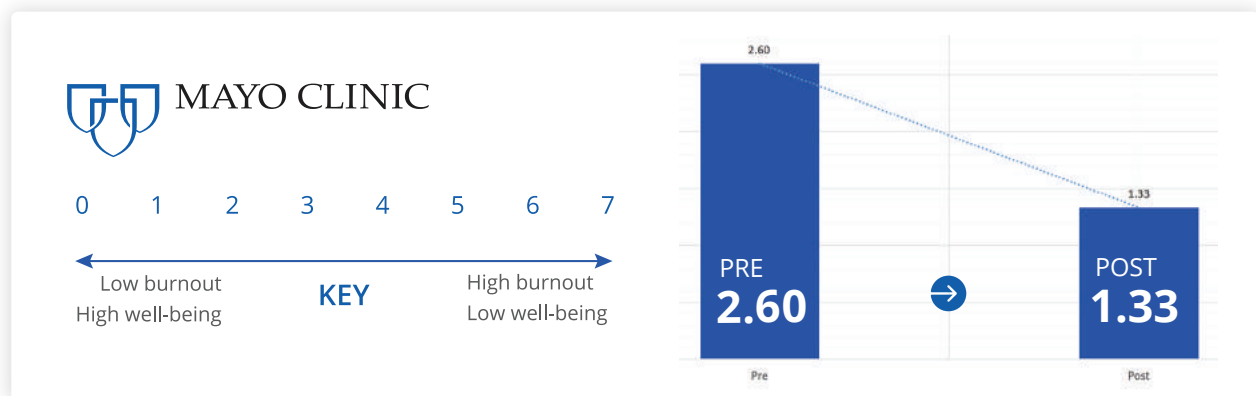
Numerous national cohorts consisting of tens of thousands of physicians have shown that the WBI is a valid and useful tool to identify those at risk for low quality of life, high fatigue, suicidal ideation and burnout. In particular, the 9-item (as opposed to the original 7-item) WBI includes two items intended to assess work-life integration and meaning in work. The ability of the WBI to stratify individuals in distress and stratify individuals with more positive well-being makes it an extremely useful tool for organizations to quickly assess the overall physician burnout risk.

The WBI is an extremely useful screening instrument because it is brief (takes less than one minute to complete), simple to score and analyze, and has national benchmark data.

The WBI can be used frequently to assess physicians' current level of well-being and to gain insights into whether their current level of distress is placing them at risk for potentially serious consequences. Receiving such information has been shown in a large study of US surgeons to prompt consideration of behavioral change to promote well-being across a number of dimensions. This sentiment was echoed in the pilot study: "Knowing my WBI number made me realize I needed to make some changes for myself before it was too late."

Dyrbye, Satele, and Shanafelt (2016) claim that the WBI is useful for organizations "to encourage help-seeking behaviors before distress places individuals at higher risk for an adverse personal or costly professional consequence. In addition, employee scores could be aggregated and de-identified by a third party to allow for reports of scores being used to explore well-being of employees by a variety of demographic factors (years employed, age, sex, job category) and track well-being over time to gain insight into potential ramifications of new organization strategy on employee satisfaction, retention, and well-being. Data suggests workplace-based interventions for workers with common mental health conditions can improve work disability outcomes, work function and productivity, and reduce cost."

In the pilot study the average score for the physicians was 2.60, which puts them above the burnout risk threshold of 2.0 (See the next page for a more in-depth breakdown of the WBI). However, after the individual and group sessions we saw the score drop below the burnout threshold to an average 1.33. **This WBI score change is one of the most significant changes in terms of relevance to physician resilience.**



Sample Well Being Index

1. Email address *

2. During the past month, have you felt burned out from you work? *

Mark only one oval.

- Yes
 No

3. During the past month, have you worried that your work is hardening you emotionally? *

Mark only one oval.

- Yes
 No

4. During the past month, have you often been bothered by feeling down, depressed, or hopeless? *

Mark only one oval.

- Yes
 No

5. During the past month, have you fallen asleep while sitting inactive in a public space? *

Mark only one oval.

- Yes
 No

6. During the past month, have you felt that all things you had to do were piling up so high that you could not overcome them? *

Mark only one oval.

- Yes
 No

7. During the past month, have you been bothered by emotional problems (such as feeling anxious, depressed, or irritable)? *

Mark only one oval.

- Yes
 No

8. During the past month, has your physical health interfered with your ability to do your daily work at home and/or away from home? *

Mark only one oval.

- Yes
 No

9. The work I do is meaningful to me. *

Mark only one oval.

	1	2	3	4	5	6	7	
Strongly Disagree	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Strongly Agree

10. My work schedule leaves me enough time for my personal/family life. *

Mark only one oval.

	1	2	3	4	5	6	7	
Strongly Disagree	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Strongly Agree

Each of the original 7-item WBI items is answered “yes/no” with 1 point assigned for each “yes” response. A total score (0 – 7) is calculated by adding the number of “yes” responses. In samples of physicians and medical students, every one point increase in score results in a step-wise increased probability of distress and risk for adverse personal or professional consequences.

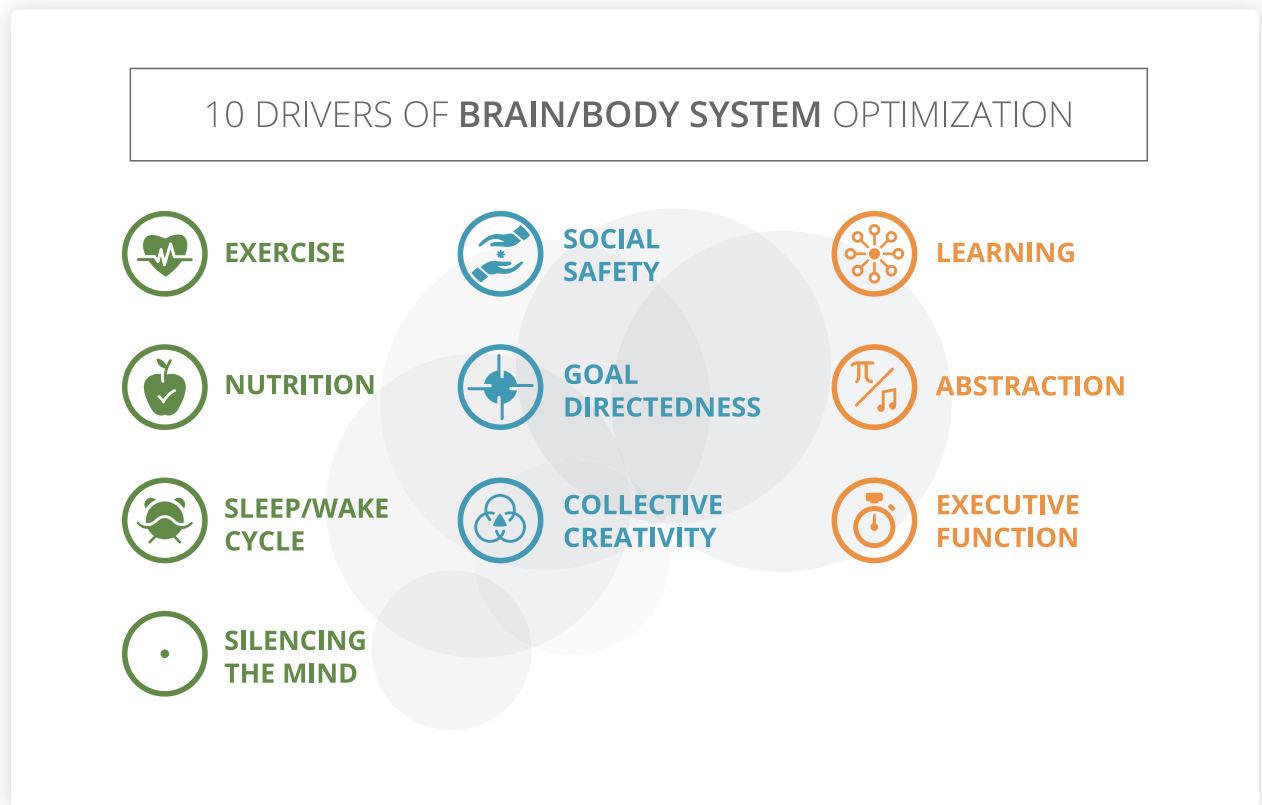
Pooled analysis in over 13,000 medical students, residents/fellows, and physicians indicate that the WBI can identify individuals in distress, as well as identify those individuals whose degree of distress places them at risk for adverse professional consequences (i.e. making medical error, low career satisfaction, intent to leave current position/medical school).

The expanded 9-item version of the WBI includes two additional items for assessing meaning in work and satisfaction with work life integration. Individuals who indicate a low level of meaning in work or work life balance (1 or 2 on the 7-point Likert scale) have 1 point added to their score while those who answer favorably (response option of a 6 or 7) have 1 point subtracted from their score. No adjustment to total score is made for those who indicate a neutral level (response option of 3 to 5). Accordingly, the total score for the WBI ranges from -2 to 9.

Neurozone Brain Performance Diagnostic (BPD) Overview

The main purpose of the BPD, according to Neurozone, is to help individuals optimize their brain/body systems to reach a state of thriving and high performance. The Neurozone methodology to accomplish this is by linking neuro-behavioral markers with human competencies for optimization of the brain/body system.

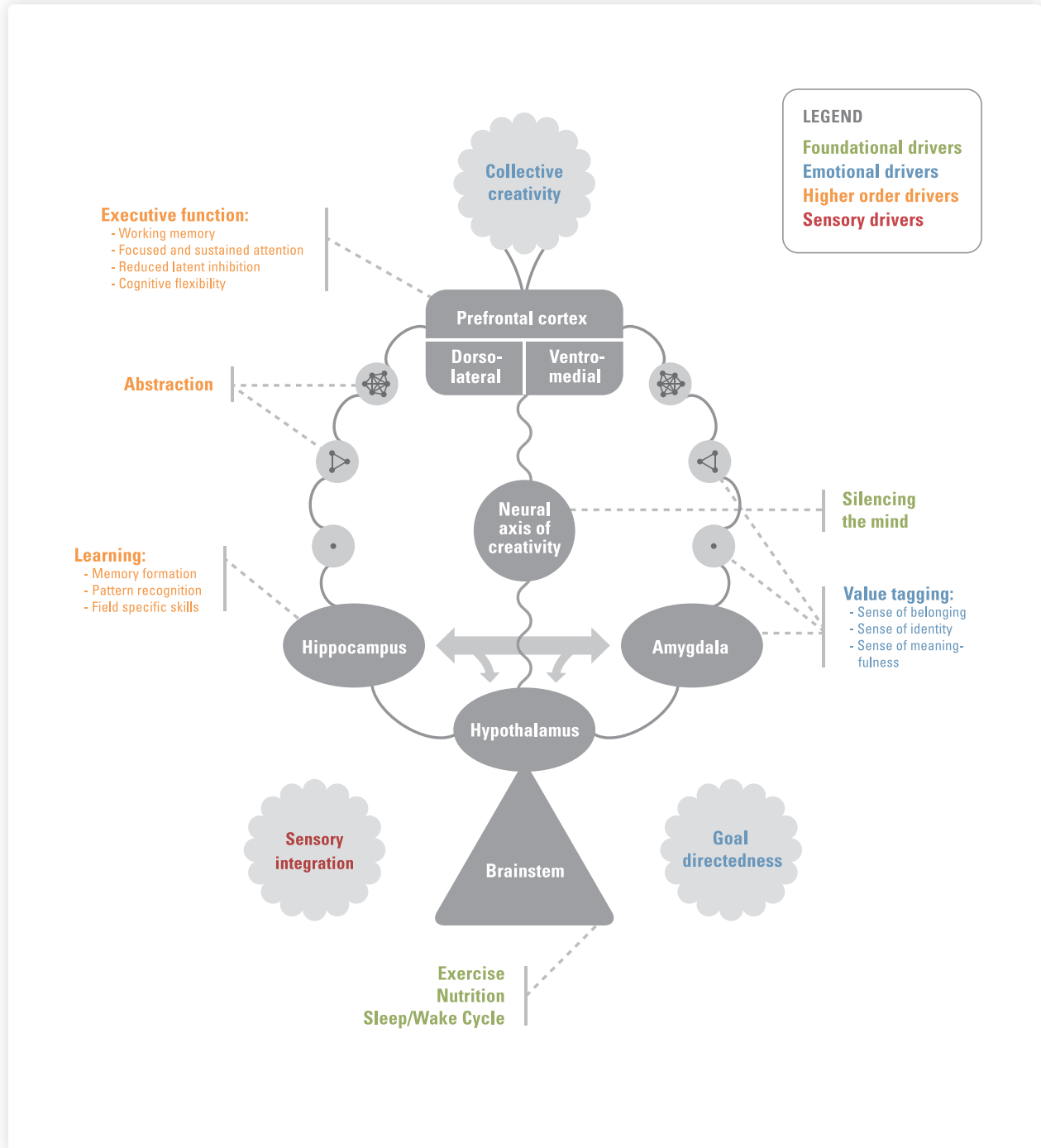
The ten neuro-behavioral markers, more simply called “drivers,” identified by Neurozone that most affect the brain/body system are:



All of the drivers are grouped according to corresponding brain anatomy and functionality. The drivers in green above make up the Foundational Drivers; the blue are the Emotional Drivers; and the orange are the Higher Order Drivers. The Foundational Drivers correspond structurally to the brainstem, the hypothalamus, and the proposed neural axis of creativity; the Emotional Drivers correspond to the amygdala, ventromedial cortex and prefrontal cortex; and the Higher Order Drivers to the hippocampus, dorsolateral pathways and prefrontal cortex. (Please see the next page for a graphical overview of these drivers.)

The brain is a complex system in which the performance capacity of each driver affects the system as a whole. For example, nutrition, sleep and exercise are three of the most essential brain performance drivers. If just one of these is even marginally neglected, brain performance will be affected. This is the basis for measuring behaviors to correlate brain performance.

The Neurozone Model of Brain Performance: Drivers

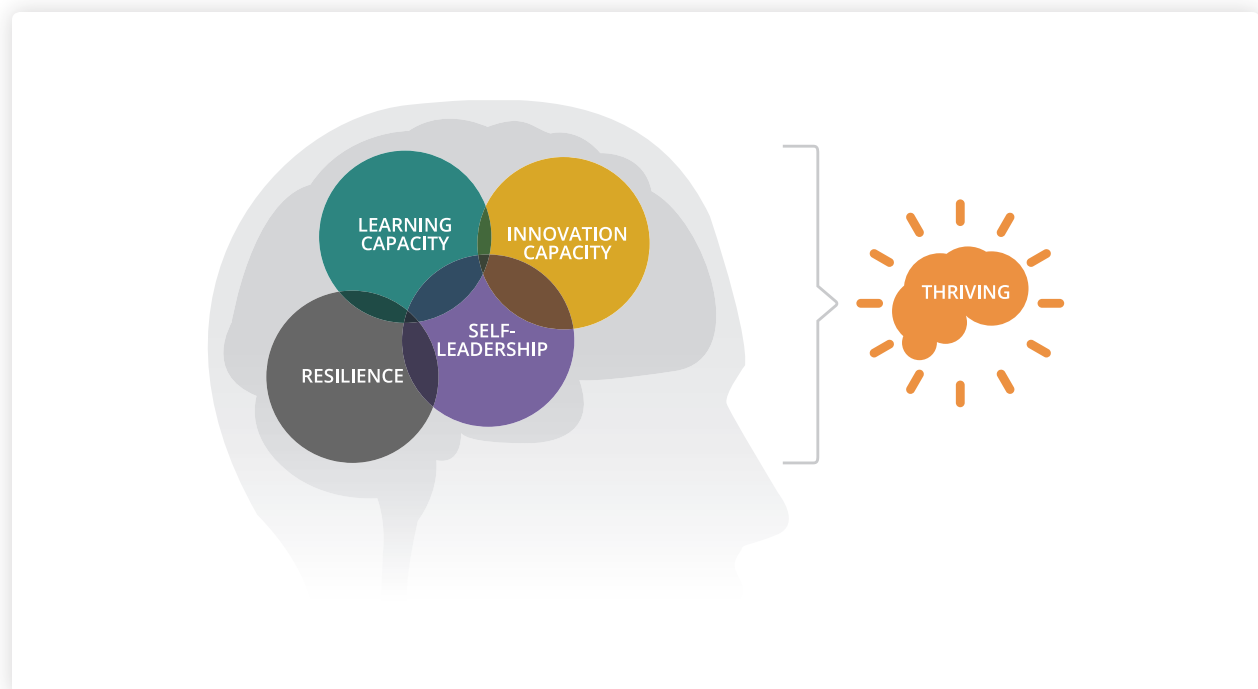


According to Neurozone, even though the brain consists of many different structures with well recognized, independent functions, it always performs as one system. The most sophisticated part of the system, namely the prefrontal cortex, is directly affected by how you breathe, by how much you move, and by whether you get a good night's sleep. From the most basic to the most sophisticated, everything affects everything, and for the brain to thrive, it needs to be optimized as one system.

From a neuroscientific perspective, the following major factors need to be in place for the brain to thrive:

- a) A baseline relaxed physiological state: a state of silent alertness in which the brain is ready to respond to threats and opportunities, big and small.
- b) An appropriate and well-developed reward system to guide goal-directed behavior and to achieve higher and higher order rewards.
- c) The ability and the opportunity to bond. Bonding first occurs at the moment of birth, sustaining us in our most important relationships throughout life.
- d) Meaningful co-existence in a group in the knowledge that I know myself, I make a meaningful contribution, and I am embraced by my group.
- e) Unconscious focus: this requires a well-regulating, creative, problem-solving prefrontal cortex with the ability to focus our attention and to sustain it.
- f) The ability to grow new neurons and multiply connections as needed where growth factors are readily available for neurogenesis and neuroplasticity.
- g) Finally, an accurate internal representation of what is out there: a problem-solving ability to make sense of the physical and emotional world, allowing us to meet and overcome life's challenges.

In this model of brain performance, Neurozone identifies four major conditions for individuals and organizations to thrive. These are Resilience, Self-leadership, Learning Capacity and Innovation Capacity.



This overall model for thriving and optimal brain performance, where the ten key drivers feed into the four major conditions, is called the “FourCore” model, and can be represented by the following diagram:



Of particular importance to this study is the concept of “Resilience.” Resilience is a dynamic human capacity without which we could not survive. Unlike inert resilient objects with the capacity to ‘bounce back’ to their original state, we have the ability to not only bounce back but to keep building resilience to more effectively deal with future stressful of events. Effective integration of the brain performance drivers will build resilience.

Resilience is the capacity of the Brain/Body System to withstand the challenges that threaten its stability. By scrutinizing published and peer-reviewed research, Neurozone has identified and isolated the seven behaviors required to enhance resilience: Exercise, Nutrition, Sleep/Wake Cycle, Silencing the Mind, Social Safety, Goal Directedness and Collective Creativity.

Resilience is an active and adaptive process. For example, the brain actively and continuously adapts at a molecular and neuronal level in the presence of a stressor. This adaptive capability determines its resiliency. Enhanced resilience helps optimize performance of the Brain/Body System under stress and sets an individual up to operate at their best in all conditions.

Resilience, as defined by the drivers that make up the score on the BPD assessment, is modeled below:



Physician Results Overview

The following results were observed in the pre-intervention and post-intervention BPD assessment for the physicians.

All scores are based off a 100-point scale, all scores are from the self-assessed battery of questions that are the copyrighted property of Neurozone. These questions ask about behaviors within each of these drivers (i.e. "Do you go to sleep at approximately the same time each day in your work week?" Answer choices are then: Never, Sometimes, Often, or Always; or in another domain: "I identify with the values of my family and friends," and the choices are: Strongly Disagree, Disagree, Neutral/Unsure, Agree, and Disagree.)

The "norms" listed next to each graph come from thousands of individuals assessed by Neurozone in other business domains.

All statistically significant changes are denoted by an asterisk (i.e. "Exercise*" means that the mean score change for Exercise was statistically significant, at $p < .05$).

FourCore Scores Overview

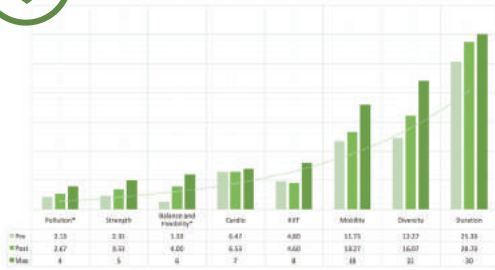


FourCore Scores: Foundational Drivers

EXERCISE*



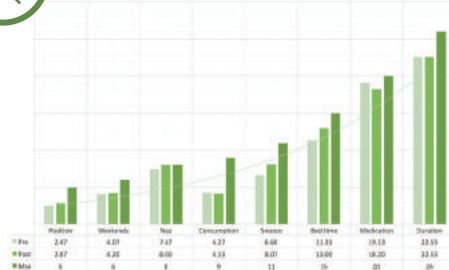
BEFORE **66.40** → AFTER **79.40** (Norm 51)



SLEEP/WAKE CYCLE



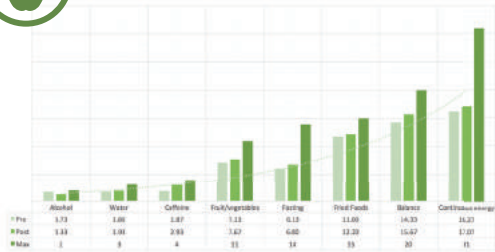
BEFORE **77.87** → AFTER **81.00** (Norm 57)



NUTRITION



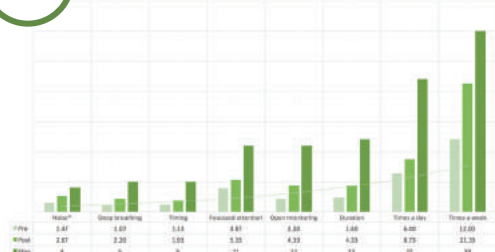
BEFORE **61.10** → AFTER **65.60** (Norm 51)



SILENCING THE MIND*



BEFORE **30.53** → AFTER **50.87** (Norm 31)

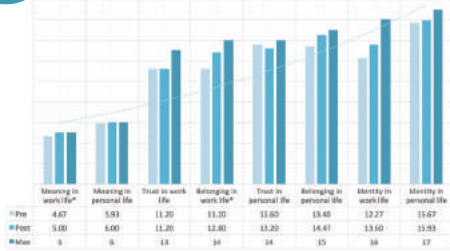


FourCore Scores: Emotional Drivers

SOCIAL SAFETY



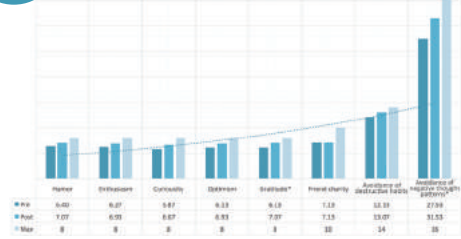
BEFORE **87.93** → AFTER **92.20** (Norm 70)



GOAL DIRECTEDNESS*



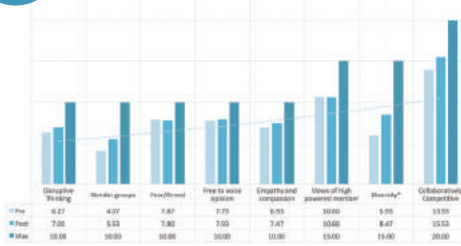
BEFORE **77.60** → AFTER **86.40** (Norm 60)



COLLECTIVE CREATIVITY



BEFORE **63.33** → AFTER **70.33** (Norm 56)

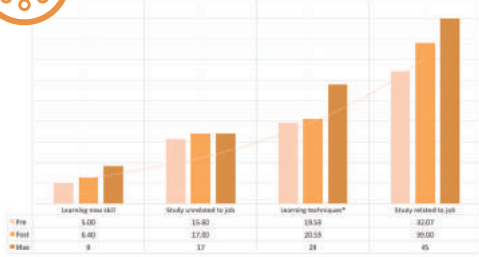


FourCore Scores: Higher Order Drivers

LEARNING



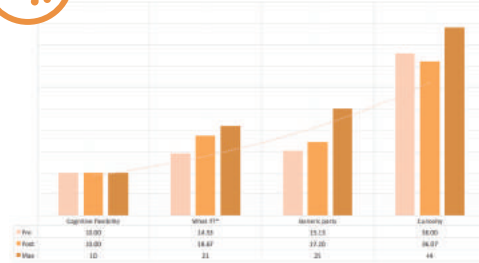
BEFORE **72.20** → **82.93** (Norm 52)



ABSTRACTION



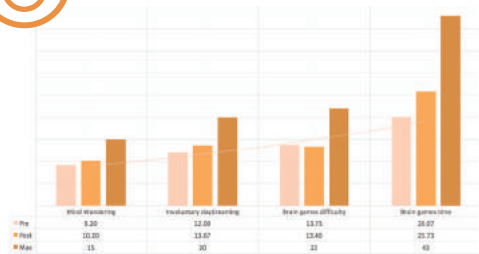
BEFORE **77.67** → **81.93** (Norm 62)



EXECUTIVE FUNCTION



BEFORE **55.00** → **63.00** (Norm 45)



SURVEY RESULTS: Research Questions

1. What aspects of the ten key drivers that contribute to optimization of performance (as defined by Neurozone) are shown to be strongest when measured in physicians?

The top three drivers that scored the highest in the pre-intervention assessment were:

1. Social Safety (87.93)
2. Sleep/Wake Cycle (77.87)
3. Abstraction (77.67)

SOCIAL SAFETY is an unconscious mental evaluation that precedes almost all of our actions. The brain assigns a value to complex sensory cues, asking: “Do I belong here?” “Is this me?” “Does this give me meaning?” The amygdala, ventromedial pathways and the ventromedial prefrontal cortex facilitate social safety and are richly interconnected with the dorsolateral pathways and the dorsolateral prefrontal cortex (our “problem-solving machine”). These systems screen solutions for relevance and appropriateness. The scores for Social Safety in this study were compiled from questions to evaluate the change in each participant’s sense of identity, belonging, perceived trust, and sense of meaning.

SLEEP/WAKE CYCLE: Sleep is a rhythm as essential as our breathing patterns or heartbeat, except that its rhythm is an optimum 7 to 9 hours in 24. But we don’t just sleep to rest. Sleep and wake cycles have been shown to be highly active brain states regulated by the hypothalamus and brainstem. During sleep the brain builds and consolidates memory via the hippocampus and facilitates challenging problem-solving at the level of the dorsolateral pathways and dorsolateral prefrontal cortex. The scores for Sleep/Wake Cycle in this study were compiled from questions to evaluate the change in each participant’s quality and consistency of sleep habits, including body position and dependency on sleep medications.

ABSTRACTION is the capacity to form novel conceptualizations of possibilities based on hypothetical groupings of non-obvious patterns and their relationships. Abstraction draws upon knowledge as the building blocks of innovation, and largely takes place in the dorsolateral pathways. These pathways are sometimes referred to as the ‘super highway’ in route to the dorsolateral prefrontal cortex, where the most sophisticated problem solving takes place. The scores for Abstraction in this study were compiled from questions to evaluate the change in each participant’s level of curiosity, inclination towards abstract thinking and cognitive flexibility.

The top three drivers that scored the highest in the post-intervention assessment were:

1. Social Safety (92.2)
2. Goal Directedness (86.40)
3. Learning (82.93)

Social Safety stayed on top of the list. It improved, but not statistically significantly. The two new drivers in the post-assessment that became part of the top three strongest scores were Goal Directedness and Learning. Of the three in this list, only Goal Directedness was statistically significant ($p < .05$).

GOAL DIRECTEDNESS is an unconscious brain state essential for goal achievement. This is not the same as goal setting. Simply put, our goal is to stay alive, survive and ultimately to thrive. To achieve this, the brain has developed a system that avoids threats and seeks rewards. The striatum (not shown here) directs our attention to stimuli. In addition, the amygdala, ventromedial pathways and ventromedial prefrontal cortex play an important role in goal-directed behavior. The scores for Goal Directedness in this study were compiled from questions to evaluate the increase in each participant's positive social character traits and decrease in each participant's negative social character traits. These included negative thought patterns and destructive habits, charity, enthusiasm and gratitude, among others.

LEARNING: The brain learns and builds new knowledge by forming memories. The hippocampus is the key structure in this process. It feeds knowledge to the appropriate long-term memory sites where it can be used as the building blocks of innovation. Learning can be enhanced by harnessing a characteristic of the brain called neuroplasticity, which describes its ability to form new circuits and pathways based on experiences. This happens primarily in the hippocampus. Neurozone also introduces a term they dub 'Hippocampal Fitness'. This refers to the state of the hippocampus when it is most ready to learn, filled with good nourishing growth factors and budding new circuits. The scores for Abstraction in this study were compiled from questions to evaluate the change in each participant's inclination towards learning.

2. What aspects of the ten key drivers that contribute to optimization of performance (as defined by Neurozone) are shown to be weakest when measured in physicians?

The three drivers that scored the lowest in the pre-intervention assessment were:

1. Silencing the Mind (30.53)
2. Executive Function (55.00)
3. Nutrition (61.10)

With **Silencing the Mind (STM)** we refer to purposeful sessions to enhance focus and/or to examine thoughts without reacting, thereby preventing worrying about the future or regretting the past, also referred to as mindfulness. Studies show that silencing your mind for just 15 minutes daily will positively affect the whole brain/body system. Among many benefits, this promotes a relaxed physiological state at the level of the hypothalamus and amygdala and enhances the ability to focus and sustain attention at the level of the dorsolateral prefrontal cortex. It promotes brain cell formation in the hippocampus and reduces the sensitivity of the amygdala, calming it down and promoting clarity of mind through proper activation of the prefrontal cortex. Scores for this driver were compiled from questions to evaluate the change in frequency, duration, and application of techniques in each participant's practice of silencing the mind.

EXECUTIVE FUNCTION is assigned to the dorsolateral prefrontal cortex (the outer top part of the frontal lobe). Regarded as the CEO of the brain, this is where the most sophisticated and enriched thinking takes place. The dorsolateral prefrontal cortex is interrelated with the ventromedial prefrontal cortex (the inner bottom part of the frontal lobe). Important aspects of Executive Function include working memory, focus and sustained attention. Scores for this driver were compiled from questions to evaluate the change in tendency for each participant's mind to wander and in each participant's use of brain training games.

NUTRITION: Fueling the brain properly requires an adequate supply of available glucose (carbohydrates). While the brain constitutes only 2% of the body's total mass, it uses approximately 20% of its energy and requires a steady supply of fuel. The brainstem and hypothalamus regulate cyclical intake of nutrients, while low GI-type foods ensure a sustained supply of energy for the brain and body. Scores for this driver were compiled from questions to evaluate the change in each participant's intake of foods that improve or hinder brain and body energy levels.

The top three drivers that scored the lowest in the post-intervention assessment were:

1. Silencing the Mind (50.87)
2. Executive Function (63.00)
3. Nutrition (65.60)

Although these three stayed in the same order from pre- to post-intervention assessments, they all went up in score. Silencing the Mind had the greatest overall gains and was the most statistically significant of any of the measures assessed ($p < .001$).

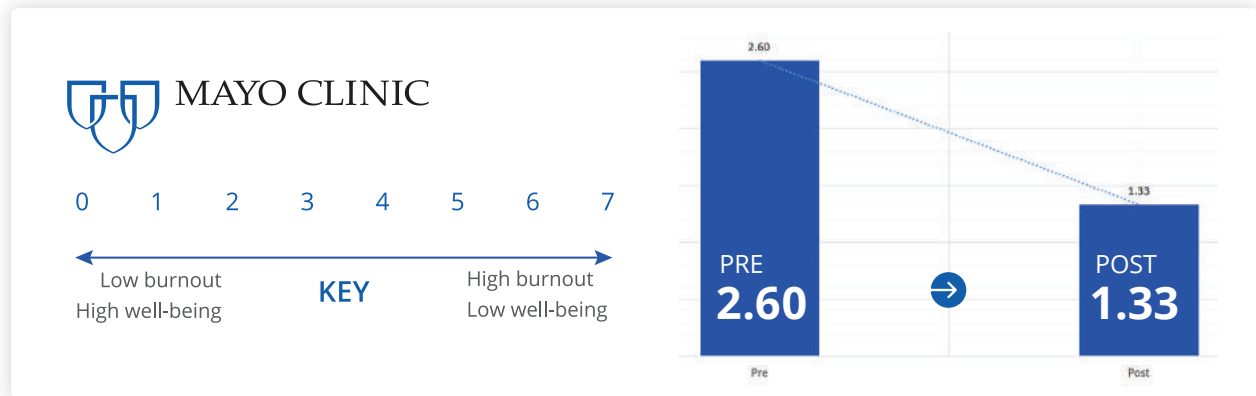
3. Can the Neurozone content, supported by It's Elation, Inc. coaching and *Master Your Mindset™* facilitated group sessions, improve the ten key drivers that contribute to optimization of performance?

As shown in the graphs found in the preceding pages, the conclusive answer is: yes. All ten drivers that contribute to optimization of performance increased after the coaching intervention from Elation. Three of those (Exercise, Silencing the Mind, and Goal Directedness) had statistically significant increases ($p < .05$). Additionally, there were statistically significant gains in all FourCore conditions to optimize an individual's ability to thrive (Self-Leadership, Innovation Capacity, Learning Capacity, and Resilience). Finally, the optimized Brain/Body system score also significantly increased from pre- to post-assessment.



4. Will improvement of the ten key drivers that contribute to optimization of performance lead to a decreased risk of physician burnout?

Physician burnout risk threshold was defined in this study as having a 9-item WBI score of 2.0 or greater. As shown earlier, the average physician's WBI score pre-intervention was 2.60. After the Elation individual and group sessions over the 90 days of the study, the average WBI score saw a statistically significant decrease down to 1.33: over a full standard deviation lower.



This change demonstrates that the coaching interventions do indeed show a strong correlation to lowering the risk of physician burnout. Another area of particular interest to this study was the examination of whether there were also correlations between the Neurozone FourCore model of brain performance and the well-documented WBI scores in regard to a physician population. The correlations between the four major conditions for individuals to thrive (Resilience, Self-leadership, Learning Capacity and Innovation Capacity) and the Optimized Brain/Body System scores with the WBI are shown below.

CORRELATION MATRIX

Well-Being Index (WBI)	Self-Leadership Index	Innovation Capacity Index	Learning Capacity Index	Resilience Index	OBBS Index
Pearson Correlation	-.715**	-.405*	-.555**	-.598**	-.479**
Sig. (2-tailed)	.000	.026	.001	.000	.007

SURVEY RESULTS: Discussion

1. Does measuring physician resilience at the individual level lead to changes that could help reverse the physician burnout epidemic?

In Stanford Medicine's WellMD model, personal resilience is defined as "an individual's skills, behaviors, and attitudes that contribute to physical, emotional, and professional well-being." With that definition in mind, we can see that a focus on "skills, behaviors, and attitudes" is essential when it comes to improving "physical, emotional, and professional well-being."

The focus of the Neurozone Brain Performance Diagnostic (BPD) is to assess which physiologically-linked behaviors have the greatest potential to affect an individual's overall well-being. According to the Brady KJS, Trockel MT, Khan CT, et al. (2017) article in *Academic Psychiatry*, "Although well-being lacks a universally agreed-upon definition, it is generally understood to include both the presence of positive elements (e.g., engagement, happiness, quality of life, meaning and fulfillment, and physical health) and the absence of negative elements (e.g., physical illness, depression, anxiety, and burnout)."

At the basis of the Neurozone BPD assessment is the opportunity to add to or adjust one's current behaviors to allow the brain to return to homeostasis, and thus enjoy the positive elements associated with well-being. Since the brain is a continuous attention seeker and pays unconscious attention to the most basic threatening stimulus, the BPD assesses what current behaviors may be signaling threats in an individual's brain, and therefore what might be taking away from well-being and adding to burnout. The brain essentially ensures our survival by avoiding or removing the potential threats from a basic to sophisticated level. If a basic threat to survival such as lack of sleep is present, the brain will pay unconscious attention to this and sophisticated problem-solving ability is inhibited. Thus, the BPD is an excellent tool to assess the most imminent behaviors that are threatening the functioning of the unconscious brain.

Interestingly, four out of the five Drivers (behaviors) that were lowest in the BPD assessment taken by the physicians in this study fell under the umbrella of the "Resilience" category. In contrast, only two of the top five strongest drivers contributed to Resilience. This again underlines the importance of looking for objective measurements to point out the areas at the individual level that could be contributing to burnout. Physicians are accustomed to taking objective measurements of patients, so having a tool based on brain neurology, anatomy, and physiology that can help them analyze their own at-risk behaviors is an essential first step.

2. Does coaching for physician resilience at the individual level lead to changes that could help reverse the physician burnout epidemic?

As mentioned above, an assessment is only the first step in facilitating a meaningful change in the "skills, behaviors, and attitudes" that can lead to an increase in an individual's well-being. After the assessment conclusion, individual access to coaching in the skills, behaviors, and attitudes that can lead to immediate and long-term change is necessary to provide the most leverage from the foundation provided by the assessment results. In this study, this role was facilitated by It's Elation, Inc. The results have been clear: individual coaching works.

The seven drivers that make up Resilience in the Neurozone model are Exercise, Nutrition, Sleep/Wake Cycle, Silencing the Mind, Social Safety, Collective Creativity, and Goal Directedness. It is important to note that although all ten drivers improved from the pre- to post-intervention assessments, only three of them improved with statistical significance: Exercise, Silencing the Mind, and Goal Directedness. Achieving that statistical significance with such a relatively small sample size (N=15) and short intervention period (90 days) speaks to the compelling ability of coaching to affect those three drivers.

The most exciting benchmark for the effectiveness of individual coaching, however, is not even the improvements to these drivers. Before this study, Neurozone's assessment had never been tested on a group of physicians, meaning there had been no solid evidence for its effectiveness in predicting or positively influencing burnout risk in physicians. The Mayo Clinic's Well Being Index (WBI) proved to be exactly the tool needed to accurately measure change in risk over a defined time period. Much has already been said about the validity of the WBI, so here I will instead emphasize the following point: in a prospective longitudinal study of approximately 2,000 physicians at Mayo Clinic, each 1-point increase in burnout risk was associated with a 30% to 40% increase in the likelihood that physicians would reduce their professional work effort during the next 24 months based on an independent correlation with payroll records (Shanafelt TD, Mungo M, Schmitgen J, et al. 2016).

One can then reasonably assert that the study's intervention, which led to a greater than 1-point decrease on the WBI score (indicating decreased burnout risk). These findings also indicate a very high likelihood that these physicians will increase, or at a minimum, maintain their work effort into the future beyond the parameters of this study. This echoes the old adage that health is not just the absence of disease; in the same way, physician wellness is not just the absence of burnout. Individual coaching that equips physicians with tools to improve their daily skills, behaviors, and attitudes is a critical step in maintaining flourishing, healthy physicians and reversing the epidemic of physician burnout.

3. If there was one behavior that seemed more critical than any of the others to focus on, what would it be?

Discussing single parts independent of the system that they exist within is a dangerous slope that can lead to misleading insights. When looking to optimize any system, best practice is to look for an optimization of the system's overall balance. Failure to do so in the context of this study, or failure to recognize the performance capacity of each driver in the Neurozone model to affect the entire brain's performance, can lead to misinformed and even dangerous inferences.

However, with that forewarning out of the way, it does appear that the one driver that showed the greatest potential for impacting resilience more than any other was Silencing the Mind. The Silencing the Mind driver was the lowest overall score in the pre-test and is one of the four Foundational Drivers in the Neurozone model. Silencing the Mind is defined as, "purposeful sessions to enhance focus and/or to allow thoughts without reacting, thereby preventing worrying about the future or regretting the past (mindfulness)."

There are numerous studies that show Silencing the Mind techniques like meditation training may affect emotional processing in everyday life, not just during meditation. This is demonstrated physiologically in the anatomy of the brain by altered amygdala response after just 8-weeks of meditation training. In other words, Silencing the Mind training has been shown to affect emotional processing in the brain outside of a meditative state.

According to Stanford's WellMD 2017 report, "Physician group mindfulness training programs have been shown to significantly increase mindful behaviors and reduce burnout." This study's scores show the same correlation. A statistically significant increase in Silencing the Mind correlated with a statistically significant decrease in the WBI scores to below the burnout threshold. Thus, one can argue that mindfulness, meditation, and other Silencing the Mind techniques is an Archimedes' lever to enhancing physician well-being. Consequently, training programs that incorporate mindfulness training are essential to the success of improving physician resilience.

4. With such a small sample size, can we trust the Resilience scores?

This was a pilot study to examine whether there was a need to continue these sorts of assessments and coaching interventions. As such, the results of this study are not intended to prove that one thing causes another, but to investigate if these correlations are worth exploring. One of the correlations that we wanted to explore was whether there was strong relationship between Neurozone's Resilience score and the well-documented WBI when it comes to assessing physicians.

One way to examine the trustworthiness or validity of quantitative results is to look at the power of those results. The power is equivalent to the ability of a test to detect an effect. In order to achieve a strong power with this study's small sample size, we look for two other conditions to be present: a very high correlation (above .50) and a very strong significance level (ideally below the strictest significance of $p < .001$).

As seen in the correlation matrix (p.19), the correlation between the WBI and Resilience was $-.598$, wherein a negative number indicates an inverse relationship. This means as scores for Resilience (as defined by Neurozone's BPD assessment) increased, indicating better resilience, the WBI score went down, indicating a lower likelihood of experiencing burnout. With the number being above the .50 mark this meets the first criteria for a strong power. The second component, the statistical significance, also fulfilled the requirement for a stronger power. Not only was the significance level below .001, but it actually ended up being even stronger with $p < .000$. This combination of factors gives us more confidence that there indeed is a noteworthy correlation between the lower WBI score and an increase in Resilience.

This marks an important touchstone in the quest to identify behaviors that physicians can focus on to increase resilience and mitigate burnout. As a reminder, Resilience consists of seven behavior groups: Exercise, Nutrition, Sleep/Wake Cycle, Silencing the Mind, Social Safety, Goal Directedness and Collective Creativity. Focusing on these behaviors can lead to neuro-physiological changes in the brain that can improve resilience at the individual level. The coaching performed by Elation in this study proved to be powerful in positively affecting these numbers, ultimately leading to a significantly healthier score on their Well Being Index.

Group Meeting Summaries

1ST MEETING | 9/8/17

ATTENDANCE

Neurozone: 1 | Elation: 3 | Physicians: 11 | RMC: 1

1) Introduction

- a) Overview of project from Dr. Bush
- b) Two methodologies coming together (Elation and Neurozone) to assist in physician resilience

2) Physician Burnout

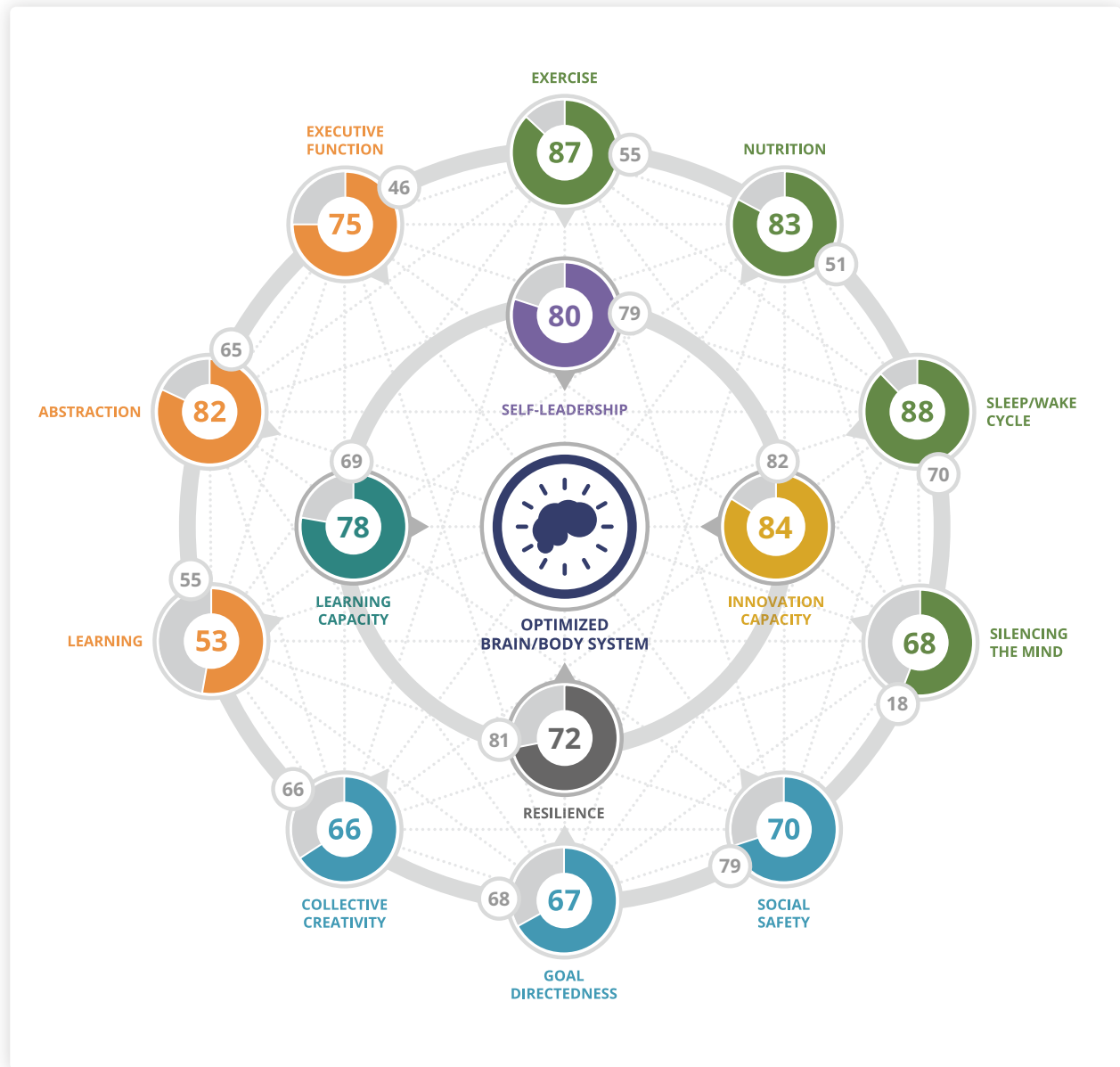
- a) What to do about problem...proven interventions with the individuals...to drive the solution for the system
- b) From high performance lens...optimization of performance...using NZ 4 Core Survey
- c) Survey: must take to kick off intervention
- d) Voluntary Group Sessions: one hour...exposure to neuroscience studies on performance/mindset...shared/group learning experience...allow group to collaborate as well
- e) Voluntary Executive Leadership Coaching: to help you get better at whatever you want to get better at....certified coaches....individual level....30-60 mins, but up to individual...100% confidential
- f) Summation Gathering: all participants to provide qualitative insights, narrative, feedback

3) Background of Neurozone

- a) Burnout from neural perspective...implosion of brain/body system...NZ came from solving this problem...to make well again, increase thriving, and improve performance through a model of brain performance (that is now NZ): optimizing brain/body system of individuals and groups
- b) Optimizing problem solving...not only adequate knowledge, but also optimizing the system...NZ defines through FourCore (10 drivers...subgroups of the four core drivers...these are all Action driven)
- c) Data set of over n= over 3,000

4) NZ report overview/explanation:

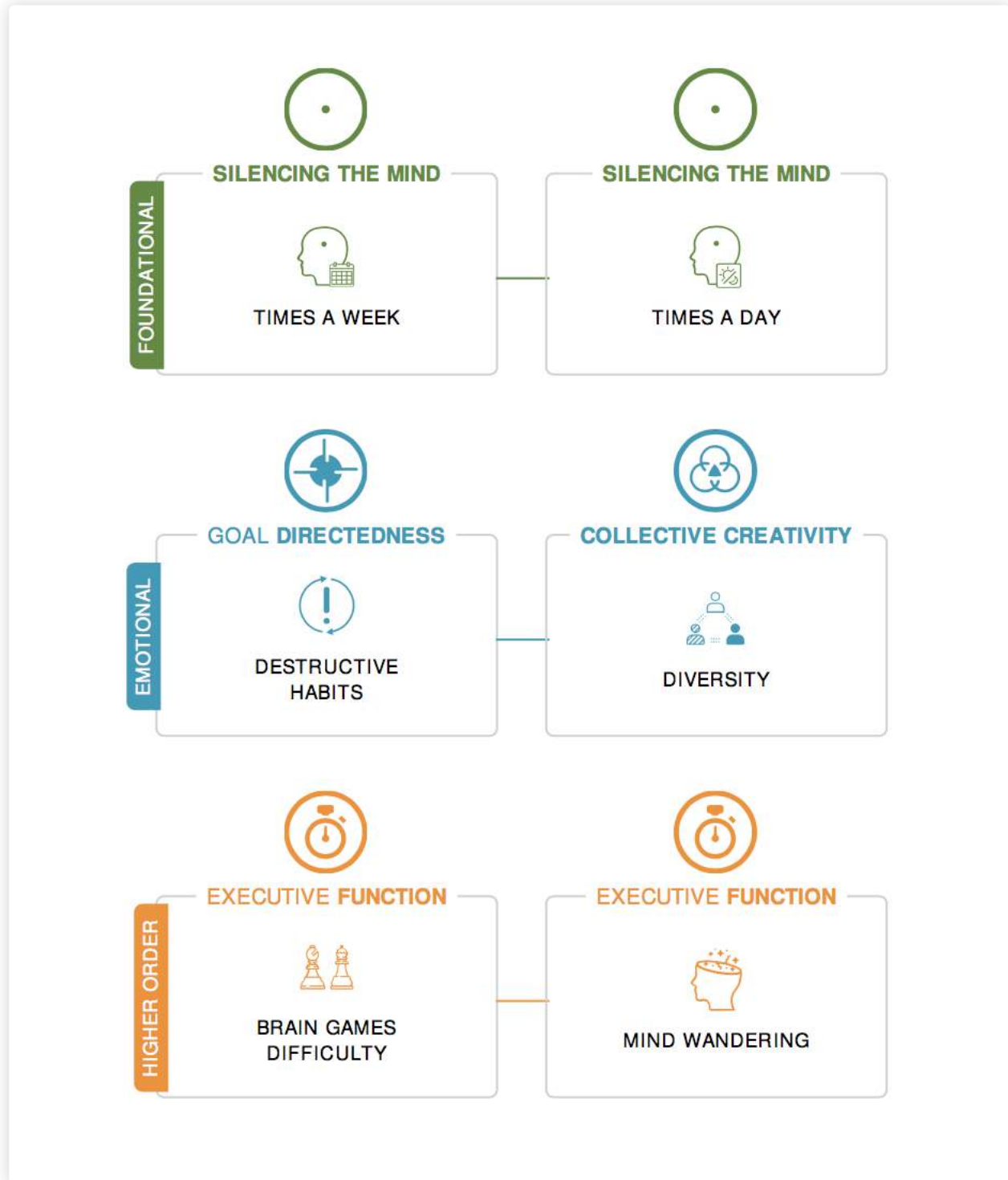
- Blue = Emotional Drivers
- Orange = High Order Drivers; Problem Solving machine
- Green = Foundational Drivers
- All driven by biology and physiology
- All found by self-reported survey
- All correlated to biological markers



5) NZ report overview results:

- a) There will be 6 recommendations for optimization of performance for each individual

**Your High Impact Recommendations:
Top 6 Ways to Optimize Your Brain/Body System**



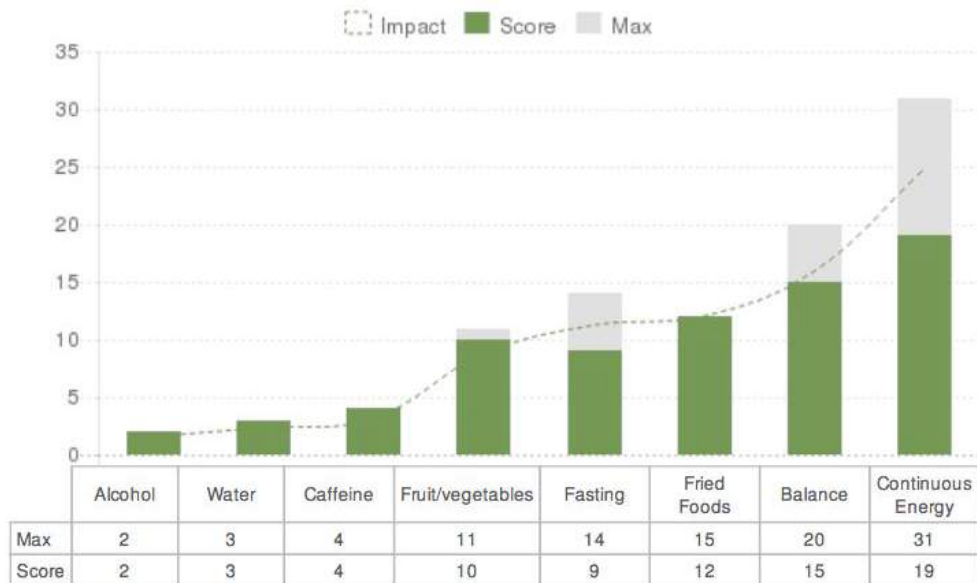
6) NZ report overview results:

- “Opportunity scores”, NOT capacity...for each of the 10 drivers
- The “creative whiteboard video” is a link to a YouTube video developed by NZ...related to brain performance and its correlation to this Driver

2. NUTRITION



Nich's Nutrition Driver is currently 74% optimized compared to Nich's age group who are typically 47% optimized on this Driver. The graph below demonstrates which Nutrition related behaviors can have ('max') the most impact on Nich's Nutrition score, as well as shows the current contribution ('score') that Nich's behavior has on the total Nutrition score. To move to a state of complete brain/body system optimization, we suggest that Nich starts with the behaviors that have the highest level of impact.



CREATIVE WHITEBOARD VIDEO

To learn more about how nutrition affects brain performance, view this video online:
<https://www.youtube.com/watch?v=FkEt6Gb2p0&rel=0>

c) All linked to Apps that can help (see below on right hand side)



7) We are looking for systemic solutions to this burnout problem

a) Getting the group together for comments is part of the solution seeking process

2ND MEETING | 10/13/17

ATTENDANCE

Elation: 3 | Physicians: 15 | RMC: 1

1) Quick recap/overview of study

- a) NZ “4 Core” survey
- b) Individual Coaching
- c) Mindset group sessions
 - i) Also meant for communication of physicians in group setting

2) Intent of Meeting: tap into collective group's ability to systemically intervene (increase resilience)

- a) What patterns may be emerging?
- b) “What insights/observations have come from 4 Core Assessment and/or Coaching?”- Self observations

3) Develop organizational competency

- a) “how thinking affects performance”
- b) “how mindset drives outcomes”

4) Human Systems vs Complex Adaptive Systems

- a) Human Systems- mechanistic (linear, knowledge driven like building rockets)
- b) Complex adaptive systems (nonlinear, human system like raising teenagers)
 - i) these latter are “not predictable”
 - ii) hence the requirement for adaptive approaches
- c) One metric brought up: engagement

5) Behavior --> Outcome ...incomplete

Mindset <---> Behavior <---> Outcome

- a) “How do these dynamics play out within the systems in which you are operating?”
- b) How might better understanding our thinking improve our resilience?
- c) Word/Color test...audible and synchronized...creating stress for the brain
 - i) Ref: Daniel Kahneman “Thinking, Fast and Slow”...brain is trying to reduce energy use, create habit, path of least resistance
- d) Fast thinking can help to solve problems quickly and can lead us astray (“hard-wired thinking”)
- e) Not acknowledging these two systems will impede change could already be down the wrong path from first decision

6) Fast thinking: when does it serve us? And when does it not?

- a) Emotion is rooted in limbic brain, and that is where the brain is operating
- b) Self-realization (personal frame of reference)

QUESTION:

Describe a time when you either reacted too quickly or over reacted to something at work?

PHYSICIAN RESPONSES:

- Calls in middle of night
- Attacking the messenger
- Colleague not understanding as well

QUESTION:

*What are the hardwired patterns of thinking within your work environment that influence physician resilience and burnout? *Assuming that there is influence from NZ assessment**

PHYSICIAN RESPONSES:

- No control over schedules (i.e. on call)
- Being pulled in multiple directions all at once
- Not being able to appropriately meet patients needs (because of the two listed above)
- Process of medicine AND documentation...two separate tracks that never meet...not integrated
- Drive for perfection
- Fear of failure
- Social precedence for performance
- Within system there is a Mission statement...common goal...that actually helps resilience
- Inefficiencies
- "Additions" to routine which leads to perceiving it as working harder...as opposed to working "smarter"...disruptions in routine (I heard increased responsibility in same amount of time)
- Trained to recognize patterns...experts at diagnosing...so anything that takes them out of that flow leads to frustrations..."wasted energy"... "want to be in flow state" and not interrupted from it consistently
- Most rewarding is interactions with people (patients and each other)...so having a system of prioritization and accurate/non-judgmental collaboration of these priorities

7) One page overview of performance training....controlling what one can within high pressure scenarios**8) The conversations after the meetings...**

- a) These interactions are excellent...deep
- b) i.e. when I attend to the NZ constructs, I'm able to get my work done all in 8 hours...when I don't it takes 10-12-14 hours

3RD MEETING | 11/14/17

ATTENDANCE: Elation: 3 | Physicians: 13 | RMC: 1

1) Group sessions are the most “minimal”....to give info and take advantage of being able to collaborate while we're together

- a) Began by sharing “insights” into the process so far, coaching, etc.
- b) Overview: 4 Core Survey + Coaching + Mindset Group Work

2) Turning knowledge into practice....Doing vs. Knowing....today will be about connecting content to application

- a) “physician informed resilience”
- b) must be led by physicians
- c) this is the only way to change the system that is burning out some of the most resilient humans

3) A lot of signals happening in the unconscious brain before the conscious brain gets burnt out....

- a) “Filters and Biases, and the stories they inspire”

QUESTION:

What are some of the common misunderstandings or misperceptions regarding physicians in your organization?

PHYSICIAN RESPONSES:

- That we're fine
- That most are burnt out
- Money is the main motivator
- Sexism doesn't exist

4) Our brains are designed to make sense of the world....Quickly and Efficiently

- a) Because of that...Our brains are naturally biased
- b) Purpose of Filters and Bias (Cognitive Bias)
 - i) Too much information
 - ii) Not enough meaning (filling in a space in knowledge)
 - iii) Helps us act fast
 - iv) Helps sort what we should remember

5) Affinity Bias

- a) We like people like us
- b) Examples of how we give preference to people that connect to us

6) Confirmation Bias

- a) We like to be right
- b) Examples of how we agree with those saying what we think, and less value to those saying things we disagree with

QUESTION:

What are some of your biases? Some biases in your own thinking?

PHYSICIAN RESPONSES:

- Physicians spoke with each other, but no group sharing

7) Self-awareness

- a) from identifying own biases allows us to adapt behavior and decisions to become more efficient and effective
- b) Showed images: Disney, Starbucks, King's Hat, puppy
- c) Reactions in brain to these are dependent upon experiences, biology (i.e. puppy pic, which is related to a baby's face, is a very quick to calm us down)

QUESTION:

How might better managing filters and biases help us in making decisions?

INSIGHTS:

- Brain attempts to create a story where there are gaps/spaces...CA example: books being better than movies because our brain has already created images/stories
- This capacity is extraordinary, and never ending
- Leaders ask: my story that I'm getting out of this data is this...what are you getting?
- Our brains make connections
- Our brains make up stories
- Our "stories" come through our lenses, our biases, our filters

QUESTION:

What are the stories that we mistakenly assume are true?...or believe are absolutely true?

INSIGHTS:

- Example: Moneyball...takes challenging systems and thinking to make new progress
- Our brains are naturally biased...1st thought - 2nd thought
- Here's my first thought...do I now have a second thought...and now I can take action

QUESTION:

What administrative or systemic biases impact physician resilience and burnout?

PHYSICIAN RESPONSES:

- Centralizing things in Denver will make things more efficient...but has led to the exact opposite...has led to less control...i.e. changing database without ever asking physicians and staff in charge of it...This "centralizing" leads to frustrations
- Holy grail = maximum efficiency...so that is what led to moving to Denverwhat if we asked another question for the Holy grail, like what can we do to support providers and make sure they are happy and are sustainable (not just that the "system" is sustainable)
- Physicians do not know about business
- Never invited to discussions on how operations (systems) work...b/c it takes you away (=losses) from seeing patients
- Attending meetings matter...but really most work gets done in "backdoor deals"
- There is transparent communication
- That there is ALWAYS an opportunity for increased productivity...do we really want to be "operating at our max all the time"?
- This process is to help providers...but what are we doing to help providers really? Seems that all this is focused on "the system's efficiency"

4TH MEETING | 12/8/17

ATTENDANCE: Elation: 34 | Physicians: 9 | RMC: 1

1) Introduction

- a) Acknowledge that this is a research project
- b) Intent is to help explore the systemic problem of burning out some of the most resilient people on the planet...physicians
- c) PHYSICIAN INFORMED organizational change
- d) Retaking the Survey again next week
- e) Individual "coaching" still available

2) Understanding Resilience

- a) A recap of the initial information
- b) You are not a machine, you are humans and part of a human system
- c) No proof we intentionally created an epidemic of burnout...this needs to be acknowledged in order to realize we don't yet know how to fix it

3) Reflections from previous meetings

- a) Went over Physician Responses to questions from Meetings 2 and 3

4) Today's meeting: The Social Brain

- a) What do you find most rewarding about being a physician?
 - i) *make mental note of a couple words*

5) Social Brain- the need to belong

- a) Emotional pain and physical pain are experienced in same part of brain
- b) Study reference...then why are we so wired to feel pain this way
- c) Goes beyond just survival
- d) Minimize social threat, and maximize social reward

6) Our amygdala assigns Value

- a) Dopamine vs Cortisol type responses
- b) Child belonging...to sense of identity (people that connect to me; becoming part of a group/ social construct with clarity of who I am)....which leads to paying more attention to purpose
 - i) How important is this for my survival?
 - ii) Does this help me belong?
 - iii) Is this me?
 - iv) Does this give me meaning?
 - v) Does this threaten my....all of the above?

7) If we are sitting in threat mode constantly then we will not be maximizing performance

- a) We should be returning to homeostasis
- b) But are we systemically keeping people in a heightened state of threat?

8) Default Network

- a) Brain is distracted and taken out of flow by social threats
- b) Social network thinking is Default Network
- c) Our brains are designed to be social...and a major part of the unconscious brain is paying attention to social threats/rewards

9) Where you most likely might see *threats* and *rewards*...words that deal with these concepts, and heavily influence them coming up:

- a) Security
- b) Certainty
- c) Fairness
- d) Affinity
- e) Status
- f) Autonomy
- g) Respect
- h) Trust
- i) Purpose
- j) *a narrative of examples around each of these
- k) Giving a list of words so you can see where these dynamics are playing out on a daily basis
- l) What you find rewarding (the question from earlier)...is there a connection to this list?

QUESTION:

How might better understanding the Social Brain impact Organizational Resilience?

PHYSICIAN RESPONSES:

- Honed in on Purpose, Autonomy, and Respect....respect gets lost when you take away the first two
- Mismatch between threat and rewards...threats outweighing rewards
- Connectedness added to the list...related to Belonging
- Being mindful of the individuals...regardless of system pressures....physicians being mindful of connectedness to vulnerable patients helps add to resilience

*Social dynamics are playing out all the time...and the attention/energy we put into them will influence our clarity of all other interactions, and therefore performance, for the day.

QUESTION:

What creates social threat within your workday? In other words, what is taking away from your resilience on a daily basis?

PHYSICIAN RESPONSES:

- Being asked to do more with less...and not being equipped with tools, resources, support for this increased load...therefore taking away from joy (special emphasis on Joy)
- You know you are competent....your social threat becomes the people that you are connected with in your daily work flow...how do we keep flow efficient without detracting from purpose?
- Lack of alignment and lack of focused goals within the system...not on same page for purpose and path....
- No feedback loop from worker ants...there is no structure to go from bottom up...just from top down is the way it feels....this happens in micro- and macrocosms
- Feedback mechanism with peers (some anonymous)....positive and negative....to allow recognition and to take you out of your silo to know what others are perceiving as good/bad about what you are currently doing....this would involve a clear purpose of why this is being done
- Perception of lack of commitment from others in the organization....is the administration going to be here as long as I am?this can create a large threat of buying in to what they

- are pushing down...especially when they are challenging physicians' commitment
- When there are no clear goals!
 - Purpose and goals need to be clear...and local level needs to feel that they have a voice in these...and what happens to create the paths to these goals
 - Lack of respect between physician generalists and physician specialists can arise
 - Lack of trust
 - When decisions "come from above"...autonomy is diminished
 - Lack of certainty that we are all on the same page...anxiety from feeling we are half step off from one another
 - Is there something we can do to create better group flow?
 - "lack of engagement, lack of alignment has a very real, but very hard to measure impact"

Discussion of Group Sessions

1) It is clear that optimization of a single part will lead to sub-optimization of the whole.

All complex adaptive systems (the focus of Group Meeting #2) must face this dilemma head on. Optimization of a whole dynamic system, whether that be the human body, a sports team, or a hospital system, can only come from a balance of the operation of the parts making up that system. This must be acknowledged by all parts of the system for progress on the issue of burnout to occur. If any one part takes more than its balanced share, then the whole system will begin to collapse.



Wellness Framework

The WellMD Center created a guiding framework - including mission and vision statements as well as an operational definition of professional wellness - to serve as the foundation for its strategic planning and goal execution.

Definition of Professional Wellness

Professional wellness is not simply the absence of burnout but a positive state of physical, mental and social well-being combined with a sense of professional fulfillment.

Mission

The WellMD Center was created to improve the professional wellness of Stanford Medicine physicians and the associated wellbeing of their patients, their trainees, and the members of the medical teams they lead; and to be a national leader in this field.

Vision

To create a preeminent Stanford Medicine culture that promotes organizational excellence, collaboration, and self-care with a goal of professional fulfillment for all members of our care teams.

Conceptual Model

The Center has created a conceptual model with three primary wellness domains that must be addressed to ensure optimal physician wellness and achieve professional fulfillment.

- Culture of Wellness
- Efficiency of Practice
- Personal Resilience



A commitment to address all three domains will enhance our ability to understand the determinants of burnout in our population and help guide our efforts to improve professional fulfillment.

2) How do you balance institutional efficiency with engagement and flow at the individual level?

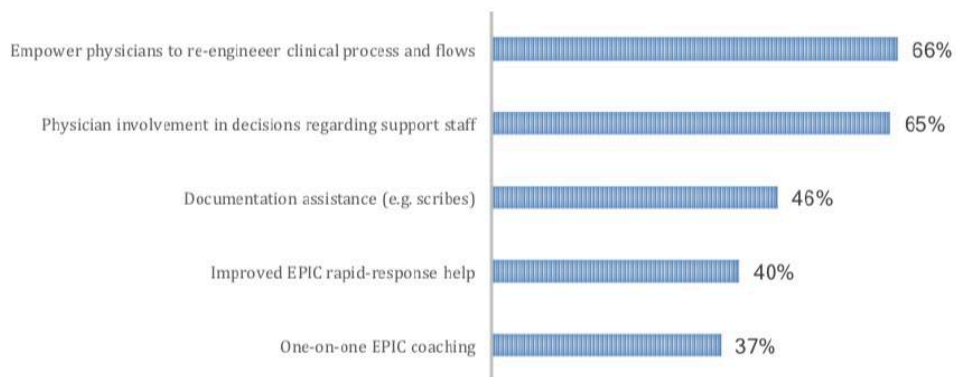
This question seems to be at the heart of all of the comments collected from both the group meetings and the individual surveys. There is no linear, one-size-fits-all solution to this problem. This is evident in the many approaches being undertaken by large health organizations across the country to overcome physician burnout. What seems to be a common thread, though, is that none should be valued above the other. Clear goals of the institution, an extrinsic system that values rewards as much or more than punishments, feedback mechanisms for old practices and new implementations, and a trusted flow that puts empowerment in the hands of the practitioners all seem to be necessary components to answering this question.

EFFICIENCY OF PRACTICE



Efficiency of Practice refers to workplace systems, processes, and practices that promote safety, quality, effectiveness, positive patient and colleague interactions, and work-life balance.

EFFICIENCY OF PRACTICE STRATEGIES RATED HIGHLY



3) Who “owns” the duty of balancing the parts of a medical system?

PART 1: Physicians’ responses seem to point to the system stripping them of their intrinsic motivation (autonomy, in particular) as one of the biggest disruptors of their flow at the individual level. Having a sense that they are “in” on the decision-making processes of the management could help this balance.

What systems are already in place to make this happen? How can those systems be improved to address the issues brought up in this study? What hierarchy within the system from management to practitioner needs to be implemented to give more of a perception of autonomy and voice back to the practitioner without taking away too much efficiency from the organization as a whole? Addressing these questions can help guide the process to solving this first part.

PART 2: Physicians’ ownership of their individual health was acknowledged by the physicians throughout this study, but little action was taken at the individual level to keep up with their health, as would be the rational extension this acknowledgement. A common misperception is that because they may be excellent at identifying and addressing health issues in others then they are excellent at doing the same for themselves. Chronic problems, which seem to be driving the widespread issues dealing with physician burnout, are not always easy to diagnose and fix. They require proper assessment and guidance that often does not fit well into the schedule of a physician. Additionally, as we are all aware, knowing what to do and actually doing it are two very distinct things.

Assessments like the Neurozone BPD and interventions like the individual and group sessions facilitated by Elation seem to be critical to assisting physician wellness and stopping physician burnout at the individual level. **This study demonstrated how significant these results can be in only three months.** There needs to be institutional guidance toward these sorts of programs to keep the parts (the physicians) working at their absolute best within a complex, adaptive system. The institutional costs to losing physicians to burnout is far more than keeping them healthy in the first place. In their 2017 Well MD status report, Stanford University acknowledged these costs: “At current rates of burnout, by 2018 about 90 physicians will have left Stanford attributable to burnout with an economic loss of up to \$84,000,000 in recruitment costs alone.”

Thus, it begs the case that medical institutions should, at a minimum, provide easy access to coaching and intervention programs like those offered by Elation. However, it is ultimately the individual physicians that must take ownership of their health. Models that involve some form of shared investment or personal ownership for individual coaching seem to have the greatest impact and completion rates.

CULTURE OF WELLNESS



Culture of Wellness consists of the organizational work environment; the values and behaviors that promote self-care, personal and professional growth; and compassion for ourselves, our colleagues and our patients.

Appendix A: 9-Item Well Being Index

Respondents are asked to answer seven yes/no items and receive a score from 0–7 (1 point for each item answered “yes”), based on responses.

During the past month:

Have you felt burned out from you work?

Have you worried that your work is hardening you emotionally?

Have you often been bothered by feeling down, depressed, or hopeless?

Have you fallen asleep while stopped in traffic or driving?

Have you felt that all things you had to do were piling up so high that you could not overcome them?

Have you been bothered by emotional problems (such as feeling anxious, depressed, or irritable)?

Has your physical health interfered with your ability to do your daily work at home and/or away from home?

For the final two, please circle the number that you feel most appropriately describes how you feel.

The work I do is meaningful to me.

1	2	3	4	5	6	7
Strongly Disagree			Neutral			Strongly Agree

My work schedule leaves me enough time for my personal/family life.

1	2	3	4	5	6	7
Strongly Disagree			Neutral			Strongly Agree

Appendix B: Supplemental Questions

- 1) What are the primary contributors to physician burnout in your organization? The more specific your responses the better.**
- 2) What would you suggest your healthcare organization address to most effectively reduce physician burnout?**

Appendix C: Responses to Supplemental Questions

Responses in purple are from pre-Intervention, and responses in white are from post-intervention

**What are the primary contributors to physician burnout in your organization?
The more specific your responses the better.**

What would you suggest your healthcare organization address to most effectively reduce physician burnout?

Production pressure, pressure to not make a mistake.	Not sure
Working long hours. Working with staff who are burned out can influence one's feeling of burnout. Having limited resources locally to make changes to the EMR.	Make improvements to create engagement around EMR and to quickly make changes that are requested locally.
Unsure	Unsure
Working more hours than I get paid for	Recruit physicians that love being doctors
Overwhelming EMR for physician who is not technologically advanced, high level of patient needs on daily basis with lack of easy access for patient assistance with things like counseling and medications, unrealistic expectations for quality measures, call schedule 1:3, lack of effort or interest of patients to achieve health goals,	Increase staffing assistance in office, establish parameters for quality that match specific patient caseload, create time for charting and a true break at lunch that doesn't require being at desk, make patient surveys that provide helpful feedback and not merely number rating scales
Being required to complete meaningless documentation during patient encounters, medical record documentation that allows cut and paste with no real information that is helpful to others reading notes, lack of team effort and communication in managing patients	Sessions on mindfulness, exercise and stress management are important for all providers
Overwork, litigation, personal or family illness, loss of autonomy, marital issues	Overwork
Litigation, relationship stresses, personal or family illness	Acknowledge when a physician has a major life stressor, and trigger an evaluation to improve resiliency
Profit based medicine	Worry less about the profit margin in the primary care arena and more about patient care

<p>Disconnect between administrators and physicians; Assumptions made by administrators about physicians; The conflicting administrative/business goals of financial success over customer/patient satisfaction and employee/physician satisfaction</p>	<p>Understand that increased physician productivity does not equal improved patient medical care. I think we are making more mistakes now than ever.</p>
<p>Lack of the long term view as it pertains to the experiences of those who are in direct contact with patients...nickel and diming...lack of ancillary support staff, I don't get to practice at the top of my license!</p>	<p>Pay or credit time for extracurricular activities such as belonging to a committee, doing research, pursuing higher education; give more education to physician leaders; be a less sexist institution and stop lying that it isn't!</p>
<p>Lack of communication with line staff about major changes; sexism in the workplace; we have a lot of incompetent non physicians/ non providers who make providers' jobs more difficult</p>	<p>Create a wellness leadership position and protect provider time to engage in resilience development activities; put a small gym in the hospital for use by the providers who work in the hospital; more proteinaceous snacks in the med staff office; plan well enough in advance for staffing that docs are not on duty for weeks in a row and no time off</p>
<p>The primary contributors to burnout for me are a feeling of being overwhelmed such that I cannot provide care/ service that I expect. I feel frustrated by the volume of commitments I have. I get irritable when I cannot balance my family life, exercise, professional and personal life. New ideas in our organization cause stress and I am sensitive to the negative attitude of those around me. I tend to retreat from negative people.</p>	<p>I think our culture should promote a balance of life.</p>
<p>The biggest frustration is inaction. Many meetings fail to come to a conclusion to answer the question that the meeting was supposed to solve. I feel like there is a reluctance to invest in people and programs because they don't want to spend the money. There are too many programs that accept mediocrity.</p>	<p>Invest in good people, empower them to do their jobs, provide them with the necessary resources. Those members that don't function appropriately need to be evaluated by masters in their field to make sure they are prioritizing, communicating and executing. If they are not capable of performing then they need to be reassigned to tasks they can do or removed. Mediocre and poor performers discourage others from excellence. I would also like to work in a place where resources are divided based on performance and opportunity instead of given to the members that complain the loudest.</p>
<p>Demands to do more - billing, health maintenance, group care, lead your team, chart quickly, insurance/paperwork bureaucracy.</p>	<p>Discuss it and talk about it.</p>

<p>Inability to control your schedule and workload, tasks continue to be piled onto the doctor that haven't been in the past (charting, billing, answering emails, quality metrics, etc.).</p>	<p>Train up staff and hire staff to be able to help take some of the extra work off the docs.</p>
<p>Lack of follow up by senior leadership on concerns raised about program issues.</p>	<p>Provide feedback to physicians on their strengths and weaknesses and follow up with them regularly to work on improving weaknesses.</p>
<p>Poor leadership, lack of follow through on issues/problems, no feedback to providers.</p>	<p>Develop a system to give routine feedback to staff and providers (from each other) and create incentives and punishments (if needed) to improve strengths/weaknesses.</p>
<p>Call, Sleep deprivation, EMR, Patient volume, Pulled in multiple directions, Inefficiency.</p>	<p>Call burden, NP/PA support, Work schedule flexibility.</p>
<p>Lack of communication, system changes, EMR, call.</p>	<p>Communication, involvement in decisions Regulatory requirements.</p>
<p>Decisions made at headquarters, in Denver, that seem to invalidate local physician expertise. Feels like physician input is not valued by central authority. Local leadership tries their best, but are hampered to some extent.</p>	<p>As plans are made genuinely ask the question - "How will this impact providers and support staff, and will it enhance their loyalty as well as the bottom line? Time and effort required for documentation, adherence to metrics.</p>
<p>Lack of connection to other physicians. Emphasis on performance metrics that may not reflect a true value for the organization or patients. Perception that everything is decided on in Denver and that we don't have a real input on how the hospital is operated.</p>	<p>Encourage social interaction among physicians.</p>
<p>The lack of communication, lack of control over work environment, a perceived lack of respect for physicians in general, lack of clear direction for the organization at the clinic level</p>	<p>Invest more time in physician involvement, development of strategies to involve physicians in processes that directly affect their work flow without penalizing them monetarily, there is great pressure to produce revenue, compensating physicians for doing activities like this would help, when we agree to do activities outside of patient care it usually comes out of our ability to produce rvu's (pay check) or we have to decide to do it on our personal time. I think that we (physicians) have a lot of good ideas that can help the overall success of the organization but we are more valued by the amount of rvus we can generate</p>

<p>Communication seems to be top down and not the other way, organization's actions put the organization before people, there is a bias that physicians are not willing to participate, the organization often puts production before physician involvement (i.e. more financial pressures to be in clinic than at committee meetings etc.), the organization is not receptive to "out of the box" thinking-unless it comes from top down, patient experience could be enhanced in the clinic if we listened to what they want, we have seemed to have lost "down home hospitality" and patients seem to have less value for what we offer, we have transformed patients into commodities.</p>	<p>The value of physicians has been underappreciated, we have become commodities for production. I encourage admin to invest in the physicians not only with financial incentives and fancy dinners but with opportunities to become leaders in the organization. This will increase the engagement of physicians. We used to have lead physicians at each clinic. The lead physician was responsible for going to the executive committee meeting(NOC) and bringing the information back to the clinic doctors, they wrote the physician meeting (POC) agenda, they worked with the other physicians on clinic issues, then worked with the clinic managers to implement the new ideas. Right now the POC meeting is an informational meeting that has predetermined results, handed down from above, and we physicians are encouraged to comply. Physicians are on the front line, we have ideas, we know what our patient's want, patients want our involvement, we give SCLHS a face, reengage us!</p>
<p>Asking too much non-clinical work, especially EMR documentation.</p>	<p>Allow doctors to be with patients, use scribes.</p>
<p>Focusing on the wrong things. We should focus on the joy of doing what we do.</p>	<p>Focus on goals of joy for our providers that come from what they actually do - don't "add" stuff to try to solve the burnout issue. Simplify and focus efforts on actual tangible things we are already doing that can enhance joy.</p>
<p>Expecting more work electronically without compensation for non-patient hours.</p>	<p>Be reasonable with compensation for all aspects including non-patient hours.</p>
<p>Not recognizing and paying for the time it takes to manage the inbox/paperwork for our patients. We only get paid for the time spent in the room with our patient which is only part of the care.</p>	<p>Give credit and payment based on the work load in total and for high quality, not just the billable hours. Make sure the support staff is in place to make my job effective and productive and enjoyable.</p>

Appendix D: Consent Form Page 1



Consent to Participate in a Research Study Rocky Mountain College • Billings, MT

Title of Study: *A Project to Enhance Physician Resilience and Mitigate the Risk of Burnout*

Primary Investigator:

Name: Dr. Nich Pertuit **Dept:** HHP **Phone:** 406-665-5280

Introduction

- We invite you to take part in a research study *A Project to Enhance Physician Resilience and Mitigate the Risk of Burnout* at St. Vincent Healthcare and SCL Health in Montana which seeks to create a unique solution that allows physicians to enhance their personal resilience and more effectively mitigate the risk factors for burnout on an ongoing basis. Taking part in this study is entirely voluntary. We urge you discuss any questions about this study with our primary investigator. If you decide to participate you must sign this form to show that you want to take part in this study.

Purpose of Study

- Physician well-being is important to patients as well as to the physicians themselves. Indeed, it is crucial to the functioning of our entire system of healthcare delivery. At the same time, physicians work in a profession subject to high levels of stress, and are at risk for experiencing the phenomenon of burnout. This inherent risk is likely to be further magnified by the isolation of the rural healthcare setting where solutions like wellness programs may be impractical to deliver. The proposed project will create a unique solution that allows physicians to enhance their personal resilience and more effectively mitigate the risk factors for burnout on an ongoing basis. It is a collaboration between St. Vincent Healthcare; It's Elation, Inc.; Frontier Neurosciences, LLC; Rocky Mountain College, and Neurozone (Pty) Ltd. with the support and endorsement of other regional medical institutions.
- Approximately 20 physicians will take part in this research in Montana.
- Ultimately, this research may be presented back to SCL with de-identified information to keep all of your responses confidential, but to also help alleviate the risk of physician burnout in a systematic manner by identifying common themes and solutions. This research could also be submitted to be published in a peer-reviewed journal article.

Appendix D: Consent Form Page 2

Description of the Study Procedures

- This project ultimately seeks to develop and deploy a mobile micro-learning application and an integrated delivery system that allows physicians to enhance their personal resilience and mitigate the risk of burnout. This is the initial study within that project to test the Neurozone Assessment on physicians, explore any correlations between the assessment and the Well-Being Index (Mayo Clinic), and determine whether coaching and facilitated group sessions implemented by It's Elation, Inc., can lead to a decrease in indicators that lead to physician burnout.
- Once all 20 participants have been identified, their names, demographics, contact emails, and phone numbers will be shared with Dr. Nich Pertuit. Dr. Pertuit is the Primary Investigator (PI) on this study. All information shared with It's Elation, Inc. will be deidentified to only the attributes necessary to complete their portion of the study.
- It's Elation, Inc. will then contact each participant with an introductory email that includes the 9-item Well Being Index (WBI), and a link to their Neurozone Assessment (NZA). Participants will be given one week to complete this task. Once all participants have responded this will initiate Day 0 of the study.
- From Day 0 the study will last 120 more days. Including initial recruitment, contact, and submission of WBI and NZA, the coaching and facilitated sessions, and analysis of the data, the total expected time for this exploratory study is about 5 months.
- During the 120 day intervention period there will be 4 facilitated sessions, measuring out to once every 30 days. These facilitated sessions will be completed in groups. Groups will be assigned through discussion with physicians to accommodate open time in their schedule. All sessions will have material compiled and presented by It's Elation, Inc. These sessions are estimated to last between 90 and 120 minutes. In between these facilitated session there will one-on-one coaching sessions, occurring once every 3 weeks, also facilitated by It's Elation, Inc. There will be a total of between 4 and 5 coaching sessions. These sessions will be completed on the phone, and are estimated to last between 30 to 60 minutes.
- Upon the completion of the final facilitated and group sessions, the physicians will once again retake the WBI and the NZA. This quantitative data will be analyzed by Dr. Pertuit and Rocky Mountain College. A full report of findings will be shared with appropriate personnel from It's Elation Inc., Neurozone, and SCL Health within 4 weeks of completion of the study.

Risks/Discomforts of Being in this Study

- There are no reasonable foreseeable (or expected) risks. There may be unknown risks.

Benefits of Being in the Study

- The benefits of participation are both individual and systematic. Individually you will be granted free access to Neurozone's *Brain Performance Diagnostic, 2.0* tool as both a pre- and post-test. You will be allowed to participate in group and facilitated sessions to

Appendix D: Consent Form Page 3

improve your ten key drivers, and hopefully regain more control over your health, and reduce risk of burnout. Again, this will come at no cost to you. Systematically, you will be part of a research project aimed at finding widespread, easy to implement solutions for entire healthcare organizations.

Confidentiality

- The records of this study will be kept strictly confidential. Research records will be kept in a locked file, and all electronic information will be coded and secured using a password protected file. We will not include any information in any report we may publish that would make it possible to identify you.

Payments

- There are no monetary payments associated with this study.

Right to Refuse or Withdraw

- The decision to participate in this study is entirely up to you. You may refuse to take part in the study *at any time* without affecting your relationship with the investigators of this study or Rocky Mountain College. Your decision will not result in any loss or benefits to which you are otherwise entitled. You have the right not to answer any single question, as well as to withdraw completely from the study at any point during the process; additionally, you have the right to request that the investigator not use any of your interview material.

Right to Ask Questions and Report Concerns

- You have the right to ask questions about this research study and to have those questions answered by me before, during or after the research. If you have any further questions about the study, at any time feel free to contact me, Dr. Nich Pertuit at nich.pertuit@rocky.edu or by telephone at 406-665-5280. If you like, a summary of the results of the study will be sent to you.
- If you have any problems or concerns that occur as a result of your participation, you can report them to the Dr. Pertuit at the email above.

Consent

- Your signature below indicates that you have decided to volunteer as a research participant for this study, and that you have read and understood the information provided above. You will be given a signed and dated copy of this form to keep, along with any other printed materials deemed necessary by the study investigators.

Subject's Name (print): _____

Subject's Signature: _____ Date: _____

Investigator's Signature: _____ Date: _____

Literature Reviews

Executive Leadership and Physician Well-being: Nine Organizational Strategies to Promote Engagement and Reduce Burnout

By Tait D. Shanafelt, MD, and John H. Noseworthy, MD, CEO

THE CHALLENGE FACING HEALTH CARE EXECUTIVES

This is a challenging time for health care executives. Increasing price competition, narrowing of insurance networks, and a greater proportion of patients with noncommercial insurance (e.g. Medicare, Medicaid) due to the Affordable Care Act have all resulted in declining reimbursements. In parallel, requirements for “meaningful use” of electronic health records have resulted in large capital expenditures and increased clerical burden for staff.^{1,2} These financial challenges have, by and large, been addressed by increasing productivity expectations for physicians (i.e. caring for more patients with the same amount of time/resources), efforts to improve efficiency, and expense reductions to decrease the cost of care delivered (doing more with less).

Health care organizations are also facing a variety of other threats. Increased mergers and consolidation of competitors place contracting at risk and are a perpetual, existential threat to organizational survival. The implementation of new quality metrics and requirements for public reporting necessitates greater attention to measures of system safety and increased resources to count, track, and report these dimensions. The national shortage of nurses and physicians in many specialties makes it challenging to maintain adequate staffing.^{4,5} Assessment of patient satisfaction and ubiquitous ratings of hospital “quality” creates incessant pressure to keep up with competitors in the technological “arms race” and to invest resources to maintain a state-of-the-art physical plant. Attacks from cyber criminals and nation states are a constant threat to information security as well as the trust of patients and the public.

These myriad challenges often lead health care executives to focus on external threats. This can create a blind spot to equally important internal threats to organizational health. Successfully navigating the external challenges requires not only tremendous leadership but also committed and productive physicians working in partnership with leaders (who may or may not be physicians themselves). Executives need their physicians to be engaged, nimble, resilient, and invested in helping the organization improve quality, develop more efficient care delivery models, and enhance productivity.⁶

Unfortunately, today’s health care leaders face these challenges with an increasingly exhausted and disillusioned physician work- force. National studies indicate that at least 50% of US physicians are experiencing professional burnout.^{7,8} Burnout is a syndrome characterized by exhaustion, cynicism, and reduced effectiveness.⁹ Burnout in US physicians has increased during the past decade and is dramatically higher than that of US workers in other fields.^{7,8} The rate of burnout among physicians varies by clinical discipline, with many of the specialties at the front line of access to care (eg, family medicine, general internal medicine, and emergency medicine) at highest risk.⁷ Although burnout can also affect nurses and other health care workers, the focus of this manuscript is the epidemic of burnout among US physicians.

IMPLICATIONS OF PHYSICIAN BURNOUT

There is a moral and ethical imperative to address burnout in physicians. Physician burnout contributes to broken relationships, alcoholism, and physician suicide.¹⁰⁻¹⁶ In addition to the moral-ethical argument, there is a strong professional and business case to reduce physician burnout and promote physician engagement. Studies indicate that physician burnout influences quality of care, patient safety, and patient satisfaction.¹⁷⁻²⁴ Physician distress has also been linked to physician prescribing habits, test ordering, the risk of malpractice suits, and whether or not patients adhere with physicians' medical recommendations (Figure 1).^{11,25-28} Based on these relationships, it has been argued that physician distress is an important quality indicator for medical centers to monitor.

Burnout also has strong links to physician turnover and professional work effort.³⁰⁻³⁴ The costs of replacing a physician (recruitment, onboarding, and lost patient care revenue during recruitment, relocation, and ramp up) are estimated to be 2 to 3 times the physician's annual salary.³⁵⁻³⁸ Even if physicians do not leave, burnout can have a potentially large effect on productivity.

A SHARED RESPONSIBILITY

Given the professional repercussions of physician satisfaction and burnout, health care organizations have a vested interest in cultivating physician engagement. Engagement is the positive antithesis of burnout and is characterized by vigor, dedication, and absorption in work.^{40,41} Any health care organization that recognized it had a system issue that threatened quality of care, eroded patient satisfaction, and limited access to care would rapidly mobilize organizational resources to address the problem. Burnout is precisely such a system issue.^{30,41} Extensive evidence suggests that the organization and practice environment play critical roles in whether physicians remain engaged or burn out (Figure 2). Although a host of factors can contribute to burnout and engagement, these can largely be grouped into 7 dimensions: workload, efficiency, flexibility/control over work, work-life integration, alignment of individual and organizational values, social support/community at work, and the degree of meaning derived from work.^{39,42,43} Each of these dimensions is influenced by individual, work unit, organizational, and national factors (Figure 3).³⁹ Given this fact, reducing burnout and promoting engagement are the shared responsibility of individual physicians and health care organizations.^{30,44,45}

Mistakenly,^{46,47} most hospitals, medical centers, and practice groups operate under the framework that burnout and professional satisfaction are solely the responsibility of the individual physician. This frequently results in organizations pursuing a narrow list of "solutions" that are unlikely to result in meaningful progress (eg, stress management workshops and individual training in mindfulness/resilience). Such strategies neglect the organizational factors that are the primary drivers of physician burnout and are correctly viewed with skepticism by physicians as an insincere effort by the organization to address the problem. Casting the issue as a personal problem can also lead individual physicians to pursue solutions that are personally beneficial but detrimental to the organization and society, such as reducing professional work effort or pursuing a concierge practice model. The fact that more than 50% of US physicians are now burned out underscores the need for a system-level strategy.^{8,44,48,49}

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