

Leveraging Mind-Body Neuroscience and Mindfulness to Improve Pediatrics: A national collaboration to promote the translation of research into pediatrics training, practice and policy

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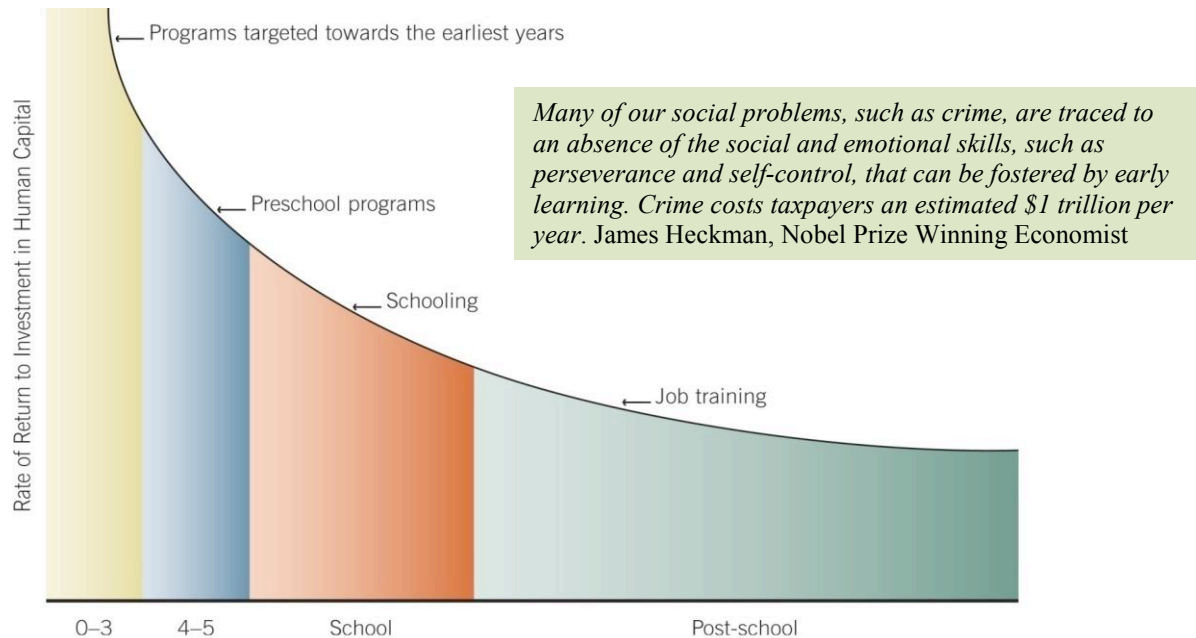
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## Background

As the call for the transformation of the US health care system grows, health care leaders are challenged to catalyze and foster a model of health care focused on the proactive pursuit of whole person and whole population health and well-being. This is coupled with the increasing realization of the importance of epigenetics and life course medicine which informs early promotion of health and the prevention of illness as well as optimal management of acute and chronic disease. Against this backdrop, a critical mass of research evidence is supporting the growing consensus that mind-body and mindfulness-based methods are relevant to healthy child development and lifelong health. The evidence is growing to support the impact of these methods on reducing negative effects associated with maternal stress during pregnancy as well as on healthy parent-infant attachment and youth risk behaviors. Additional research reveals the potential of mind-body and mindfulness-related methods to:

- (1) ameliorate the negative psychological, social and biologic impacts of toxic stress, adverse childhood events and trauma; including difficulty focusing attention and regulating emotions.
- (2) promote strengths, resilience, self-regulation, school and work readiness and positive lifelong health behaviors among all children;
- (3) reduce burden of illness and improve health outcomes for the nation's 20% of children who experience chronic conditions and special health care needs (CSHCN) and the many more who are at risk.

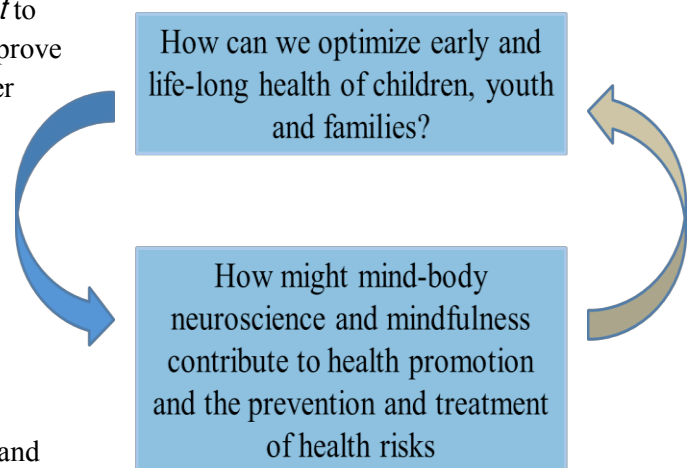
Complementing clinical applications are mindfulness-based health care quality improvement models (MCQI), such as The Joint Commission's High Reliability Organization's model (HRO) as well as mindfulness-based medical and health professional training to promote physician and clinician well-being and effectiveness in delivering high quality, patient-centered care.



## Purpose and Methods

With efforts beginning as early as 2008, the purpose of the Mindfulness In Pediatrics and Maternal and Child Health working group has been to promote advancement of the translation of mind-body and mindfulness-based methods through the exploration and integration of information regarding:

- (1) specific ways in which *mindful practice is relevant* to routine maternal and pediatric care in ways that improve provider and team well-being, the patient encounter and clinical and administrative outcomes
- (2) the *state of the evidence* to support proactive efforts related to the translation of mind-body and mindfulness-based methods into pediatric training, including into existing national training guidelines and patient-centered care and clinical protocols;
- (3) to *assess and monitor interest of key stakeholders* and identify *high-priority opportunities* to leverage mind-body neuroscience and mindfulness to improve the quality of pediatric health care;



- (4) to identify *key barriers* and both training and practice-based *resource needs* and gaps; and
- (5) begin a *dialogue to specify research and development priorities*, including data and methods priorities to monitor population-based needs, uptake and impact of mind-body and mindfulness-based methods to improve pediatric health care and health outcomes in the US.

Since 2011, we have engaged in an ongoing series of Appreciative Inquiry interviews among ourselves and potential partners and have conducted iterative cycles of resources scans and gaps analyses. In addition to assembling and characterizing existing research and science, we have also analyzed newly released data from the 2011-12 National Survey of Children's Health (NSCH). These data allow, for the first time in the US, a picture of the experiences and needs of children related to adverse childhood events, child resilience and family connectedness and stress. We also evaluated data on use of mind-body methods and associations with conventional medical care experiences and expenditures using the National Health Interview Survey (2007 ) and the Medical Expenditures Panel Survey (2008).

## Overall Rationale and Strategic Guidelines

Mindfulness is defined as the four-pronged capacity to 1) pay attention 2) on purpose 3) in the present moment 4) without judgment. Developing and practicing mindfulness is often referred to as "fitness for the mind" and has taken center stage in training programs across the United States. The simple-sounding ability to be fully present and mindful in any moment is consistently associated with the cultivation of essential skills and overall health and well-being. A mapping of national Maternal and Child Health Leadership Competencies and Training Goals to empirical evidence on the benefits of practicing mindfulness reveals its cross-cutting relevance to these competencies, especially self-reflection, communication, negotiation and conflict resolution, and developing others. Similar alignment exists with ACGME and similar standards.

## Emerging Strategic Guidelines

Analysis of the ongoing Appreciative Inquiry interview process and periodic "drop-in dialogues" conducted through the Mindfulness In Pediatrics/MCH initiative, are resulting in an emerging set of strategic guidelines as summarized below:

**Adults as Agents:** Improve child health and health care by focusing on the adults interacting with and developing and managing organizations focused on children's health care (providers, parents, teachers, administrators, policy maker and the community at large—"no wrong door" for children to being met with presence and taught inside-out, self and stress regulation abilities). Here, each encounter is an opportunity and each patient and family encounter is an opportunity to activate the effect of authentic presence in addressing with creativity family and patient concerns and foster sustainable open communication and connectedness.

**Whole Health Care Teams and Settings:** Leverage the national focus on establishing integrated, coordinated, patient-centered care through the Medical Home practice model and the focus of The Joint Commission (TJC) on High Reliability Organizations (HROs) and collective mindfulness.

**Anchor to Existing System Improvement Priorities:** Focus on addressing existing priorities for child health and health care quality (e.g. patient safety, patient centeredness and engagement, childhood obesity, CSHCN, improving adherence, no shows, etc.) and integrate with these at training, advocacy and research levels.

**Systemic Integration:** Engage at the Education, Research and Training Levels

Launch and Learn: Given the safety, affordability, adaptability and accessibility of mindfulness-based approaches, both “n of 1” and efforts to “launch and learn” efforts should be encouraged; including a listening and learning infrastructure to ensure we adopt, adapt and spread effective approaches.

### **Making the “CAACE” for Mindfulness**

Cross-Cutting: Mindfulness is a core skill underlying many other leadership and health promotion capacities impacting children, youth and families, including most mind-body therapies used today.

Accessible: Mindfulness is accessible and does not require special equipment or resources to learn and practice.

Adaptable: Mindfulness can be explained and cultivated in a variety of culturally appropriate and flexible ways.

Connecting: By its nature mindfulness practice connects us to ourselves, our environment and to each other. Connection is a cross-cutting factor related to effective health care, team performance and child and family well-being.

Enabling: Mindfulness is a core skill required to enable other skills and abilities to be cultivated, such as self-reflection and effective learning, enhanced resilience and stress management, positive relationships and problem solving and so on.

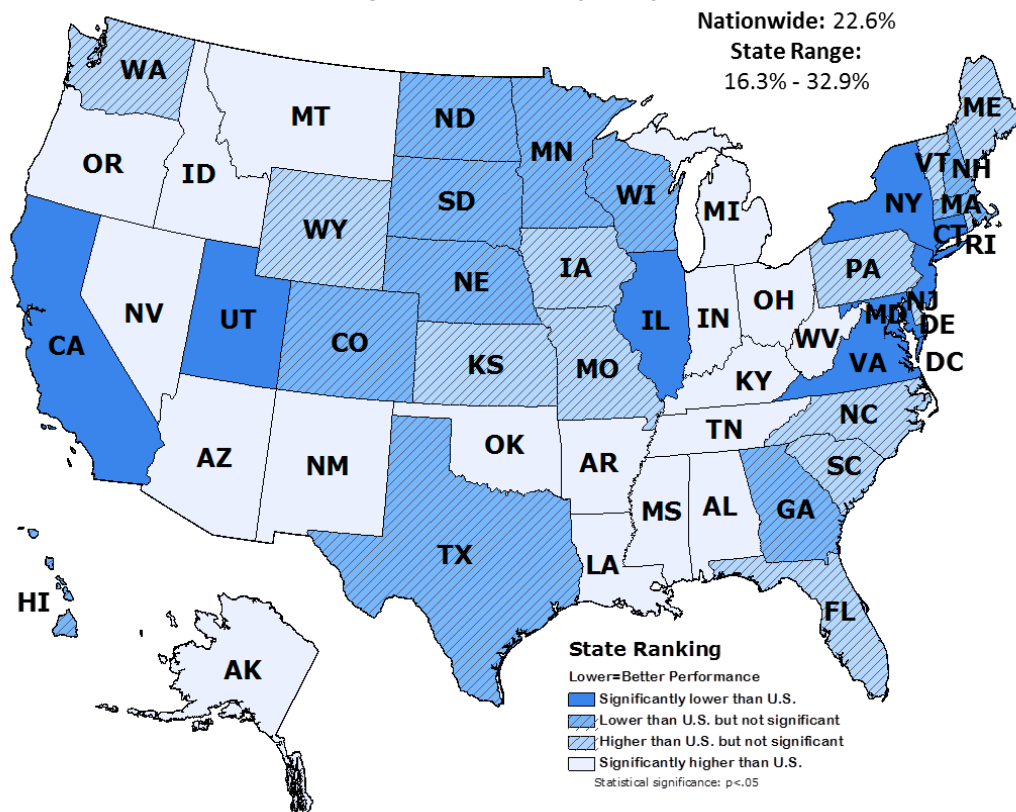
### **Prevalence of US Children Exposed to Adverse Child/Family Events (ACEs) and Other Home, School and Community Risk and Protective Factors**

**“It is easier to build strong children than to repair broken men.”  
Frederick Douglass (1817–1895)**

Almost half of US children (48%) experienced at least one adverse child/family event in 2011-12. Nearly 25% of US children age 0-17 experienced two or more such Adverse Childhood Events (ACEs), ranging from 16.3% to 32.9% across US states. Among US youth age 12-17, this increases to nearly one-third who have experienced two or more adverse childhood events (30.5%), with a range of 23.0% to 44.4% across US states. Children with ACEs are systematically less likely to experience protective home, school and community factors or live in homes with parents who are healthy.

**Adverse Child and Family Experiences – Child experienced two or more adverse child and family experiences, out of nine items included in the survey.**

**Data: 2011-12 National Survey of Child Health (NSCH)**



**9 ACEs Components Assessed in the NSCH**

1. An estimated 7% of children live in families where it is very often hard to get by on their family's income.
2. CSHCN are more likely to experience living with a parent or guardian who got divorced or separated.
3. An estimated 3.1% of children have lived with a parent who died, ranging from 1.4% to 7.1% across US States.
4. An estimated 6.9% of children have lived with a parent or guardian who served time in jail or prison.
5. CSHCN are twice as likely as non-CSHCN to have seen or heard adults slap, hit, kick, punch, or beat each other up in the home (12.6% compared to 6.0%). Parents of CSHCN also report a greater prevalence of aggravation with child (22.6% usually or always feel aggravated) compared to parents of non-CSHCN (8.6%).
6. An estimated 14.5% of children living in poverty have been victims of or witnesses to neighborhood violence.
7. The percent of children who have ever lived with anyone who was mentally ill or suicidal ranges from 5.4% to 14.1% across US states.
8. An estimated 10.7% of children have lived with someone with an alcohol/drug problem.
9. The percent of parents who indicated that their child was ever treated or judged unfairly because of his/her race or ethnic group ranges from 1.4% to 9.9% depending on the child's race/ethnicity.

<b>Prevalence of Experiencing Positive and Protective Health Indicators: By Adverse Child/Family Experiences Status</b>	<b>All Children</b>	<b>Children with 1+ ACEs</b>	<b>Children with 2+ ACEs</b>
Protective Home Environment (no smoking in home; share meals; limit TV; read/tell stories; know child's friends)	28.7%	19.5%	15.6%
Report Feeling Safe and Supported in Neighborhood	56.8%	47.7%	44.6%
Experiences Factors that Promote School Success (engaged; high attendance; participates;)	63.3%	53.9%	48.6%
Usually or Always Exhibits Calm and Control When Things Don't Go His/Her Way: Age 6-17 years	68.0%	58.6%	54.6%
Met All Components of "Thriving" Index: (Age 6-17)	51.7%	41.0%	35.9%
Mother's Overall Health is Excellent/Very Good	56.7%	42.9%	35.8%

## Children and Youth With Chronic Conditions, Special Needs and At Risk for Developmental and Chronic Problems

One in five children currently experience chronic conditions and special health care needs. An additional 40% exhibit health risks and needs putting them at increased risk for such health needs. As summarized in the table below, nearly 60% of US children either already have or are at increased risk for chronic health problems—the type of health issues mind-body and mindfulness-based approaches have been shown to be most effective for. Risks include moderate/high risk for developmental problems, being overweight or obese or being born premature. Health needs and risks are systematically more likely for non-white, lower income and older children. Despite this, it remains that the majority of children in the US with such needs and risks are white and live in non-poor households.

“Each of us needs periods in which our minds can focus inwardly. Solitude is an essential experience for the mind to organize its own processes and create an internal state of resonance. In such a state, the self is able to alter its constraints by directly reducing the input from interactions with others.”

Daniel Siegel  
The Developing Mind

	Nation	Children of Color (non-White)	Household Income: Below 200% FPL	Adolescents: 12-17 years
<b>Children With Special Health Care Needs (CSHCN)</b>	19.8%	18.2%	20.4%	25.1%
<b>Non-CSHCN Who May Be At Risk for Special Health Care Needs</b>				
Chronic Conditions; Not CSHCN (1+ of 18 conditions)	10.0%	9.7%	12.2%	14.0%
Met 1+ CSHCN Consequences (but not full screener)	12.9%	11.9%	15.6%	12.8%
Developmental Delay Risk: Mod/Severe (< age 6)	22.9%	17.7%	27.7%	N/A
Adverse Child and Family Experiences (2+)	19.3%	17.7%	26.8%	27.2%
Born Premature	10.1%	9.7%	11.0%	9.2%
Overweight/Obese: BMI-for-age at or above 85th percentile (age 10-17 years only)	30.0%	24.3%	39.5%	34.0%
<b>Non-CSHCN and Has 1+ Above Risk Factors</b>	48.6%	45.0%	57.3%	57.7%
<b>CSHCN + Non-CSHCN With 1+ Risk Factors</b>	<b>58.8%</b>	<b>61.6%</b>	<b>66.1%</b>	<b>68.3%</b>

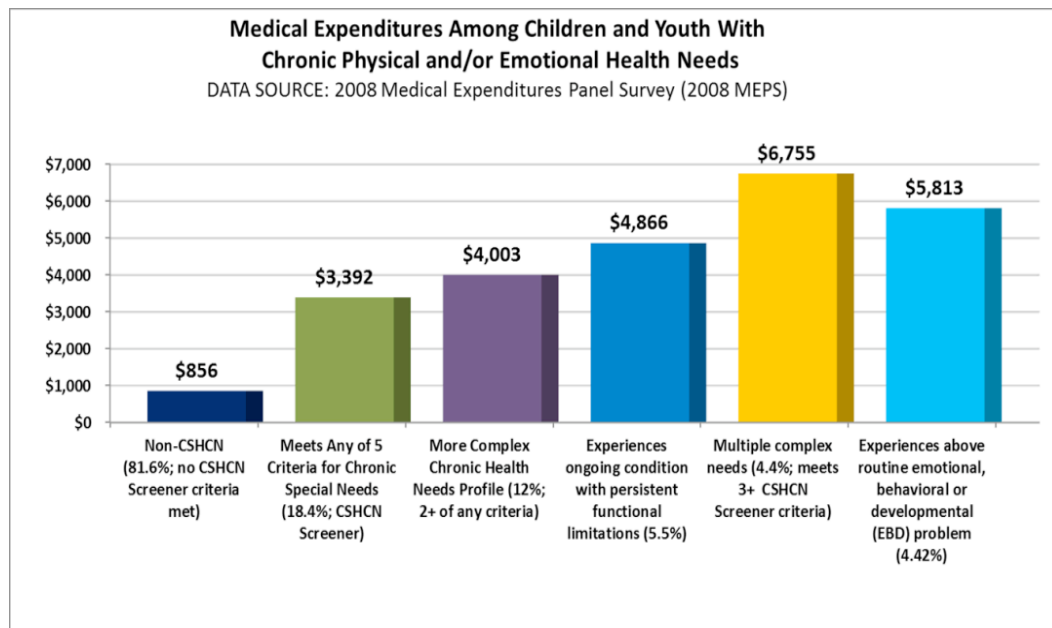
## Who Stands to Benefit: Characteristics for Children and Youth Exposed to ACEs and/or Who Have or Have An Increased Risk for Chronic Conditions and Special Needs

Mind-body methods and mindfulness-based approaches to health care can be especially valuable for children with special health care needs (CSHCN) and/or elevated health risks, including exposure to adverse child/family experiences (ACEs). The table below summarizes the demographic characteristics of CSHCN, those exposed to two or more ACEs and children with elevated health risks as defined above.

Demographic Characteristics of US Children and Youth Experiencing Adverse Childhood Events, Special Health Care Needs and Elevated Risk for Chronic Problems		All Children Nationally	Child Exposed to 2+ Adverse Child/Family Experiences (2+)	Children with Special Health Care Needs (CSHCN)	Non-CSHCN Who Are At Risk for Chronic Problems
Age	0-5 years	32.7%	18.1%	18.8%	31.9%
	6-11 years	33.2%	35.8%	38.0%	30.4%
	12-17 years	34.1%	46.1%	43.2%	37.7%
Sex	Male	51.2%	51.0%	58.1%	51.0%
	Female	48.8%	49.0%	41.9%	49.0%
Race/Ethnicity	Hispanic	23.7%	22.7%	17.4%	26.3%
	White, NH	52.5%	48.7%	56.8%	47.4%
	Black, NH	13.5%	18.5%	16.4%	16.2%
	Other, NH	10.3%	10.1%	9.3%	10.2%
Household Income Level	0-99% FPL	22.4%	34.6%	23.6%	28.3%
	100-199% FPL	21.5%	27.3%	21.6%	23.2%
	200-399% FPL	28.2%	26.3%	27.9%	26.9%
	400% or more	27.8%	11.8%	26.9%	21.6%



Not only may children with special health care needs be especially able to benefit from the further integration of mind-body and mindfulness based methods in pediatrics, doing so might have an impact on costs of conventional medical care. As shown in the figure above, when we examine national medical expenditures data, we see that CSHCN—especially those with the emotional, behavioral and developmental problems mind-body and mindfulness based methods are most effective for—have much higher conventional medical care costs than other children.

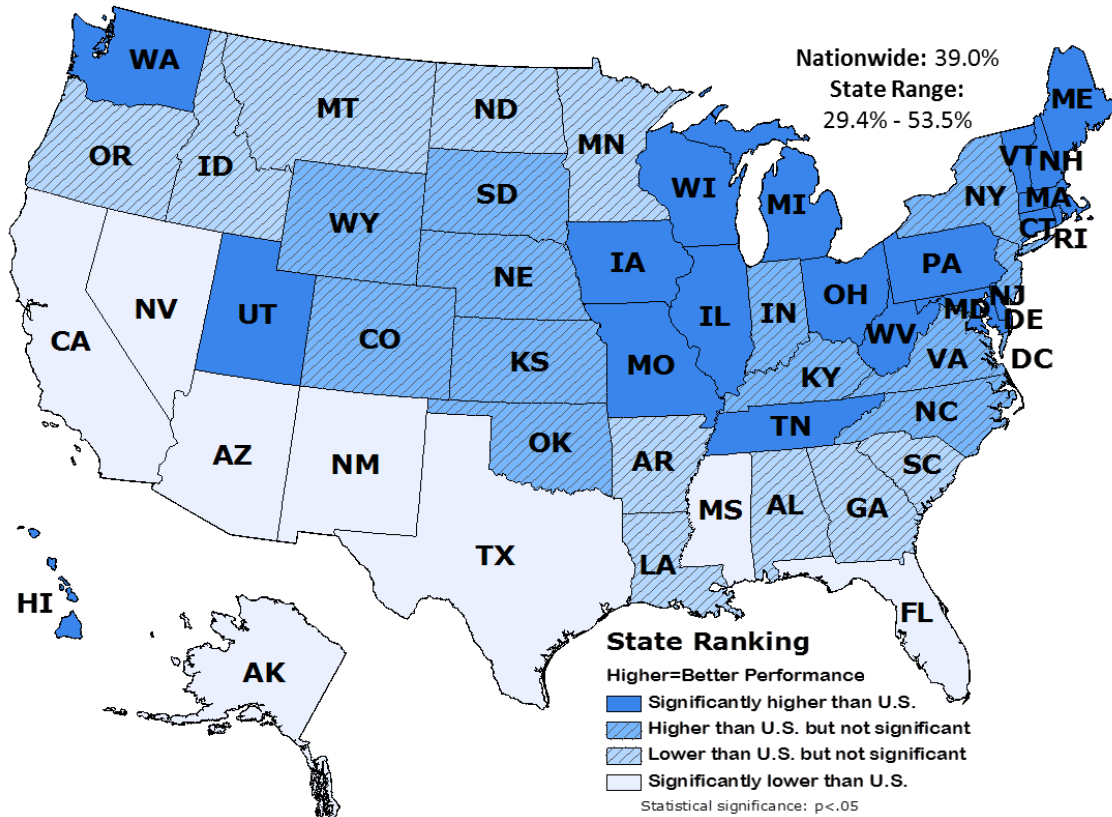


### Potential for Conventional Care to Improve Quality and Address Whole-Child and Whole-Family Health and Well-Being

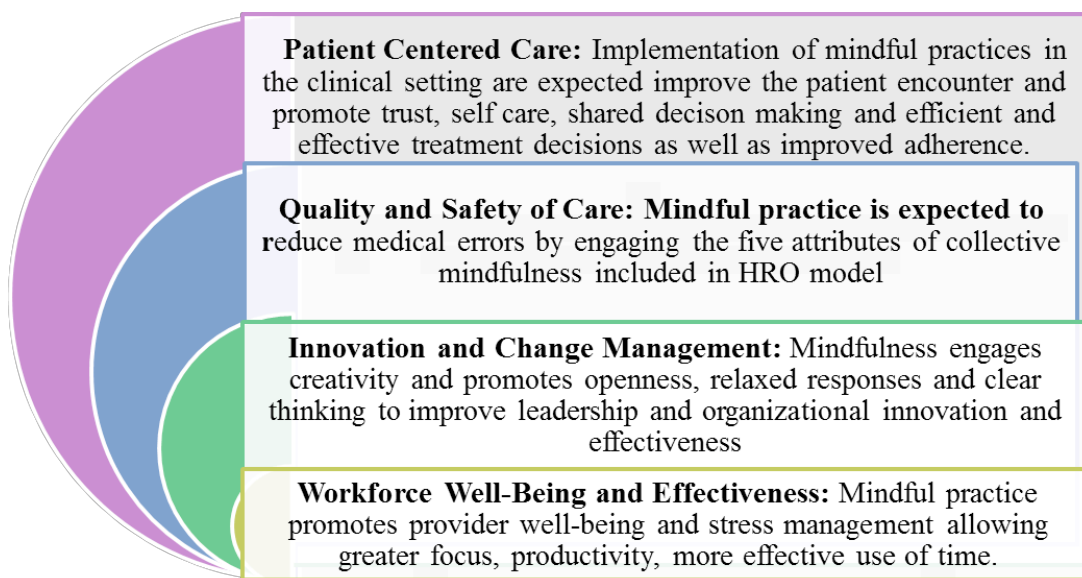
Studies consistently reveal large gaps in quality of care and outcomes for children, youth and families in the US, with fewer than half receiving clinical quality of care endorsed in national guidelines, including essential preventive and developmental services. Findings from the 2011-12 National Survey of Children's Health show that fewer than 2 in 5 US children meet a minimum quality of care standard, including having adequate health insurance, experience care in a medical home and having at least one preventive care visit per years (see US map below). Despite decades long efforts to improve the quality and safety of health care in America, progress has been slow---suggesting a new model of QI that emphasizes the “who” and “we” aspects of improvement as much as the “what” and “how” process oriented approaches now dominant in health care settings. The Joint Commission's High Reliability Organizations (HRO) model is one such model, which focuses on establishing “collective mindfulness” as the key force to transform health care quality and safety in the US. Organization-wide mindfulness training that addresses both the individual and collective aspects of “paying attention with awareness and acceptance” naturally result in creating the “open and adaptive system” conditions and culture for HRO characteristics to grow and be sustained.



## Prevalence of US Children Receiving a Minimum Quality of Health Care (Adequate Insurance, Has a Medical Home, and At Least One Preventive Visit)



## Example Mechanisms of Effect Expected By Integrating Mindfulness in Children's Health Care



## Highly reliable organizations characteristically exhibit six key collective and individual mindfulness capacities

**Continuous Awareness;** the capacity to continuously update situational awareness is the essential core capacity required in the HRO model. By definition, this requires mindful, open attention.

**Preoccupation with Failure** – paying vigilant attention to early detection of small errors and reporting of errors and near misses. This may also be viewed as staying curious and engaged in the face of failure.

**Reluctance to Simplify** – overcoming the tendency to simplify by inviting new information, skepticism to conventional wisdom, questioning standard procedures, and reconciling diverse opinions.

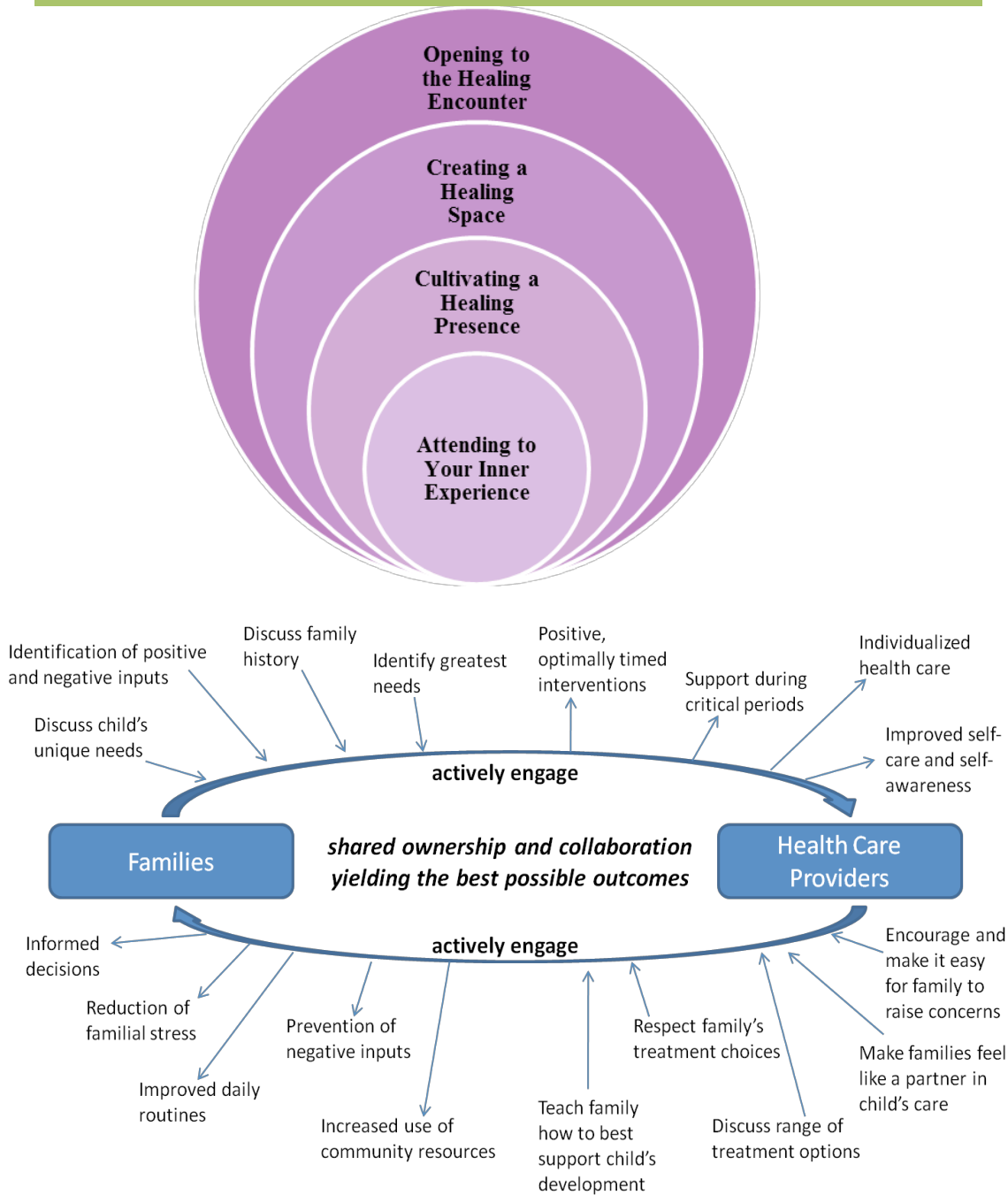
**Sensitivity to Operations** – paying attention to operational detail and exhibiting a willingness to consider alternative perspectives

**Commitment to Resilience** – encouraging employees to confront organizational obstacles and actively find solutions or workarounds in ways that promote respect and creativity

**Deference to Expertise** – migrating decision making to the person with the unique knowledge needed to confront and resolve the given situational complexities, regardless of their place in conventional hierarchy.

In addition to collective mindfulness within health care systems and provider teams, transforming health care to effectively promote whole person and population health innately involves “relational mindfulness” with patients, families and communities. In this way, improving health care not only requires clinicians, teams and the organizations they operate within to do things differently, we are also called to *be* different. Studies increasingly confirm the practical importance of self-reflection, mindfulness and personal development to navigate the inherently complex, relationship-centered processes of engaging patients and each other in improving the quality and safety of health care. Engaging the “presence effect” in clinical care requires clinicians, teams and leaders to prioritize highly personal tasks to (1) further improve real time self-reflection and mindful, transparent communication skills, including the capacity to perceive and inductively respond to the tacit knowledge essential to partnership-based care; (2) make assessment and non-reactive reflection on performance a habit and (3) proactively shift patient and care team relationships from paternalism to mutuality. Here we are called to overcome any reluctance to relate and to suspend the instinctive complaint that there is no time to do so. It implies accepting and allowing the vulnerability involved in seeing and creatively addressing with patients and families inherent challenges, barriers, failures and uncertainties involved in addressing health needs and a willingness to tolerate the predictable discomfort that may result from the shifts in power engaging patients and families implies. Each of these qualities require mindfulness.

**The Four Phases of Practitioner Mindfulness**  
**Starting Point Framework: (1) First Focus on Self; (2) From Fixing to Connecting;**  
**(3) Activate “The Presence Effect”**



*Healing presence is the condition of being consciously and compassionately in the present moment with another or with others, believing in and affirming their potential for wholeness, wherever they are in life.* “ Mindfulness In Pediatrics Workgroup Member

## Prevalence and Patterns of Mind-Body and Mindfulness-Based Methods Among US Children: By Type of Health Risks and Functioning



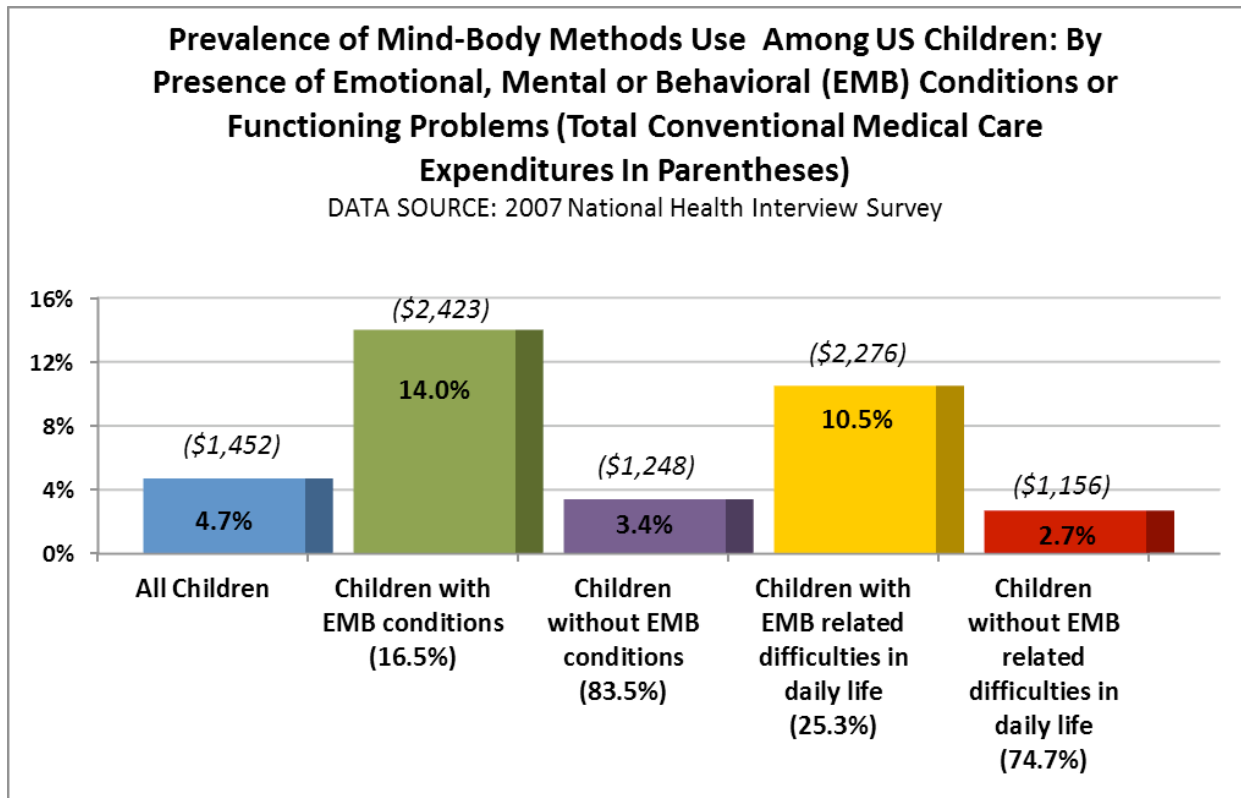
Most recent national, population-based data show that fewer than 5% of US children and youth use one or more of a number of mind-body methods to support their health and well-being, including mindfulness-oriented methods such as meditation, deep breathing and stress reduction training (see Table below). While rates of use increase to as high as 14% among children and youth who experience emotional, behavioral or developmental problems (see Figure below), when reviewed against emerging evidence of effectiveness and safety of these methods, our findings suggest a potentially large underuse of mind-body and mindfulness-based methods to improve child health outcomes. For example, among children with ADHD, mindfulness practices have been shown to significantly reduce school absentee periods, rule infractions, externalizing problems, suspension days and attention problems and improve self-esteem.

“Without mindfulness, there is no therapy. Mindfulness is a necessary state to be in to live your life. All growth occurs because you are in a state of mindfulness. Without mindfulness, there is no growth.” Bessel van der Kolk  
Professor of Psychiatry, Boston University. Author : Treating Traumatic Stress in Children and Adolescents

Mind-Body Modalities	Estimated child population	Weighted %
Deep breathing exercises	1,557,534	2.14
Yoga	1,504,905	2.07
Meditation	724,648	1.00
Support group meetings	439,022	0.60
Progressive relaxation	329,026	0.45
Guided imagery	293,444	0.40
Stress management class	284,753	0.39
Biofeedback	119,398	0.16
Tai Chi	112,633	0.15
Hypnosis	66,677	0.09
Qi Gong	50,419	0.07

Yet, most recent National data reveal that fewer than 15% of children with ADHD used mind-body therapies (NHIS, 2007), whereas 67.5% of these children did use prescription medications for their condition—and despite potential adverse effects of these medications. Other studies show that relative to treatment-as-usual control participants, those receiving mindfulness-based stress reduction training experienced reduced symptoms of anxiety, depression, and somatic distress, and increased self-esteem and sleep quality.

When we link national data on mind-body therapy use with information on conventional medical care (CMC) expenditures (2008 MEPS), we consistently find that children and youth utilizing these methods are among the highest users of CMC (see Figure here). These findings strongly support that conventional care providers inquire about and consider the potential value and both positive and potentially negative impact of these methods for the children and youth they care for.



## Evolving Strategy and Areas of Contribution

“The success of an intervention depends on the interior condition of the intervenor.”

William O’Brien, former CEO, Hanover Insurance

In recognition of the nascent stage of the field and the rapid change underway in health care, we are embracing a **“simple rules” strategy**, whereby we will humbly jump into the “confusion”, keep moving, seize opportunities and continuously assess areas and methods to make an “added value” contribution. Through our efforts thus far, we have identified six key areas for contribution:

1. **Demystify and Make Mindfulness Explicit:** Bring to life the mindfulness component of High Reliability Organizations within The Joint Commission and in efforts to improve patient centered care.

2. **Contribute and Advance Training and Practice:** Identify, tailor and streamline mindfulness and mind-body education and training resources for providers and teams caring for children. Specify and foster the narrowing of resource gaps.
3. **Monitor and Promote Best in Class Methods:** Continuously scan new research and invite case examples in order to identify feasible and effective “best in class” methods cultivate mindfulness in organizational and health care settings, professional and parenting training and in clinical encounters and processes.
4. **Catalyze and Foster Innovation and Knowledge:** Articulate and communicate a research agenda and model research ideas for further development and promotion among researchers and innovators.
5. **Establish a “Living” Container for Dialogue and Creativity:** Create a mutually supportive container to experience and explore the integration of mindfulness into our own lives and spheres of child health (being available to one another; drop in dialogues; online community, etc.)
6. **Pursue High Leverage Integration Opportunities:** Integrate mindfulness principles and best practices into existing systems change models as well as in national data collection platforms and quality improvement and training and education models.

### Mindfulness In Pediatrics Sponsorship, Coordination and Working Group

The Mindfulness In Pediatrics initiative is an all-volunteer effort, direct costs of which are supported through The Child and Adolescent Health Measurement Initiative (e.g. CAHMI staff, supplies, paid consultant services, telecommunications). Below is a summary of working group members participating in this summary.

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PedCAM: Pediatric Complementary and Integrative Medicine Research Consortium

PAS Special Interest Group on Integrative Medicine: Erica Sibinga

National Initiative for Children’s Healthcare Quality: Tom Dahlberg

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Additional CAHMI Staff Support: Bryn Wilson, Richard LeDonne, Narangeral Gombojav, Julie Robertson

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