

HEALTH PROMOTION AND PREVENTION IN CHILD AND ADOLESCENT MENTAL HEALTH

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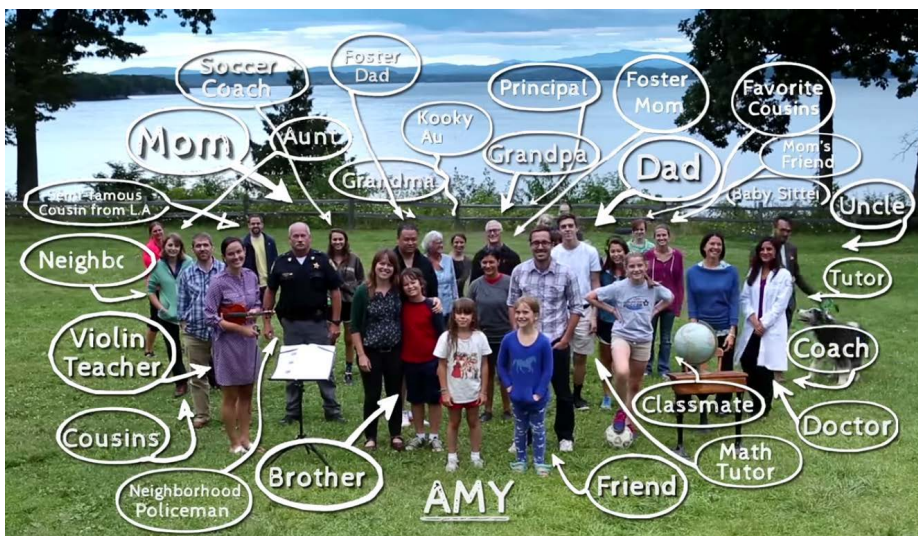


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The perfect storm for positioning the field of child and adolescent mental health to the forefront of health care reform is upon us. If we embrace the power and scope of health promotion and illness prevention, our field will become central to the care and wellbeing of all children and families. Child and adolescent psychiatrists are the only physicians trained to understand the emotional and behavioral correlates of the structure and function of the developing brain. No other field combines classic medical training with an understanding of brain and behavior development from birth to age 24, the age span that defines the children and families we serve. Over the past two decades multiple domains in medical research have matured to the point that child and adolescent psychiatry is perfectly positioned to execute a paradigm shift in how our field is defined and practiced.

The change agents include rapid advances in the understanding of genetics (Rijlaarsdam et al, 2014), epigenetics (Weder et al, 2014), and structural (Ducharme et al, 2011) and functional (Stringaris et al, 2015) neuroimaging studies of large populations of children across development (Verhulst & Tiemeier, 2015). This research allows our field to understand the unique vulnerabilities and opportunities that occur during the epoch of brain development. With the explosion of interest in, and evidence from the Adverse Childhood Experiences (ACEs) study, it is now clear that the same factors that place children at risk for anxiety, depression, and substance abuse also contribute to similarly elevated risk for obesity, diabetes, and hypertension (and many other general medical problems) (Felitti et al, 1998).

These data allow our field to rightly claim a special role in addressing and preventing the factors that precede the most common and costly of all medical illnesses, not just psychiatric illness. Another major advance exists in the area of health promotion. Cardiologists would never define themselves as physicians who only care for patients' with end stage heart disease, rather cardiology is defined as a field that also has developed heart health promotion and illness prevention programs (e.g., through diet and exercise). This has led the rest of medicine to appreciate the importance of promoting cardiac health in all humans. Child and adolescent psychiatry should and can follow the same method. Modern neuroscience gives child and adolescent psychiatrists the opportunity to design brain health promotion programs from pregnancy to adulthood.

Epidemiologic research in psychiatry and child psychiatry has moved away from dependence on categorical models of diagnoses as embodied by DSM-V (American Psychiatric Association, 2013) and into quantitative diagnostic procedures. It has become increasingly obvious that all children (indeed all humans) experience sadness, anxiety, inattention, risk taking, rule breaking, and quirkiness—thus redefining the target populations for child and adolescent psychiatry away from serving only children who meet criteria for largely inadequate diagnoses to all children. In other words, all of us carry symptoms of emotional and behavioral vulnerability and a new child psychiatry can devote itself to the service of all children.

To conclude, the era of family-based medical care is upon us. The realization that treating children as if they exist in a vacuum is no longer tenable in our field or in any other field in medicine. However, we can take the lead in developing new programmatic approaches. For almost as long as our field has existed, the argument

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for family based care has been made; however, with new research, we now have the evidence to confidently move the argument forward that the best way to help children or adolescents achieve wellness is to help their families become well.

These advances, taken together, invite child and adolescent mental health practitioners to operate under the following postulates: the environment influences genomic health, which in turn influences the structure and function of the brain, which in turn influences a child's thoughts, feelings, and behaviors. Given that all health begins with emotional and behavioral health, the path to wellness begins with creating healthy environments for all children and families.

With this in mind child psychiatry can enter the epoch of accountable care and health care reform with the following responsibility: we must design, test, and implement health promotion programs aimed at building healthy brains from birth to adulthood. We must design, test, and implement illness prevention programs aimed at helping those at risk from developing psychopathologies and medical morbidities (that are very difficult to treat in adulthood). When we intervene we should do so in a family-based manner with the knowledge that the best way to serve a child is to serve a child's family. If child psychiatry accepts this charge, we essentially place ourselves at the center of health care reform. Our profession already contributes to the health and wellbeing of children in school settings, in pediatric and community settings, as well as in our clinics and hospitals. Armed with new evidence we can contribute strategies to promote health in all children, to prevent the development of illness in many, and to intervene in a more evidenced family based way for those who struggle with emotional and behavioral illness.

In this chapter we provide child and adolescent mental health practitioners with the evidence for illness prevention and health promotion and describe one model of family based intervention that already is in place in schools, pediatric settings, and clinics in the US and elsewhere (Hudziak & Bartels, 2008; Mrazek & Mrazek, 2007).

HISTORY OF PREVENTION

Over the last 50 years, the terminology surrounding prevention has undergone a number of revisions (Mrazek & Mrazek, 2007) summarized in Table A.14.1. In 1964, in an effort to establish a consistent nomenclature, the field of psychiatry adopted a series of definitions to describe efforts toward prevention. In Caplan's *Principles of Prevention Psychiatry*, prevention was subdivided into three categories: primary, secondary and tertiary (Caplan, 1964). Primary prevention was defined as "an intervention designed to decrease the number of new cases of a disorder or illness;" secondary prevention was defined as "an intervention designed to lower the rate of established cases of a disorder or illness," and tertiary prevention was defined as "an intervention designed to decrease the amount of disability associated with an existing illness" (Mrazek & Mrazek, 2007).

In 1983, Gordon proposed a prevention classification system based on the costs and benefits of delivering an intervention to a targeted population (Gordon, 1983; O'Connell et al, 2009). Gordon's taxonomy distinguished between universal, selective, and indicated prevention. In this framework, universal prevention referred to strategies for an entire population. Selective prevention referred to strategies that targeted a subpopulation deemed to be at risk for a disorder.

The environment influences genomic health, which in turn influences the structure and function of the brain, which in turn influences a child's thoughts, feelings, and behaviors.

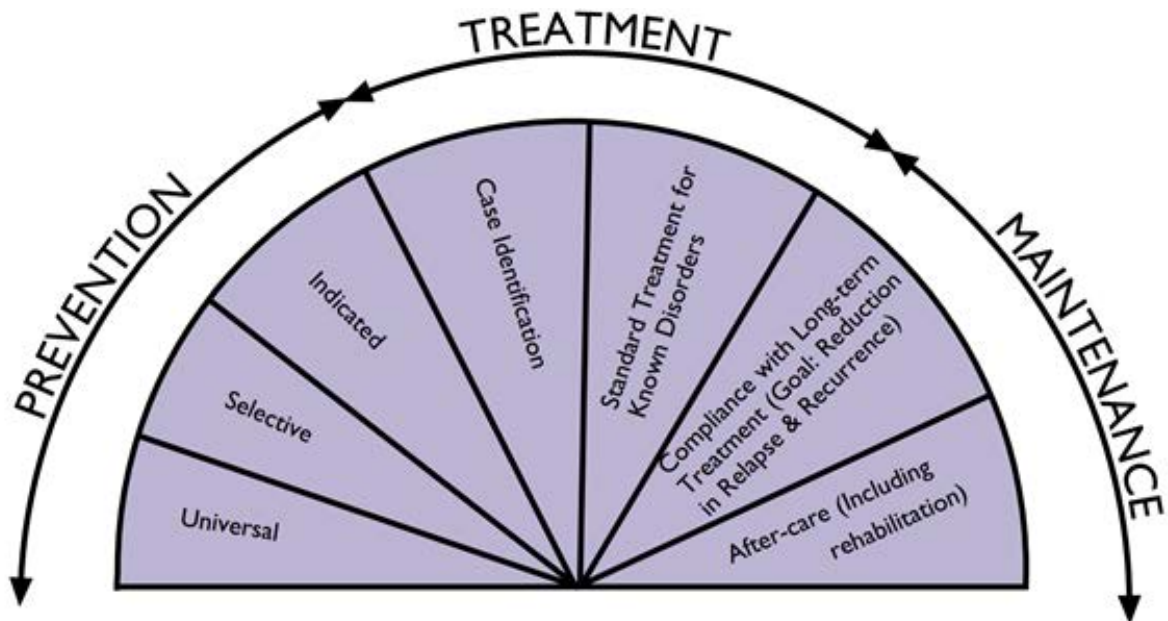
Table A.14.1 Conceptualizations of prevention interventions

TYPES OF PREVENTION (Caplan, 1964)	
Primary	Aims at decreasing the number of new cases of a disorder
Secondary	Seeks to lower the rate of established cases of a disorder or illness in the population (prevalence)
Tertiary	Endeavours to decrease the amount of disability associated with an existing illness
LEVELS OF PREVENTION PROPOSED BY GORDON (1987)	
Universal	Targets everyone in the eligible population
Selective	Focuses only on individuals whose risk of becoming ill is above average (e.g., have specific risk factors)
Indicated	Targets individuals who are identified as being at high risk for the future development of a disease
LEVELS OF PREVENTIVE INTERVENTIONS RECOMMENDED BY THE INSTITUTE OF MEDICINE (Mrazek & Haggerty, 1994)	
Universal	Targets the general public or a whole population group that has not been identified on the basis of individual risk. The intervention is desirable for everyone
Selective	Focuses on individuals or a subgroup of the population whose risk of developing mental disorders is significantly higher than average. The risk may be imminent or it may be a lifetime risk
Indicated	Targets high risk individuals who are identified as having minimal but detectable signs or symptoms of a mental disorder but who do not meet currently full criteria for a diagnosis

Finally, indicated prevention referred to strategies that targeted *individuals who were asymptomatic*, but deemed, based on an individualized assessment, to be at increased risk (Gordon, 1983).

In 1994, a US Institute of Medicine (IOM) report—*Reducing Risk for Mental Disorders: Frontiers for Preventive Intervention Research* (Mrazek & Haggerty, 1994)—proposed a continuum of care beginning with prevention, and including both treatment and maintenance (see Figure A.14.1). Prevention referred to interventions implemented prior to a patient receiving a diagnosis; treatment referred to interventions provided to individuals suffering from a disorder; and maintenance referred to long-term interventions designed to reduce rates of relapse and disability and to promote rehabilitation among individuals with chronic mental illness (Mrazek & Haggerty, 1994; Mrazek & Mrazek, 2007). Approximating the model proposed by Gordon, the 1994 IOM committee divided what was formally referred to as primary prevention into indicated, selective, and universal preventive interventions. In this model, distinction among indicated, selective, and universal interventions was based on the population being targeted. Universal interventions were designed to serve an entire population, selective

Figure A.14.1 Range of interventions available to deal with mental health problems according to the US Institute of Medicine model (Mrazek & Haggerty, 1994)



interventions served individuals at heightened risk, and indicated interventions served populations manifesting early symptoms of a disorder (Mrazek & Haggerty, 1994). This conceptualization differed from Gordon's model because indicated preventive interventions targeted individuals with prodromal symptoms (rather than individuals who were at-risk, yet asymptomatic). Within the context of such definitions, the IOM's 1994 report also proposed that as risk increases the intensity of the intervention and the costs associated with that intervention would also increase (Springer & Phillips, 2006).

While the IOM model provides a useful framework for conceptualizing the nature and degree of risk faced by vulnerable populations, it is important to note that there is often significant overlap and inter-relatedness among vulnerable populations (Springer & Phillips, 2006). Indeed, individuals manifesting the early symptoms of psychopathology (i.e., an indicated population), are often a subset of individuals at increased risk (i.e., a selective population). As such, the distinction between selective and indicated preventive interventions is often nebulous. Beyond the broad definitions provided by the IOM in 1994 there are no explicit criteria for whether a preventive intervention be classified as selective or indicated (Springer & Phillips, 2006).

HEALTH PROMOTION

In 2009, a National Academy of Sciences (NAS) committee largely concurred with the continuum (i.e., including prevention, treatment, and maintenance) laid out in the IOM's 1994 report. However, the NAS' report suggested that in addition to prevention, treatment, and maintenance, the conceptualization should be broadened to include the *promotion* of mental health. Citing the World Health Organization's (1986) proclamation that health is more than merely the absence of disease, the NAS committee defined mental, emotional, and behavioral health promotion as "efforts to enhance individuals' ability to achieve developmentally

appropriate tasks (developmental competence) and a positive sense of self-esteem, mastery, wellbeing, and social inclusion, and to strengthen their ability to cope with adversity” ([Blueprints for Healthy Youth Development](#)). In the NAS report, health promotion was characterized as focusing on wellbeing rather than on the prevention of illness. While drawing this distinction, however, the report also highlighted the considerable overlap between prevention and health promotion, stating that: “both [prevention and health promotion] focus on changing common influences on the development of children and adolescents in order to aid them in functioning well in meeting life’s tasks and challenges and remaining free of cognitive, emotional, and behavioral problems that would impair their functioning” (O’Connell et al, 2009).

ESTABLISHED PREVENTIVE INTERVENTIONS

Both the IOM and NAS have acknowledged on a conceptual level the importance of prevention. However, research within child and adolescent mental health has lagged behind such conceptual advances. To date there are a limited number of preventive interventions and even fewer with a strong empirical-base. Therefore, selecting an evidence-based preventive intervention can prove difficult for physicians, mental health care providers, communities, schools, and parents alike.

There are, however, a number of registries which evaluate and rank preventive interventions based on the strength of their empirical evidence, one such registry is the [Blueprints for Healthy Youth Development Program](#). Funded by the Annie E Casey Foundation, the Blueprints for Healthy Youth Development Program provides a freely available registry of evidence-based preventive interventions. Since its inception, the Blueprints program has reviewed more than 1,400 preventive interventions. During this time, only 14% of programs have met the registry’s minimum inclusion criteria, and less than 1% have been designated as “model” programs.

To be designated as a “*model program*”, a preventive intervention must have:

1. A minimum of either two high quality randomized control trials or one high quality randomized control trial and one high quality quasi-experimental evaluation
2. A positive intervention impact sustained for 12 months after the program intervention ends; and
3. A significant impact, intervention specificity, and dissemination readiness.



Click on the image to access the Blueprints for Healthy Youth Development Program website. This website provides a freely available registry of evidence-based preventive interventions that have been evaluated according to the research evidence backing them. More than 1,400 preventive interventions have been evaluated thus far.

To be a “*model plus program*” an intervention must meet the above model criteria and have undergone independent replication.

In the interest of providing an overview of the existent preventive interventions with the largest evidence-base, each of the programs receiving the “model” or “model plus” designation from the Blueprints registry is briefly described below, more details for these and other programs can be found in the Blueprints website. Based on the definitions established in the IOM’s 1994 report, the programs reviewed below have been categorized as universal or selective/indicated preventive interventions.

UNIVERSAL PREVENTIVE INTERVENTIONS

The Life Skill Training Program (LST)

The LST is a classroom-based program designed to prevent adolescents from engaging in alcohol use, drug use, and violent behavior. The LST is designed to teach students self-management skills, social skills, and drug-resistance skills, and has been associated with short- and long- term reductions in tobacco use, alcohol use, illicit-substance use, poly-substance abuse, violence, and delinquency. In addition, at 6- and 10- years follow up, the LST has been associated with reductions in risky driving (Griffin et al, 2004), and HIV risk behaviors (Griffin et al, 2006).

The Positive Action Program

This is a school-based program designed to enhance social-emotional learning and positive behavior in elementary and middle school students (aged 5 to 13 years). The classroom component teaches self-management skills as well as strategies to increase the use of positive social behavior. The Positive Action Program also includes a school-wide component designed to reinforce the classroom intervention. The Positive Action Program has been associated with a reduction in suspensions and absenteeism, in substance use, violence, and sexual activity, increased rates of socio-emotional development, higher life satisfaction, reduced rates of depression and anxiety, reduced rates of unhealthy food consumption, as well as overall improvements in school quality (Washburn et al, 2011).

The Promoting Alternative Thinking Strategies (PATHS)

The (PATHS) program is school-based also and is designed to reduce aggression and promote emotional and social competencies in children grades K-6 (5 to 11 year olds). The PATHS intervention targets five domains: self-control, emotional understanding, positive self-esteem, relationships, and interpersonal problem-solving skills. This intervention attempts to involve parents by incorporating home activity assignments and providing parents with information. PATHS has been associated with lower rates of conduct and externalizing problems, lower internalizing scores, better emotion recognition abilities, reductions in delinquency, and higher proficiency scores in reading, writing, and maths (Riggs et al, 2006; Schonfeld et al, 2015).

Project Toward No Drug Abuse (TND)

Project TND is a drug prevention program for high school students who are at risk for substance use and violent behavior. Project TND is designed to enhance

self-control, communication, resource acquisition, and decision-making. Project TND has been implemented as a universal preventive intervention in general populations as well as a selective preventive intervention among high-risk students. Project TND has been associated with reductions in cigarette and marijuana use, “hard” substance use, weapon carrying, and victimization, with reductions in “hard” drug use being sustained for up to five years post-intervention (Sussman et al, 2002; Sun et al, 2006).

SELECTIVE OR INDICATED PREVENTIVE INTERVENTIONS

Nurse Family Partnership (NFP)

The NFP is a maternal health program which provides home visitation for first-time, low-income mothers by maternal and child health nurses. The intervention is designed to improve pregnancy outcomes, improve infant health, promote infant development, and improve the mother’s life-course trajectory. In particular, during pregnancy, the NFP is designed to eliminate cigarette-, alcohol-, and drug-use, and encourage exercise, and sound personal hygiene habits (Olds et al, 1997). The NFP also aims to prepare mothers for labor, delivery, and child care. Among mothers, the NFP program has been associated with reductions in unintended pregnancies, domestic violence, and increased rates of employment. Among children, the NFP has been associated with reductions in hospitalization for injury and illness, accelerated language development, reduced rates of behavior problems at age 6, and reduced rates of arrests, internalizing disorders, and substance use at age 12 (Olds et al, 2014).

New Beginnings

The New Beginnings program is an intervention for divorced mothers with children ranging in age from 5 to 18. This is a parent-driven intervention designed to help mothers engage in effective child behavior management strategies, enhance the quality of mother-child interactions, and reduce children’s exposure to interparental conflict. Among children, the New Beginnings program

Australian Nurse-Family Partnership Program

Nurse-Family Partnership
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The ANFPP facilitate nurse visits for women during their pregnancy and throughout the first two years of their children's lives

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Click on the image to access the Australian Nurse Family Partnership.

has been associated with decreases in internalizing, externalizing, and aggressive behaviors (Wolchik et al, 1993; 2000). With respect to family dynamics, the New Beginnings intervention has been associated with improvements in the use of effective discipline strategies, parent-child communication, and positive routines (Wolchik et al, 1993).

Treatment Foster Care Oregon (TFCO)

The TFCO is a 6-month intervention for adolescents with a history of antisocial behavior, emotional disturbance, and delinquency. Foster families from the community are recruited and trained to provide adolescents with clear and consistent limits, appropriate consequences, and positive reinforcement for appropriate behavior. In so doing, the TFCO system also provides adolescents with a mentoring adult and separation from delinquent peer group. The TFCO uses a behavior modification approach where adolescents can accrue points for appropriate behavior and can gain increased levels of independence over time. The TFCO also includes individual and family therapy and emphasizes that adolescents develop interpersonal skills and participate in social and recreational activities. The TFCO program is associated with a reduction in days spent incarcerated, in tobacco and marijuana use, in violent offenses and, among females, in the odds of becoming pregnant (Kerr et al, 2009).

Multisystemic Therapy (MST)

MST is a family and community based intervention designed to improve antisocial behavior patterns in adolescent juvenile offenders. MST works across multiple settings (i.e., home, school and community) to increase prosocial behavior and decrease antisocial behavior. MST has been associated with decreased rates of re-arrest, recidivism, incarceration, psychopathology, and substance use, as well as increased rates of community service (Fain et al, 2014).

Multisystemic Therapy-Problem Sexual Behavior (MST-PSB)

Similar to the broader MST, MST-PSB focuses on the family, school, peer, and community systems in which an adolescent is embedded in order to reduce antisocial behavior. However, MST-PSB concentrates specifically on the dimensions of the youth's environment that are related to problematic sexual behavior. MST-PSB strives to increase each adolescent's friendships and age appropriate sexual experiences, and works with adolescents to increase perspective-taking abilities and maladaptive beliefs and attitudes, particularly around sexual offending. MST-PSB is associated with reductions in re-arrests for sexual and non-sexual crimes (Borduin et al, 1990), parent and child psychiatric symptoms, youth behavior problems, as well as improvement in peer relationships, family functioning, and academic performance (Borduin et al, 2009).

The Blues Program

The Blues Program is a group cognitive-behavioral intervention for adolescents with prodromal symptoms of depression. The program seeks to provide social support and helps adolescents restructure maladaptive thoughts, develop plans to respond to future stressors, and participate in pleasant activities. The Blues Program has been associated with reductions in depressive symptoms immediately following the intervention (Rohde et al, 2014), 6 months post-intervention (Stice et al, 2008), and one and two years post intervention (Stice et

al, 2010). Adolescents participating in the Blues Program also report reductions in substance abuse immediately following the intervention and 6-months post-intervention.

The Body Project

This is a 4-week group intervention designed for high school and college-aged females with disordered eating. The Body Project engages participants in body acceptance exercises and teaches strategies to avoid peer pressure. Post-intervention, the Body Project is associated with decreases in thin ideal internalization (the extent to which an ideally slim female body is internalized), body dissatisfaction, negative affect, risk for obesity onset, symptoms of bulimia, and disordered eating (Stice et al, 2006). Many of these effects are maintained for three years.

Brief Alcohol Screening and Intervention for College Students (BASICS)

BASICS consists of a two-session intervention designed for individuals aged 18-24 who are at-risk for alcohol use disorders. BASICS seeks to help college-aged students better understand the risks associated with drinking, enhance motivation to change, develop skills to drink moderately, and ultimately make better alcohol-use related decisions. College-aged students who participate in BASICS demonstrated reduced rates of drinking and problem behaviors at 2- and 4- years follow up (Baer et al, 2001). Among first year college students, BASICS has been associated with lower levels of peak blood alcohol concentration and reductions in the number of drinks consumed during the weekend.

Functional Family Therapy (FFT)

This is a family-based intervention targeting delinquent adolescents and their families. FFT is designed to enhance parenting skills, youth compliance, family communication and supportiveness, while decreasing negativity and dysfunctional behavioral patterns. FFT is associated with reductions in recidivism, youth internalizing and externalizing symptoms, substance use, as well as enhanced family interaction patterns (Alexander & Parsons, (1973).

Parent-Management Training-Oregon Model (PMTO)

The PMTO is a group-based parent training intervention for the parents of children ranging in age from early childhood to late adolescence. PMTO is designed

Click on the image to access the BASICS program website of the University of Michigan.

to enhance effective family management skills and thereby reduce antisocial and problematic behavior in children. Research suggests that PMTO is associated with reductions in coercive parenting, noncompliance, and negative reinforcement, and increases in effective and positive parenting (Forgatch & DeGarmo, 1999). Among children, PMTO is associated with reduced rates of oppositional defiant disorder, aggression, internalizing disorders, and externalizing disorders. Nine years post intervention, PMTO is associated with decreases in teacher-rated delinquency and arrest rates (Martinez & Forgatch, 2001; DeGarmo et al, 2004; Forgatch & DeGarmo, 2007; Forgatch et al, 2009).

SUMMARY OF EXISTING PREVENTIVE INTERVENTIONS

Irrespective of the population being targeted, the goal of preventive interventions is to reduce the influence of established causal risk factors, augment the availability and/or influence of known protective factors, and reduce the likelihood that children will develop (or progress towards) psychopathology.

Cutting across the many contexts (e.g., individual, peer, family, school, community) in which a given child or adolescent is embedded, and utilizing a variety of therapeutic modalities (e.g., school-based, individual, group, family) the preventive interventions outlined above can exert a significant influence on a variety of known risk and protective factors. Broadly speaking, these interventions can be broken down into those involving the child and those involving the family, summarized in Table A.14.2.

ESTABLISHED AND EMERGING MODALITIES FOR PREVENTION AND HEALTH PROMOTION

Clearly, at both the child and family level, preventive interventions have the capacity to shore up protective factors and reduce risk factors. Given the prominence of family level variables in the preventive interventions outlined, and given the known genetic and environmental contributions to every developmental psychopathology that has been studied, we view parental emotional/behavioral well being and positive parenting as critical components of prevention and health promotion in children and adolescents. As such we will briefly review the research surrounding parental psychopathology and positive parenting. Then, keeping in mind that emotional/behavioral health is a key component of overall health, we present the emerging science supporting the health-promoting capacities of music, mindfulness, nutrition, and exercise.

Established Modalities

Parental Psychopathology

The presence of a parent with psychopathology serves as a nonspecific risk factor for multiple forms of psychopathology in the offspring including internalizing, externalizing, and substance use disorders (Rutter & Quinton, 1984; Beardslee et al, 1998; McLaughlin et al, 2012). The risk associated with parental psychopathology is conferred via genetic and environmental mechanisms (Boomsma et al, 2005; Althoff et al, 2006; Van Grootheest et al, 2007; Hudziak & Bartels, 2008). Yet, even when the influence of prominent environmental risk

Table A.14.2 Risk and protective factors that can be modified by preventive interventions

	RISK FACTORS	PROTECTIVE FACTORS
CHILD-BASED	<ul style="list-style-type: none"> • Low school commitment • Body-image concerns • Aggressive behavior • Physical violence • Poor academic performance • Substance use • Attitudes toward drug use • Attitudes toward antisocial behavior • Interaction with antisocial peers 	<ul style="list-style-type: none"> • Coping skills • Problem-solving skills, • Perceived risk of drug use • Social interaction skills • Drug refusal skills • Prosocial involvement • Interaction with prosocial peers • Academic self-efficacy
FAMILY-BASED	<ul style="list-style-type: none"> • Family violence • Parental mental health difficulties • Poor family management • Neglectful parenting • Lack of prenatal care • Household adults involved in antisocial behavior • Low socioeconomic status • Maternal substance use during pregnancy • Parental unemployment • Unplanned pregnancy • Parent stress 	<ul style="list-style-type: none"> • Clear standards for behavior • Non-violent discipline • Good attachment to parents • Parental social support

factors (e.g., childhood adversity, low SES) is controlled for, a child who has a parent with psychopathology is still 1.5-8 times more likely to develop emotional/behavioral problems (Bijl et al, 2002; Wansink et al, 2016).

Research also suggests that when parental psychopathology is treated the risk conferred to offspring is reduced. For example, children who have a parent with a depressive disorder are four times more likely to develop psychopathology (Beardslee et al, 1998). When maternal depression is treated, children show reduced rates of psychopathology, improved academic performance, and enhanced overall functioning (Weissman et al, 2006; Gunlicks & Weissman, 2008). The reduction in child problem behaviors associated with the successful treatment of maternal depression are maintained at 6 months, one, and four years follow up (Gunlicks & Weissman, 2008). Thus, treating parental psychopathology, can promote mental health in the offspring.

Parent Training

Along with parental psychopathology, the parenting practices employed within the home exert a considerable influence on the environment in which a child's development occurs. It has been suggested that a potential mechanism through which some forms of parental psychopathology confer risk for child psychopathology is via parenting behavior. Indeed, research suggests that parental psychopathology can compromise effective parenting behavior (Harvey et al,

2011), and that a reciprocal relationship exists between parenting behavior and child psychopathology (Burke et al, 2008).

Parent training programs are designed to provide parents with parenting strategies to increase their child's compliance and prosocial behavior, and reduce their child's oppositional and aggressive behavior (see Chapter A.12 of the Textbook for a detailed description of parenting programs). Some of the best researched programs are: *Helping the Noncompliant Child* (McMahon & Forehand, 2015), *The Incredible Years* (Webster-Stratton, 2006), *Parent Management Training* (Kazdin, 2005), and Triple-P (Sanders et al, 2000).

It is well established that parent training programs are an effective treatment for children struggling with clinically significant disruptive and externalizing behavior. However parent training is also effective in children and adolescents without clinically significant psychopathology. Even among otherwise healthy toddlers, the preventative use of parent training has been associated with reductions in externalizing and disruptive behavior over a five-year period (Dishion et al, 2014). Therefore, effective and positive parenting can both treat and prevent the development of child psychopathology.

Emerging Modalities

Beyond the established role of parental psychopathology and parent training, there are a number of health-promoting modalities that have an emerging evidence base and are established enough that we believe they can begin to be implemented with little risk in standard practice. These are mindfulness training, nutrition, exercise, and music training.

Mindfulness

As it applies to modern Western health care, mindfulness has been defined as the ability to disengage from one's beliefs, thoughts, and actions, and attend to moment-to-moment experience in a non judgmental manner (Ludwig & Kabat-Zinn, 2008). It has been suggested that such a state can be fostered using a variety of techniques (e.g., mindfulness meditation, mindful breathing, mindful movement, and short meditations during the course of the day) (Allen et al, 2006) (see Appendix A.14.1).

Over the last 35 years, mindfulness has been incorporated into a number of psychosocial interventions including: dialectical behavior therapy, acceptance and commitment therapy, mindfulness-based stress reduction (MBSR), and mindfulness-based cognitive therapy, with research suggesting that such interventions can be effective in treating a range of conditions including borderline personality disorder, anxiety disorders, mood disorders, eating disorders, high stress levels, and chronic pain.

Beyond the application of mindfulness to clinical populations, research also suggests that mindfulness may be a helpful strategy for individuals who do not evidence clinically significant levels of psychopathology. Among otherwise healthy adults, MBSR is associated with increases in mindfulness that temporally precede reductions in negative affect (Snippe et al, 2015). Similarly, among college students without clinical levels of psychopathology, MBSR is associated with a decrease in symptoms (Allen et al, 2006).

A body of work suggests that mindfulness may be particularly beneficial for women during pregnancy. Both randomized controlled (Vieten & Astin, 2008; Guardino et al, 2014) and uncontrolled studies suggest that mindfulness training for pregnant women is associated with reductions in physical pain, stress, depression, and anxiety. Maternal stress and anxiety during pregnancy have been associated with infant's being born preterm and of low birth weight, as well as poorer cognitive, emotional, and developmental outcomes in infancy and childhood (Van den Bergh et al, 2005; Guardino et al, 2014). Thus, some have argued that helping mothers achieve emotional/behavioral wellness during pregnancy may be a means to prevent the development of negative outcomes in children.

In addition to work suggesting that mindfulness may be an effective intervention for adults, research also suggests that it may be an effective prevention and treatment strategy in children. Meta-analyses suggest that mindfulness interventions have a small to moderate effect on emotional/behavioral symptoms in general populations of children and adolescents and a slightly larger effect in clinical populations (Zenner et al, 2014; Zoogman et al, 2015). However, while mindfulness interventions may effectively promote resilience in universal populations of children and treat psychopathology in children with mental disorders, more randomized control trials exploring their affect in children are needed.

Nutrition

It has long been established that a nutritious and well-balanced diet is a critical component of overall wellness. Research suggests that a healthy diet contributes to enhanced cardiovascular health, reduced rates of cancer, and longevity. Recently, research has begun to suggest that there is an association between nutrition and mental health.

In both children and adults, diet quality has been shown to influence learning, memory, and mood (Gomez-Pinilla, 2008; Zainuddin & Thuret, 2012). In adolescents, internalizing and externalizing disorders are positively associated with increased consumption of fast food, red meat, and sugar, and negatively associated with increased consumption of fresh fruit and vegetables (Oddy et al, 2009). Prospective longitudinal studies suggest that, among adolescents, diet quality may be causally related to mental health (Jacka et al, 2011). In adults, diets of low quality are associated with increased rates of anxiety and depression, reduction in molecular substrates involved in cognitive processing, and increased risk for neurological disorders.

In addition to overall diet quality, a variety of nutritional deficiencies has been associated with emotional/behavioral illness. Cross sectional work in adults suggests that low serum cholesterol is associated with antisocial, violent, and self-injurious behavior. Cross sectional studies with children suggests that iron and zinc deficiencies are associated with externalizing behavior and ADHD, respectively (Liu et al, 2015). Longitudinal research with children suggests that zinc, iron, and vitamin B deficiencies during early childhood are associated with externalizing disorders during adolescence (Liu et al, 2015). In children, diets low in omega-3 fatty acids have been associated with hyperactivity, learning disorders, and behavioral problems, and recent interventional studies suggest that omega-3 fatty acid supplementation results in reductions in externalizing behaviors (Liu



Engaging in physical exercise is associated with a decreased risk for a host of general medical conditions. It has also been suggested that exercise may be a preventive intervention for psychopathology.

et al, 2015). It has been hypothesized that the association between nutritional deficiencies and mental health may be mediated by epigenetic changes and altered brain structure and function (Liu et al, 2015).

Exercise

Engaging in physical exercise is associated with a decreased risk for a host of general medical conditions including obesity, diabetes, and cardiovascular disease. It has also been suggested that physical exercise may be a viable preventive intervention and treatment for psychopathology.

Most research exploring the effects of exercise on clinically significant psychopathology in adults has examined the influence of exercise on depression and anxiety (Rebar et al, 2015). Among adults with depression, some meta-analyses suggest that exercise has a moderate to strong effect on depressive symptoms while others suggest that it has a minimal effect. According to another report (Physical Activity Guidelines Advisory Committee, 2008), in otherwise healthy adults, correlational studies suggest that individuals who are regularly physically active report fewer symptoms of anxiety and depression and have lower risk of developing a depressive disorder and anxiety disorder. While such work does not elucidate the direction of these effects, a recent meta-analysis using data from 400 randomized trials and 14,000 participants suggests that, among adults with non clinical levels of anxiety and depression, exercise results in a medium but significant reduction of depressive symptoms, and a small but significant reduction of symptoms of anxiety (Rebar et al, 2015). Such work suggests that exercise may be a viable preventive intervention among individuals with subclinical symptomatology.

Research has also explored the relationship between physical activity and psychopathology in children and adolescents, suggesting that physical activity appears to have a small but beneficial effect on symptoms of anxiety and depression, a large effect on self-esteem, and to be associated with improved cognitive performance, classroom behavior, and academic achievement (Biddle & Asare, 2011). In addition, aerobic exercise programs in children have a moderate to large effect on the symptoms of ADHD (Cerrillo-Urbina et al, 2015).

Music

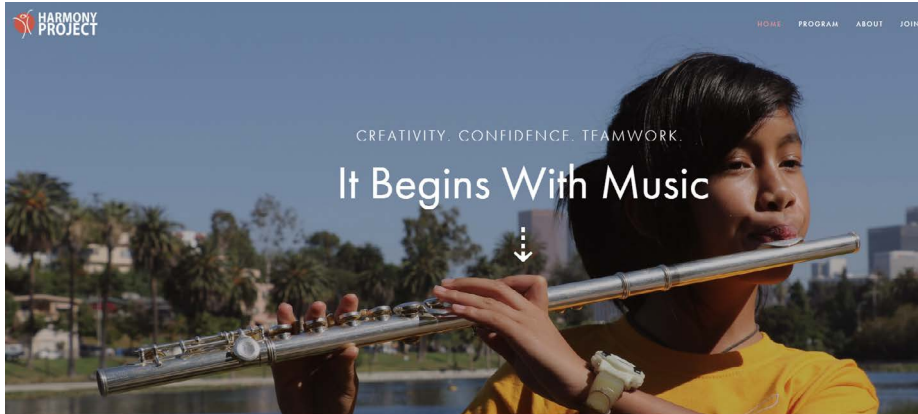
Recently there has been an explosion of interest in the neurophysiological, cognitive, and behavioral correlates of playing music. While music is an emerging

health promoting modality, research to date suggests that playing a musical instrument is associated with alterations in brain structure and function, enhanced cognitive functioning, and improvements in academic performance. A long standing body of work with children and adults suggests that, relative to amateur musicians and non-musicians, practiced musicians show structural and functional differences in various regions of the brain. In adults, practiced musicians display structural differences in the primary sensorimotor cortex, superior premotor cortex, superior parietal cortex, primary auditory cortex, cerebellum, inferior frontal gyrus, and lateral temporal lobe (Gaser & Schlaug, 2003). Research among adult professional musicians suggests a positive association between music training during childhood, adolescence, and adulthood and white matter tract development. Similarly, cross sectional studies with children suggest that, relative to children who do not play musical instruments, children who play an instrument show increased grey matter in the sensorimotor cortex and occipital lobe, increased activation of the temporal lobe during rhythmic and melodic discrimination tasks (Schlaug et al, 2005), and distinct patterns of cortical thickness maturation in the dorsolateral prefrontal cortex (Hudziak et al, 2014).

Given the cross-sectional and correlational nature of much of this research, such work cannot conclude whether structural and functional brain differences are a consequence of increased musical practice or whether it reflects underlying neuroanatomical differences that predated exposure to music. Recently, however, research with children has begun to suggest that musical training may indeed be causally related to both changes in cognition and changes in brain structure and function. Relative to a control group of children matched on age, verbal IQ, and SES, children who played an instrument for one year showed significantly greater fine motor and visual discrimination skills (Schlaug et al, 2005). Relative to a control group, children who engaged in musical training for 15 months exhibited improvements in motor and auditory skills, as well as structural changes in the right precentral gyrus, the corpus callosum, the right primary auditory region, the periculate, and the left middle occipital lobe (Hyde et al, 2009).

Music training in children may be causally related to changes in cognition. Relative to a control group who did not receive musical instruction, 5 year old children who received 20 minutes of twice weekly music instruction showed improvements in spatial temporal tasks at 4 and 8 months (Rauscher & Zupan, 2000). Another study with low-income 4 and 5 year olds also suggests that, relative to a control group, children receiving 75 minutes daily of music instruction for 30 weeks showed improvements in visuospatial reasoning (Bilhartz et al, 2000). Despite this evidence the majority of school children do not play a musical instrument regularly. There are, however, two emerging preventive intervention programs that use music training as a means to offset risk: *El Sistema* (Cuesta et al, 2007) and [The Harmony Project](#).

El Sistema originated in Caracas, Venezuela, and is a music education program serving more than 500,000 Venezuelan children. More recently, *El Sistema* has been implemented in the US and currently more than 2 million at risk American children partake in the *El Sistema* curriculum. The *El Sistema* program is believed to have resulted in a 20% reduction in school dropout, a 22% increase in participation in community activities, and a 28% increase in employment among children who participate (Cuesta et al, 2007).



The Harmony Project is a non-for-profit organization based in the US that provides music instruction and ensemble performance experiences for low-income youth.

The [Harmony Project](#) is a non-for-profit organization based in the US that provides music instruction and ensemble performance experiences for low-income youth. The Harmony Project is currently being implemented in seventeen sites in Los Angeles as well as seven other major cities across the US. Students participating in the Harmony Project receive several hours of musical instruction per week. Children enrolled show significant gains in neural and auditory processing mechanisms linked with reading and language skills. In addition, participation in the Harmony Project is associated with parent-rated improvements in mood, health, grades, and behaviors. Relative to schools that do not participate, participating schools show improvements in graduation rates and college attendance. While music training is an integral part of the Harmony Project, the project also utilizes a mentorship model and thereby offsets risk by capitalizing on other known protective factors (e.g., social support) (Kraus et al, 2014; 2014b).

THE VERMONT FAMILY-BASED APPROACH (VFBA)

Examining these emerging domains of prevention and health promotion, it becomes evident that few, if any, of the evidence based preventive interventions described above take into account the emerging literature from neuroscience, psychology, and genetics to incorporate treating family psychopathology, positive parenting, mindfulness, nutrition, music training, and exercise into one cohesive approach. With that in mind, we present here a new clinical and public health paradigm: the [Vermont Family-Based Approach](#).

The VFBA was developed by James J Hudziak MD at the Vermont Center for Children, Youth, and Families and is designed to integrate research on developmental psychopathology into a family-based therapeutic intervention. The VFBA is conceptualized as a means to both treat and prevent the development of emotional-behavioral illnesses in children, and is based on a few central tenets:

1. Emotional-behavioral health is the cornerstone of all health
2. All health is familial
3. Health promotion, prevention, and intervention should take into account the emerging evidence on music, mindfulness, nutrition, and exercise.



[Click on the image to view a short video clip describing the Vermont family-based approach \(4:42\).](#)

- ***VFBA Tenet #1: Emotional-behavioral health is the foundation of all health.***

This arises from the emerging literature on the role of psychopathology in nearly every other medical discipline. Nowhere is this more evident than in the role of adverse childhood experiences on a wide range of child and adult pathologies, from obesity and diabetes to sexually transmitted diseases (Felitti et al, 1998). This literature demonstrates that the way that experiences are managed during childhood does not just affect later mood and behavior but also other medical conditions seemingly *unrelated* to psychopathology. Further, attending to patients' emotional/behavioral health allows for a more adequate treatment of multiple other conditions including heart disease, cancer, and diabetes, again demonstrating that the cornerstone of health promotion, prevention, and intervention of medical conditions is attending to emotional/behavioral health.

- ***VFBA Tenet #2: All health is familial.***

In the VFBA paradigm, the treatment of parental psychopathology and the utilization of parent training are viewed as means to both treat and prevent the development of child psychopathology. Given that parental psychopathology is a known risk factor for child psychopathology, the VFBA seeks to improve child and adolescent mental health by providing mental health care to the children *and* their parents. The VFBA is based on the premise that addressing parents' clinical and subclinical mental health needs will help to prevent and facilitate the treatment of existing emotional and behavioral conditions in the children.

Along with parental psychopathology, the parenting practices employed within the home exert an influence on the environment in which a child's development occurs. As such, in addition to addressing both children's and parents' mental health needs, the VFBA utilizes evidence-based parent training strategies to improve parent-child dynamics. Thus, within the VFBA paradigm, parenting training is conceptualized as a treatment to help families who are struggling with child psychopathology, as well as a means to bolster parenting skills and prevent the development of psychopathology among children who are otherwise healthy.

- ***VFBA Tenet #3: Health promotion, prevention, and intervention should take into account the emerging evidence on mindfulness, nutrition, exercise, and music.***

The VFBA promotes family wellness by encouraging the entire family to engage in health promoting activities including mindfulness training, healthy eating, exercise, and music training. In this way, the components of the VFBA serve as both effective treatments for children and parents with psychopathology, as well as selective, indicated, and universal preventive interventions for families who are well.

Mindfulness

Given the growing body of evidence suggesting mindfulness' utility as both a treatment and a preventive intervention, there is reason to be optimistic about the role of mindfulness in mental health. However, while there are some randomized controlled studies on the effects of mindfulness-based interventions



[Click on the image to view a lecture by James Hudziak MD describing in some detail the rationale behind the Vermont family based approach to behavioral disorders \(1:28:07\).](#)

(e.g., mindfulness-based CBT) many studies on its effects are compromised by small sample sizes, lack of control groups, lack of randomization, and lack of data on treatment compliance (Burke et al, 2008). In particular, more well-controlled studies are needed on the effect of mindfulness in children. Nonetheless, the state of the evidence is such that within the VFBA paradigm, mindfulness is conceptualized as a health promoting activity. As such, parents and children who are well, at-risk, and struggling with psychopathology are encouraged to engage in mindfulness practices.

Nutrition

Given the body of research implicating overall diet quality and specific nutritional deficiencies in general medical as well as emotional-behavioral disorders, the VFBA paradigm conceptualizes a healthy, balanced diet as a treatment strategy among families who are struggling with emotional/behavioral illness, as well as a preventive intervention among those who are well.

Exercise

While it cannot be concluded with certainty that the relationship between exercise and mental health is direct and causal, it seems reasonable to hypothesize that the reductive effects of physical activity on psychopathology “cannot be explained by a single mechanism acting in isolation; rather the effects are most likely due to the contribution of several mechanisms (e.g., mood, feelings of mastery, self-efficacy) and neurophysiological (hippocampal neurogenesis, hypothalamic pituitary adrenal axis regulation” (Zainuddin & Thuret, 2012). Given the available research, the VFBA paradigm conceptualizes exercise as a viable treatment and preventive strategy, and encourages parents and children to engage in physical activity through structured exercise programs, often using fitness coaching, and positive reinforcement.

Music

Because of the body of research suggesting that music training is associated with changes in brain structure and function, and the findings from school-based programs such as *El Sistema* and Harmony Project that music training is associated with improvements in cognition as well as improved academic performance, the VFBA strongly encourages a musical component for the entire family. Although a randomized controlled trial using clinical samples has yet to establish a direct relationship between music training and a reduction in psychopathology, the available evidence suggesting music training’s utility as a preventive strategy as well as music training’s impact on neuroanatomy has led to its incorporation in the VFBA. Within the VFBA paradigm, children who are well and children who are struggling with emotional/behavioral problems, along with their families, are encouraged to play a musical instrument.

Demonstrating the effectiveness of the VFBA

While the effectiveness of each of the components of the VFBA have been demonstrated to a larger or lesser extent, the VFBA in its entirety has not been formally tested. A randomized clinical trial of the VFBA paradigm is currently underway. This trial is projected to include 120 to 160 families with a child between the ages of 3 and 6. Families enrolled in treatment will be partnered with a family wellness coach who will help them implement a health and wellness plan

based on the results of a family-wide assessment. This assessment will include standardized measures of each family members' emotional/behavioral health, as well as assessment of the health promoting activities in which they engage. Each family's health and wellness plan will be tailored to their specific needs, but will rely on the fundamental principles of the VFBA: family-wide mental health care, positive parenting strategies, mindfulness, nutrition, exercise, and music training.

SUMMARY

Child and adolescent psychiatry is perfectly positioned to play a critical role in health promotion, illness prevention, and family-based intervention. We are the only medical professionals who understand the impact of the environment on the genome (epigenome), the structure and function of the developing brain, and related thoughts, feelings, and behaviors (symptoms). We can prescribe wellness to all children (e.g., mindfulness, exercise, nutrition, sleep, music etc.) regardless of whether or not they are at risk or already struggling with emotional or behavioral problems. We can assist in prevention by ensuring that all parents have access to parent training, and promote the idea that treating parental emotional and behavioral problems is a far more powerful tool than ignoring such problems. We can become the field that recognizes the importance of prescribing social supports and education around the difficult task of raising healthy children and, when we treat children who are in the grip of psychopathology, we should do so in a family-based manner that includes concomitant health promotion and illness prevention prescriptions. Basic developmental neuroscience and genomic evidence exists (the Adverse Childhood Experiences study provides a perfect platform for national attention) and accountable care is an invitation to fund a reform that will place child and adolescent psychiatry at the center of health care reform.



Parents play a critical role in the optimal development and well-being of their children. While this is true for all parents and all children, it is particularly relevant for the caregivers of children with developmental disorders. To respond to this need, WHO developed the WHO Parent Skills Training Package for caregivers of children with developmental disorders. Fifty four experienced health professionals from 18 countries attended a capacity-building workshop on the WHO Parent Skills Training Package hosted by WHO in April 2015.

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Appendix A.14.1

YOGA WITH CHILDREN

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Yoga is mindfulness in motion and conscious awareness of the body's experience in the present moment.

ATTENTION

Practicing yoga has been shown to improve attention, including better performance on objective tasks that measure attention.

Postures that allow for individuals to focus include balancing and standing postures.

MOUNTAIN POSE- stand with your feet together or hip-width distance apart, ground evenly through both feet, and the arms fall alongside the body, palms forward facing. As the feet press into the ground notice the crown of the head reach up towards the sky. Direct the gaze on an unmoving object at eye-level. Breathe slowly and deeply, holding in this posture for 5 breaths.

TREE POSE- shift all weight into the left leg and place the right foot on the ankle, calf, or inner thigh of the left standing leg. Balance as the arms rise above the head, branching out like a tree. Find a steady and pointed gaze, breathe slowly, and hold for 5 breaths. Switch the standing leg and repeat.

EMOTIONAL REGULATION

Yoga creates changes in the brain that correspond to less reactivity, and better ability to engage in tasks even when emotions are activated.

FIVE POINTED STAR POSE- stand with feet one legs-width apart with the outside edges of the feet parallel. Extend the arms out to the sides at shoulder height. Feel the chest open, arms reaching, feet pressing in the ground, and crown of head extending to the sky. Breathe deeply and hold with a steady gaze, or close the eyes, for 10 breaths. Accept the challenge of being a star, holding the posture. Notice how you might really want to move and you hold the posture anyway!

COMPASSION

People randomly assigned to yoga and mindfulness trainings are more likely to help someone in need and have greater self-compassion. Postures that increase levels of compassion include those which might be challenging and require quieting of self-judgment.

DANCER POSE- shift weight into the left leg and bend the right leg, holding the right ankle behind the back with the right hand. Point the right knee down towards the ground, lift the left arm high into the air, and find a point of focus at eye-level. Notice where the mind travels to as the right foot kicks into the hand and the chest opens wide- finding balance between reaching forward and pushing back. Keep the mind focused on the breath and balance of the body rather than what other people's postures look like. Notice the beauty, strength, and steadiness of your own posture! Hold for 5 breaths and then switch standing legs to repeat.

ANXIETY

Practicing yoga brings one's attention to the present moment, reducing the focus on the past and future. This reduces rumination and worrying, leading to a reduction in anxiety. To ground the front body should be close to the Earth, feeling the containment of the ground beneath.

CHILD'S POSE- kneeling down, bring the big toes to touch and the knees wide, as the hips push back to the heels and the torso rests down, between the thighs. The forehead should meet the floor as the arms extend overhead, or stack the fists to create a support for the forehead. Notice the weight of the body pour into the floor as the breath deepens and each part of the body relaxes. Hold here for 5-10 breaths, relaxing into the ground with each exhale.

MINDFULNESS WITH CHILDREN

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GROUNDING

These exercises bring attention to the physical body and can help manage excess energy as preparation for focusing.

TENSE AND RELEASE- Squeeze your feet. Release. Squeeze your hands. Release. (Continue through the body—shoulders, face, ears, eyes, and the whole body.) This exercise can be done sitting in a chair, in the car, or lying in bed preparing for sleep.

FOCUSING

These exercises train us to gather our attention, like the rays of a sun, to one point of focus.

SITTING LIKE A FROG (ELINE SNEL EXERCISE) – Find a quiet place for you and your child to practice. Notice that frogs like to jump and move but frogs can also be very still and breathe. (Show a big belly breathe.) A frog’s tummy rises and falls. The frog notices everything around him as he sits and doesn’t get carried away by ideas that pop into his head. He sits and preserves his energy and breathes. You can use a 2-minute sand timer for this exercise.

TUNING-IN

These exercises give guidance on cultivating awareness of each individual’s internal experience.

FLOWER, THORN, BUD- You and your child can share the experiences of the passing day. Make sure as the adult to share your own experiences from the day.

What was the highlight of your day? (Flower)

What was difficult during your day? (Thorn)

What are you looking forward to tomorrow? (Bud)

MINDFULNESS CHANGES THE BRAIN

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AMYGDALA

Activated when detecting and reacting to emotions, especially

difficult or strong emotions such as fear. This part of the brain is less activated and has

less gray matter density following mindfulness training.

HIPPOCAMPUS

Critical to learning and memory, and helps regulate the amygdala. This part of the brain

is more active and has more gray matter density following mindfulness training.

PREFRONTAL CORTEX

The part of the brain most associated with maturity, including regulating emotions

and behaviors and making wise decisions. This part of the brain is