



Adverse Childhood Experience:
Impact on Physical Health
Project ECHO
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Main Points

- Adverse Childhood Experience (ACE) can have long lasting consequences, augmenting the brain's stress responses, modifying brain development, impairing cognitive functions and increasing the risk of behavioral and physical health disorders as adults.
- ACE can also modify the inflammatory response and increase the risk of physical health disorders: coronary artery disease and myocardial infarction, cerebrovascular disease and stroke, obesity, type II diabetes, asthma, as well as certain forms of cancer.
- In many adult patients with ACE, the underlying disturbances in brain development are the foundation for unhealthy behaviors and impair learning new, more healthy coping behaviors.

Main Points (2)

- Trauma-informed care (TIC) is a systematic approach to the effects of trauma on the provision of health care.
- TIC has five components: (a) screening and trauma recognition, (b) understanding the health effects of trauma, (c) patient-centered communication and care, (d) emphasis on emotional safety and avoiding triggers, and (e) knowledge of helpful treatment for trauma patients.
- TIC can be successfully implemented in pediatric and adult primary care and can mediate some of the adverse effects of ACE.



A Series of Prospective Studies Named the Adverse Childhood Experience (ACE) Studies Have Changed the Perspective on the Effects of Trauma, Especially During Childhood and Adolescence

The Adverse Childhood Experience (ACE) Studies

- In the 1980s, the dropout rate at Kaiser Permanente's (KP) obesity clinic in San Diego was about 50%; despite all of the dropouts successfully losing weight.
- Vincent Felitti, head of KP's Department of Preventive Medicine discovered that **a majority of 286 dropouts had experienced childhood sexual abuse.**
- Felitti and Robert Anda from the CDC went on to survey childhood trauma experiences of KP patients recruited from 1995 through 1997.
- The 17,337 participants were volunteers from approximately 26,000 consecutive KP members and were asked about different types of ACEs that had been identified in earlier research literature and were prospectively followed for 20 years for health outcomes.
- Multiple studies following this cohort found that: (1) **ACE is common.**

ACE Studies (2)

- About 2/3 of participants reported at least one ACE.
- 28% of study participants reported physical abuse and 21% sexual abuse.

(2) ACE often occur together. Almost 40% of the original sample reported two or more ACE and 12.5% experienced four or more.

(3) ACE occur in clusters, many subsequent studies have examined the cumulative effects of ACE rather than the individual effects.

(4) ACE have a dose–response relationship with health outcomes.

(5) The number of types of ACE was strongly associated with adulthood high-risk health behaviors.

(6) The ACE studies' results suggest that maltreatment and household dysfunction in childhood contribute to health problems decades later.

ACE: It's a National Problem

- Objective: **updated prevalence of ACE in the US using a large, diverse, and representative sample of adults in 23 states.**
- Respondents included 248,934 noninstitutionalized adults older than 18 years.
- Results: **61.55% had at least 1 and 24.64% reported 3 or more ACEs.**
- Significantly higher ACE exposures were reported those who identified as black, Hispanic or multiracial, those with less than a high school education, those with income of less than \$15 000 per year, those who were unemployed or unable to work and those identifying as gay/lesbian or bisexual.
- **Emotional abuse was the most prevalent ACE (34.42%), followed by parental separation or divorce (27.63%) and household substance abuse (27.56%).**
- Conclusions: This report demonstrates the burden of ACEs among the US adult population using the largest and most diverse sample to date.
- **These findings highlight that childhood adversity is common across sociodemographic characteristics**, but some individuals are at higher risk of experiencing ACEs than others (Merrick, Ford, Ports, Guinn, 2018).

ACE: It's a World Wide Problem

- The multiple ACE studies were ground breaking, but concerns arose on the generalizability of the findings to populations in other geographic areas such as low and middle income countries and populations with greater ethnic and cultural diversity.
- Recently, studies among populations of
- **Australia** (Loxton, Townsend, Dolja-Gore et al., 2019),
- **China** (Nie, Yu, Wang et al., 2015),
- **Africa** (Kidman, Piccolo, Kohler, 2020)
- **South America** (Reisen, Viana, Neto, 2019) and
- **Europe** (Bellis, Hughes, Ford et al., 2019)
- have confirmed the **ACE studies' findings among geographically, economically, culturally and ethnically diverse populations.**

Pre ACE Studies: the DSM Definition of Traumatic Events

- Historical and literary references to the after-effects of psychological trauma date as far back as 2000 BC in the cuneiform tablets of Babylon.
- **Since the beginning of humankind, traumatic events such as disasters or wars change human behavior and functioning.**
- Despite the passing time, reactions to traumatic events are not very different.
- **Psychopathology following such events is almost the same** and since 1980 it is described as post traumatic stress disorder (Kucmin, Kucmin, Nogalski et al, 2016).
- DSM 5 definition of trauma: **The person was exposed to: death, threatened death, actual or threatened serious injury, or actual or threatened sexual violence.**

Post ACE Studies: Definition of Trauma

- Individual trauma results from an event, series of events, or set of circumstances that is **experienced by an individual as physically or emotionally harmful** or life threatening and that has **lasting adverse effects on the individual's functioning and mental, physical, social, emotional, or spiritual well-being** (<https://store.samhsa.gov/system/files/sma14-4884.pdf>)
- Trauma can be **anything that results from experiences that overwhelm an individual's capacity to cope.**
- Trauma can result from abuse and neglect, family conflict, poverty, having a life-threatening illness, undergoing repeated and/or painful medical interventions, accidents, witnessing acts of violence, grief and loss, intergenerational events, etc. (http://bccwh.bc.ca/wp-content/uploads/2012/05/2013_TIP-Guide.pdf).



Trauma Affects the Biology of the Developing Brain Differently Than the Fully Developed Adult Brain

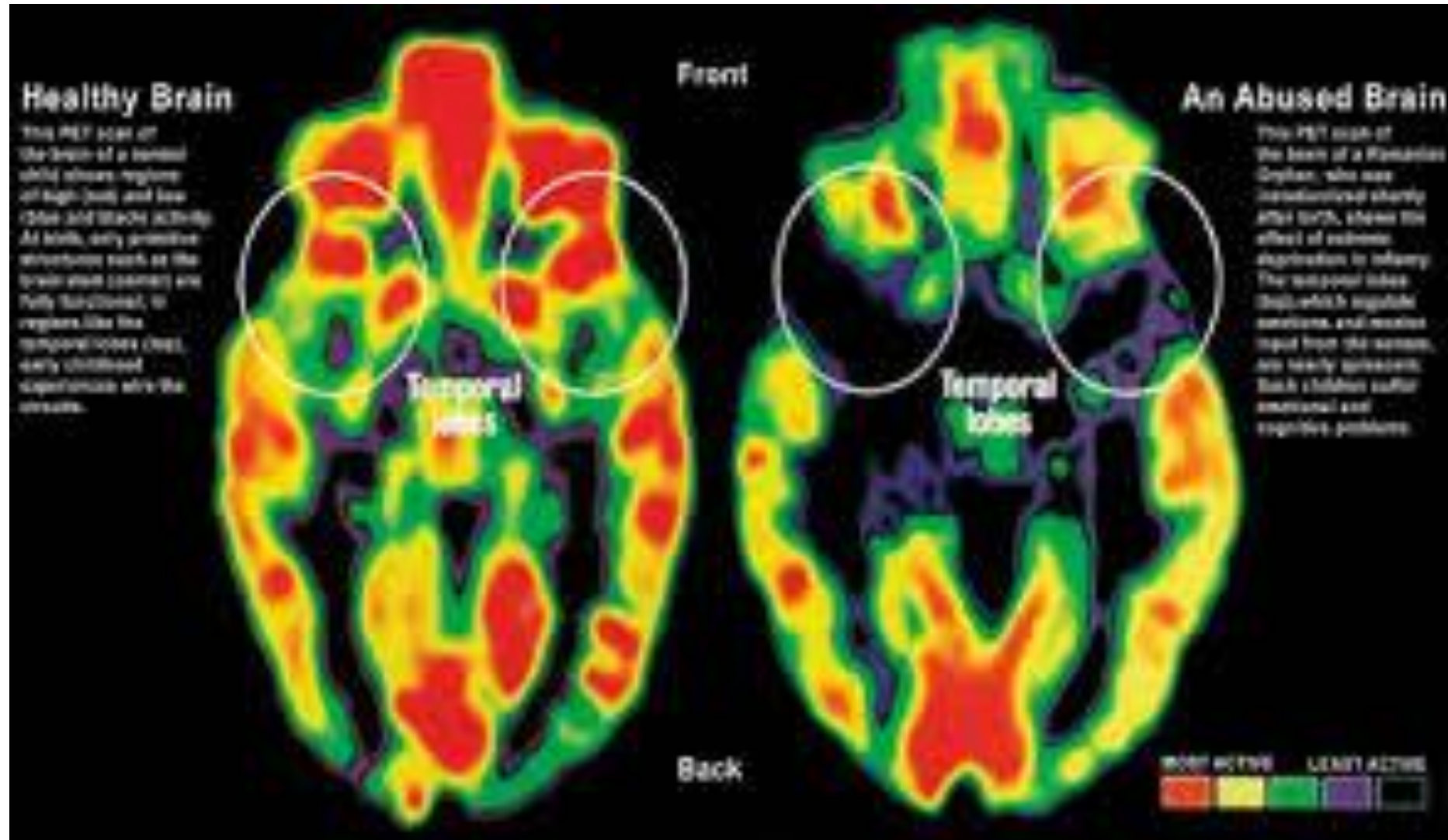
Effects of ACE on Brain Development

- **Early stress and maltreatment produces a cascade that alters brain development.**
- The first stage involves the stress-induced programming of the **glucocorticoid, noradrenergic, and vasopressin-oxytocin stress response systems to augment stress responses.**
- The over active stress response systems produce **effects on neurogenesis, synaptic overproduction and pruning, and myelination during specific sensitive periods.**
- Consequences include reduced size of the mid-portions of the corpus callosum; attenuated development of the left neocortex, hippocampus, and amygdala along with **abnormal frontotemporal electrical activity.**

Teicher, Andersen, Polcari, Anderson, Navalta, 2002

fMRI Images of Healthy Brain and Patient with ACE

Note the Loss of Prefrontal Metabolism Associated with Inhibition of Emotional Impulses



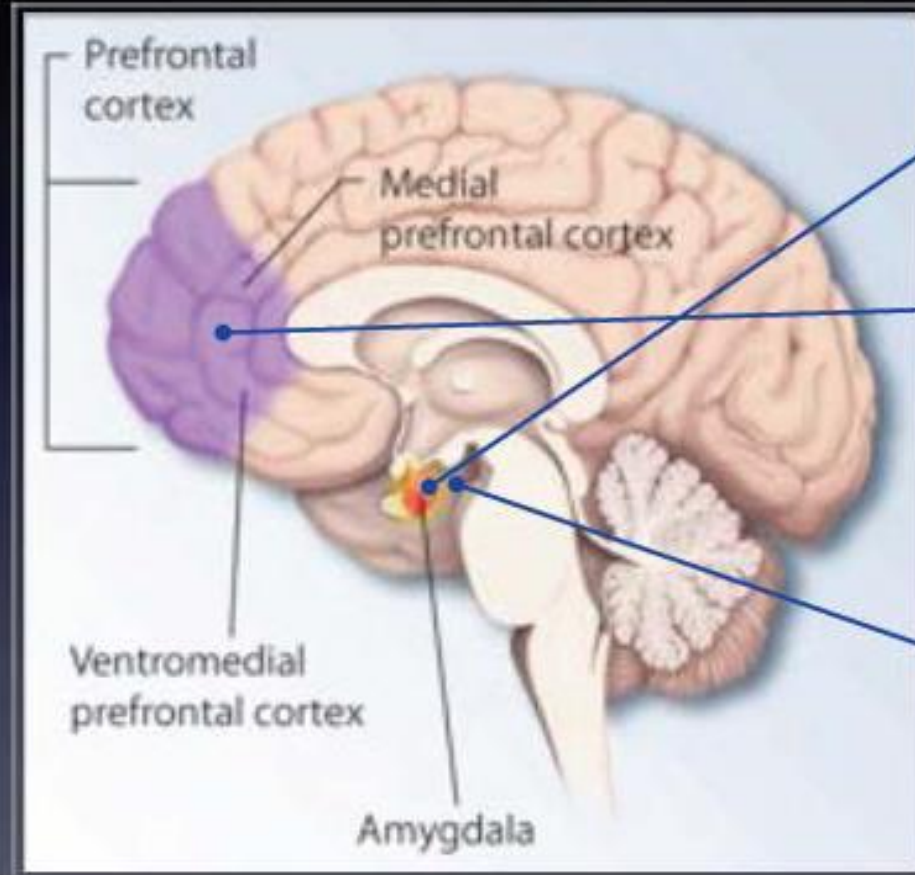
14 Amplified Stress Response

Decreased Ability to Resist Impulsive Behavior and Intense Emotions

Decreased Ability to Learn New Behaviors



What happens?



Amygdala:
activates the stress response
Toxic stress: enlargement

Prefrontal cortex:
usually a check to the amygdala
Toxic stress: loss of neurons, less able to function

Hippocampus:
major role in memory and mood
Toxic stress: impairment in understanding and emotion

Executive Function Skills are Compromised by ACE

Working Memory

Hold on to information

while working on something else

Follow multiple steps

Mental Flexibility

Innovate

Easily switch gears

Multitask

Alter strategies

Impulse Control

Filter distractions

Resist temptation

Maintain focus

Persist

Think before acting

Effects of ACE on Physical Health

- **ACE is associated with increased vulnerability to several major medical disorders including coronary artery disease and myocardial infarction, cerebrovascular disease and stroke, type II diabetes, asthma, as well as certain forms of cancer.**
- **The net effect is a very significant reduction in life expectancy in people with ACE (Lippard & Nemeroff, 2020).**
- Adverse childhood experiences are the “single biggest contributor to the risk of psychiatric and physical disorders, more than any single gene or factor” (Strakowski, 2020)

Effects of ACE on Physical Health (2)

- **ACEs, including child abuse and family dysfunction, are linked to leading causes of adult morbidity and mortality.**
- **Purpose:** To determine if ACE exposure increases the risk of chronic disease and disability using a larger, more representative sample of US adults.
- **Methods:** Ten states and the District of Columbia included an optional ACE module in the 2010 Behavioral Risk Factor Surveillance Survey, a national cross-sectional, random-digit-dial telephone survey of adults.
- Respondents were asked about nine ACEs, including physical, sexual, and emotional abuse and household member mental illness, alcoholism, drug abuse, imprisonment, divorce, and intimate partner violence.

Gilbert, Breiding, Merrick et al., 2014

Effects of ACE on Physical Health (3)

- An ACE score was calculated for each subject by summing the endorsed ACE items.
- After controlling for sociodemographic variables, weighted AORs were calculated for self-reported health conditions given exposure to zero, one to three, four to six, or seven to nine ACEs.
- **Results: Compared to those who reported no ACE exposure, the adjusted odds of reporting myocardial infarction, asthma, fair/poor health, frequent mental distress, and disability were higher for those reporting one to three, four to six, or seven to nine ACEs.**
- **Odds of reporting coronary heart disease and stroke were higher for those who reported four to six and seven to nine ACEs; odds of diabetes were higher for those reporting one to three and four to six ACEs.**

Gilbert, Breiding, Merrick et al., 2014

Effects of ACE on Health Utilization

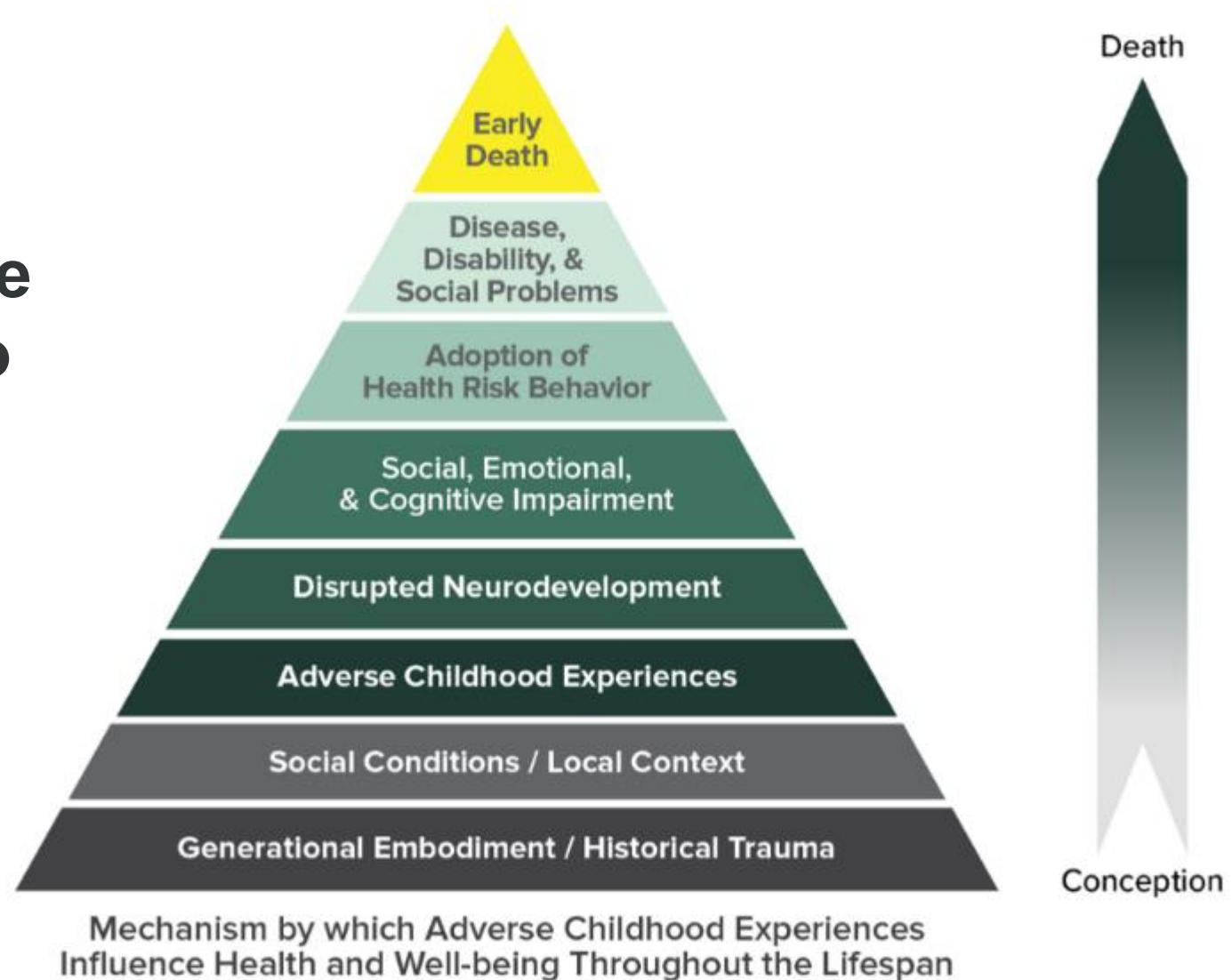
- To determine associations of ACE with adult health care utilization in an underserved, low-income population.
- Questionnaires on ACE were completed by 38,200 adults (mean age 54), two-thirds African American, recruited from community health centers across 12 Southeastern states.
- **The percentages reporting emergency room visits and doctor's office visits, with high chronic disease index scores, rose monotonically with rising ACE score.**
- Odds ratios (CIs) for those with four or more vs. zero ACEs were 1.37 (95% CI 1.27-1.47) for 1-10 times and 1.80 (95% CI 1.29-2.52) for more than 10 times ER visits, 1.37 (95% CI 1.18-1.59) for over 10 doctor's visits, and 2.29 (95% CI 2.06-2.54) for three or more chronic diseases.
- **High ACE levels were associated with greater chronic disease burden and greater health care utilization in adulthood. Long-lasting effects from ACE on the health care of underserved populations are indicated. There is an urgent need to train health care providers, patients, and their families on ACE effects and treatments for better health care outcomes.**

Effects of ACE on Health Utilization (2)

- ACEs have been associated with a variety of negative health outcomes. However, the association between ACEs and access and utilization of health care have been largely ignored.
- Examined data from the 2011 Behavioral Risk Factor Surveillance System (N = 101 527).
- Conducted logistic regression analyses, with 9 ACEs as independent variables, in relation to the odds of being insured, having a personal health care provider and receiving a physician checkup in the past year.
- After accounting for potential confounders, **all ACEs were associated with lower odds of being currently insured and receiving a physician checkup in the past year.**
- Physical abuse, emotional abuse and several measures of household dysfunction were associated with lower odds of having a personal provider.
- Our findings suggest potential pathways by which ACEs may impact health.
- **Provision of health insurance and providing care in a trauma-informed manner should be considered for individuals with a history of ACEs.**

How ACEs Impact Health Outcomes

Health Risk Behaviors Adapted in Adolescence and Early Adulthood to Mitigate Heightened Stress Responses Form the Foundation of Adult Disease and Early Death



Implications For Physical Health Practices

- **Multiple types of patients seen in practices focusing on physical health may have unrecognized traumatic stress components to their disorders of obesity, diabetes, asthma, myocardial infarction, coronary artery disease, COPD, and stroke.**
- **Many medical interventions are traumatizing** (adding to cumulative traumatic stress) or re-traumatizing for patients and their families.
- **Women with trauma histories experiencing routine prenatal care and child birth can be re-traumatized.**
- Previous trauma with heightened stress responses and impaired executive functions may be the unrecognized basis for many patient's health risk behaviors and the inability to learn new coping behaviors.

Trauma Informed Care (TIC)

- Definition: TIC is a strengths-based service delivery approach that is rooted in an understanding of and responsiveness to the impact of trauma, that emphasizes physical, psychological, and emotional safety for both providers and clients (Hopper, Bassuk, & Olivet, 2010).
- **We need to presume the clients we serve and our staff members may have a history of traumatic stress and exercise “universal precautions”** (Hodas, 2006).
- Pediatrics was one of the first specialties to incorporate aspects of TIC into the care of their patients.

Pediatric Primary Care Approaches to ACE

- Assess the evidence for prevention and treatment of child trauma.
- Results: 12 articles describing 10 different studies.
- The intervention approaches taken in the studies were diverse and included the **implementation of screening programs or tools, training clinicians to recognize and discuss psychosocial issues with patients and their families, and providing primary care professionals with community resource lists.**
- Nine out of 10 studies included in the review reported favorable results.
- **Findings suggest that interventions in pediatric primary care settings are feasible and can favorably affect clinical practices and families' outcomes.**

Pediatric Primary Care Approaches to ACE (2)

- Early detection of and intervention in childhood trauma has powerful potential to improve the health and well-being of children.
- Systematic review on the pediatric health outcomes associated with ACE.
- 35 studies were included.
- **Conclusion: Childhood adversity affects brain development and multiple body systems, and the physiologic manifestations can be detectable in childhood.**
- **A history of childhood trauma should be considered in the differential diagnosis of developmental delay, asthma, recurrent infections requiring hospitalization, somatic complaints, and sleep disruption** (Oh, Jerman, Marques et al., 2018).

Pediatric ACE Interventions are Mostly Successful

- Summarize evidence from RCTs for the efficacy of interventions involving pediatrics to prevent poor outcomes associated with ACEs.
- A total of 22 articles describing results of 20 RCTs were included.
- Parent mental illness/depression was the most common ACE measured, followed by parent alcohol or drug abuse, and domestic violence.
- **5 of 6 studies that directly involved pediatric primary care practices improved outcomes, including 3 trials that involved screening for ACEs.**
- **8 of 15 studies that measured child health outcomes, and 15 of 17 studies that assessed the parent-child relationship, demonstrated improvement.**
- Multicomponent interventions that utilize professionals to provide parenting education, mental health counseling, social service referrals, or social support can reduce the impact of ACEs on child behavioral/mental health problems and improve the parent-child relationship for children aged 0-5 years.

A Model for Trauma-Informed Primary Care (TIPC)

- The TIPC model provides a guide for primary care providers to screen for ACEs and personalize the care of patients with a history of childhood trauma.
- The model, based on the trauma-informed care model used in mental health, has five components:
 - (a) screening and trauma recognition,**
 - (b) understanding the health effects of trauma,**
 - (c) patient-centered communication and care,**
 - (d) emphasis on emotional safety and avoiding triggers, and**
 - (e) knowledge of helpful treatment for trauma patients.**

ACE Screening

- The CDC and KP developed the ACE scale to identify negative experiences in childhood.
- Systematically review outcomes associated with the ACEs in the CDC-Kaiser ACE scale.
- Results: we identified 96 articles.
- There were more studies focusing on psychosocial and behavioral outcomes than medical outcomes.
- Psychosocial and behavioral outcomes had higher odds ratio than medical outcomes with increasing ACE scale scores.
- Conclusions: **Exposure to multiple ACEs is associated with a wide variety of outcomes.**
- **This data suggests a benefit of screening for ACEs using this scale and highlights the need to find interventions to ameliorate their effects.**

ACE Screening for Cardio Metabolic Risk or Disease Patients

- Adult primary care patients with cardio metabolic disease (hypertension, diabetes, stroke, angina, myocardial infarction, coronary artery bypass graft, angioplasty) or with a risk factor (obesity, smoking, high cholesterol, family history) were surveyed regarding ACEs.
- **Exposure to ACEs was reported by 174 participants (61%).**
- Greater ACE exposure was associated with less likelihood of selecting diet or physical activity as a behavior change goal (linear-by-linear association $p = .009$).

Maunder, Tannenbaum, Permaul et al., 2019

ACE Screening for Cardio Metabolic Risk (2)

- **ACE are common among patients at cardio metabolic risk** and are related to quality of life and factors associated with outcomes and behavior change.
- **ACE should be taken into account when managing cardio metabolic risk in family medicine** (Maunder, Tannenbaum, Permaul et al., 2019).
- **Young adults with high ACE scores are at increased risk of early-onset chronic disease.**
- **Trauma-informed care and ACE prevention are crucial public health priorities** (Sonu, Post, Feinglass, 2019)

Trauma Informed Communication

- People who have experienced significant trauma become very **concerned with safety**.
- Establishing that they feel safe and periodically checking on their sense of safety is the first priority in communicating effectively with patients who have experienced trauma.
- Communicating effectively in general about mental illness and substance use is a specific skill set that can be learned.
- There are multiple types of trainings on communicating about mental health issues. Mental Health First Aid (MHFA) is one of those trainings, that is relatively brief and evidence based.

Referral Communication Issues For Patients with ACE

- **Safety and Abandonment Fears:** Often trauma patients experience referrals as abandonment and may experience any new treatment provider as a safety risk. Often referrals for these patients take multiple sessions to assure safety and ameliorate the perceived loss of relationship.
- **Reluctance to Discuss Trauma:** Often trauma patients avoid discussion of trauma secondary to fear of re experiencing traumatic memories. The long term benefits of therapy versus the short term costs of re experiencing often need repeated discussion before a trauma patient agrees to and follow ups on a referral.
- **Therapy can hurt!** Some types of therapy can lead to re experiencing traumatic memories consciously and in nightmares. Again, the long term benefits of therapy versus the short term costs of re experiencing often need repeated discussion before a trauma patient agrees to and follow ups on a referral.

Behavioral Health Treatment For Patients with ACE

- A focus on the prevention or mitigation of adversity in childhood is an important direction of many programs, **many individuals do not access support services until adulthood, when health problems may be fairly engrained.**
- The current review examines the evidence base for psychosocial interventions for adults with a history of ACEs.
- The review focuses on **interventions provided in primary care, as that is the setting where most patients will first present and are most likely to receive treatment.**
- 99 studies met inclusion and exclusion criteria.
- **Overall, CBT have the most evidence for improving health problems, in particular, improving mental health and reducing health-risk behaviors in adults with a history of ACEs.**
- **Expressive writing and mindfulness-based therapies also show promise,** whereas other treatments have less supportive evidence (Korotana, Dobson, Pusch, Josephson, 2015)

Patients with ACE May Respond Differently to Antidepressants

- Cross-sectional and more recent longitudinal studies demonstrate is associated with **increased risk for first mood episode, episode recurrence, greater comorbidities, and increased risk for suicidal ideation and attempts** in individuals with mood disorders (Lippard & Nemeroff, 2020).
- **Review of head-to-head comparisons of antidepressants among adult MDD patients with a reported history of ACE or no history to evaluate if ACE may help clinicians choose antidepressants with greatest likelihood of successful outcome.**
- Sertraline and the group of antidepressants with low affinity for the serotonin transporter may be less suitable for MDD patients with ACE history than
- **Escitalopram, venlafaxine-XR, or antidepressants with high affinity for the serotonin transporter** (Perna, Daccò, Alciati et al., 2020).

Mindfulness May be A Non Threatening Treatment for Patients with ACE

- OBJECTIVES—To conduct an effect size analysis of mindfulness based intervention for anxiety and mood symptoms in clinical samples.
- The search identified 39 studies totaling 1,140 participants receiving mindfulness-based therapy for a range of conditions, including cancer, generalized anxiety disorder, depression, and other psychiatric or medical conditions.
- RESULTS—Effect size estimates suggest that mindfulness-based therapy was moderately effective for improving anxiety (Hedges' $g = 0.63$) and mood symptoms (Hedges' $g = 0.59$) from pre to post treatment in the overall sample.
- The effect sizes were robust, unrelated to publication year or number of treatment sessions, and were maintained over follow-up.
- CONCLUSION: **These results suggest that mindfulness-based therapy is a promising intervention for treating anxiety and mood problems in clinical populations.**

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Thank You

Contact Us



 808-695-7700

 www.beaconhealthoptions.com



Appendix



ACE Survey in PDF Form

<https://www.theannainstitute.org/Finding%20Your%20ACE%20Score.pdf>

Trauma is a Risk Factor for Most Adult Behavioral Disorders

- **Trauma is a risk factor for virtually all mental disorders (particularly depressive, anxiety, dissociative and personality disorders),**
- **Some trauma survivors are resilient, some develop PTSD and others develop other mental disorders,**
- The variety of symptoms that trauma survivors express (mood, cognitive, perceptual, somatic), make it difficult to classify.
- **Post Traumatic Stress defies categories, the authors conclude that Post Traumatic Stress is currently best conceptualized as a specifier for other mental disorders.**

42 Effects of Childhood Trauma on Psychiatric Disorders

- The effects of trauma on brain development **provide the neurobiological framework through which early abuse increases the risk of developing PTSD, depression, ADHD, Borderline Personality Disorder, Dissociative Identity Disorder, and substance use disorders** (Teicher, Andersen, Polcari, Anderson, Navalta, 2002).

MHFA

- MHFA teaches you **how to identify, understand and respond to signs of mental illnesses and substance use disorders.**
- The training gives you the **skills you need to reach out and provide initial help and support to someone who may be developing a mental health or substance use problem or experiencing a crisis.**
<https://www.mentalhealthfirstaid.org/about/>
- Objective: assessment of the effectiveness of the MHFA on improving mental health knowledge, stigma and helping behavior.
- A total of 18 trials (5936 participants) were included.
- **This review supports the effectiveness of MHFA training in improving mental health literacy and appropriate support for those with mental health problems up to 6 months after training.**