

## I. The Adverse Childhood Experiences (ACE) Studies

The adverse childhood experiences (ACE) studies show that trauma in childhood increases risk for autoimmune <sup>1</sup> and other chronic diseases, additional health problems later in life <sup>2</sup> and in future generations. A [Kaiser-CDC study](#) with over 17,000 participants identified this connection. Results have been reproduced with different populations <sup>3</sup> and a continuation of the original study with over [450,000 patients](#) \*. California is [screening for ACEs](#) with initiatives from their first [Surgeon General, pediatrician Nadine Burke Harris, MD](#).

The key point from this body of research is that the effects of childhood trauma are not just psychological. Trauma alters brain development, function and structure; autonomic nervous system regulation; physiology, stress responses <sup>4-6</sup>, and gene function (epigenetics) <sup>7</sup>. The [American Academy of Pediatrics](#) has used this and other research to develop a new policy <sup>4</sup>, [assessment tools](#), and a [trauma toolbox](#) for primary care. For more info: [WHO](#), [CDC](#) <sup>8</sup>, [RWJ](#), [PBS](#) <sup>9</sup>, [NPR](#) <sup>10</sup>, [New York Times](#) <sup>11</sup>, [CBS 60 minutes](#), and news site [ACES Too High](#).

## II. ACEs Increase Risk for Chronic Illnesses and Poor Physical Health <sup>1,2,12</sup>

Asthma	Irritable Bowel Syndrome	Rheumatoid arthritis
Cancer	Inflammatory Bowel Disease	Sjogren's
Celiac disease	Liver Disease	Sleep Disorders <sup>14</sup>
Chronic Fatigue (ME/CFS)**	Lung Disease (Asthma, COPD)	Stroke
Coronary heart disease	Lupus	Thyroid, Grave's
Diabetes, type 1 & type 2	Multiple Sclerosis	Thyroid, Hashimoto's
Fibromyalgia (FMS)**	Myasthenia Gravis	Poor self-related health
Hypertension <sup>13</sup>	Obesity	<i>more listed on <a href="#">website</a></i>

\*\* similar findings on chronic fatigue (ME/CFS) <sup>15-16</sup>, fibromyalgia <sup>16</sup> & unexplained symptoms

## III. How Are ACEs Measured? ACE Score is based on a maximum of 10 points

The ACE questionnaire asks about exposure to 10 specific types of trauma from 0-18 years of age. Original Qs were drawn from areas in public health for which national programs were being developed in the 1990s. Other types of trauma also increase risk (accidents, unsafe neighborhood, etc). 1 point for any event per category.

1 _ Physical abuse (Stats: 1 in 3.5 Americans)	6 _ Loss of a parent from divorce or separation
2 _ Sexual abuse (1 in 5)	7 _ Violent treatment of mother (1 in 10)
3 _ Emotional abuse (1 in 9)	8 _ Member of household mental illness (1 in 5)
4 _ Physical neglect	9 _ Member of household jailed (1 in 30)
5 _ Emotional neglect	10 _ Member of household substance abuse (1 in 4)

## IV. ACE & Chronic Illness Facts & Stats

- 63% of population In U.S. has ACE score  $\geq 1$ ; 25% an ACE score of 2; 12.5% ACE  $\geq 4$  <sup>2</sup> (see [CDC](#))
- Life expectancy Is 20 years shorter if ACE  $\geq 6$  <sup>2</sup>; premature death 2x higher with ACE  $\geq 4$  <sup>12</sup>
- Dose response Risk increases with additional ACEs <sup>2</sup>; age of onset decreases <sup>6,17</sup>
- C reactive protein Indication of inflammation, is higher with a history of ACEs <sup>1</sup>
- Amplifies risk ACEs may increase sensitivity to other risk factors such as infections <sup>1</sup>
- Multigenerational Maternal ACEs increase child's risk physical / emotional health conditions <sup>4,18</sup>
- Treatment When Drs ask about ACEs it validates, removes blame <sup>19,20</sup>, & offers [new tools](#)
- Book & How To ACEs Overview & how one medical Dr screens for ACEs: [The Deepest Well](#) <sup>21</sup>
- Autoimmune disease 20% increased risk with each additional point in ACE score <sup>1</sup>; A [recovery story](#) <sup>22</sup>
- Hospitalizations  $\geq 70\%$  higher for autoimmune disease with ACE of  $\geq 2$  vs ACE of 0 <sup>1</sup>

Veronique Mead, MD, MA 2021.5.19 ([CC BY-NC-ND 4.0](#)) for more see [Chronic Illness Trauma Studies ACE Fact Sheet](#)

## References

1. Dube SR, Fairweather D, Pearson WS, Felitti VJ, Anda RF, Croft JB. Cumulative Childhood Stress and Autoimmune Diseases in Adults. *Psychosom Med*. 2009;71(2):243-250.
2. Felitti VJ, Anda RF, Nordenberg D, et al. Relationship of childhood abuse and household dysfunction to many of the leading causes of death in adults. The Adverse Childhood Experiences (ACE) Study [see comments]. *Am J Prev Med*. 1998;14(4):245-258.
3. Hughes K, Bellis MA, Hardcastle KA, et al. The effect of multiple adverse childhood experiences on health: a systematic review and meta-analysis. *Lancet Public Health*. 2017;2(8):e356-e366.
4. Shonkoff JP, Garner AS, Committee on Psychosocial Aspects of C, et al. The lifelong effects of early childhood adversity and toxic stress. *Pediatrics*. 2012;129(1):e232-246.
5. Garner AS, Shonkoff JP, Committee on Psychosocial Aspects of C, et al. Early childhood adversity, toxic stress, and the role of the pediatrician: translating developmental science into lifelong health. *Pediatrics*. 2012;129(1):e224-231.
6. Luby JL, Barch D, Whalen D, Tillman R, Belden A. Association Between Early Life Adversity and Risk for Poor Emotional and Physical Health in Adolescence: A Putative Mechanistic Neurodevelopmental Pathway. *JAMA Pediatr*. 2017.
7. Romens SE, McDonald J, Svaren J, Pollak SD. Associations between early life stress and gene methylation in children. *Child Dev*. 2015;86(1):303-309.
8. CDC (Centers for Disease Control and Prevention). Adverse Childhood Experiences (ACEs) [website]. 2016; CDC 24/7: Saving Lives, Protecting People: <https://www.cdc.gov/violenceprevention/acestudy/>. Accessed Nov 2, 2016, 2016.
9. Bouffard K. Why stress may be fueling the childhood asthma epidemic [TV news with segment from Karen Bouffard of The Detroit News]. 1996-2016 PBSNewsHourproductions LLC. Dec 9, 2015, 2015.
10. Starecheski L. 10 Questions Some Doctors Are Afraid To Ask. *National Public Radio: What Shapes Health*. Vol 2015. Washington, D.C.: National Public Radio (NPR); 2015:NPR Science Desk: Shots.
11. Bornstein D. Putting the Power of Self-Knowledge to Work (Part III of III). *The New York Times*. August 23, 2016;The Opinion Pages.
12. Bellis MA, Hughes K, Leckenby N, Hardcastle KA, Perkins C, Lowey H. Measuring mortality and the burden of adult disease associated with adverse childhood experiences in England: a national survey. *J Public Health (Oxf)*. 2015;37(3):445-454.
13. Su S, Wang X, Pollock JS, et al. Adverse childhood experiences and blood pressure trajectories from childhood to young adulthood: the georgia stress and heart study. *Circulation*. 2015;131(19):1674-1681.
14. Kajeepeta S, Gelaye B, Jackson CL, Williams MA. Adverse childhood experiences are associated with adult sleep disorders: a systematic review. *Sleep Med*. 2015;16(3):320-330.
15. Heim C, Nater UM, Maloney E, et al. Childhood trauma and risk for chronic fatigue syndrome: association with neuroendocrine dysfunction. *Arch Gen Psychiatry* 2009;66(1):72-80. doi: 66/1/72
16. Borsini A, Hepgul N, Mondelli V, Chalder T, Pariante CM. Childhood stressors in the development of fatigue syndromes: a review of the past 20 years of research. *Psychol Med*. 2013;44(9):1809-1823.
17. Shaw MT, Pawlak NO, Frontario A, Sherman K, Krupp LB, Charvet LE. Adverse Childhood Experiences Are Linked to Age of Onset and Reading Recognition in Multiple Sclerosis. *Front Neurol*. 2017;8:242.
18. Madigan S, Wade M, Plamondon A, Maguire JL, Jenkins JM. Maternal Adverse Childhood Experience and Infant Health: Biomedical and Psychosocial Risks as Intermediary Mechanisms. *J Pediatr*. 2017.
19. Felitti V, Anda R. Lifelong Effects of Child Maltreatment. In: Chadwick DL, Alexander RA, Giardino AP, Esernio-Jenssen DJ, Thackeray D, eds. *Chadwick's Child Maltreatment: Sexual Abuse and Psychological Maltreatment*. Vol 2. 4th ed. Saint Louis, MO: STM Learning, Inc; 2014:12.
20. Goldstein E, Athale N, Sciolla AF, Catz SL. Patient Preferences for Discussing Childhood Trauma in Primary Care. *Perm J*. 2017;21.
21. Burke Harris N. *The Deepest Well: Healing the Long-Term Effects of Childhood Adversity*. Houghton Mifflin Harcourt; 2018.
22. Nakazawa DJ. *Childhood Disrupted: How Your Biography Becomes Your Biology, and How You Can Heal*. New York City: Atria Books; 2015.

\* per email conversation with Dr. Felitti, spring 2018