

# ASD, TRAUMA AND SUD

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# HIGHLIGHTS FROM THE LAST WEEK

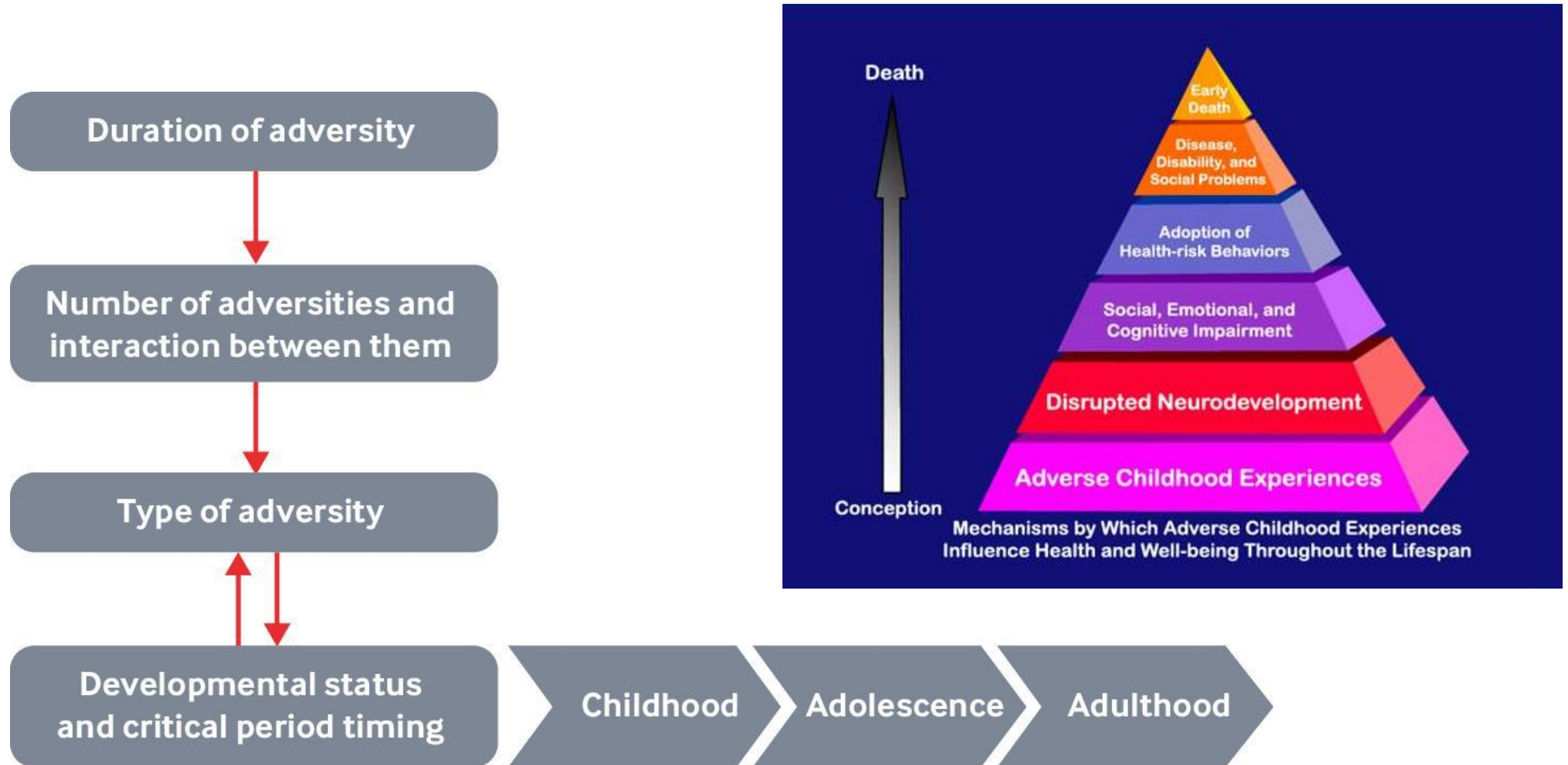
- ❑ There has been a dramatic increase in the diagnosis of ASD and other neurodevelopmental disorders in the recent years.
- ❑ More subtle forms of ASD are being increasingly recognized.
- ❑ Australia follows the global trend.
- ❑ Comorbidity is a rule.
  - ❑ Other neurodevelopmental disorders like ADHD, ID, SLD
  - ❑ Anxiety, depression, OCD
  - ❑ Trauma spectrum disorder
- ❑ lack of research and longitudinal follow-up study.

# DEFINING TOXIC STRESS

Prolonged activation of the stress response systems that can disrupt the development of brain architecture and other organ systems and increase the risk for stress related disease and cognitive impairment, well into the adult years.

Children with neurodevelopmental disorders are more vulnerable to toxic stress.

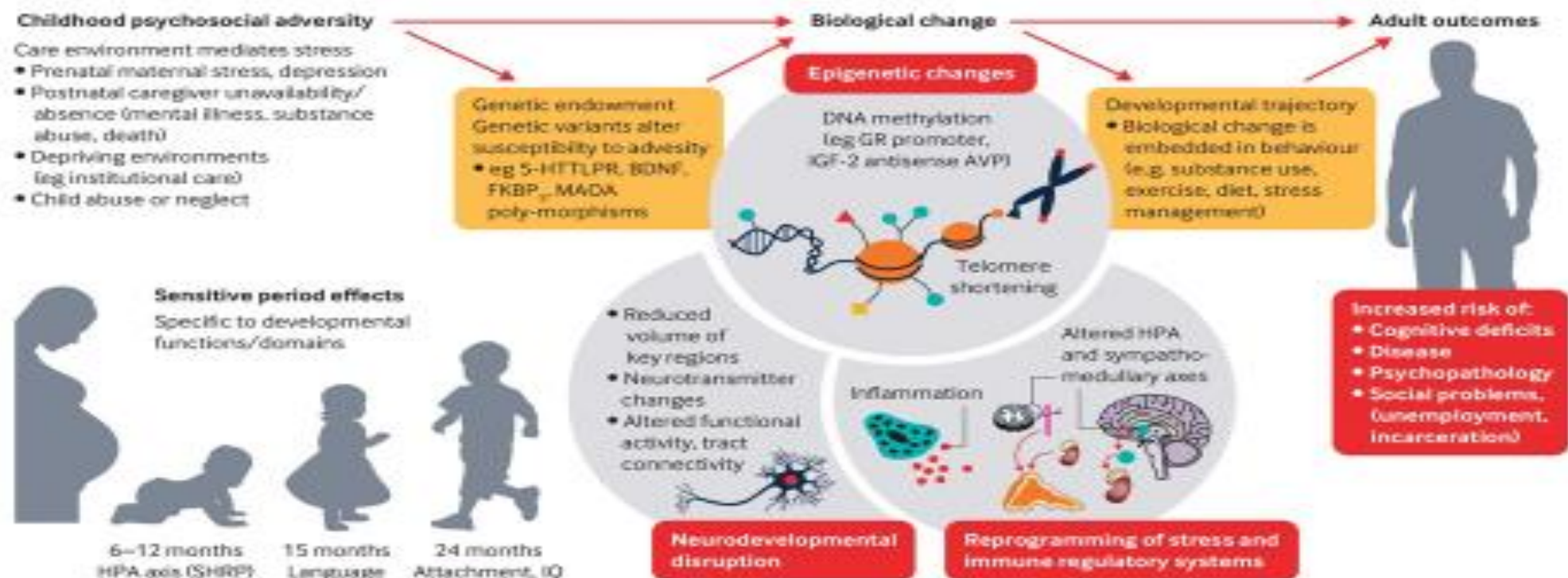
## The interplay of adversities, context, and human development .



Charles A Nelson et al. BMJ 2020;371:bmj.m3048



**Some of the pathways that mediate exposure to early adversity and adult outcomes.**



Charles A Nelson et al. *BMJ* 2020;371:bmj.m3048





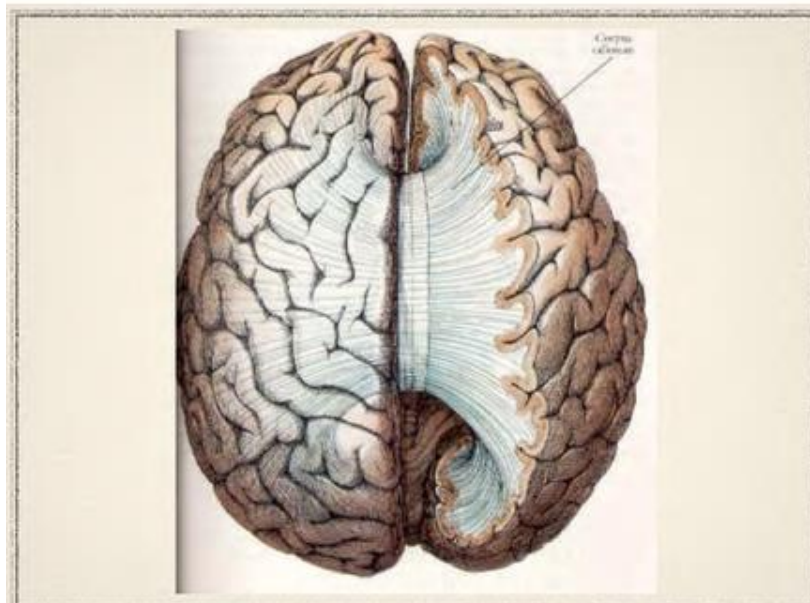
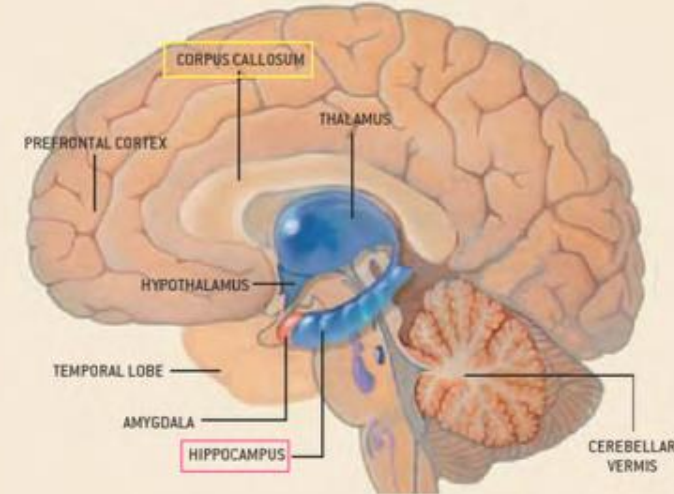
## Questions

*What brain structures are affected by exposure to childhood maltreatment?*

*Does the type of maltreatment matter or are they all stressors?*

*What is the relationship between childhood abuse, brain changes and psychiatric illness?*

## First Neuroimaging Findings



## Childhood Abuse and the Regional Anatomy of the Corpus Callosum

Myelinated regions, such as the corpus callosum (CC) are potentially vulnerable to the impacts of early exposure to excessive levels of stress hormones, which suppress glial cell division critical for myelination.

## SUBDIVISIONS OF THE CORPUS CALLOSUM



Teicher MH, Ito Y, Glod CA, Andersen SL, Dumont N, Ackerman E: Preliminary evidence for abnormal cortical development in physically and sexually abused children using EEG coherence and MRI. *Ann N Y Acad Sci* 1997; 821:160-75

Comparison between abused/neglected boys, non-abused psychiatric control boys (contrast group), and healthy boys.

Region	Abused/neglected	Contrast	Healthy	Group diff.
1 (rostrum)	0.306	0.109	0.128	0.1000
2 (genu)	0.761	0.900	0.864	0.1300
3 (rostral body)	0.463	0.615	0.606	0.0020
4 (ant. midbody)	0.361	0.486	0.523	0.0001
5 (post. midbody)	0.331	0.416	0.429	0.0055
6 (isthmus)	0.889	1.100	1.152	0.0043
7 (splenium)	0.403	0.466	0.496	0.5450
(n)	13	13	61	

Overall differences between groups, MANCOVA,  $p < 0.0001$

Association of Early Experience and Age on Regional Anatomy of Corpus Callosum in Boys, Based on Step-wise Regression.

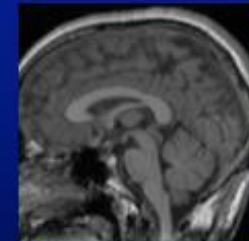
Region	Physical Abuse	Sexual Abuse*	Neglect*	Age**	PTSD*
1 (rostrum)	--	--	-41.7%†	7.4%‡	--
2 (genu)	--	--	-29.2%¥	--	--
3 (rostral body)	--	--	-33.2%¥	--	--
4 (ant. midbody)	-9.6%†	--	-30.7%¥	--	--
5 (post. midbody)	--	--	-40.2%¥	1.5%†	--
6 (isthmus)	--	--	-45.7%¥	--	--
7 (splenium)	--	-18.3%†	-24.2%§	--	--

† $p < 0.10$ , ‡ $p < .05$ , § $p < .01$ , ¥ $p < .001$

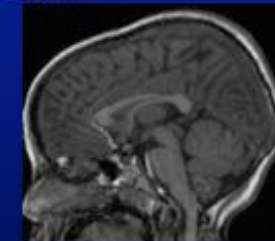
\*Values are expressed as % change in volume associated with positive history

\*\*Values are expressed as % change in volume per year of age.

## Childhood abuse affects corpus callosum



Control



Neglect

The morphology of the corpus callosum is significantly affected by early neglect (as well as physical abuse and sexual abuse).

Teicher et al. (2004) *Biological Psychiatry* 56, 80-85



## Deficient Hemispheric Integration

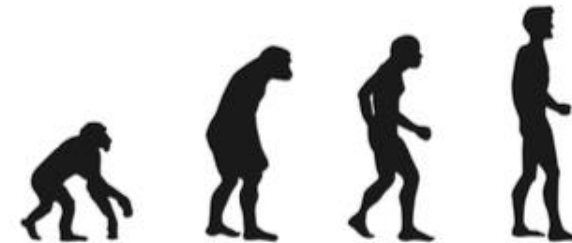
discoveries that abused patients have diminished right-left hemisphere integration and a smaller corpus callosum suggest an intriguing model for the emergence of borderline splitting.

With less integrated hemispheres, they may shift between logical and rational state to highly emotional state.



## Deficient Hemispheric Integration

Lack of integration between the hemispheres may also be a factor in the genesis of dissociation and multiple distinct identities.



The logical alternative is that exposure to early stress generates molecular and neurobiological effects that alter neural development in an adaptive way that prepares the brain to survive and reproduce in a malevolent world.

Teicher MH: Scars that won't heal: the neurobiology of child abuse. Scientific American 2002; 286(3):68-75

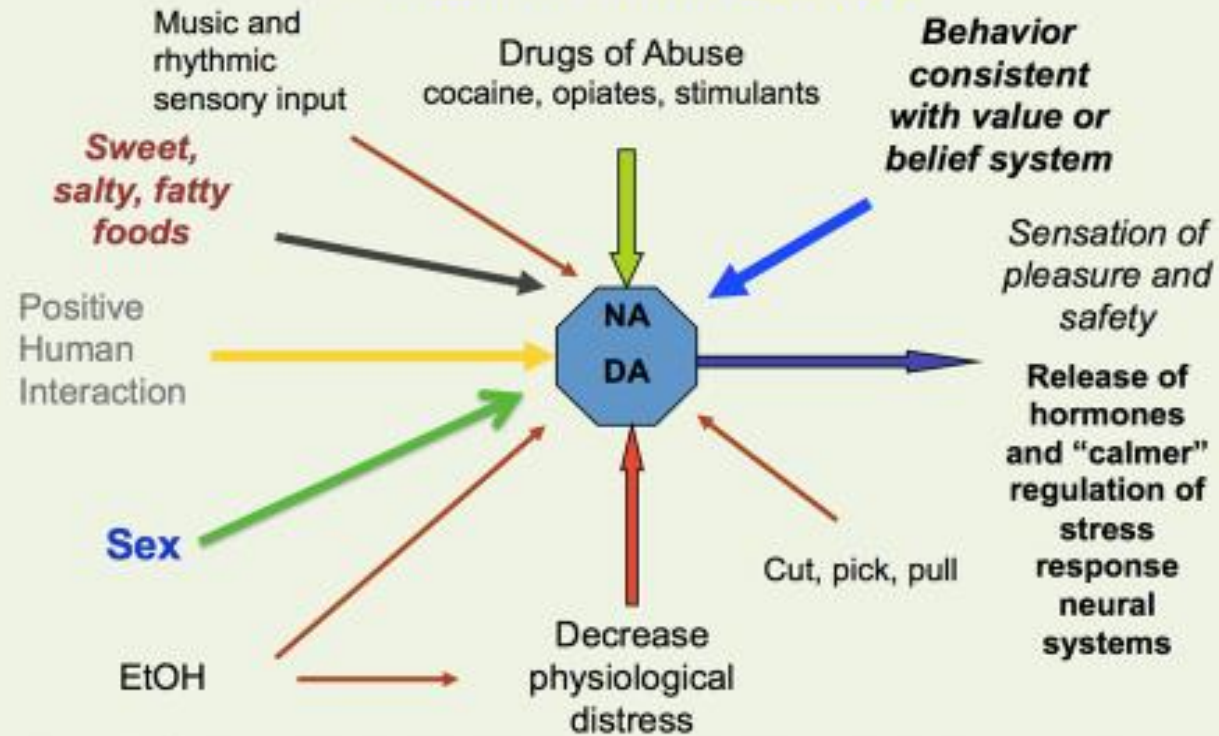


# ASD AND ADDICTIONS

RRB a core symptoms of ASD  
Behavioral addictions Vs RRB

- ❑ Substance abuse disorders were thought to be rare.
- ❑ But the adult follow-up studies were dealing with the DSM-III diagnosis of ASD
- ❑ Clinically not uncommon

## Stimulation of "Reward" Neural Systems in the Human Brain: *Multiple*



JAMA Pediatrics | Original Investigation

# Risk of Substance Use Disorder and Its Associations With Comorbidities and Psychotropic Agents in Patients With Autism

Jing-Syuan Huang, MD; Fu-Chi Yang, MD, PhD; Wu-Chien Chien, PhD; Ta-Chuan Yeh, MD; Chi-Hsiang Chung, PhD; Chia-Kuang Tsai, MD, PhD; Shih-Jen Tsai, MD, PhD; Sung-Sen Yang, PhD; Nian-Shen Tzeng, MD; Mu-Hong Chen, MD, PhD; Chih-Sung Liang, MD

**IMPORTANCE** The risk of substance use disorder (SUD) in patients with autism spectrum disorder (ASD) remains unclear.

**OBJECTIVE** To investigate the risk of SUD in patients with ASD and its associations with comorbidities, psychotropic agents (PAs), and mortality.

**DESIGN, SETTING, AND PARTICIPANTS** This retrospective, population-based, cohort study of 1936 512 participants used data from the Taiwan National Health Insurance Research Database and was conducted from January 1, 2000, to December 31, 2015. Included participants attended at least 3 outpatient visits within the 1-year study period for symptomatic ASD as determined by the *International Classification of Diseases, Ninth Revision, Clinical Modification (ICD-9-CM)* diagnostic codes. Individuals diagnosed with ASD before 2000, those diagnosed with SUD before the first visit for ASD, and those with missing data were excluded from the analysis. Patients with ASD and non-ASD controls were matched 1:4 by age, sex, and index date.

[+ Supplemental content](#)

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## Key Points

**Question** Do patients with autism have a higher risk of substance use disorder than the general population, and is this risk associated with psychotropic treatment, comorbidities, or mortality?

**Findings** In this cohort study of 6599 individuals with autism spectrum disorder (ASD) and 26 396 controls without ASD, a diagnosis of autism was associated with an increased risk of substance use disorder, and the risk was much higher in those who had behavioral comorbidities and those who did not receive psychotropic agents. The mortality risk was higher in patients with autism and co-occurring substance use disorder than in non-ASD controls with or without substance use disorder.

**Meaning** These findings suggest that patients with ASD are vulnerable to the development of substance use disorder, and the use of psychotropic agents for autism is associated with a decreased risk of substance use disorder.



# FORMULATION

NEED FOR AN INTEGRAL APPROACH

Bio–psychosocial–cultural

Trans–diagnostic

Trans–generational

Interpersonal

Bi–directional

Role of infancy and early attachment.

