

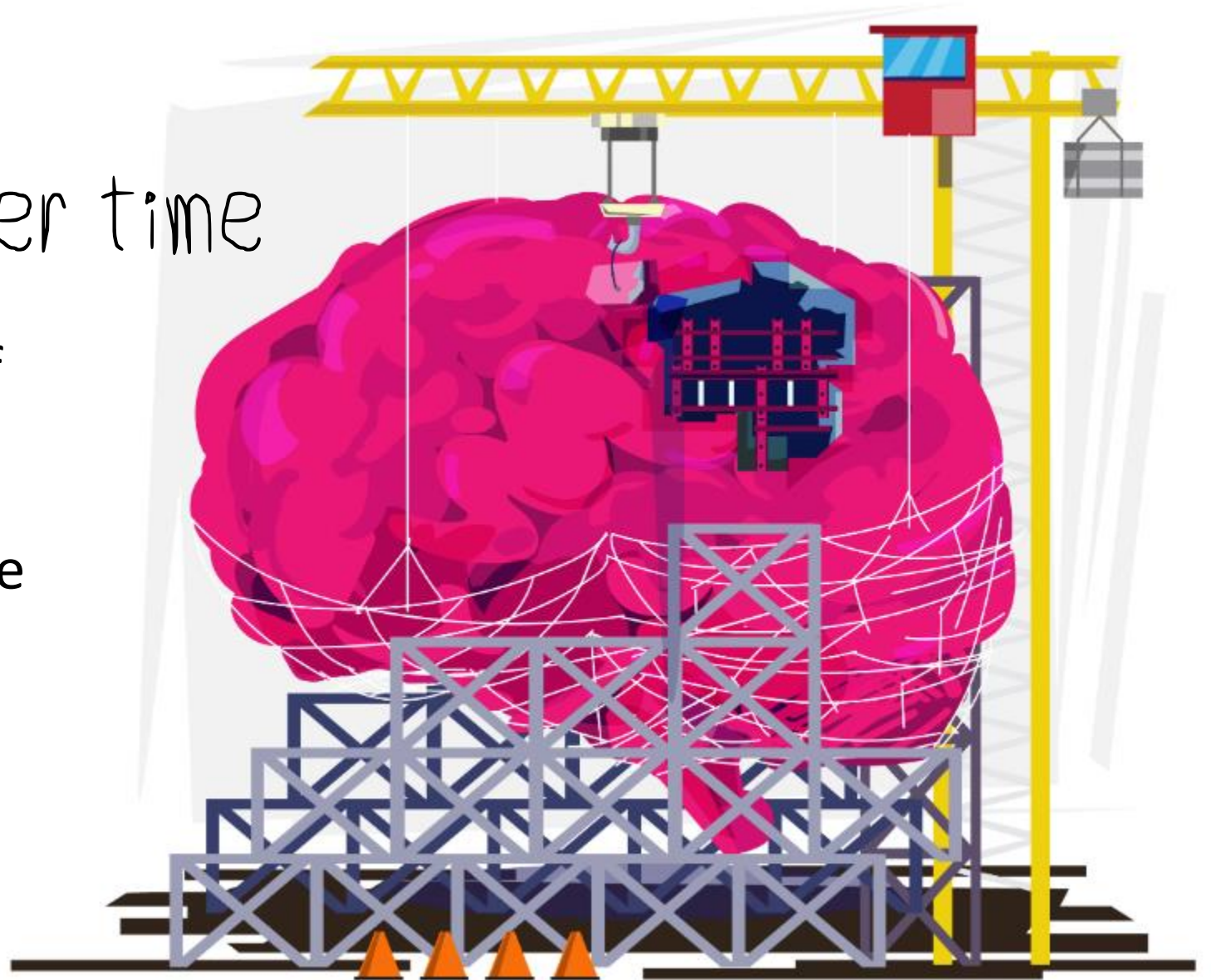
UNDERSTANDING
THE EFFECTS OF
TRAUMA



together ACE epidemiology and modern brain
research reveal a story too compelling to ignore

Brains are built over time

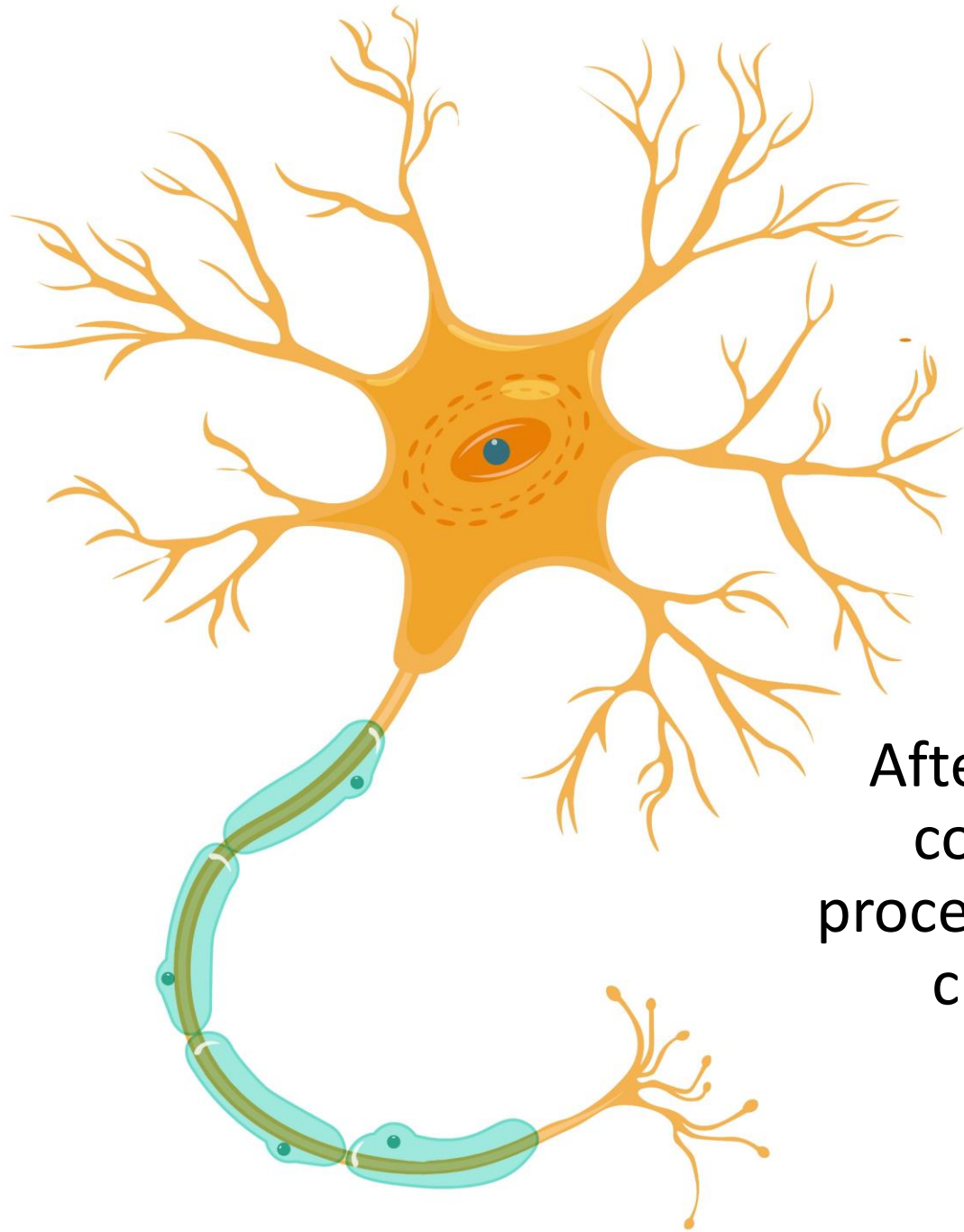
The basic architecture of the brain is constructed through an ongoing process that begins before birth and continues into adulthood.





Rapid Growth

Simpler neural connections and skills form first, followed by more complex circuits and skills. In the first few years of life, more than 1 million new neural connections form every second.



Pruning back the overgrowth

After this period of rapid proliferation, connections are reduced through a process called pruning, which allows brain circuits to become more efficient.

A never ending process

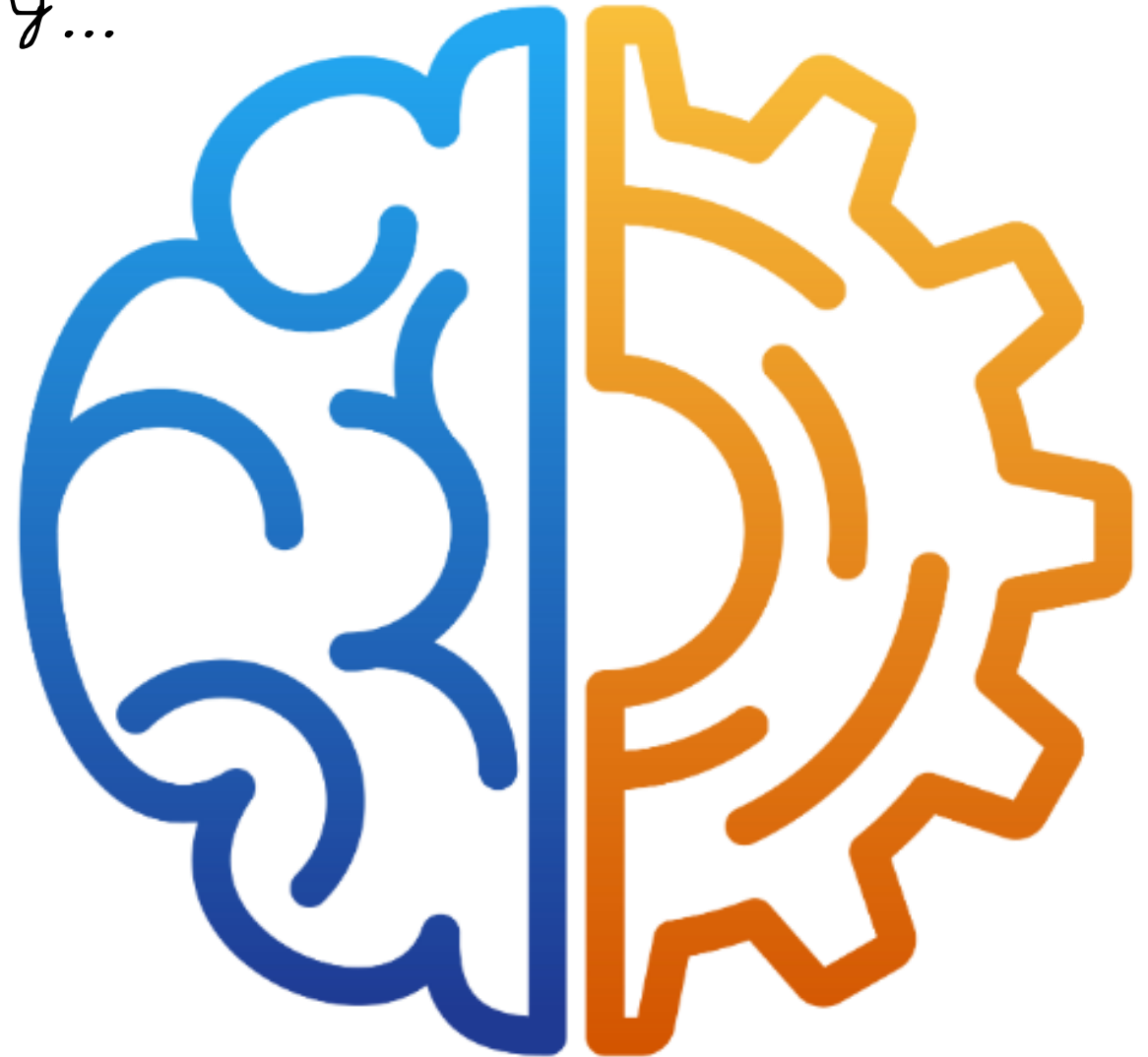
The early years are the most active period for establishing neural connections, but new connections can form throughout life and unused connections continue to be pruned.



It keeps going and going...

Because this dynamic process never stops, it is impossible to determine what percentage of brain development occurs by a certain age.

More importantly, we know that the connections that form early provide either a strong or weak foundation for the connections that form later.

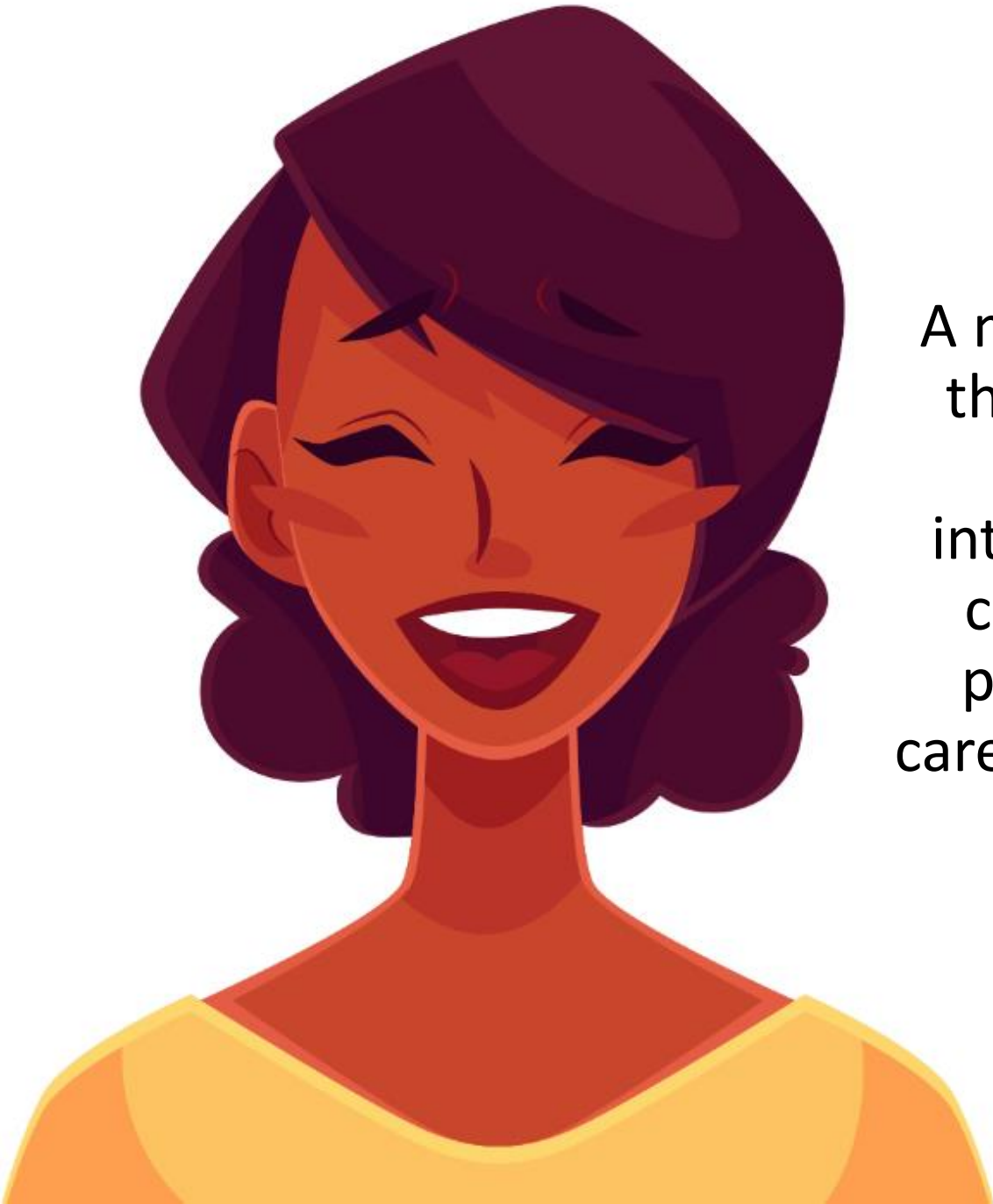




Under construction

Although genes provide the blueprint for the formation of brain circuits, these circuits are reinforced by repeated use.

Ultimately, interactions of genes and experience shape the developing brain and construct brain architecture.



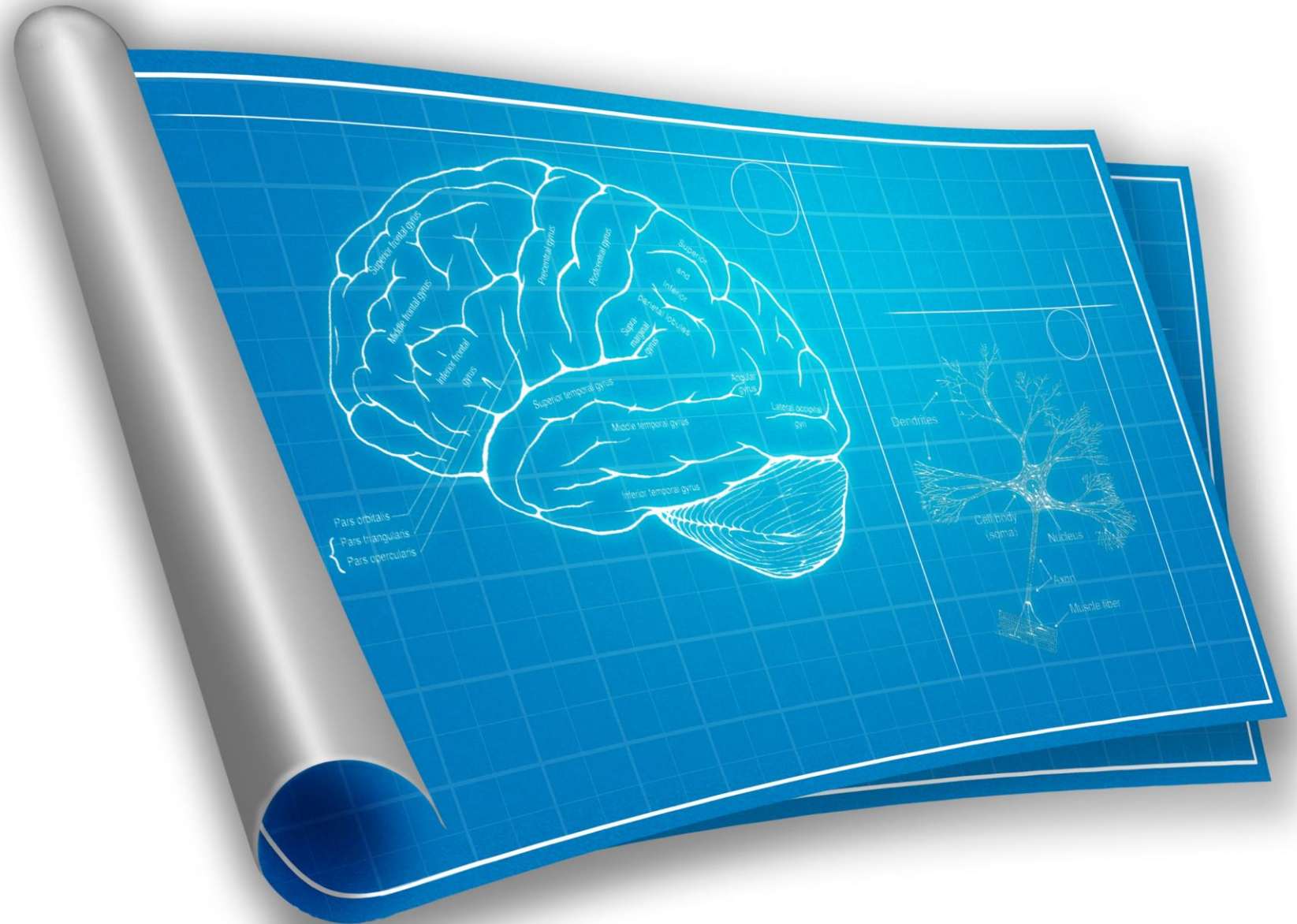
A major ingredient in this developmental process is the interaction between children and their parents and other caregivers in the family or community.





In the absence of responsive caregiving—or if responses are unreliable or inappropriate—the brain’s architecture does not form as expected, which can lead to disparities in learning and behavior.

Emotional well-being and social competence provide a strong foundation for emerging cognitive abilities, and together they are the bricks and mortar of brain architecture.

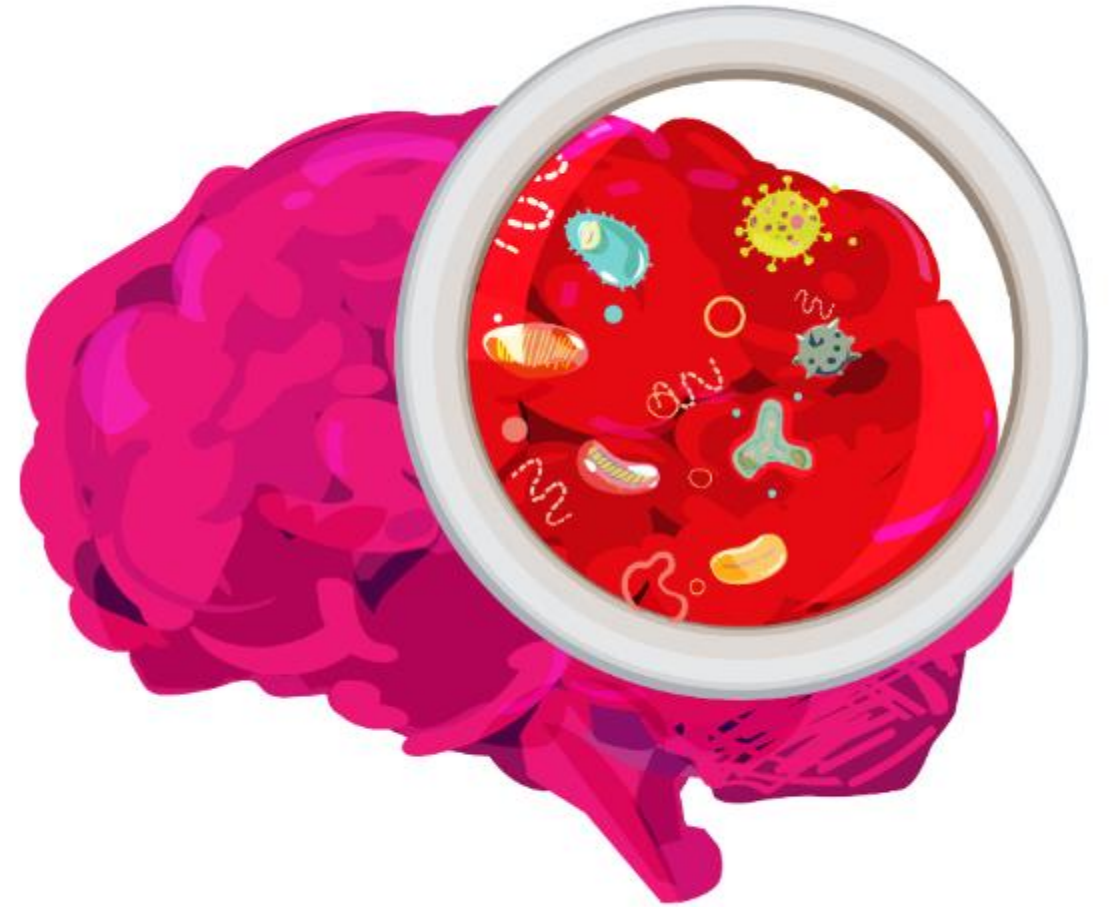




The emotional and physical health, social skills, and cognitive-linguistic capacities that emerge in the early years are all keys for success in school, the workplace, and in the larger community throughout a person's life.

Toxic Stress

Toxic stress weakens the architecture of the developing brain which can lead to lifelong problems in learning, behavior, and physical and mental health.



Not all stress is bad

Experiencing stress is an important part of healthy development. Activation of the stress response produces a wide range of physiological reactions that prepare the body to deal with threat.



What makes it toxic?

When stress responses remain activated at high levels for significant periods of time, without supportive relationships to help calm them, toxic stress results.

This impairs the development of neural connections, especially in the areas of the brain dedicated to higher-order skills.



AAAAA

Children with toxic stress live much of their lives in fight, flight, or fright (freeze) mode. They respond to the world as a place of constant danger.



San Francisco pediatrician Nadine Burke Harris explains it this way, “If you’re in a forest and see a bear, a very efficient fight or flight system instantly floods your body with adrenaline and cortisol and shuts off the thinking portion of your brain that would stop to consider other options. This is very helpful if you’re in a forest and you need to run from a bear. The problem is when that bear comes home from the bar every night.”



If a bear threatens a child every single day, his emergency response system is activated over and over and over again. He's always ready to fight or flee from the bear, but the part of his brain – the prefrontal cortex – that's called upon to diagram a sentence or do math becomes stunted, because, in our brains, emergencies – such as fleeing dangerous bears – take precedence over doing math.



What are the effects?

For children and adolescents who have experienced trauma, the resulting impact on the brain is connected with difficulties in emotional regulation, behavior problems, poor concentration, and deficits in verbal memory.





Toxic Spillover

A “toxic stress response” in early childhood can weaken developing brain architecture and recalibrate the threshold for activating the stress response system for life.

It occurs under circumstances of chronic or overwhelming adversity without the buffering support of caring, consistent, and supportive relationships.



Cortex Control

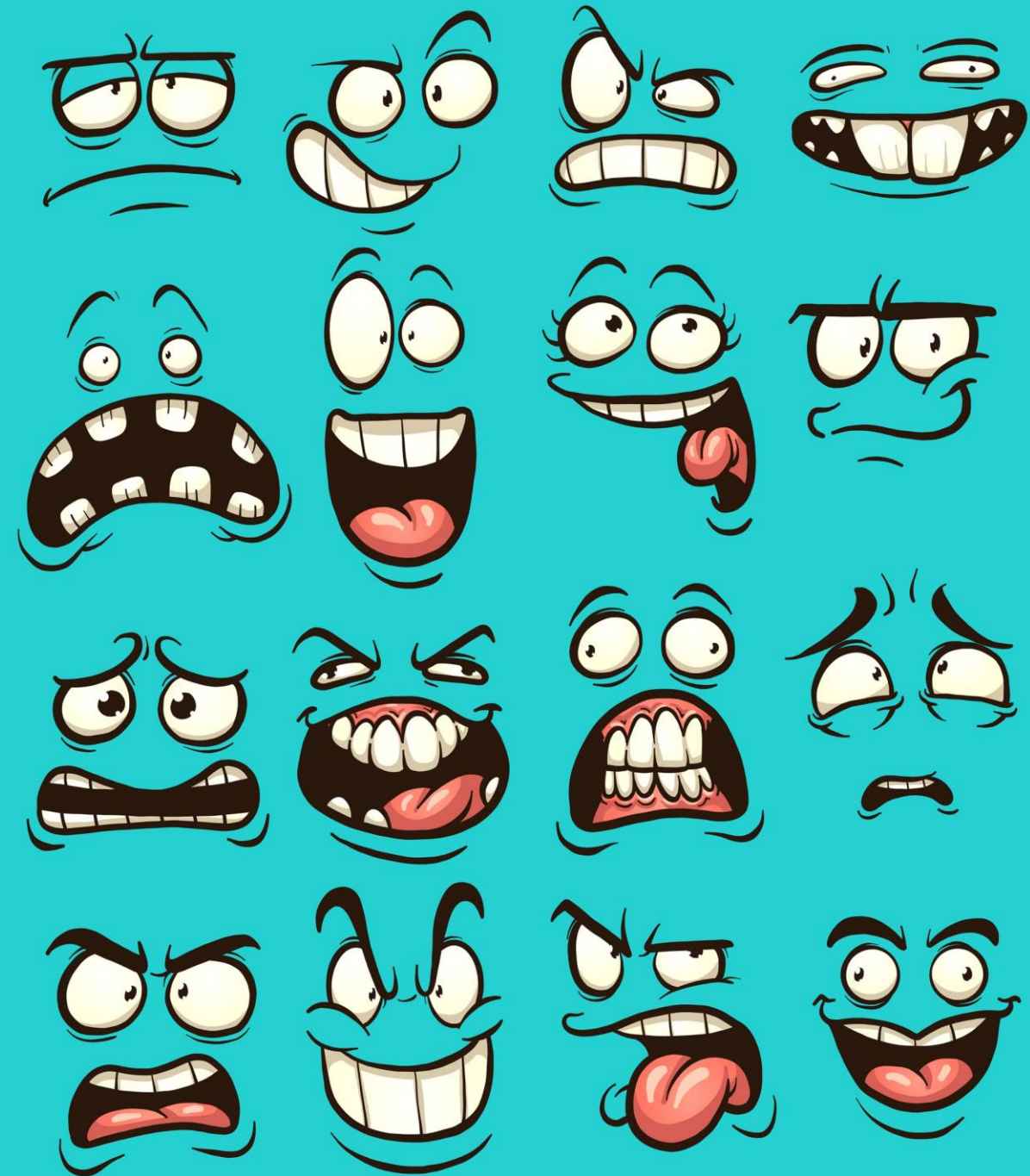
The cortex is involved in processing emotions; it helps us to evaluate a potentially threatening situation and to “look before we leap.”

However, recent research has shown that emotional reactions can take place without conscious awareness and the cortex, which helps with our ability to control our emotional reactions, is not necessarily involved in all emotional experiences.



Developing the ability to manage behavior and feelings, that is, emotional regulation, is critical for a child's mental and physical health.

Healthy emotional regulation is connected with higher academic achievement, lower levels of negative emotionality, higher levels of empathy, and higher levels of social competence.



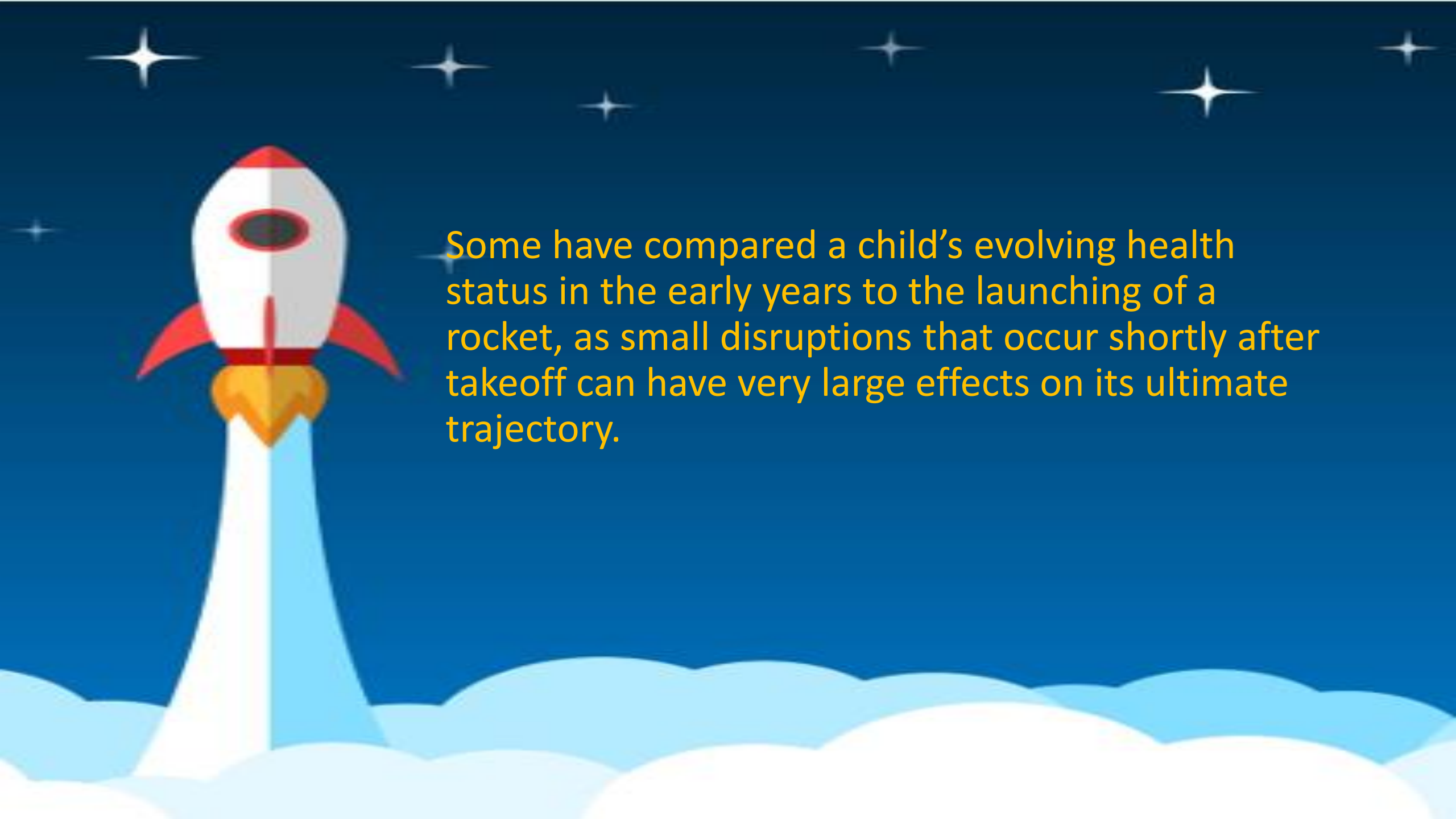


Early interactions between parent and infant are regulatory experiences, i.e., experiences that help the young child manage stress and proceed through development.

When lack of attachment and emotional regulation is due to trauma, the effects are literally written into the child's brain.

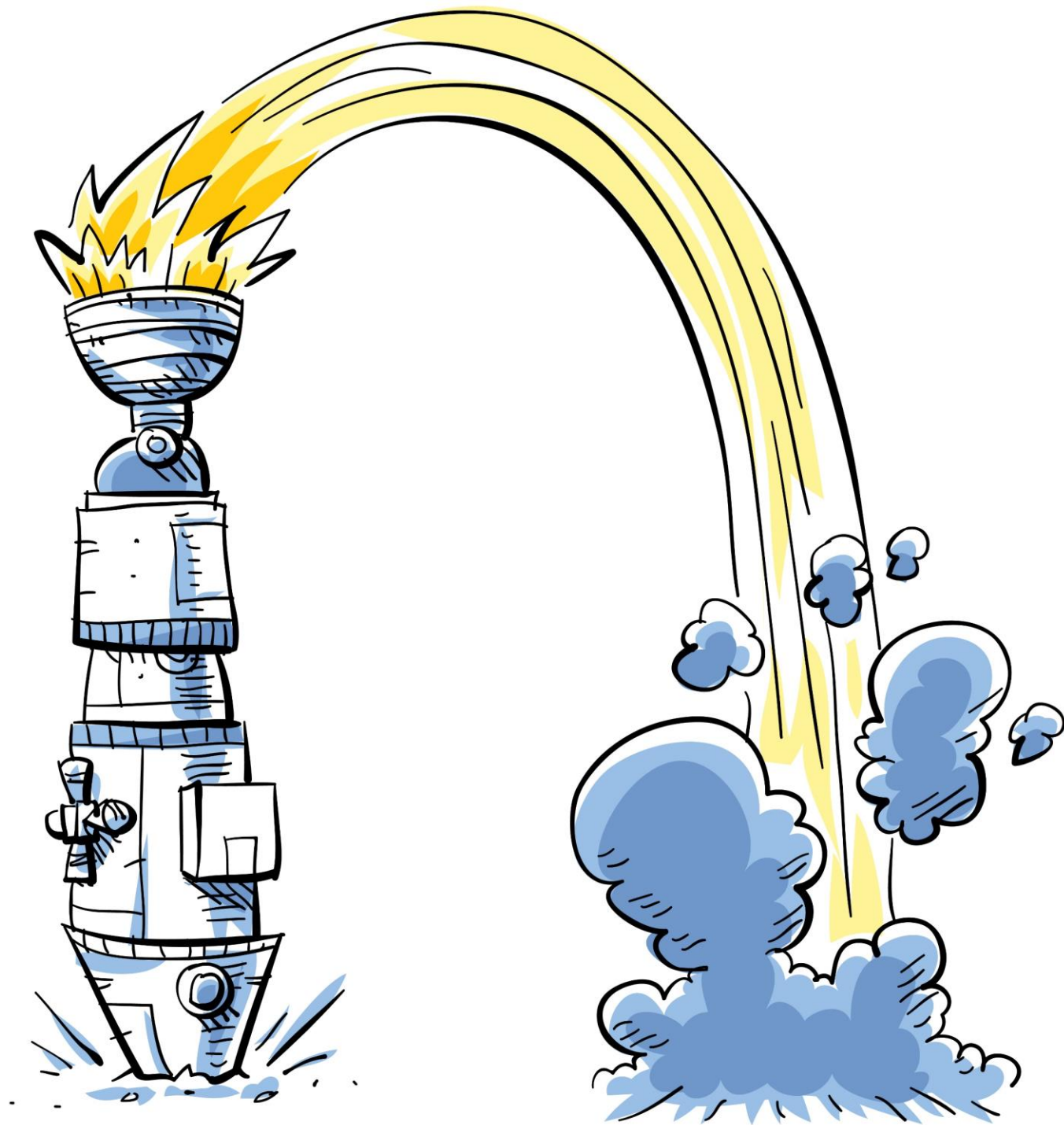
Science tells us that meeting the developmental needs of young children is as much about building a strong foundation for lifelong physical and mental health as it is about enhancing readiness to succeed in school.



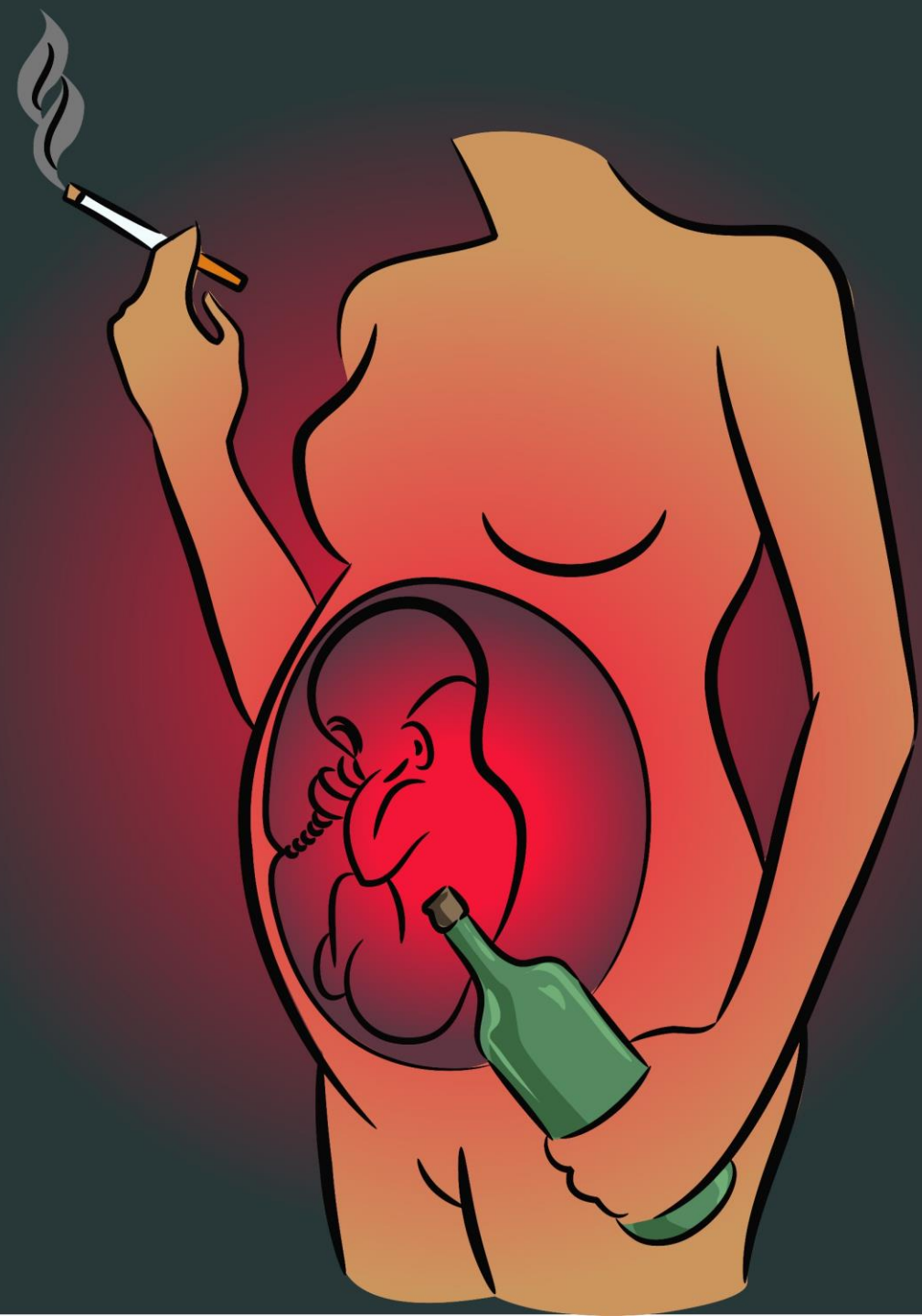


Some have compared a child's evolving health status in the early years to the launching of a rocket, as small disruptions that occur shortly after takeoff can have very large effects on its ultimate trajectory.

Thus, “getting things right” and establishing strong biological systems in early childhood can help to avoid costly and less effective attempts to “fix” problems as they emerge later in life.



An extensive body of scientific evidence now shows that many of the most common chronic diseases in adults—such as hypertension, diabetes, cardiovascular disease, and stroke—are linked to processes and experiences occurring decades before, in some cases as early as prenatally.





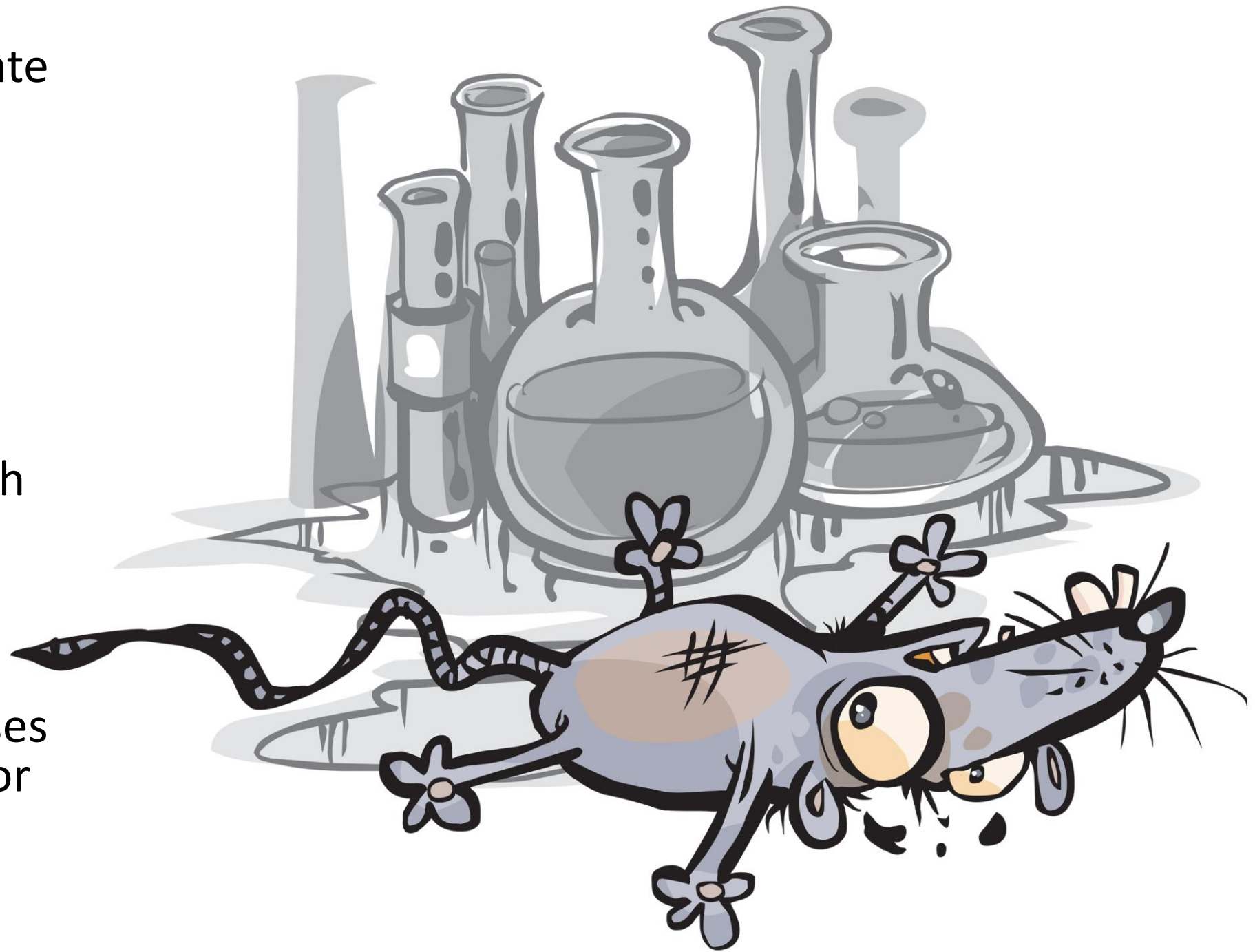
Early experiences or exposures can affect adult health in two ways—by the chronic wear and tear of repeated damage over time or by the biological embedding of specific physiological disruptions during sensitive developmental periods.

Science shows that there can be a lag of many years, even decades, before early harm is expressed in the form of overt disease.



Animal studies indicate that toxic stress also can have direct, negative, and persistent effects on brain circuits that control reward and motivation.

For example, research on rodents has demonstrated that profound neglect during early development increases drug-seeking behavior in adult rats.

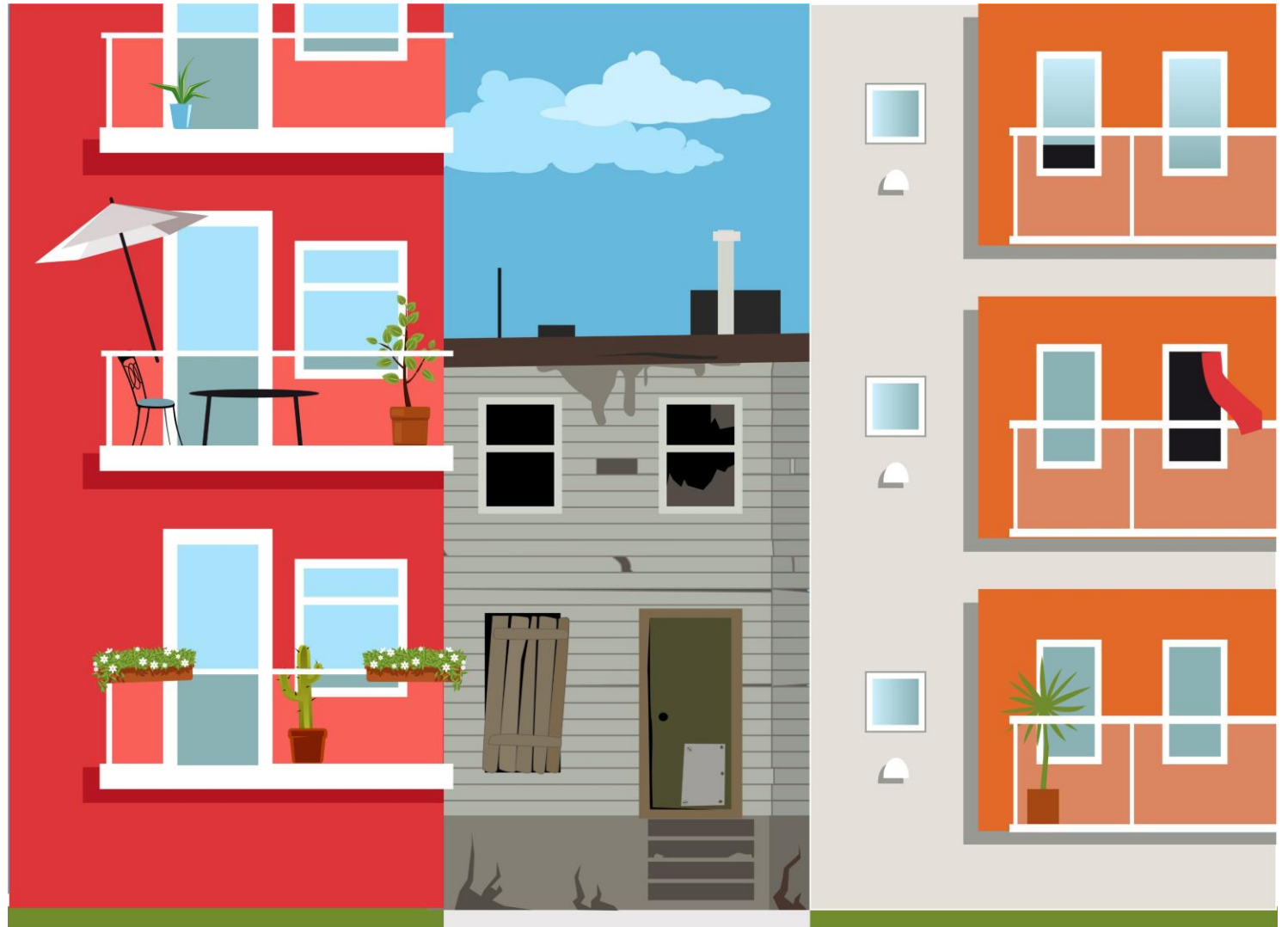




Significant progress in lifelong health promotion and disease prevention could be achieved by reducing the burden of significant adversity and trauma on young children.

The disproportionate exposure of low-income children to abuse, neglect, and other adversities has been implicated as an important contributor to health disparities.

Preventing and mitigating the impact of these ACEs is critical to decreasing health disparities.





A call for change

A call for a broader perspective on health promotion and disease prevention is guided by the following three overarching concepts.

First

Experiences are built into our bodies (for better or for worse) and significant adversity early in life can produce physiological disruptions or embedded biological “memories” that persist far into adulthood and lead to lifelong impairments in both physical and mental health.

Second

Genes and experiences interact to determine an individual's vulnerability to early adversity and, for children experiencing severe adversity, environmental influences appear to be at least as powerful, if not more powerful, than genetic predispositions in their impact on the odds of having chronic health problems later in life.

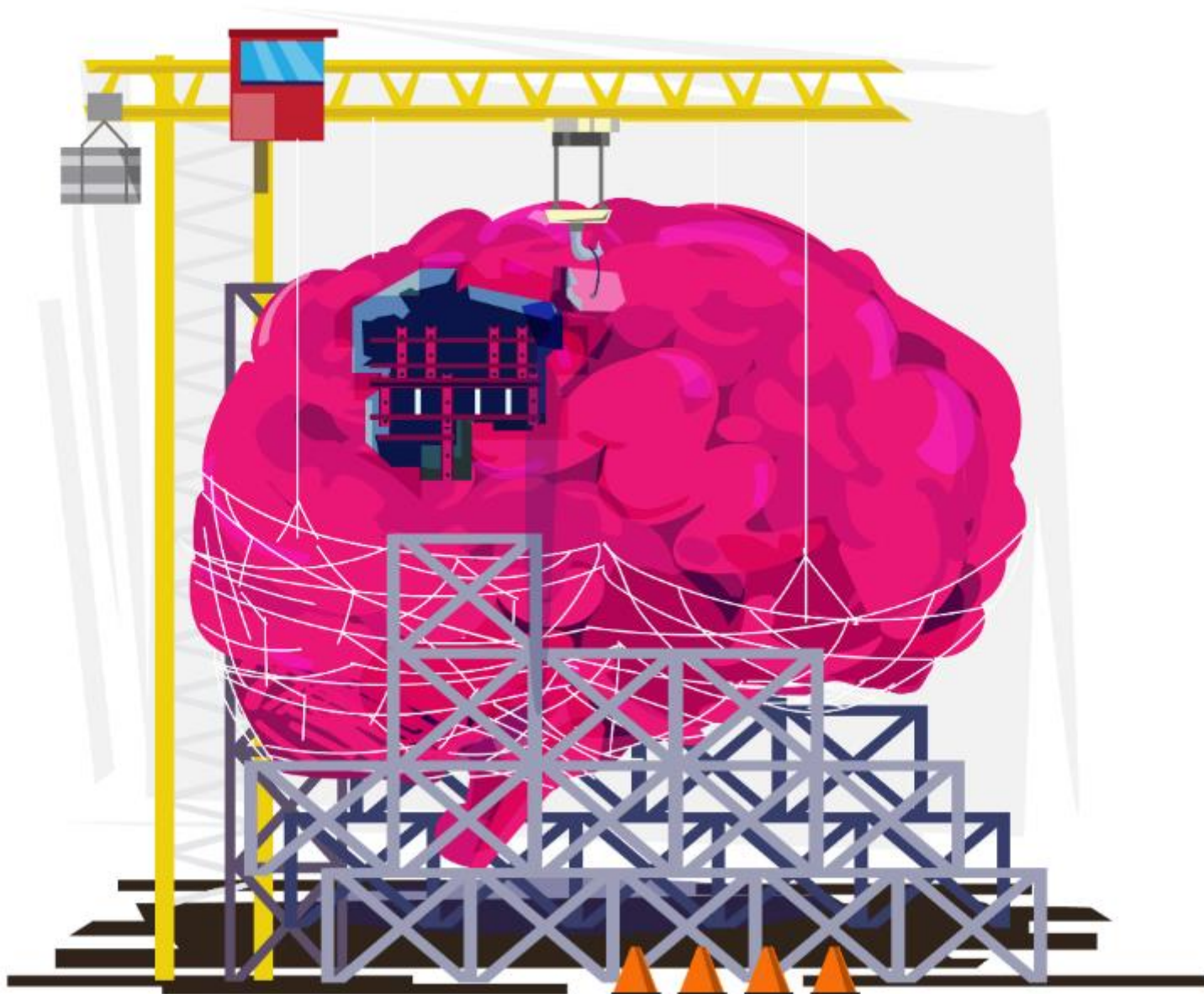
Third

Health promotion and disease prevention policies focused on adults would be more effective if evidence-based investments were also made to strengthen the foundations of health and mitigate the adverse impacts of toxic stress in the prenatal and early childhood periods.

So what does it all mean?

What all this means, says Anda, is that we need to prevent and treat adverse childhood experiences and, at the same time, change our systems – educational, criminal justice, healthcare, mental health, public health, workplace – so that we don't further traumatize someone who has already traumatized. You cannot do one or the other and hope to make any progress.





The good news is that the brain is plastic, and if toxic stress stops and is replaced by practices that build resilience, the brain can slowly repair much of the damage.

“There is no more effective neurobiological intervention than a safe relationship.”

-Bruce Perry, PhD, MD,
researcher & child
psychiatrist



“It’s not just a social worker’s problem. It’s not just a psychologist’s problem. It’s not just a pediatrician’s problem. It’s not just a juvenile court judge’s problem.”

In other words, this is everybody’s problem.

