

# BRAIN ARCHITECTURE

Early experiences build brains



Contrary to popular belief, the structure of our brains as they develop in early childhood is determined by more than just our genes. The experiences we have in the first years of our lives also affect the physical architecture of the developing brain.

Because brains are built in stages, with more complex structures built on simpler structures, it's crucial to get the early years right. Just as a house needs a sturdy foundation to support

the walls and roof, a brain needs a good base to support all future development.

Building better brains is possible by exposing children to positive, nurturing interactions at a young age. These positive experiences are the bricks that build sturdy brain architecture, leading to improved learning and behaviour as well as better physical, mental, and social wellbeing throughout life.



## BUILDING BETTER BRAINS

We all have the tools to help build better brains. By understanding the science behind brain development we can take action that will improve our physical and mental health and reduce risk for addiction across the lifespan.



[AlbertaFamilyWellness.org/BrainArchitecture](https://AlbertaFamilyWellness.org/BrainArchitecture)

# TOXIC STRESS

A force that disrupts brain architecture



Stress is one of the forces that shapes brain architecture in a developing child. Whether it strengthens or weakens brain architecture has to do with the kind of stress, its intensity and duration, and whether supportive caregivers are present in the child's life. Not all stress is bad. Events that create "positive stress" — like meeting new people or starting the first day of school — are healthy when supportive adults are around because they help prepare young brains and bodies for future challenges.

Other, more traumatic events, like a natural disaster or losing a loved one, aren't good for us. But if supportive caregivers are around to buffer the

stress response, these situations won't do lasting damage to the brain. That's called "tolerable stress."

A third kind of stress weakens brain architecture and can disrupt healthy development. "Toxic stress" occurs when no supportive caregivers are around to buffer the body's response to repeated negative experiences. Things that cause toxic stress may include abuse, neglect, parental addiction, violence outside the home, or chaotic environments. Young children whose brain development has been disrupted by toxic stress are at a much higher risk for later physical and mental health problems, including addiction.



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# AIR TRAFFIC CONTROL

The “executive function” system of the brain



Strong brain architecture supports the development of integrated cognitive, social, and emotional skills called “executive function” which operates like “air traffic control” in a child’s mental airspace.

Think of a young child’s brain as the control tower at a busy airport. All the planes landing and taking off simultaneously demand the controller’s attention to avoid a crash. A young child faces similar challenges learning to pay attention,

plan ahead, deal with conflicts, or follow rules at home or in the classroom.

Children require strong air traffic control skills to help regulate the flow information, prioritize tasks, and find ways to manage stress and avoid mental collisions along the way. Fortunately, these skills can be built throughout childhood and into early adulthood through practice and coaching.



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# SERVE & RETURN

Positive interactions build sturdy brain architecture



One way a solid brain foundation can be built and maintained in a developing child is through “serve and return” interactions. Serve and return works like an imaginary tennis match between a child and a caregiver. But instead of hitting a ball back and forth, various forms of communication pass between the two.

A child literally reaches out for interaction. A good caregiver will

“return the serve” by speaking back, playing peekaboo, or sharing a toy or a laugh.

These interactions exchanged throughout a young person’s developing years are the bricks that build a healthy foundation for all future development.



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# RESILIENCE

Tipping the scale toward positive outcomes



Resilience is the ability to stay healthy even in circumstances of severe stress. The foundations of resilience are strong brain architecture and air traffic control skills, which develop over time, based on the interaction of genes and life experiences.

A person's experiences load up the resilience scale over the course of development. When toxic stress experiences outweigh positive supports, the scale can tip toward negative life outcomes like heart disease, depression, and addiction.

When positive supports offset the burden of bad experiences, the scale

tips toward positive outcomes like good physical and mental health and strong relationships.

Anyone can become more resilient at any stage of life, but it's easiest to build the foundations of resilience in early childhood. We can all play a role in providing the positive supports that help others become more resilient. We can even shift the scale's balance point to favour positive outcomes. Find out how with an interactive resilience scale at [AlbertaFamilyWellness.org/Resilience](http://AlbertaFamilyWellness.org/Resilience).



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