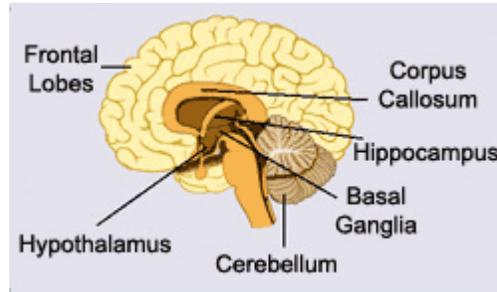


### **How Alcohol Affects the Baby's Brain:**

The most common effect is permanent brain damage which leads to learning disabilities, behavior problems, memory deficits, attention deficit hyperactive disorder, and/or mental retardation. This is called "static encephalopathy" meaning brain damage that doesn't get any better and doesn't get any worse. There is way to reverse the damage.

More subtle damage from occasional binge drinking can cause damage that is like buck shot - scattered holes in the brain that affect whatever area that was developing at the time, causing brain cells death, migration of cells to the wrong place, or tangles in the neurons with inaccurate connections.



### **Regions of the brain most affected:**

.Corpus Callosum - processes information between right brain and left brain

.Cerebellum - motor control

.Basal Ganglia - processes memory

.Hippocampus - learning and memory

.Hypothalamus - controls appetite, emotions, temperature, and pain sensation

.Frontal lobes - executive functions, impulse control, judgment

The corpus callosum and the frontal lobes are affected by alcohol exposure in ways that are manifested in behavior that is perceived to be inappropriate and immature.

The corpus callosum separates the right brain from the left brain and passes information from one brain to the other. The left brain controls rules, consequences, concrete ideas, practical details, and orderly sequences. The right brain controls abstract thinking, emotions and feelings, creativity, and intuition. The corpus callosum helps both sides of the brain work together to make everyday decisions.

In persons with FAS, the corpus callosum is damaged and does not function adequately. There are not as many pathways between the two sides of the brain, and so information is passed slowly or ineffectively. This may account in part for why a person with FAS/FAE has an impulse to do something, and the action may happen first, and the

realization of the consequences may occur later, after the fact. They know the rules and understand the consequences, but are not able to think before they act.

Another part of the brain that affects one's ability to control impulses and inhibitions is the prefrontal cortex, or the frontal lobes.

### **The frontal lobes control "Executive Functions" (EFs) (prefrontal cortex):**

#### Executive Functions and Alcohol Effects:

- .inhibitions: socially inappropriate behavior, as if inebriated
- .problem solving: inability to figure out solutions spontaneously
- .sexual urges: inability to control sexual impulses, especially in social situations
- .planning: inability to apply consequences from past actions
- .time perception: difficulty with abstract concepts or time and money
- .internal ordering: like files out of order, difficulty processing information
- .working memory: storing and/or retrieving information
- .self-monitoring: needs frequent cues, requires "policing" by others
- .verbal self-regulation: needs to talk to self out loud, needs feedback
- .motor control: fine motor skills more affected than gross motor
- .regulation of emotion: moody "roller coaster" emotions, exaggerated,
- .motivation: apparent lack of remorse, need external motivators

## How Prenatal Alcohol Exposure Affects Development of the Brain



Brain of healthy baby    Brain of baby with FAS

Fetal Alcohol Syndrome (FAS) and Fetal Alcohol Effects (FAE) are disorders that occur as a result of the consumption of alcohol during pregnancy. The alcohol molecule is very tiny and passes easily across the placenta from mother to baby, as early as 2 weeks after

conception until birth. Although the alcohol can affect the development of all cells and organs, the brain is particularly vulnerable to the effects of alcohol exposure, and damage can occur throughout pregnancy.