

# All About The Brain

Brain development is a continuous process starting from the 3<sup>rd</sup> gestational week <sup>1</sup>

## Sequence of neurodevelopmental process in human brain:<sup>2</sup>



### Number of nerve cells:<sup>3</sup>

Grow at ~**250,000** per minute throughout pregnancy; and reaching 100 billion neurons at birth

### Number of synapses:<sup>3</sup>

Born with trillions of synapses while reducing in numbers through childhood to early adolescence

## Examples of influencing factors on brain development:<sup>4</sup>



Genetics



Sensory stimuli



Drugs



Diet & Nutrition

## The brain nutrients:

### Choline:

- Supports structural integrity and signaling functions of cell membranes<sup>5</sup>
- Acts as a precursor for the biosynthesis of acetylcholine as the neurotransmitter<sup>6</sup>

### Sphingomyelin:

- Acts as a component of brain's cell membrane<sup>7</sup>
- Contributes to the formation of myelin sheaths<sup>8</sup>



**References:** 1. Stiles J and Jernigan TL. *Neuropsychol Rev.* 2010;20:327-348. 2. Semple BD et al. *Prog Neurobiol.* 2013;0:1-16. 3. Ackerman S. *Discovering the brain.* National Academy Press. 1992; 86. 4. Kolb B and Gibb R. *J Can Acad Child Adolesc Psychiatry.* 2011;20(4):265-276. 5. Zeisel SH. *Annu Rev Nutr.* 2006;26:229-250. 6. Zeisel SH et al. *FASEB J.* 1991;5(7):2093-2098. 7. Tanaka K et al. *Brain Dev.* 2013;35:45-52. 8. Kinney HC et al. *Neurochem Res.* 1994;19(8):983-996.

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