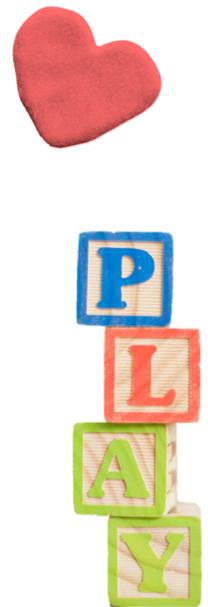
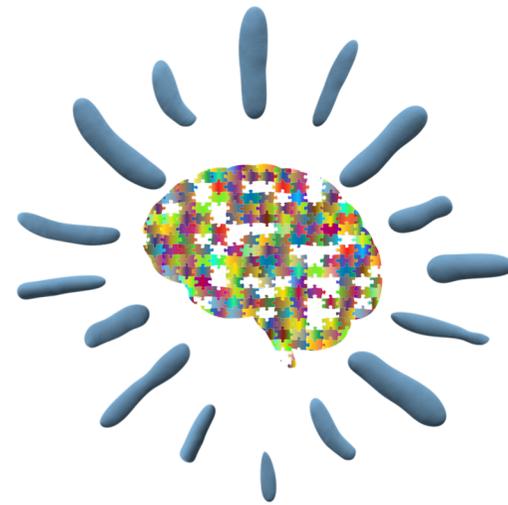


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BUILDING
BABY'S
BRAIN

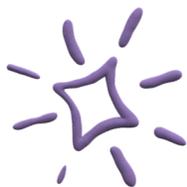


BRAIN DEVELOPMENT IN CHILDHOOD

Information for Parents and Carers

Anne Maree Taney

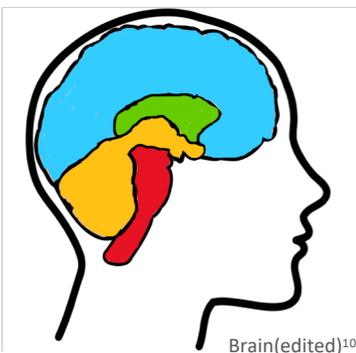
Overview of Brain Development



A child's brain is 90 per cent of adult size by the time they are four years old.¹ This amazing development of the brain occurs from the bottom up and also from side to side.^{2,3} There are critical periods for the development of each area of the brain.¹ Ideal growth in each area requires exposure to specific types of experiences.^{1,4} This booklet will give you an understanding of how and when each area of baby's brain develops - and some activities and games which are suitable to promote brain growth in this region. When intervention is needed, a therapist uses this knowledge to target the area of the brain that needs development.^{4,5,6} Different therapies work best for different regions of the brain.^{4,5,6}

Connection with a primary care giver and a safe, predictable environment allows the baby's brain to develop in the best way possible.¹

- 4. Cortex 3-6yrs¹
- 3. Limbic System 1-4yrs¹
- 2. Diencephalon 6mths -2yrs¹
- 1. Brainstem 0-9mths¹



Brain(edited)¹⁰

While the brain is "plastic" and is able to make new connections throughout life, the lower regions are the hardest to heal or change after the initial developmental period.^{1,6} This is one of the reasons why the first few years are so important. The upper regions are more responsive to intervention.^{1,6}

Play is essential to healthy brain development.^{4,6,8}

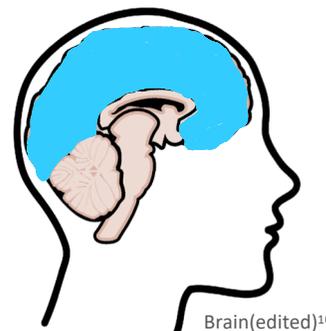
Cortex



Most Active Growth: 3-6 years^{1,4}

The cortex is responsible for thinking, reasoning and creativity.¹ Important skills such as being able to pay attention, make decisions and do planning are part of the cortex's function.¹ The cortex is also where we process social and emotional information.¹ The cortex continues to develop into the mid 20's,⁶ however it remains able to grow and change throughout life, enabling us to learn new skills and ways of thinking.¹

Healthy development of the cortex, and growing independence depends on the earlier needs being met and continuing to be met.



Brain(edited)¹⁰

Maslow's Hierarchy of Needs⁹



Interventions to regulate or develop the cortex

Art, Music, Dance	Stories with that teach lessons
Physical Games and Sport	Riddles & Problem-solving games
Therapies that target the Cortex: CBT, Drama, Story Telling, Field trips and exposure to performing arts, museums etc. ⁴	



Children playing soccer¹⁰



Puzzles¹⁰



Children dancing¹⁰

The Limbic System

Most Active Growth: 1-4 years^{1,4}

The Limbic System is responsible for emotional and behavioural regulation, and connection to others - initially the primary care giver.^{1,6} Also associated with the limbic system is - social language development, empathy, tolerance and interpretation of non-verbal language¹. From Maslow's Hierarchy of Needs, all needs up to and including love and a sense of belonging are important to the development of the limbic system.

The limbic system is the emotional centre of the brain. Positive, safe experiences provide a foundation for future relationships^{1,6}



Interventions to regulate or develop limbic system

Arts and Craft
Sharing games
Win/lose games
Role Play
Pretend Play
Turn Taking
Creative Dance
Chores



Art and crafts and Pretend Play¹⁰



Games

Hide & Seek; Candyland

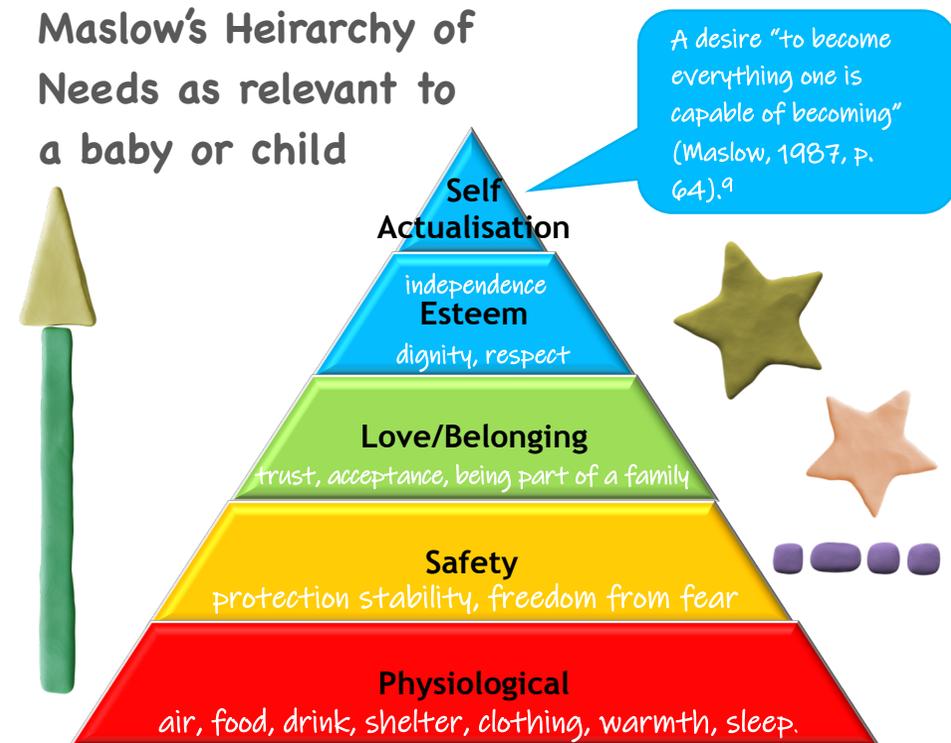
Therapies that target the Limbic System: Parallel play, Play Therapies, Performing Arts, Creative Arts.^{1,4}

Maslow's Hierarchy of Needs⁹

According to Maslow (1943), an American Psychologist, an individual's lower order needs have to be met sufficiently before their growth needs become important or achievable.⁹ This theory fits with Dr. Bruce Perry's model of bottom up brain development⁵; however there are overlapping needs at each stage of development. As we look at how each part of baby's brain develops, we will also see how they link to Maslow's Hierarchy of Needs.⁹

In order to become everything they are capable of becoming⁹, our children require these needs to be met throughout their lifetime. It is especially important as baby's brain is developing.

Maslow's Hierarchy of Needs as relevant to a baby or child

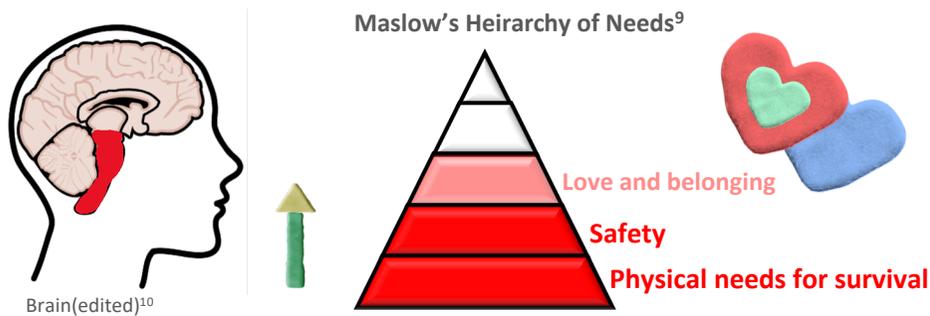


Brainstem

Most Active Growth: 0–9 months ^{1,4}

The brainstem is responsible for our basic survival.¹ It controls breathing, heart rate, swallowing and body temperature.^{1,6} The brainstem is also a highway for motor and sensory information and is associated with the survival modes of fight, flight, freeze or collapse.¹ Important developmental functions relate to the baby being able to trust that their needs will be met consistently by an attentive care giver.¹

Meeting the baby's physical and safety needs and providing connected and attentive care is essential to healthy brain stem development.^{1,6}



Interventions that regulate or develop the brainstem

Rocking & cuddling	Music & Movement
Drumming	Play with clay
Patterned massage	Play with sand
Swinging	Tapping
Games: Peek-a-boo; Pat-a-cake in sand	
Therapies that target the Brainstem: EMDR, Massage; Drumming, Reiki Touch. ^{1,4}	



Connected attentive care ¹⁰

Diencephalon and Cerebellum

Most Active Growth: 6 months–2 years ^{1,4}

The cerebellum is responsible for balance and coordination¹. The diencephalon is important in relaying and processing sensory and motor information and has a role in managing emotions.¹

Promoting a feeling of safety and connection to your baby and providing a range of experiences that use the five senses are important at this stage of brain development.¹ Physical activity is also important.¹



Interventions that regulate or develop the diencephalon

Using Senses	Attunement	Rhythm
Sand, clay, playdough	Music	Swimming
Movement and music	Reading to child	Drumming
Games: Action Songs (e.g When all the cows were sleeping, Row, Row, Row your boat).		
Therapies that target the Diencephalon: Music and Movement; Reiki Touch, Therapeutic massage, Equine or canine interactions. ^{1,4}		



Reading & playing in the sand¹⁰

