



THE ONTOGENY OF HUMAN NEUROLOGIC FUNCTIONS

Brain Stage	Average Time Frame	Vision	Auditory	Tactile	*	Highest level of skill	*	Mobility	Language	Manual			
12	6 years to peer level	Skills equal to or above peers and consistent w/ dominant hemisphere	Skills equal to or above peers and consistent w/ dominant hemisphere	Skills equal to or above peers and consistent w/ dominant hemisphere	CONCEPTION		CORTEX	Skills equal to or above peers and consistent w/ dominant hemisphere	Skills equal to or above peers and consistent w/ dominant hemisphere	Skills equal to or above peers and consistent w/ dominant hemisphere			
11	5-6 years	Reading books	Sophisticated concept of time and space	Sophisticated stereognosis Sophisticated proprioception				Hop, skip, jump and other sophisticated skills	Sophisticated ability to express an abstract thought	Spontaneous writing of many words			
10	4-5 years	Reading initial books	Conception of sophisticated abstract language	Concepts of solidity				Run and walk in complete cross pattern	Ability to participate in an organized conversation Proper articulation	Spontaneous writing of several words			
9	3-4 years	Reading sentences	Conception of gramatical and idiomatic language	Concepts of Shape				Initial walking in cross pattern	Structured sentences Advancing vocabulary	Reproducing symbols and words			
8	2-3 years	Reading phrases Reading many words	Conception of worldly information leading to concept of time & space	Concepts of size				Initial running in cross pattern	Initial sentences Many phrases	Sophisticated bimanual skills			
7	18-24 months	Reading several words Identifying complex symbols	understands basic directions	Concepts of texture				Walk and run with arms down without pattern	Initial phrases Many new words	Bilateral and simultaneous cortical opposition			
6	12-18 months	Complete convergence Identifying simple abstracts	Understands many words and phrases	Initial stereognosis				Walk with arms in primitive balance role Free standing Cruising	Several meaningful words however pronounced	Primitive use of tools Initial bimanual function			
5	9-12 months	Initial binocularity	Understands several single words	Awareness of third dimension				Functional creeping culminating in a cross pattern Pull to stand	Word like sounds	Bilateral cortical opposition Unilateral cortical opposition			
4	6-9 months	Appreciation of fine detail	Appreciation of environmental sounds	Proprioceptive ability as related to balance and space Gnosis				APPRECIATION		MIDBRAIN	Initial creeping Assume and maintain quadruped	Range of expressive and meaningful sounds	Mature bilateral prehensile grasp
3	3-6 months	Seeing gross detail Unified ocular movement	Localization of sound	Localization of touch							Functional crawling culminating in a cross pattern	Experimental use of sounds	Initial prehensile grasp
2	Birth to 3 months	Biocular outline perception	Response to threatening sounds Initial perception of sounds	Awareness of temp & discomfort Early proprioception Vital tactile				PERCEPTION	PONS	VITAL	Initial crawling	Vital sounds	Bilateral vital release
1	Birth	Pupillary reflex	Startle reflex	Babinski reflex				RECEPTION			MEDULLA & CORD	REFLEX	Complete movement of extremities
Source: Sandler & Brown 1980 Second ed.		AFFERENT SENSORY PATHWAYS				Functional	Color key	EFFERENT MOTOR PATHWAYS					
						Zero							