Myelination Timetable

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General pattern of myelination - from caudal parts in cranial direction and from dorsal parts in frontal direction.

Fetus

< 35 weeks - no myelination is detected.

38–40 weeks - myelination in some of *longitudinal tracts*, *inferior colliculus*, *inferior and superior cerebellar peduncles*.

- myelination ***proceeds rostrally*** from pons along corticospinal tracts → cerebral peduncles → posterior limb of internal capsule → central portion of centrum semiovale.

Newborn

- myelination is primarily in sensory tracts (newborn has limited motor capabilities but well-developed sensory input!)
- *subcortical white matter* matures last - ***proceeding anteriorly*** from occipital region (around calcarine fissure at 4 months) to frontal and temporal lobes (11–14 months); ***peripheral extension*** into subcortical white matter is essentially complete by 22-24 months.

  After age 2 yrs, pattern of myelination is grossly that of adult brain.
- myelination contributes significantly to brain weight increase during first two years (water content of brain decreases).
  - myelin synthesis is most active during first 8 months of life; continues into adolescence and adulthood.

Postnatal myelination follow-up:

Period - imaging	Time: normal myelination places
first 6 months –**T1-MRI** (myelinated parts appear bright).	**full term birth**: dorsal medulla and brain stem, cerebellar peduncles, small portion of cerebral peduncles, narrow portion of posterior limb of internal capsule, small portion of central corona radiata, deep white matter in region of precentral and postcentral gyrus.
	first months: myelination in optic radiations
	3 months: splenium of corpus callosum; only parts of posterior fossa that are not myelinated are related to pons.
	4 months: subcortical white matter around calcarine fissure.
	6 months: complete corpus callosum
6 ÷ 24 months – **T2-MRI**	**8 months**: anterior limb of internal capsule, subcortical white matter around pre- and postcentral gyri.
	18 months: subcortical myelination reaches most frontal parts.

- after 1 year, brain is fully myelinated by T1 criteria.
- after 2 years (even up to second decade), symmetrical T2 hyperintensity* persists in periventricular white matter lateral and dorsal to trigonal areas - should not be confused with pathology!

*poorly defined, delineated by thin rim of normal white matter.

BIBLIOGRAPHY for ch. "General Histology, Myelination, BBB" → follow this LINK >>