Normal Variant EEG Patterns

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Summary
The object of this chapter is to familiarize the reader with a number of commonly encountered normal variants of brain-derived EEG activity. The term “normal variant pattern” refers to those rhythms or waveforms that have features reminiscent of either interictal or ictal EEG abnormalities. However, these patterns have been found in a substantial proportion of tracings from healthy subjects and, therefore, are not currently thought to represent pathological entities. It is, therefore, vital that such patterns be appropriately recognized by the EEG reader as normal variants and not erroneously confused for pathological patterns. This chapter addresses four main categories of variant EEG activity:

1. Rhythmic patterns.
2. Epileptiform patterns.
3. Lambda and lambdoids.
4. Age-related variants.

EEG artifacts derived from sources other than brain-derived activity will not be reviewed.

Key Words: Benign; EEG; epileptiform; rhythm; variant.

1. RHYTHMIC VARIANT PATTERNS
There are six main types of rhythmic variant EEG patterns:

1. Alpha variant.
2. Mu rhythm.
4. Subclinical rhythmic electrographic (theta) discharges in adults (SREDA).
5. Midline theta rhythm.
6. Frontal arousal rhythm (FAR).

1.1. Alpha Variant
This pattern was described first by Goodwin in 1947. There are two types of alpha variants, “slow” and “fast.” The slow (subharmonic) alpha variant appears as an abrupt rhythm usually at half the frequency of the patient’s more typical waking background rhythm, and often of greater voltage (Fig. 1). The fast (harmonic) alpha variant may appear as a notched or bifurcated form of the patient’s usual waking background rhythm, so that a superimposed harmonic rhythm of twice the alpha frequency occurs. Alpha variants are blocked with eye opening and exhibit a posterior predominance, just as with normal alpha rhythms. Alpha variants vary in their prevalence within a subject’s tracing, alternating with periods of normal-appearing alpha.
Fig. 1. Slow alpha. This subject is 46 yr of age. Note how the posterior background rhythm shifts from a bilateral 11-Hz rhythm earlier in the figure to a somewhat notched biposterior 5- to 6-Hz rhythm late in the figure.