COMPARISON OF PATIENT DATA TO QUANTITATIVE EEG NORM
DATABASE PERMITS INDIVIDUAL RATIONAL PHARMACOTHERAPY

Wilfried Dimpfel
Clinical Research, Justus-Liebig-University Giessen c/o NeuroCode AG,
Sportparkstr. 9, 35578 Wetzlar, Germany

Conventional subjective EEG interpretation based on visible oscillations of electric
brain activity does not allow for drawing any therapeutic consequences. However, it
is possible to quantitate these oscillations by frequency analysis using mathematical
Fast Fourier Transformation. This objective description of the electric activity allows
direct comparison of EEG activity patterns among different patients. In order to
compare patient data to normal brain function, a norm database was built up using
data from several clinical studies with healthy volunteers. A total of 250 recordings
under the conditions of eyes open and eyes closed were collected. Individual
aberration from normal values was calculated including its statistical significance.
Probabilities higher than 100 : 1 were considered to be pathological. Successful
treatment diminished the statistical significance of the aberration index. Based on this
experience a hypothesis was created to use this information for individual rational
pharmacotherapy. If known from preclinical or clinical studies, which frequency is
mainly modulated by certain drugs, one can try to match the deviating frequency with
a drug acting preferably on this particular frequency. Furthermore, it is known that
particular frequencies relate to special neurotransmitters like alpha2 waves under the
control of dopamine. Thus, a drug can be chosen based on its capability to interfere
with the particular neurotransmitter related to the deviating frequency. Examples will
be presented like a demented patient having increased alpha2 power on position C3
and C4 for years. Reduction was achieved by Salvia extract known from preclinical
experiments for its capability to decrease alpha2 power.