THE APPLICATION OF COGNITIVE NEUROSCIENCE TO CLINICAL RESEARCH I: DETECTING COGNITION ENHANCEMENT IN MAN

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Introduction: Cognition enhancement has become a 'hot topic' and is currently arousing intense public and scientific debate. While definitions vary, cognition enhancement can be defined as improved ability to perform tasks involving mental ability; either by counteracting impairment, or by producing improvement above existing levels. The principal and arguably only direct and objective measure of cognitive ability involves the use of tasks that demand mental efficiency. This paper concerns a computerised test system designed to detect changes in cognitive function in clinical trials.
Methods: The CDR System has been used in almost 1400 trials worldwide. The core tests cover attention, information processing, working memory, executive control, and various aspects of verbal and non-verbal episodic memory. The core tests have remained constant over the last 29 years and have been supplemented with others. The studies are tabulated and show effects in the core areas of cognitive function: Attention & information processing, Working memory/executive control, Episodic memory.
Results: The paper summarizes public domain data from 186 clinical trials conducted from 1975 to the present; 146 peer-reviewed papers; 28 published and 3 unpublished abstracts; 7 studies with negative results. The trials involve data from 5,765 healthy volunteers (age 5 to 90 years) and 8,185 patients from 33 different clinical conditions
Conclusions: To the author's knowledge, this is the largest database ever assembled of cognitive enhancement identified with a single test or test system. It demonstrates that a single system can be used in a diverse range of conditions to detect cognition enhancement.