

The Brain during Psychotherapy: Some Neurological changes and their Significance

(Lecture at Ben Gurion University, Israel)

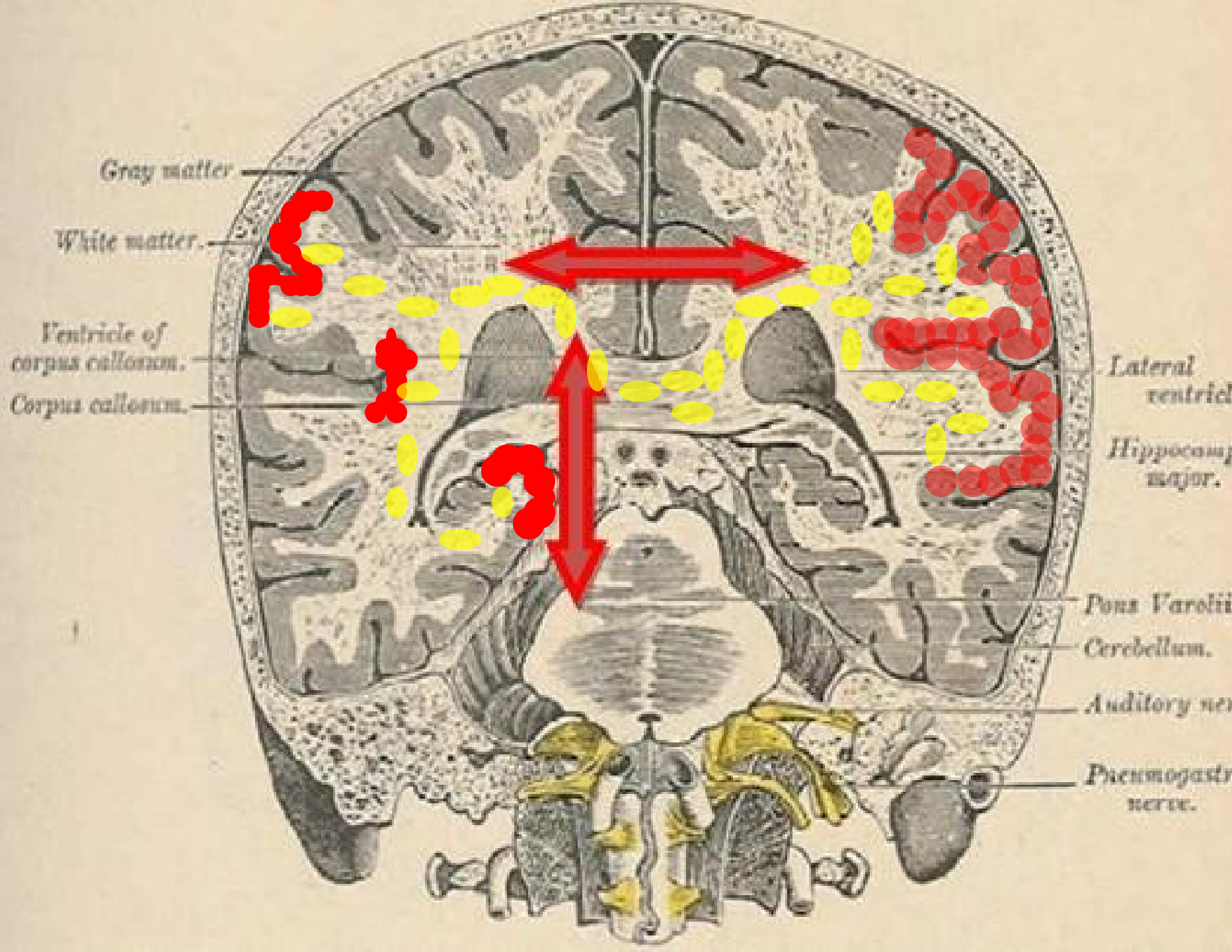
Andrei Novac, M.D., F.A.P.A.
Clinical Professor of Psychiatry
Director, Traumatic Stress Program
UC Irvine

“Neuro”- stages of Psychotherapy

- I. Setting of the Stage = Getting acquainted
- II. Transprocessing =
Processing+Transduction
- III. Rebuilding of the new Self = Change

Biological Basis of Transprocessing

- I. Neuronal firing during activity
- II. Activation of synapses
- III. Increased neurotransmitter activity
- IV. Long-term potentiation (LTP)
- V. LTP and protein synthesis
- VI. Encoding of information
- VII. Plastic remodeling
- VIII. Neurogenesis
- IX. Top-down and bottom-up neural activity
- X. The default brain system and SCMS
- XI. The language brain



The Self and Consciousness

- Panksepp 1998: Proto-emotions: SEEKING, RAGE, FEAR, Care/nurturance, PANIC/separation, PLAY/joy
- Panksepp and Northoff 2009: = SCMS:
 - Lower structures (RAS)
 - Higher structures

Congruent > Baseline



Incongruent > Baseline



Incongruent > Congruent



Superior parietal lobule

Broca's area

Prefrontal cortex

Multisensory
perception during
speech (visual and
auditory)
(Andersen, et al)

Epigenetics

- Aristotle (c. 300 bce) = development based on sequence of steps
- In biology since 1970s, in plants
- In humans, the study of the Dutch Famine of 1944 to 1945 (impact on metabolism, cardiovascular disease, birth weight, etc.)
- More recently: behavioral epigenetics
- In 2009, NIH started the epigenome project
- Behavioral epigenetics studies: psychiatric disorders, learning and memory, neurodevelopment, parenting, stress, neurodegenerative disorders

Epigenetics (cont'd)

- DNA in the nucleus = 2 meters (approx. 6 feet) in a relaxed form
- Tissues: brain, blood cells
- Mechanisms: methylation, demethylation, histones
- Histones: acetylation, methylation (change within hours of behavioral changes)

Experimental Models of Transference

- (Gerber, Peterson, Andersen, Ochsner, Roose)
- Columbia Center for Psychoanalytic Training & Research
- Using a paradigm of familiar characters, significant others of subjects, and controls

For additional information regarding
this subject, please contact Dr. Novac
at anovacmd@gmail.com