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Foundations of Ketamine-Assisted Psychotherapy

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Module 3

What is Ketamine?

Module 3

Lesson 3.1

Chemistry & Mechanisms of Action in the Brain

NMDA Receptor Blockade

Mechanism

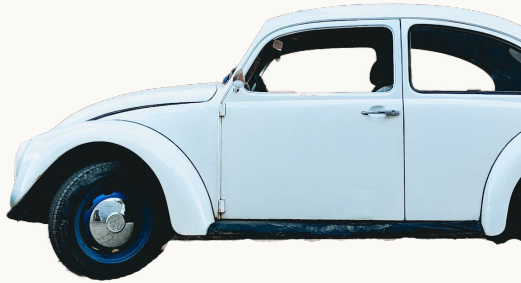
Blocks NMDA receptors, leading to GABAergic inhibition and a surge of glutamate release.

Effect

Rapid improvements in mood by restoring glutamatergic signaling

Analogy

Wakes up dormant neurons like jump starting a car battery; lets them communicate freely



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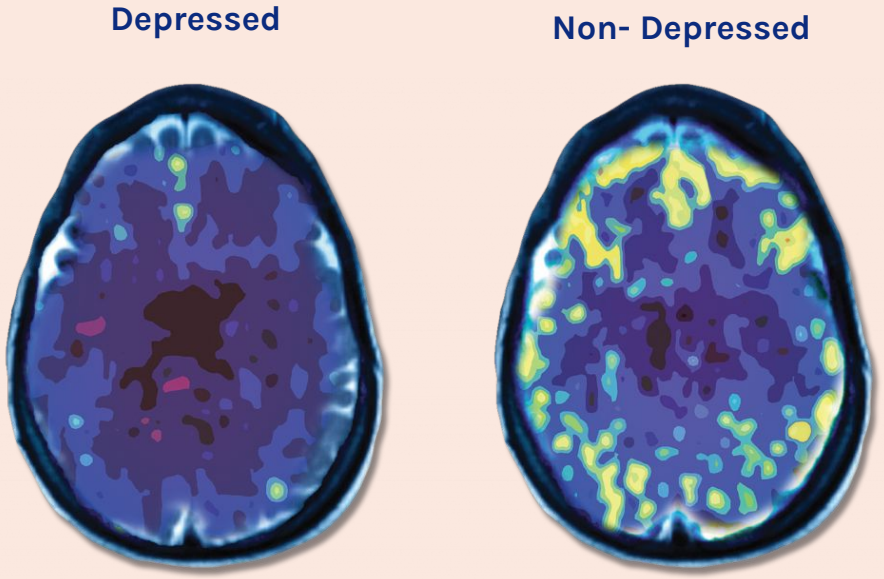
Brain Activity is Reduced During Depression



A PET scan measures vital functions such as blood flow, oxygen use, and blood sugar (glucose) metabolism.

Source: Mark George M.D. Biological Psychiatry Branch
Division of Intramural Research Programs, NIMH 1993

Lateral Habenular Burst Mode

Mechanism

Turns off “burst mode” in the lateral habenula (the “anti-reward” center)

Effect

A break from stress mode: facilitates emotion processing, reduces avoidance of negative affective states

Analogy

Giving a dose of ketamine is like extinguishing the “fire” of stress in the brain

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BDNF & Neuroplasticity

Mechanism

Stimulates BDNF, leading to neurogenesis & new connections

Effect

Neuron growth & a window of opportunity for deep therapeutic work* (neuroplasticity), including: making new connections and strengthening connections.

Analogy

Ketamine is like fertilizer for neurons

*Ideally done during the 24-48 hour window of optimal neuroplasticity after ketamine dosing

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Limbic/Cortical Interruption

Mechanism

Interrupts connection between cortex & limbic system

Effect

Time out from ordinary mind (decreased rumination), down regulation of default mode network (DMN), increased cognitive flexibility

Analogy

Rebooting your computer

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Thank You

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