



**MIND MEDICINE**  
A U S T R A L I A

Application of MDMA in PTSD Psychotherapy (from MAPS)

Activity		Effects	Application in PTSD Psychotherapy
<b>SEROTONIN Release</b>	Downstream Post-synaptic 5-HT <sub>1A</sub> 5-HT <sub>1B</sub>	↓depressed mood ↓anxiety ↓fear recognition (amygdala) ↓aggression and defensiveness ↑self-confidence	<ul style="list-style-type: none"> <li>Facilitates experience of positive mood and reduced anxiety</li> <li>Increases engagement and ability to focus on trauma without overwhelm</li> </ul>
	5-HT <sub>2A</sub>	↑alterations in the perceptions of meaning	
<b>NOREPINEPHRINE Release</b>		↑arousal ↑alertness ↑conscious of external stimuli	<ul style="list-style-type: none"> <li>Increases motivation to engage in therapy</li> <li>Improved recall of state-dependent memories</li> <li>Works with other activity to create optimal arousal zone</li> </ul>
<b>DOPAMINE</b> Minor ↑ secondary to Serotonin			
<b>ALPHA-2 ADRENO-CEPTORS</b> ↑activity		↑relaxation ↑calmness	<ul style="list-style-type: none"> <li>Reduces hypervigilance associated with PTSD</li> <li>Works with other activity to create optimal arousal zone</li> </ul>
<b>HORMONAL EFFECTS</b> Release of oxytocin, vasopressin, prolactin and cortisol		↑attachment ↑feelings of trust ↑empathy ↓perception of social rejection	<ul style="list-style-type: none"> <li>Improves capacity to reflect on traumatic memories</li> <li>Improves therapeutic alliance</li> <li>Improves discussion of social/emotional relationships</li> </ul>
<b>BDNF</b> Upregulation		↑neuroplasticity ↑fear extinction learning	<ul style="list-style-type: none"> <li>Allows reflection on traumatic memories during psychotherapy without being overwhelmed</li> <li>Facilitates memory reconsolidation</li> </ul>
<b>REGIONAL BRAIN CHANGES</b> ↑ PFC activation ↓amygdala activation ↓cerebral blood- right amygdala and hippocampus		↑detection of happy faces ↓detection of fearful faces ↓subjective fear response on recall of negative memories	<ul style="list-style-type: none"> <li>Enhances levels of shared empathy and pro-social functioning</li> <li>Increases reflection on painful memories of trauma during psychotherapy</li> </ul>