

**FIRE IN THE BASEMENT:**  
TRAUMA AND TREATMENT STRATEGIES

Aaron Wilson, MD



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**Raised by a Combat Veteran**



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**Disclosures**



- None

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## Objectives



- Formulate a practical, working understanding of trauma neurobiology
- Identify 4 specific modalities for the effective treatment of nervous system dysregulation
- Identify the connection between the central nervous system as it relates to mental health

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## The Scale of Trauma



- Adverse Childhood Experiences Study
- High ACE scores correlate with:
  - Higher workplace absenteeism, financial problems
  - Higher rates of depression (F>M)
  - Higher rates of being on an antidepressant, prescription painkillers
  - Significantly higher risk of IV drug use
  - Significantly higher risk of suicide attempts
  - More likely to suffer from any of the 10 leading causes of death

<https://www.cdc.gov/violenceprevention/acesstudy/about.html>

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## The Scale of Trauma



- **60%** of all men experience at least one trauma, **4%** will develop PTSD
- **50%** of all women experience at least one trauma, **10%** will develop PTSD
- Estimated **15.2%** of Vietnam Veterans, **30%** lifetime prevalence
- Estimated **12.1%** of Gulf War Veterans
- Estimated **13.8%** of OIF/OEF Veterans

<https://www.cdc.gov/violenceprevention/acesstudy/about.html>

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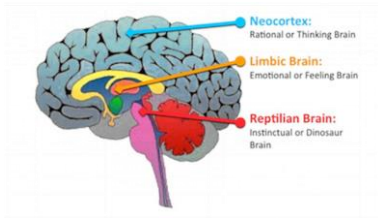
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Review of Neuroanatomy




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Review of Neuroanatomy



**Reptilian Brain**

- Most Primitive Part of Brain
- Online at Birth
- Eat, Sleep, Wake, Breathe, Feel Pain, Urinate, Defecate
- Together with Hypothalamus (directly above it) control heart, lungs, endocrine, and immune systems

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Review of Neuroanatomy



**Limbic System**

- Development and organization mostly in first 6 years of life.
- Neuroplasticity – "neurons that fire together, wire together"
- Experiences contribute to emotional/perceptual map of the world.

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Review of Neuroanatomy



**Neocortex**

- Rational Brain
- First Grade (Age 7) – "the age of reason"
- Regulate behavior
- Use language
- Abstract thought
- Control attention
- Integrating memories into stories
- Empathy – Mirror Neurons

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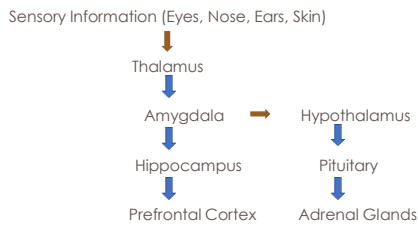
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Review of Neuroanatomy



**The Flow of Information**




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The impact of trauma



- **Thalamus shuts down** – lose autobiographical memory, trauma remembered as isolated sensory imprints.
- **Impaired attention/concentration** – Can not filter sensory inputs. Constant sensory overload.
- **Amygdala goes into overdrive** – cannot distinguish between past and present.
- **Prefrontal Cortex impaired or 'offline'** – lose sense of time and become trapped in the moment.
- **Physiology** –
  - Increased HR, BP, pupil size, fuel availability, clotting
  - Decreased immune response, digestion, relational ability

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The impact of trauma



- **Depersonalization** – biological 'Freeze' reaction
- **Dorsal Vagal** – Parasympathetic activation
- **Decreased activation** in nearly every region of the brain
- **Physiology** –
  - Increased Insulin activity, fuel storage, endorphins (raise pain threshold)
  - Decreased nearly everything else

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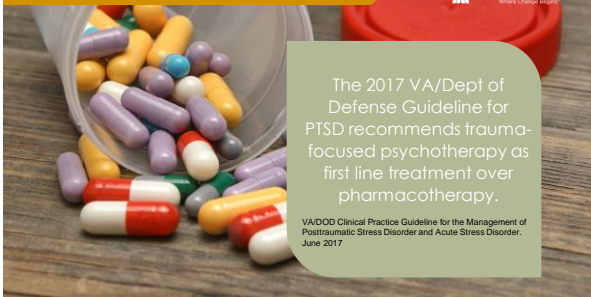
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Pharmacotherapy

The 2017 VA/Dept of Defense Guideline for PTSD recommends trauma-focused psychotherapy as first line treatment over pharmacotherapy.

VA/DOD Clinical Practice Guideline for the Management of Posttraumatic Stress Disorder and Acute Stress Disorder. June 2017

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Pharmacotherapy



**Antidepressants**

**Strong For:**

- Sertraline (Zoloft) – SSRI
- Paroxetine (Paxil) – SSRI
- Fluoxetine (Prozac) – SSRI
- Venlafaxine (Effexor) – SNRI

**Weak For:**

- Nefazodone – “Other”
- Imipramine – Tricyclic (TCA)
- Phenelzine – MAOI

**Weak Against:**

- Citalopram (Celexa)
- Amitriptyline (Elavil)

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Pharmacotherapy



**Mood Stabilizers**

**Weak Against:**

- Lamotrigine (Lamictal)
- Topiramate (Topamax)  
– for monotherapy or augmentation

**Strong Against:**

- Valproic acid (Depakote)

VA/DoD Clinical Practice Guideline for the Management of Posttraumatic Stress Disorder and Acute Stress Disorder, June 2017.

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Pharmacotherapy



**Antipsychotics**

**Weak Against:**

- Quetiapine (Seroquel)
- Olanzapine (Zyprexa)
- “Other atypicals”

**Strong Against:**

- Risperidone (Risperdal)

VA/DoD Clinical Practice Guideline for the Management of Posttraumatic Stress Disorder and Acute Stress Disorder, June 2017.

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Pharmacotherapy



Others worth mentioning

Strong Against:

- Benzodiazepines
- Guanfacine
- Ketamine as monotherapy
- D-cycloserine – outside of research setting
- Hydrocortisone – outside of research setting
- Cannabis or Cannabis Derivatives

Weak Against:

- Prazosin for global symptoms, insufficient evidence for nightmares

VA/DoD Clinical Practice Guideline for the Management of Posttraumatic Stress Disorder and Acute Stress Disorder, June 2017.

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Pharmacotherapy



Our approach at Sierra Tucson

- Collaboration with referring Providers
- Collaboration with on-site Pharmacists
- Collaboration with Naturopathic Physicians
- 'Less is More' – avoiding polypharmacy

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QUESTIONS?

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# THANK YOU

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