



# Treatment of Combat-related PTSD with Virtual Reality Exposure Therapy

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## Outline

- Rationale for Virtual Reality Exposure Therapy for PTSD
- Unique advantages of “Virtual Iraq”
- Plans for assessing the efficacy of VRET in the treatment of PTSD



# Psychotherapy for PTSD

- Cognitive behavioral therapy:
  - Cognitive restructuring
  - Relaxation/breathing techniques
  - Homework assignments
- Exposure therapy:
  - Helps confront stimuli associated with trauma
  - Identifies & neutralizes behavioral cues
    - o Prolonged/Imaginal—some patients unable or unwilling
    - o *In vivo*: higher risks, may be less practical
    - o Virtual Reality: forces realistic, but safe, exposure on patient
      - **Appears useful in Vietnam vets and World Trade Center survivors, need more controlled assessments**

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# Hypotheses

- VRET is more effective than supportive psychotherapy with a relaxation virtual environment for PTSD
- Based on intention to treat, VRET achieves more rapid responses, and higher response rates, than imaginal exposure for PTSD
- Combination VRET with pharmacotherapy has additive therapeutic effect

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# VRET Approach

- 12 90-minute sessions
  - Study manual adapted from Difede, in turn based on Virtual Vietnam
  - Begin with CBT alone for 3-4 sessions, with CR, homework, relaxation techniques, *in vivo* exposure
  - VR introduced @ 4<sup>th</sup>-5<sup>th</sup> session, ½ of session
    - 1<sup>st</sup> person, present tense
    - Therapist directed, based on knowledge of individual's trauma, following SUDS & physiologic monitoring to guide progression
    - Half of session direct VR, plus prep and f/u discussion

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# Advantages of “Virtual Iraq”

- Multi-sensory Stimuli
- Individualization of Exposure
- Physiologic Monitoring



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# Individualization of Exposure

- Flexible introduction of multi-sensory “trigger” stimuli
  - Visual, auditory, tactile, and olfactory
- Range of Scenarios
  - Urban: on streets & inside city buildings
  - Desert: checkpoints, highway
  - Inside and outside vehicles
- Variety of User Perspectives
  - Alone, with buddy, and with patrol

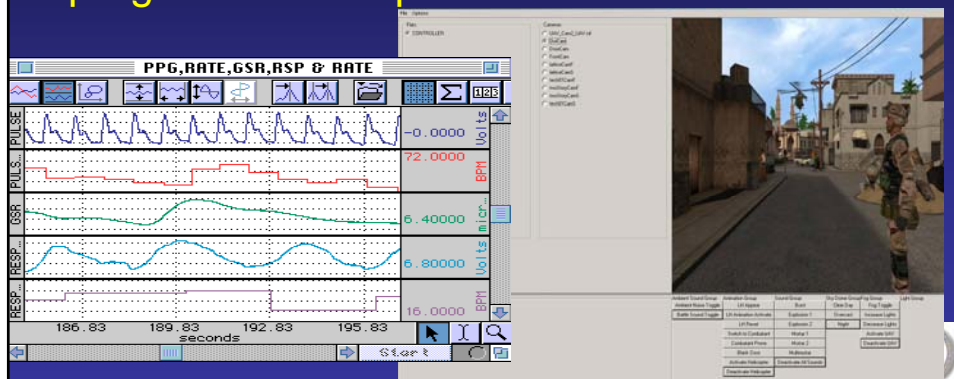


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# Physiologic Monitoring

- Can be integrated with SUDs scores to increase precision of direction and rate of progression of exposures



# Proposed Study Designs

1. CBT/VRET vs. supportive therapy/relaxation
  - Outpatient setting, max chance to show superiority
2. VRET vs. Prolonged Exposure
  - Partial hospitalization setting
  - Comparison to 1<sup>st</sup>-line treatment
    - Makes demonstration of superiority difficult
    - But, best for those enrolled, w/ significant dysfunction
3. Three Arms, to I.D. Maximum Response Rate
  1. VRET plus placebo pills
  2. VRET plus sertraline
  3. Sertraline plus relaxation virtual environment

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## VRET vs. supportive psychotherapy & relaxation

- Controls for time with therapist
- Controls for time in virtual environment
- Control arm receiving care that has reasonable chance to improve condition
- Maximizes chances for demonstrating efficacy of VRET
- Plan submitted to NIMH to randomize 26 participants, recruited from clinics

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## VRET vs. Prolonged Exposure

- Non-inferiority trial, comparison with best-evidenced 1<sup>st</sup>-line treatment
- Same schedule for both arms
- Submitted to USAMRMC, to randomize 64 patients, referred to WRAMC psych day hospital
- Primary outcome: 30% reduction in CAPS score

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## Outcome Measures

- Primary: CAPS score
- Comparison: PCL-M score
- Functional Status: SF-36, WHODAS II
- Comorbidity:
  - SCID, BDI for MDD,
  - SCID, BAI for anxiety
  - SCID, AUDIT, CAGE for alcohol abuse, dependence

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## VRET and/or pharmacotherapy

- If one or both of the previous studies show benefits for VRET,
  - Seek to identify optimal treatment combination for PTSD
  - Best response rates for pharmacotherapy and for exposure therapy are 60%--can this be improved with combination therapy?
  - Phase III, large, multicenter RCT

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## WRAMC, USU Coinvestigators

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## Consultants

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- Barbara Rothbaum, Ph.D., Emory Univ
- JoAnn Difede, PhD, Cornell
- Ken Graap, CEO, Virtually Better, Inc.

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## Other applications

- VR unit training as stress inoculation to prevent stress-induced disorders
- VR screening on return from deployment to identify those at highest risk for PTSD
  - Provides opportunity for early intervention
- Comparison of impact of various sensory stimuli using fMRI

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## Summary

- Many soldiers with PTSD reluctant to utilize mental health professionals
- Need to consider novel approaches
  - VRET has potential to enhance attractiveness and improve treatment acceptance, as well as rate of response and response rate
  - Need for well-controlled trials

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## Questions?

