



 "Virtual Reality Stress Inoculation Training
for Combat Medical Personnel" 



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 "Virtual Reality Stress Inoculation Training
for Combat Medical Personnel" 

Warfighters' Stressors

- Unpredictability
- Sleep deprivation
- Information overload
- Work overload
- Organizational constraints
- Exposure to injuries/deaths (friend/foe)

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“The Operational Problem”

We are mainly protecting warfighters against physical stressors.

STI is “body armor” for the psyche

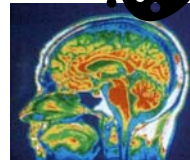


–“I think we ought to encourage every innovation...to make some of this stuff come to life in the minds of the trainees.” - GEN Wallace, TRADOC CDR.

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Stress Management

- Psychopharmacology
 - Selective Serotonin Reuptake Inhibitors; Antidepressants
 - Dependence, interference
- Psychotherapy
 - Critical incident stress debriefing
 - Cognitive-Behavioral
 - Exposure
 - In-vivo
 - Imaginal
 - **Virtual Reality (VR)**

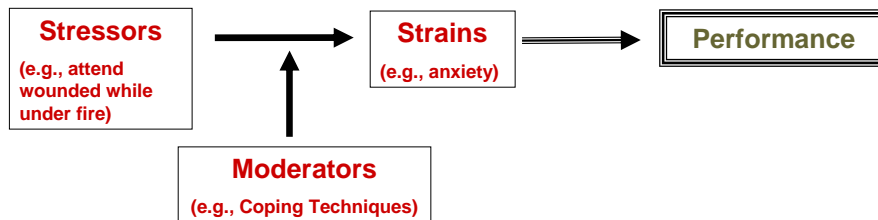


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Stress Inoculation Training (SIT)

•SIT can moderate stress-strain relationships by preparing individuals for stressful experiences.

•Coping techniques can be incorporated to enhance SIT.



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Pilot Study



USAARL Participant during a VR-SIT session

"The Usefulness of
 VR-SIT for
 Military Medical
 Females:
 A Pilot Study"



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"Virtual Reality Stress Inoculation Training for Combat Medical Personnel"



Obtained Sample-to-date


JAN '07 @ USASAM, Fort Rucker, AL = Flight Medics (FM)	13
FEB '07 @ Fort Benning, GA = Ranger First Responders	6
MAR '07 @ Lyster, Fort Rucker = Medical Personnel	12
APR '07 @ USASAM = FM	9
APR-MAY '07 @ Fort Drum = Mountain Medics	11
MAY-JUN '07 @ USASAM = FM	3
TOTAL-TO-DATE:	54

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"Virtual Reality Stress Inoculation Training for Combat Medical Personnel"


Study Information



- Budget from the Telemedicine and Advanced Technologies Research Center = \$100K.
- Date that it actually started (due to \$ getting to USAARL, games being developed, participants' class dates, available personnel, etc.) = JAN 07.
- Date to be completed: JUN 07. 

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Study Main Objectives

- *Main Hypothesis:* Those with more inoculations will show:
 - Lower strain
 - Higher performance

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Design

Participants = Medical personnel (e.g., medics, nurses).

- Targeted sample size: 63; criterion for significance (alpha) set at .05 and an effect size (f) of .40 to yield a power of .80.
 - Control Group- 9 participants that will neither receive either virtual reality (VR) or coping training (CT).
 - VR Group: 18 participants that will receive either 2 or 4 sessions.
 - CT Group: 18 participants that will receive either 2 or 4 sessions.
 - VR + CT Group: 18 participants that will receive either 2 or 4 sessions.

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Psychological Assessment

- Pre- Screening:
 - *PTSD Checklist- Military Version*

- *Bio-survey*
- *Multiple Affect Adjective Check List-Revised*
- *Presence Questionnaire*

- Post- Screening:
 - *Simulator Sickness Questionnaire*

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Bio-chemical Assessment

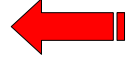
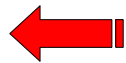
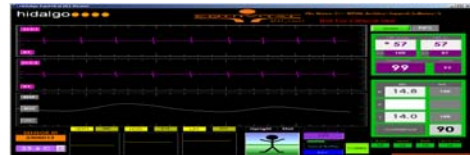
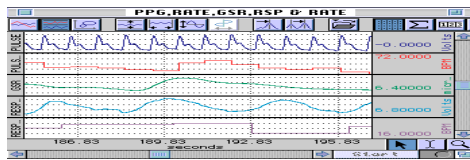
- *Salivary Amylase Kit-*
 - predict plasma catecholamine levels
 - self-contained
 - amylase levels are quantified using tabled values of time for color change and ambient temperature recording

- *Cortisol*
 - saliva and sweat
 - polypropylene fiber material

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Physiological Assessment

- Devices to monitor heart/respiration rate and skin conductance/ temperature



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VR Scenarios



Virtual Reality Medical Center

Combat Medic

Flight Medic



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Virtual Data Collection @ USAARL





CH1
CH3




07/01/21 16:45:33
CH2
CH4


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 "Virtual Reality Stress Inoculation Training for Combat Medical Personnel"
 

VR Data Collection in other posts



Game Session



Coping Session

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Hands-On Data Collection (indoors)



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Hands-On Data Collection (outdoors)



Fort Benning, Georgia



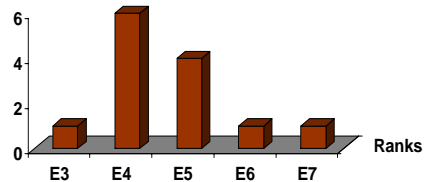
Fort Drum, New York

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Demographics- (1st sub-sample)

The first sub-sample (JAN 07, n = 13/30) was composed of Medics attending the Flight Medic’s Course at the US Army School of Aviation Medicine, Fort Rucker, AL.

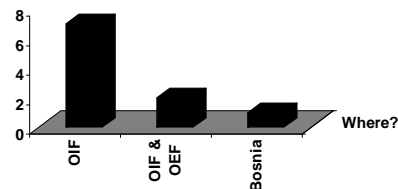
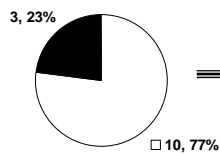
- Caucasian- “American?” (10,77%)
- Single (11, 85%)
- Reservists (10,77%)
- < 5 years of service (7, 54%)
- 21-29 years old (7, 54%)



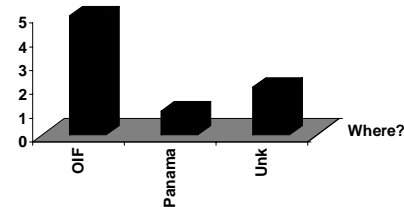
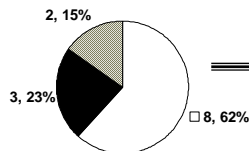
PRELIMINARY DATA...

Demographics- cont.

□ Previously Deployed ■ Not yet...

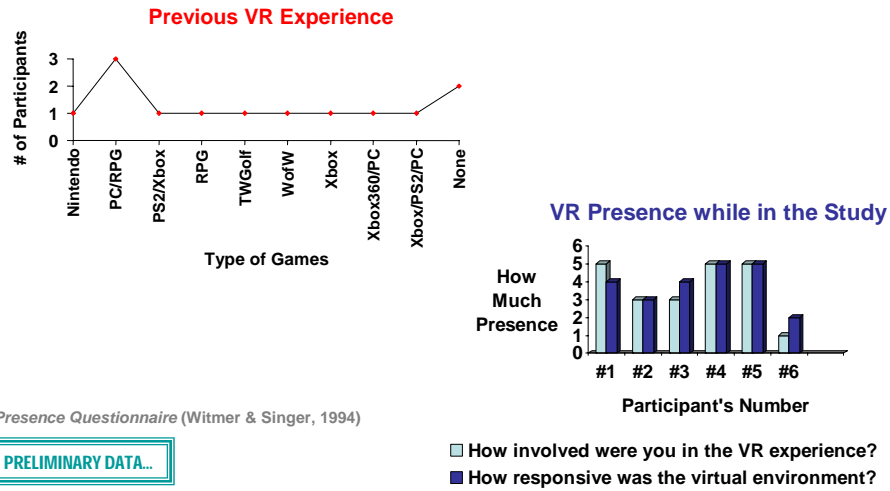


□ Deploying Soon ■ Not Soon... ▨ Don't Know



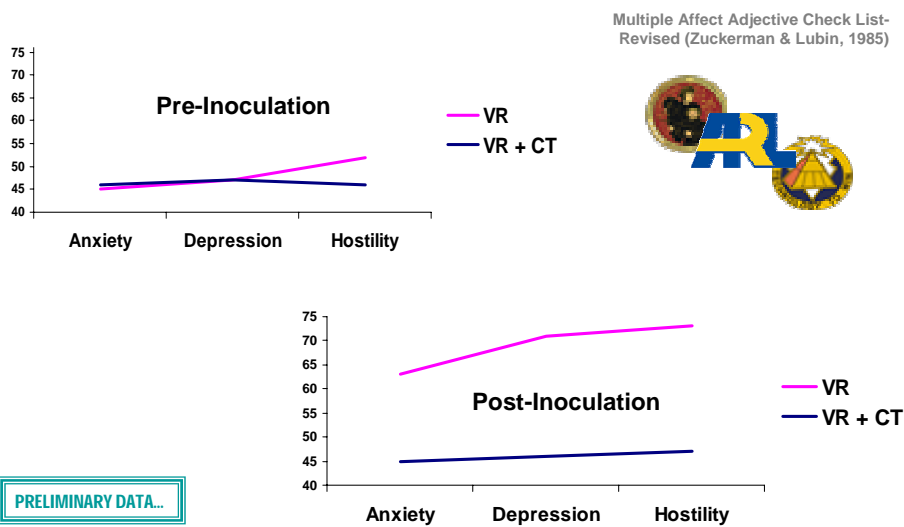
PRELIMINARY DATA...

Presence- (1st sub-sample)



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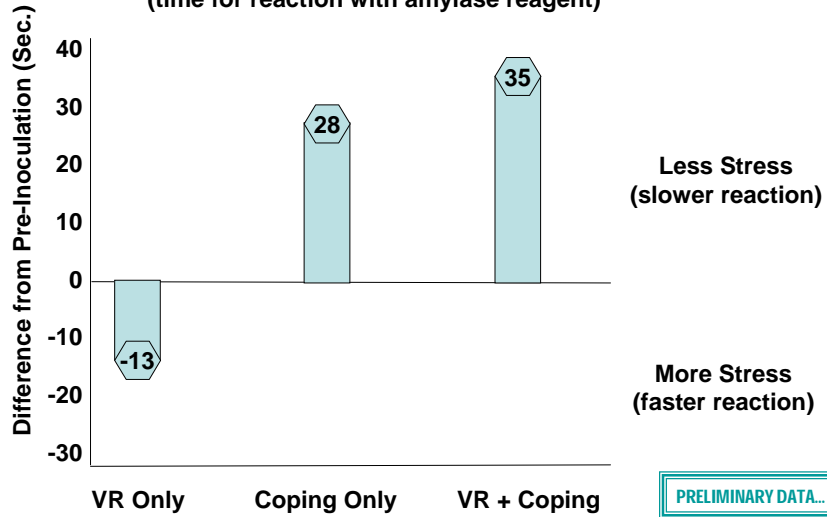
Psychological Stress (1st sub-sample)



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Bio-chemical Stress (1st sub-sample)

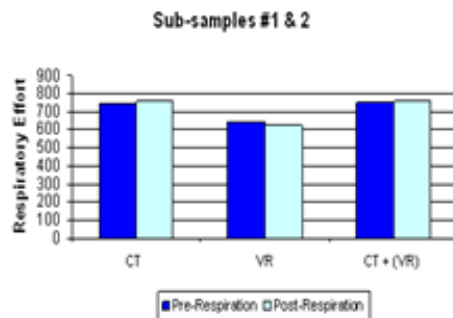
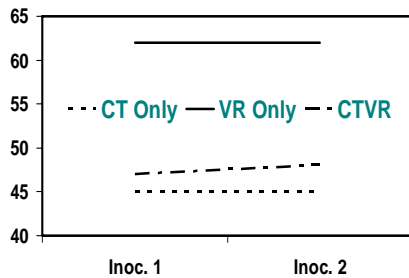
(time for reaction with amylase reagent)



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From 2 of the samples (n = 25)

Estimated Marginal Means of Anxiety



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Performance Measures



APR's Data Collection

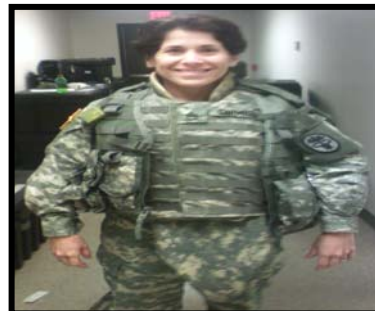
Group	VR				Hands-On
	VR-2	Go	No Go	N/A	N/A
VR-4	No Go	No Go	No Go	Go	Go
CTVR-4	No Go	No Go	Go	Go	Go
CTVR-4	No Go	Go	Go	Go	Go

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More to come...

- Last data collection?
- Beginning of the Coping VR Study?

PI's Deployment?



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Lessons Learned

- Schools are appreciative of the instructional "games."
- Participants have reported none-to-low prior PTSD symptoms.
- Most participants (i.e., males) seem to like playing the "games."
 - In fact, most (e.g., those previously deployed, including females) wanted to come back 3 and 4 times to quickly "save the casualty" and kill the "bad guys."

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Lessons Learned- cont.

- Some liked the breathing/relaxing TNG
 - Immediate physiological biofeedback tends to be well received by the VR + CT group.
 - Many CT and VR + CT participants mentioned practicing these techniques throughout the day.
- "Go's/No-Go's" can be reproduced from the lab portion of the study. However, study sites tend to "pass" all Soldiers by the end of the STXs (hands-on) portion.
- Due to technological and field data collection variables... there will be some missing data.

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Summary

- Many Warfighters are returning from theater due to combat stress.
- Few alternative therapies are available for care.
 - VR-SIT seems to be a tool that is:
 - prophylactic against stress, and
 - good for training job tasks
 - Preliminary/ongoing USAARL data suggest that VR-SIT and coping strategies are promising for hardening warfighters (i.e., medical personnel) against combat stress.

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Contact Information

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