



COMBAT & OPERATIONAL STRESS

# RESEARCH QUARTERLY

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A PUBLICATION OF THE NAVAL CENTER FOR COMBAT & OPERATIONAL STRESS CONTROL

## Lower resilience in veterans predicts alcohol misuse

**Key Findings:** Analysis of resilience and alcohol use in U.S. Iraq and Afghanistan veterans showed that changes in resilience were associated with changes in alcohol use and that lower levels of resilience at baseline were associated with greater alcohol misuse at one-year follow-up. The relationship between resilience and alcohol misuse was still significant after accounting for the effects of combat exposure, PTSD symptom severity and history of alcohol use. Additionally, younger age and male gender were associated with increased alcohol misuse.

**Study type:** Longitudinal study with self-report measures

**Sample:** 1,388 baseline and 1,090 one-year follow-up veterans who served on or after September 11, 2001 who were randomly selected from the National Post-Deployment Adjustment Study survey

**Implications:** Results suggest that resilience changes over time and may act as a protective factor against alcohol misuse. While some research has found combat exposure and other trauma to be associated with alcohol problems, the current results indicate that resilience is a stronger predictor of alcohol misuse. Considering that young male veterans may be at a

higher risk for alcohol problems, this population may especially benefit from resilience training programs.

*Green, K.T., Beckham, J.C., Youssef, N. & Elbogen, E.B. (2013). Alcohol misuse and psychological resilience among U.S. Iraq and Afghanistan era veterans. Addictive Behaviors, 39(2), 406-413. doi: 10.1016/j.add-beh.2013.08.024*

## Resting-state fMRI data predicts individual PTSD symptoms using relevance vector regression

**Key findings:** Analysis of self-report and fMRI data from earthquake survivors 10 and 15 months post-earthquake found that resting-state fMRI predicted individual scores on the PTSD Checklist with statistical significance. A multivariate statistical method called relevance vector regression (RVR) was used to allow for analysis at the individual level rather than the mass-univariate methods typically used to examine fMRI data at the group level. Activation of several parietal, prefrontal and occipital regions of the brain predicted individual PTSD symptoms.

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NCCOSC  
COMBAT & OPERATIONAL STRESS  
RESEARCH QUARTERLY  
VOLUME 6 . NUMBER 2  
SPRING 2014

Published by:



Navy Bureau of Medicine and Surgery  
Naval Center for Combat &  
Operational Stress Control  
(NCCOSC) (M95)

*Views expressed in this publication are not necessarily those of the Department of Defense.*

**Research Quarterly** is written and produced by the NCCOSC Research Facilitation Department and Strategic Communications Department.

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**Study type:** Cross-sectional study using resting-state fMRI data and self-report measures

**Sample:** 121 survivors of the 2008 Sichuan earthquake with no psychiatric comorbidity as assessed by the Structured Clinical Interview for DSM-IV and psychiatric history

**Implications:** Neuroimaging techniques and RVR may be used to identify individual psychopathology from a physiological standpoint, potentially reducing the stigma of mental illness by recognizing its biological/medical markers. Additionally, finding that the occipital and parietal regions of the brain predict PTSD symptoms challenges the idea of PTSD as a fronto-limbic disorder. Future longitudinal research is warranted to examine fMRI data pre- and post-trauma to distinguish brain activation that is pre-existing from brain activation due to trauma.

Gong, Q., Li, L., Du, M., Pettersson-Yeo, W., Crossley, N., Yang, X., ... Mechelli, A. (2013). Quantitative prediction of individual psychopathology in trauma survivors using resting-state fMRI. *Neuropsychopharmacology*, 39(3), 681-687. doi: 10.1038/mp.2013.251

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## Prolonged Exposure for chronic PTSD decreases symptoms regardless of reliable change in subjective distress

**Key Findings:** During Prolonged Exposure (PE) treatment, the majority of participants did not experience reliable changes in subjective units of distress from first to last imaginal exposure. Reliable change in distress was associated with lower baseline PTSD severity, higher level of anxiety sensitivity and the perception of imaginal exposure homework as more helpful. While all participants experienced improvements in depression, PTSD symptom severity and functioning post-treatment, after controlling for pre-treatment PTSD severity, those who experienced a reliable change in distress were found to have the lowest post-treatment re-experiencing and hyperarousal symptoms, levels of depression and impairment in social functioning.

**Study type:** Pre-post-treatment study with self-report and clinician-rating measures

**Sample:** 88 adult trauma survivors diagnosed with primary chronic PTSD who received 10 weekly 90-120-minute sessions of PE therapy as part of a larger randomized study

**Implications:** Results indicate that a reliable decrease in subjective units of distress during PE treatment is not necessary to decrease PTSD symptom severity, depression and functional impairment, but is associated with the most optimal

outcome. Providers should be aware that patients with high levels of anxiety sensitivity, lower baseline PTSD symptom severity, and those who perceive imaginal exposure homework as helpful may experience more reliable change in subjective distress during PE, thereby reaping the most significant benefits from treatment.

Bluett, E.J., Zoellner, L.A., & Feeny, N.C. (2014). Does change in distress matter? Mechanisms of change in prolonged exposure for PTSD. *Journal of Behavior Therapy and Experimental Psychiatry*, 45(1), 97-104. doi: 10.1016/j.jbtep.2013.09.003

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## Integration of smoking cessation into substance use treatment increases use of nicotine replacements but does not necessarily decrease smoking

**Key Findings:** Evaluation of veterans in a treatment program for addiction found that while nicotine replacements and a weekly tobacco recovery education class were made available to patients, approximately 76% reported tobacco use at both baseline and follow-up. No significant change in the number of cigarettes per day was found and patients reported feeling "moderately" ready to quit smoking at both baseline and follow-up. However, those who reported using tobacco upon program entry showed a significant increase in both use of nicotine replacements and engagement in nicotine recovery activities.

**Study type:** Prospective study with baseline and 30-90 day follow-up with self-report measures and retrospective chart review

**Sample:** 178 U.S. veterans (93 of whom completed both baseline and follow-up measures) admitted to intensive outpatient addiction treatment at a VA medical center

**Implications:** Results indicate that a large number of veterans in treatment for addictions report using tobacco products and may be at higher risk for medical complications than previously identified. While the integration of smoking cessation into treatment for addictions may not decrease actual tobacco use, this study found that patients are at least willing to make efforts toward quitting smoking while simultaneously enrolled in substance use treatment. Future studies should tally the exact number of cigarettes per day rather than categorizing this data (e.g., "10 or fewer per day") to increase sensitivity.

Shealy, S.E., & Winn, J.L. (2013). Integrating smoking cessation into substance use disorder treatment for military veterans: Measurement and treatment engagement efforts. *Addictive Behaviors*, 39(2), 439-444. doi: 10.1016/j.addbeh.2013.07.014

## Willingness to engage in physical conditioning is associated with lower rates of mental disorder diagnoses and early attrition in enlisted Army accessions

**Key Findings:** Analysis of TAPAS (non-cognitive personality test) scores of Army accessions showed that participants less likely to engage in physical conditioning were most likely to drop out of the Army within the first six months. Among those meeting mental disorder diagnostic criteria during their first year of service (7.2%), 68% were diagnosed within the first six months of service. Adjustment disorders and affective disorders were most commonly diagnosed. The lower one's physical conditioning score on the TAPAS, the higher their risk was for medical and mental disorders after accounting for the effects of demographic variables.

**Study type:** Retrospective cohort study

**Sample:** 15,082 U.S. Army active duty enlisted accessions with no prior service who took the 2010 TAPAS

**Implications:** The TAPAS may help identify individuals at high risk for early attrition or mental disorder diagnosis within the first six months of Army service. More research is needed to examine the efficacy of non-cognitive personality tests for the prediction of mental health diagnoses and attrition in branches other than the Army and should use longer periods of follow-up after accession. Results are similar to that of previous research indicating that higher physical fitness test results are associated with lower rates of mental disorders, suggesting further encouragement of engagement in physical conditioning.

*Niebuhr, D.W., Gubata, M.E., Oetting, A.A., Weber, N.S., Feng, X., & Cowan, D.N. (2013). Personality assessment questionnaire as a pre-accession screen for risk of mental disorders and early attrition in U.S. Army recruits. Psychological Services, 10(4), 378-385. doi: 10.1037/a0032783*

## Lorazepam decreases perceived level of intrusiveness of trauma compared to diazepam and placebo

**Key Findings:** Two hours after watching a video with real-life terrifying content (analogue trauma provocation), one group of participants received 0.5mg lorazepam, one group received 5.0 mg diazepam and the third group received 0.5mg placebo. Twenty-four hours after taking the medication, no differences were found among groups on levels of arousal, conceptual processing, state dissociation, self-referent processing, state anxiety or depression. However, the lorazepam group showed less data-driven processing and rated the intru-

siveness of the traumatic video as significantly lower than did the diazepam or placebo group. Notably, only the diazepam group showed slightly increased intrusion scores 24 hours after medication.

**Study type:** Prospective, randomized, double-blind placebo-controlled study with self-report measures and structured clinical interview

**Sample:** 65 Korean college students

**Implications:** Results suggest that one dose of lorazepam influences cognitive processing and inhibits implicit perceptual priming, thereby decreasing the perceived intrusiveness of traumatic material. Considering that intrusion is associated with the development of re-experiencing, avoidance and hyperarousal symptoms, lorazepam may decrease these PTSD symptoms. Additionally, diazepam may be contraindicated for use in PTSD patients due to its enhancement of intrusion effects.

*Lee, H.S., Lee, P.H., Lee, K.S., Kim, Y.K. & Choi, Y.K. (2013). Anti-intrusion effect of Lorazepam: An experimental study. Korean Neuropsychiatric Association, 10, 273-280. doi: 10.4306/pi.2013.10.3.273*

## Insomnia and poor sleep duration pre-deployment are associated with development of PTSD, anxiety and depression after first deployment

**Key Findings:** Among service members with no history of mental disorder diagnosis or psychotropic medication prescription, and who screened negative for depression, anxiety, PTSD and panic pre-deployment, 3.4% developed PTSD, less than 1% developed anxiety and less than 2% developed depression after first deployment. Service members who reported sleeping fewer than six hours per night pre-deployment were significantly more likely to develop PTSD than those sleeping seven hours per night. Additionally, those reporting insomnia symptoms pre-deployment were at higher risk for new-onset PTSD, anxiety and depression.

**Study type:** Longitudinal cohort study with self-report measures

**Sample:** 15,204 military service members who completed their first deployment between 2001 and 2008

**Implications:** The sleep patterns of prospective military recruits should be assessed along with medical health before accession to identify those with pre-existing sleep difficulties because they may be at higher risk for developing mental disorder diagnoses following deployment. Treatment focused on improving sleep in current service members may help prevent

future development of PTSD, anxiety and depression.

Gehrman, P., Seelig, A.D., Jacobson, I.G., Boyko, E.J., Hooper, T.I., Gackstetter, G.D., ...Smith, T.C. (2013). Predeployment sleep duration and insomnia symptoms as risk factors for new-onset mental health disorders following military deployment. *Sleep*, 36(7), 1009-1018. doi: 10.5665/sleep.2798

## Direct exposure to explosion linked to highest likelihood of PTSD diagnosis

**Key Findings:** Analysis of self-report measures found that direct exposure to a car bomb explosion was more strongly associated with PTSD than with general psychiatric symptoms such as anxiety and depression. Those who directly witnessed the explosion reported the highest level of PTSD symptoms (58.5%), followed by those who saw disturbing events after the explosion but were not witnesses (21.8% probability of PTSD). Lower levels of PTSD symptoms, albeit elevated, were found in those experiencing loss of someone close or of property (11.9% probability of PTSD). Being a “near miss” was not associated with significant psychological impact and showed no difference in symptoms from the non-exposed group. Among those directly exposed, Ehlers and Clark’s cognitive model of PTSD accounted for 63% of variance in PTSD caseness. Furthermore, media coverage of the incident was reported to be helpful rather than harmful by Omagh residents, contrary to the findings of research focused on media coverage of previous traumatic events.

**Study Type:** Cross-sectional study with self-report measures

**Sample:** 3,131 adult residents of the Omagh District Council area (Ireland), nine months following the car bombing of August 1998

**Implications:** Results confirm that the cognitive model strongly predicts PTSD symptoms, thereby implicating CBT as a first line of treatment for this type of trauma. While little research exists on the psychological impact of a “near miss,” the current results suggest it has little to none. This is particularly relevant to service members who may experience “near misses,” such as moving safely along convoy routes and then discovering another unit sustained casualties shortly after. Results emphasize the importance of community cohesion following trauma. Additionally, the reportedly helpful manner in which this event was covered by the media may be a good example for other media sources.

Duffy, M., Bolton, D., Gillespie, K., Ehlers, A., & Clark, D.M. (2013). A community study of the psychological effects of the Omagh car bomb on adults. *PLoS ONE*, 8(9), 1-9. doi:10.1371/journal.pone.0076618



## Biological markers predict PTSD treatment response

**Key Findings:** A comparison of responders and non-responders to Prolonged Exposure (PE) therapy revealed that pre-treatment levels of glucocorticoid receptor (GR) exon 1F promoter methylation (a DNA-level process associated with cortisol) predicted treatment response, but did not significantly change in either group at post-treatment or 3-month follow-up. While the FKBP5 promoter (a gene that has been found to predispose individuals to PTSD) did not predict treatment response, it did vary according to treatment outcome. For example, treatment responders showed a decrease in FKBP5 while non-responders showed an increase.

**Study type:** Pilot treatment outcome study with clinical interviews, self-report and biological measures

**Sample:** 16 combat veterans with PTSD who completed PE treatment (eight responders and eight non-responders to PE treatment)

**Implications:** Results suggest two epigenetic markers that may be associated with PTSD treatment prognosis (GR gene methylation) and symptom severity (FKBP5 gene methylation). Results also suggest that mental health treatments such as PE that result in significant symptom change may act as a form of environmental regulation that eventually alters one’s genes. This is the first study in the literature to demonstrate an association between epigenetic biomarkers and treatment response, an integral first step in establishing a biological basis for PTSD therapies.

Yehuda, R., Daskalakis, N.P., Desarnaud, F., Makotkine, I., Lehrner, A.L., Koch, E., ...Bierer, L.M. (2013). Epigenetic biomarkers as predictors and correlates of symptom improvement following psychotherapy in combat veterans with PTSD. *Frontiers in Psychiatry*, 4(118) 1-14. doi: 10.3389/fpsy.2013.00118



### ***Life and family stressors during deployment predict PTSD diagnosis among National Guard/Reserve service members***

**Key Findings:** Assessment of OEF/OIF National Guard/Reserve (NGR) service members about 4.7 months post-deployment found that 12.6% met CAPS criteria for PTSD within six months of returning home. Combat experiences, family and life stressors during deployment and lack of post-deployment social support independently predicted risk of PTSD. Among those with a high level of combat-exposure, 26.6% also high in family and life stress during deployment developed PTSD compared to only 3% of those with low level of family and life stress. Perceived adequacy of pre-deployment preparation and training functioned as a mild protective factor from PTSD, but only when the level of combat exposure was low. Level of unit support was not associated with PTSD in this sample.

**Study type:** Cross-sectional study with clinician-administered and self-report measures

**Sample:** 238 NGR members returning from deployment in Iraq or Afghanistan

**Implications:** Similar to previous research, results suggest that combat exposure predicts PTSD, specifically in those with higher life and family stress during deployment. The lack of association between unit support and PTSD is also similar to findings of past research in this population. Results suggest that while combat exposure contributes to one's risk of PTSD, family stressors and social support significantly impact this population. NGRs are "civilian soldiers" and may rely more heavily on family than on their unit for social support. Efforts aimed at decreasing family and life stressors and increasing post-deployment social support in this population may significantly decrease their risk of PTSD.

*Tracie Shea, M., Reddy, M.K., Tyrka, A.R., & Sevin, E. (2013). Risk factors for post-deployment posttraumatic stress disorder in national guard/reserve service members. Psychiatry Research, 210(3), 1042-1048. doi:10.1016/j.psychres.2013.08.039*

### **Military suicide associated with male gender, mental illness and occupation**

**Key Findings:** Analysis of factors associated with death by suicide during and after military service found that suicide was most common among those with bipolar disorder, depression and alcohol-related problems. Additionally, death by suicide was associated with fewer cumulative days of deployment, the occupation of combat specialist, deployment experience pre-2001 and male gender. Overall, 12.8% of the deaths in the current sample were due to suicide.

**Study type:** Prospective longitudinal study with retrospective analysis of data from the Millennium Cohort Study

**Sample:** 151,560 current and former U.S. service members from all branches who participated in the Millennium Cohort Study, 646 of whom died between 2001 and 2008

**Implications:** Researchers have hypothesized that the significant upward trend in military suicides since 2005 is a result of longer, more frequent deployments as well as increased combat experiences. This was the first study to prospectively examine factors of military suicide and found that this is not necessarily the case. Instead, results indicate that suicide in the military is similar to that of the civilian population and is attributable to gender and mental illness. The growing rate of suicide in the military may signify an increasing rate of mental illness. More screening and treatment for mental illness and alcohol misuse is needed in this population, while research is warranted to identify interventions that reduce or prevent suicide.

*LeardMann, C.A., Powell, T.M., Smith, T.C., Bell, M.R., Smith, B., Boyko, E.J....Hoge, C.W. (2013). Risk factors associated with suicide in current and former US military personnel. Journal of the American Medical Association, 310(5), 496-506. doi: 10.1001/jama.2013.65164*

### **Third Location Decompression mitigates alcohol misuse, PTSD and physical symptoms in those with low- to moderate-level combat exposure**

**Key Findings:** Third Location Decompression (TLD) aims to smooth transition between deployment and homecoming by allowing personnel to psychologically "unwind" for 24-36 hours with a structured program of activities in a neutral area, such as Cyprus. Among the U.K. armed forces sample, TLD did not significantly promote better post-deployment readjustment regardless of level of combat exposure. However, TLD attendees with moderate levels of combat exposure were significantly lower than controls in PTSD symptoms, multiple physical symptoms and levels of alcohol misuse.

While TLD attendees low in combat exposure were less likely to have general mental health concerns, attendees high in combat exposure showed no significant differences from the non-TLD control group.

**Study Type:** Cohort Study with self-report measures

**Sample:** 3,071 U.K. armed forces personnel, 1,407 who attended TLD, and 1,664 who did not

**Implications:** While results suggest that TLD may not result in better overall readjustment post-deployment, its residual benefits may be enough to continue and perhaps even promote its practice. Furthermore, those found to have a low-to-moderate-level of combat exposure should be routinely recommended for TLD, as such individuals are most likely to benefit from this transition program. Those with high levels of combat exposure may need more intensive support in addition to TLD to best mitigate the effects of deployment. Randomized-controlled trials are needed to assess the future utility of and policy regarding TLD.

*Jones, N., Jones, M., Fear, N., Fertout, M., Wessely, S., & Greenberg, N. (2013). Can mental health and readjustment be improved in UK military personnel by a brief period of structured postdeployment rest (third location decompression)? Occupational & Environmental Medicine, 70(7), 439-445. doi: 10.1136/oemed-2012-101229*

## U.K. military personnel more likely to report and receive treatment for medical problems than for mental health-related problems

**Key Findings:** Among U.K. military personnel previously deployed to Iraq or Afghanistan, stress/emotional problems were the most commonly reported health issue (19%), followed by general medical (8%) and alcohol problems (6%). Among those experiencing medical problems, 85% sought help, while only 42% reporting stress/emotional problems and 31% reporting alcohol problems sought help. Treatment was obtained from medical providers rather than mental health providers by 29% of those experiencing stress/emotional problems and by 17% of those reporting alcohol problems. Seeking help for stress/emotional problems was associated with female gender, functional impairment, having two or more mental health problems and having an AUDIT score of 20 or higher. Notably, officers were less likely to seek help. Non-medical help seeking for stress/emotional problems was associated with divorced or separated status and having last been deployed to Afghanistan.

**Study type:** Retrospective analysis of self-report measures from a cohort study

**Sample:** 4,725 U.K. armed forces members and reservists who had previously deployed to Iraq and/or Afghanistan

**Implications:** While many service members report having stress/emotional problems, a majority do not seek help or wait until symptoms are severe. Previous research has documented the relationship between deployment to Afghanistan and help-seeking behavior, attributing it to the effects of combat role. While results of the current study did not indicate that combat role was a factor, future research may clarify this relationship. Earlier detection and intervention for stressed service members may prevent future mental health issues. Additionally, policy aimed at decreasing mental health stigma, especially in officers, is warranted. Considering that service members who do seek help are more likely to consult medical providers, medical staff should be prepared to assess for mental health issues and, in some cases, make referrals.

*Hines, L. A., Goodwin, L., Jones, M., Hull, L., Wessely, S., Fear, N., & Rona, R. J. (2014). Factors affecting help seeking for mental health problems after deployment to Iraq and Afghanistan. Psychiatric Services, 65(1), 98-105. doi:10.1176/appi.ps.004972012*

## Brief PTSD screening instruments, especially the PCL-Bliese-4, validly diagnose PTSD in various treatment settings

**Key Findings:** Among substance use disorder (SUD) clinic patients, 37.2% met Computerized Diagnostic Interview Schedule for DSM-IV (C-DIS-IV) criteria for PTSD, 48% of whom were diagnosed in their medical records. Those meeting C-DIS-IV criteria for PTSD scored an average of 41.29 (SD = 15.90) on the PCL and 3.35 (SD = 1.08) on the PC-PTSD. Notably, those with a PTSD diagnosis in their medical record scored an average of 36.98 (SD = 20.97) on the PCL, and 2.96 (SD = 1.51) on the PC-PTSD. Among general mental health (MH) clinic patients, 53.1% met C-DIS-IV criteria for PTSD, 60% of whom were diagnosed in their medical records. Those meeting C-DIS-IV criteria for PTSD scored an average of 41.36 (SD = 16.18) on the PCL and 3.33 (SD = 1.20) on the PC-PTSD. Those with a PTSD diagnosis in their medical record received average scores of 42.23 (SD = 15.70) and 3.36 (SD = 1.16) on the PCL and PC-PTSD respectively. The PCL, PC-PTSD, PCL-Bliese-4, and the PCL-LS-2 were all found to be valid measures of PTSD; notably, the PCL-Bliese-4 demonstrated the best psychometric properties in both treatment settings.

**Study type:** Cross-sectional study using a structured interview and self-report measures

**Sample:** VA patients seeking outpatient treatment for SUD (n = 158) or general MH (n = 242)

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**Implications:** Results suggest that brief PTSD screeners such as the PCL, PC-PTSD, PCL-LS-2 and especially the PCL-Bliese-4, can be used to validly diagnose PTSD in SUD and general MH settings, potentially identifying a previously overlooked diagnosis and improving treatment outcomes. Results also suggest that PTSD is under-diagnosed in both SUD and general MH treatment settings. Future research focused on the cost and feasibility of using a brief PTSD screener in treatment settings is recommended.

Tiet, Q. Q., Schutte, K. K., & Leyva, Y. E. (2013). Diagnostic accuracy of brief PTSD screening instruments in military veterans. *Journal of Substance Abuse Treatment, 45*(1), 134-142. doi:10.1016/j.jsat.2013.01.010

## A specific pattern of brain activation in PTSD patients is associated with Prolonged Exposure treatment success

**Key Findings:** Analysis of combat veterans before and after 8-12 weeks of prolonged exposure (PE) therapy found that 37.5% no longer met criteria for PTSD post-treatment, while 62.5% showed no significant reduction of symptoms post-treatment. Those whose PTSD remitted following treatment showed significantly less activation of the left ventral anterior insula when anticipating aversive images compared to those whose symptoms remained the same post-treatment. Furthermore, significant differences were found between these two groups in connectivity of the left ventral anterior insula to

the right cingulate and mid-posterior insula. Change in cingulate connectivity was associated with higher level of self-reported resilience and lower scores on an alexithymia scale.

**Study type:** Cross-sectional treatment study using functional Magnetic Resonance Imaging (fMRI), self-report and clinician-administered measures

**Sample:** 24 male OEF/OIF veterans treated at the VA for combat-related PTSD

**Implications:** Treatments that confront avoidance and create habituation, such as exposure therapy, can help reduce activation in the areas of the brain associated with interoception. However, results suggest that an individual must be able to identify their own emotions (be low in alexithymia) and tolerate unpleasant feelings thoughts and sensations in order to change their insular processing and benefit from PE therapy. The ability to change one's insular processing has been associated with the social and emotional aspects of cognitive processing. Therefore, cognitive therapy may help individuals with PTSD and alexithymia to better identify emotions and sensations, potentially increasing the likelihood that they will benefit from PE treatment.

Simmons, A. N., Norman, S. B., Spadoni, A. D., & Strigo, I. A. (2013). Neurosubstrates of remission following prolonged exposure therapy in veterans with posttraumatic stress disorder. *Psychotherapy and Psychosomatics, 82*(6), 382-389. doi:10.1159/000348867

## Front-loaded post-deployment reintegration approach effective for Army units with lower levels of combat exposure

**Key Findings:** Behavioral health outcomes of two Army units were compared post-deployment. One unit participated in standard reintegration (48-hour liberty pass followed by 10 days of reintegration in CONUS), while the other unit used a front-loaded strategy (reintegration training occurred OCONUS, with only 1-3 days once in CONUS). Type of reintegration approach did not predict differences in behavioral health four months post-deployment. The front-loaded strategy was not associated with more risk behaviors (reckless driving, unsafe sexual behavior) or with more aggressive behavior, alcohol misuse, PTSD symptoms or less marital satisfaction. Notably, soldiers in the front-loaded group had been deployed fewer times, and with lower levels of combat exposure than those in the standard group.

**Study type:** Cross-sectional study with self-report assessments

**Sample:** 272 soldiers from the U.S. Army in Europe and 121 soldiers from an army unit stationed in the U.S.

**Implications:** When a low level of combat exposure is

### TEST YOUR KNOWLEDGE

According to the article on page 10, "OEF/OIF/OND Military families experience more frequent, longer deployments: Directions for future research," young boys most frequently struggle with reintegration once their parent returns from deployment and girls most frequently struggle with:

- A. Daily schedule changes
- B. Attachment issues
- C. Reintegration
- D. Initial separation

The answer is D. Initial separation



expected, a shorter, front-loaded reintegration approach may be appropriate. It should be noted that the two groups being compared in this study differed regarding location, potentially decreasing the generalizability of the findings. The front-loaded group (USAREUR) returned to an Army post in Germany, while the standard reintegration group (U.S. Army soldiers) returned to a U.S. post. Future research should use clinician-report measures in addition to self-report.

*Sipos, M.L., Foran, H.M., Wood, M.D., Wright, K.M., Barnhart, V.J., Riviere, L.A., & Adler A.B. (2013). Assessment of an alternative postdeployment reintegration strategy with soldiers returning from Iraq. Psychological Services. Advance online publication. doi: 10.11037/a0033308*

## DBT alone may not benefit patients with comorbid BPD and PTSD

**Key Findings:** Participants with comorbid PTSD and Borderline Personality Disorder (BPD), who completed 12 months of Dialectical Behavior Therapy (DBT) showed less reduction in self-harm behaviors than those with BPD alone, even after adjusting for number of Axis I diagnoses. Those with comorbid PTSD reported significantly more severe symptoms throughout treatment than those without comorbid PTSD. While 56% of participants dropped out of treatment, the likelihood of completing DBT was not significantly associated with whether or not the participant had comorbid PTSD.

**Study type:** Prospective longitudinal treatment study with clinician-administered and self-report measures

**Sample:** 89 civilian patients (51 with comorbid BPD and PTSD, and 39 with BPD only) receiving DBT in a community mental health treatment facility

**Implications:** Previous treatment models operated under the premise that the emotional instability and impulsivity associated with BPD should be treated before addressing comorbid PTSD. However, recently developed treatments have begun to use exposure techniques to target the concurrent symptoms of BPD and PTSD. As demonstrated by the results of the current study, PTSD symptoms such as alexithymia and emotional numbing may interfere with one's ability to benefit from DBT alone, supporting use of the newer treatments that incorporate trauma therapies. Further research is needed to identify the factors mediating the negative effects of PTSD on treatment outcomes. Additionally, research is warranted to assess the efficacy of interventions that target symptoms of both BPD and PTSD to best meet the needs of this patient population.

*Barnicot, K. & Stefan, P. (2013). Post-traumatic stress disorder and the outcome of dialectical behaviour therapy for borderline personality disorder. Personality and Mental Health, 7(3), 181-190. doi:10.1002/pmh.1227*



## Military occupation is associated with new-onset PTSD and depression

**Key Findings:** Among Navy and Marine Corps service members, battle injury rates differed by branch and occupation. For example, 67.6% of injured Marines worked as combat specialists, while 82.9% of injured Sailors worked as health care specialists. Notably, no Sailors working as combat specialists were injured in battle. Compared to service members working in functional support jobs, Sailors in health care occupations and Marines in combat occupations were significantly more likely to be diagnosed with new-onset PTSD and depression within one year following their first deployment. Notably, a larger percentage of Navy health care specialists versus Marine Corps combat specialists were diagnosed with new-onset PTSD and depression.

**Study type:** Retrospective review of deployment and health care records

**Sample:** 32,196 Marines and 8,404 Sailors diagnosed with new-onset PTSD or depression within one year after returning from deployment in Iraq

**Implications:** Results suggest that the dual role of Navy health care specialists (e.g., functioning as both caregiver and combatant) poses unique risk factors for their mental health. The combined effect of caregiving and combat stress has not been well studied and warrants further research. Differences in perceived stigma of accessing mental health care may account for the higher rates of new-onset PTSD and depression found in Navy health care specialists, compared to Marine Corps combat specialists. It is also possible that Navy health care providers are not as well prepared to handle combat stressors as are Marine combat specialists.

*Mayo, J.A, MacGregor, A.J, Dougherty A.L, & Galarneau, MR. (2013). Role of occupation and new-onset post-traumatic stress disorder and depression among deployed military personnel. Military Medicine, 178(9) 945-950.*

## Reviews to Peruse

### OEF/OIF/OND military families experience more frequent, longer deployments: Directions for future research

**Key Findings:** The OEF/OIF/OND military faces longer and more frequent deployment schedules than previous eras. These deployment schedules lead to unique stressors for all family members including shifts in the family equilibrium, anxiety, depression and sleep difficulties in spouses, internalizing, externalizing and sleep disturbance in children, and higher levels of stress in adolescents. Spouses of service members enduring long and frequent deployments who have young children at home are more likely to mistreat their child, while the separation of deployment may disrupt the parent/child attachment. Children who pick up household chores previously managed by the deployed parent may feel overburdened. Depending on a family member's age, gender and level of social support, reactions to deployment stressors may vary. While girls show difficulty with the initial separation, boys seem to struggle more with reintegration when the parent returns. Military families that are not embedded in a military community are less likely to find needed support.

**Study type:** Review article

**Sample:** Military families who regularly face the challenges of OEF/OIF/OND era deployments

**Implications:** This review of the literature yielded various results and ideas for future research. Overall, families enduring OEF/OIF/OND deployments are experiencing significant stressors. In order to best meet the needs of these individuals, it is imperative that clinicians and researchers understand the unique challenges military families face throughout deployment and the cumulative impact of longer, multiple and repeated deployments. In order to gain such information, future research is needed that takes into account the family as a dynamic system trying to maintain homeostasis. Cascade models may be useful in identifying critical periods during deployment when intervention is ideal. Additionally, longitudinal research will help with prevention efforts and policy modifications. More information is needed regarding how children process and react to parental deployment at different developmental stages. There is also a lack of research on sub-populations such as those in special operations, drone operators, veteran families and newly separated veterans. Lastly, immediate and long-term resilience training for families would be helpful as a preventative measure.

Paley, B., Lester, P., & Mogil, C. (2013). *Family systems and ecological perspectives on the impact of deployment on military families*. *Clinical Child and Family Psychological Review*, 16(3), 245-265. doi: 10.1007/s10567-013-0138-y

### Self-managed stress reduction techniques are efficacious in attenuating stress among various populations

**Key Findings:** Review of previous research showed that 54% of studies found statistically significant effects of mindfulness-based stress reduction (MBSR) on distress in individuals with rheumatoid arthritis, anxiety and in healthy college students. Additionally, 57% of studies found statistically significant effects of cognitive behavioral stress management (CBSM) on coping and anxiety in HIV patients, everyday stressors in heart disease patients, anxiety in college students, and coping, anxiety and relaxation in breast cancer patients. Among studies focused on autogenic training (AT; "telling" the body to relax and controlling breathing, heart rate, blood pressure and body temperature), 30% found statistically significant effects of AT on anxiety in nursing students and heart attack/coronary bypass patients, and distress in chronic headache patients. Lastly, 40% of studies found statistically significant effects of relaxation response training (RRT) on psychological distress in university students and distress in patients with psychosomatic symptoms.

**Study type:** Review article

**Sample:** Results of 116 randomized-controlled trials examining training programs for the self-management of emotional distress, deemed as high quality with statistically significant results

**Implications:** A review of the literature suggests that stress reduction training programs for individuals experiencing various life stressors or medical illnesses are useful in decreasing emotional stress and may be useful for military service members and their families. Considering that these techniques are self-managed, they promote a sense of self-efficacy in altering one's stress level, require minimal time and few resources. Changing the focus from treatment to prevention efforts, such as these self-management techniques, may attenuate future symptoms. This review only included multimodal stress-reduction programs. Future reviews should focus on programs using only one technique to better identify the specific effects of each method.

Crawford, C., Wallerstedt, D.B., Khorsan, R., Clausen, S.S., Jonas, W.B., & Walter, J.A.G. (2013). *A systematic review of biopsychosocial training programs for the self-management of emotional stress: Potential applications for the military*. *Evidence-Based Complementary and Alternative Medicine*, 2013, 1-23. doi: 10.1155/2013/747694



## Review of the chemical processes occurring in the brain immediately following TBI

**Key Findings:** Traumatic Brain Injury (TBI) has become an epidemic with an incidence rate higher than that of AIDS, breast cancer, Parkinson's, and multiple sclerosis. TBI is complex in that one's age, gender, location and type of injury all significantly influence symptoms, degree of damage and prognosis. Evidence suggests that repeated mTBI or moderate to severe TBI leads to neurodegenerative diseases. TBI causes changes to ions and neurotransmitters leading to a pattern of events which disturb normal brain cell function. Initially, the brain experiences decreased neuronal firing and cognitive deficits. Next, the brain's glucose metabolism (the brain's main source of energy) sharply increases in uptake (hyperglycolysis) and then decreases, leading to an 'energy crisis' during which ATP production is reduced. Production of free radicals increases (which may cause DNA, cell membrane and protein damage) while slowed antioxidant response and mitochondrial dysfunction ensue. Age has been shown to affect the duration of glucose depression following TBI in rats. Additionally, due to a slower antioxidant response and mitochondrial differences found uniquely in younger brains, children may be at increased risk for oxidative damage following TBI. Administering lactate following TBI has been shown to improve water maze performance in rats, but did not reverse the TBI-related ATP deficiency. Furthermore, three injections of sodium pyruvate have been shown to decrease cortical cell loss and improve neurobehavioral recovery. Following TBI, ketones (which can be produced through fasting) may have a protective effect by reducing the size of contusions and improving cognitive and motor functioning. Administration of ethanol pyruvate and acetyl-L-carnitine following TBI may improve behavioral outcomes and reduce lesion size.

**Study Type:** Review of previous research on chemical brain processes and TBI

**Sample:** Young adolescent and adult rats used to replicate human pathophysiology of brain injury

**Implications:** This review of the literature emphasizes the complexity of TBI and its unique symptoms and outcomes in each case. Understanding the chemical processes that take place in the brain post-TBI help to inform treatment and direct researchers toward different clinical trials that may attenuate damage to the brain and improve prognosis. No clinical trials to date have examined the use of alternative energy sources (alternative substrate therapy) in lessening the impact of the energy crisis on the brain. Future research should examine the effectiveness of early interventions among different age groups considering the vast differences found in TBI between youth and adults.

*Prins, M., Greco, T., Alexander, D., & Giza, C.C. (2013). The pathophysiology of traumatic brain injury at a glance. Disease Models & Mechanisms, 6, 1307-1315. doi: 10.1242/dmm.011585*

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## Review of pharmacological treatments for service members with PTSD

**Key Findings:** Current research suggests that the combination of psychotherapy and medication offers the greatest benefit to those with PTSD. While selective serotonin reuptake inhibitors (SSRIs) have historically been the first-line drugs used to treat PTSD, their efficacy has recently been debated. Sertraline and Paroxetine are the only SSRIs approved by the Food and Drug Administration specifically to treat PTSD. SSRIs broadly target the three symptom clusters of PTSD while also treating comorbid depression. However, current research suggests that the efficacy rates of SSRIs rarely exceed 60% and that less than 20-30% of patients achieve complete remission. Advances in neuroimaging techniques have identified structural brain abnormalities in those predisposed to PTSD, including smaller hippocampal volume and size, lower cortisol levels and decreased volume of the anterior cingulate cortex. These structural abnormalities disrupt the amygdala's ability to process fear. Exposure to stress triggers the release of neurohormones, affecting memory consolidation and creating hyperemotional arousal in the amygdala. Propranolol acts by blocking the transmission of stress hormones to the amygdala, thereby affecting reconsolidation of fear memories. Propranolol has been used for both prevention and treatment of PTSD, but remains controversial due to its disruption of

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## Reviews to Peruse

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one's "sense of self." Others argue that propranolol allows an individual to better integrate and process the trauma, leading to improved personality maturation.

**Study type:** Review of pharmacological treatments for PTSD

**Sample:** Five randomized-controlled trials and 27 non data-driven papers (review, conceptual, ethical debate) published between 2001 and 2011

**Implications:** Overall, the use of propranolol in the treatment of PTSD is promising. Future research is needed in order to replicate the current results and to compare the efficacy of propranolol to that of SSRIs in treating PTSD. Additionally, future research should focus on identifying therapeutic doses of propranolol and finding complementary therapies to be used in conjunction with this medication. Use of propranolol therapy is limited, however, to use in patients with no cardiac or vascular comorbidities.

*Tawa, J. & Murphy, S. (2013). Psychopharmacological treatment for military posttraumatic stress disorder: An integrative review. Journal of the American Association of Nurse Practitioners, 25(8), 419-423. doi:10.1111/1745-7599.12016*

### Summary of mental disorder diagnoses among active component service members from 2000 to 2012

**Key Findings:** Throughout a 13 year period of surveillance, 159,107 active component service members and 22,456 reserve members were hospitalized for a mental disorder. Annual hospitalization incident rates for active component service members remained stable from 2000 to 2006, increased until 2011 and stabilized by 2012. The sharp increase in 2006 was due to diagnoses of PTSD, alcohol abuse and dependence, depression and adjustment disorders. For reserve component members, hospitalization incidence rates nearly doubled from 2002 to 2003, remained stable until 2006, and increased again until 2011. For the reserve component, most hospitalizations were for depression. Between 2000 and 2012, those with schizophrenia had the longest length of stay, although throughout the surveillance period, length of stay for this diagnosis decreased from 19 to 10 days (median) and stays for alcohol abuse and PTSD increased between 2009 and 2012 (mean 9-12 days). Over 50% of those hospitalized between

2000 and 2012 had a co-occurring mental disorder, rates of which increased throughout the 13 years. Suicidal ideation was a top co-occurring diagnosis for all primary diagnoses except substance use disorders. Females were more likely than males to be hospitalized for PTSD, depression, adjustment disorders and bipolar disorder, yet less likely for alcohol and substance use disorders. Nearly 80% of those hospitalized for adjustment disorder had never deployed, while 21.9% of those hospitalized for PTSD never deployed. Overall, service members who had deployed at least once showed fewer hospitalizations for depression, bipolar disorder and adjustment disorder, yet more for alcohol and substance use disorders and PTSD compared to non-deployers. The most dramatic increases in length of stay occurred for those hospitalized for PTSD, depression and alcohol use disorders.

**Study type:** Longitudinal review of hospital records

**Sample:** Individuals who served in active and reserve components of the U.S. military from Jan. 1, 2000 to Dec. 31, 2012

**Implications:** Significant increases in hospitalizations for PTSD, depression and alcohol use disorders have been noted since 2006. Such findings are concerning considering the high correlation between psychiatric hospitalization and suicidal ideation. The increases noted in length of hospital stay may be due to the increase in co-occurring diagnoses and resulting complexity of treatment. While almost 80% of those hospitalized for adjustment disorder had never deployed, such findings may be due to the relationship between young age (not yet deployed) and higher rates of hospitalization. Considering that reserve members were included in this study and may have received mental health care outside of military facilities, rates may be underreported for the reserve population.

*Summary of mental disorder hospitalizations, active and reserve components, U.S. armed forces, 2000-2012. (2013). MSMR, 20(7), 4-11.*

*The Combat & Operational Stress Research Quarterly is a compilation of recent research that includes relevant findings on the etiology, course and treatment of Posttraumatic Stress Disorder (PTSD). The intent of this publication is to facilitate translational research by providing busy clinicians with up-to-date findings, with the potential to guide and inform evidence-based treatment.*

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