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TITLE: Reintegrating Troops with Mild Traumatic Brain Injury (mTBI) into Their Communities:
Understanding the Scope and Timeline of Post-Deployment Driving Problems

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14. ABSTRACT This study examines the extent to which combat driving behaviors and anxieties are carried-over into driving on American roads post-deployment from service in Operation Enduring Freedom/Operation Iraqi Freedom/Operation New Dawn (OEF/OIF/OND) and to compare such behaviors in Service Members (SMs) who have and have not served in these combat operations and who do and do not have mild traumatic brain injury (mTBI). The study has struggled to gain access to subjects, finally achieving access to FT Gordon this year. Two other sites (FT Campbell and FT Bragg) are in process as is USARIEM. This month, FT Gordon PI (S. Mooney) begins distribution of surveys. Personnel are also in training for telephone survey option and survey questions. No findings to report at this time.					
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Appendices: None

Supporting Materials : USAA report titled *RETURNING WARRIORS Driving Safety Report 2012*

INTRODUCTION: Service Members (SMs), especially Soldiers, serving in Operation Enduring Freedom/Operation Iraqi Freedom (OEF/OIF) (and newly Operation New Dawn (OND)) use combat driving maneuvers to avoid roadway threats. These become automatic as they are performed repeatedly and strongly linked to safety. A regional pilot study by the PI and graduate students (Riley-Chiabotti, Hieb, Welle, Stern, 2008; Stern, 2009; Christensen, Escobar, Riess, Stern, 2009) indicated that post-deployed Soldiers may have high levels of carryover behaviors and anxieties and that these behaviors are long lived issues – lasting for several months post-deployment. Reflecting Killgore, Cotting, Thomas, et al's. (2008) finding that general combat trauma influences risky behaviors post-deployment (including risky driving), driving carryover behaviors and anxieties regressed significantly on the level of Soldiers' OIF/OEF driving-related trauma (Polzin, Wenker, Stern EB, 2009). The current CDMRP study builds on these findings, using a drop-off-mail-back survey to provide firm national data on the scale, incidence, and timeline of combat-driving behaviors among post-deployed Soldiers with and without mild traumatic brain injury (mTBI) or mTBI with post-traumatic stress syndrome (mTBI/PTSD), and compares Post-deployment Soldiers to Soldiers who have not served in OEF/OIF/OND. **The study's goals are to determine the extent to which combat driving tendencies are carried over into post-deployment driving on American roads by Soldiers with mTBI and those without mTBI, to separate driving behaviors associated with military service from those associated with brain injury or deployment, to examine the impact of dual diagnosis of mTBI/PTSD on driving carryover, and to establish military respondents' self-recognition of driving behaviors relative to an informed third party report as a measure of self-awareness.** Further, the study compares the responses of survey participants in the three strata mentioned above with a *Knowledgeable Other* (i.e., *Family/Friend* identified by the military respondent as someone who has been a passenger when the service member drove). **The ultimate purpose of the study is to describe post-driving behaviors and to clarify the needs that will appropriate post-deployment program development for Soldiers, families, and communities.**

BODY:

The project continues to use a drop off- mail/phone return (no phone returns thus far). The project is receiving returned surveys from 1st approved site (FT Gordon), and has received approval by FT Campbell command to move forward with IRB for that site. FT Campbell falls under the review of FT Gordon IRB, and will use same non-engaged method of survey distribution. Change in FT Campbell command delayed initiating this process, and an approval letter that was received from new command failed to reach the FT Gordon IRB. The PI was unaware of this failure until recently, and will resend the appropriate letter requesting the additional site.

A planned USARIEM site, primarily expected to permit access to SMs who have not served in OIF/OEF/OND and who do not have mTBI, will use a fully engaged model to distribute and collect the surveys from USARIEM volunteers who will be given 'credit' for their participation. As with the unengaged sites, USARIEM staff will mail all SM surveys back to University of Minnesota researchers, and will have no access to that raw data. The IRB has been delayed as the PI works with the site POC (CPT L. Smith), who is assigned to this project among other responsibilities.

Recent report by USAA insurance company indicates that driving post-deployment is likely to continue to be of concern (report appended).

KEY RESEARCH ACCOMPLISHMENTS:

- Survey packets being returned by FT Gordon participants
- Two additional sites are in process for approval.

REPORTABLE OUTCOMES:

This year saw additional sites interested in project, and needed IRB applications or site addition requests in process. Survey returns are slow, but as of July 21, 2012 returns have been received from 18 participants (10 men, 08 women, 0 unknown sex), with 7 coming as SM/Friend or family pairs. None have come via the telephone option, nor have any post-cards been received. Several soldiers and Friends/Family returns have thanked us for raising the topic.

Other works that were assisted by the PI's work on this grant, and related to military challenges re. driving, and driving simulation include:

- **Military work groups:**
 - Committee member, Defense Centers of Excellence/DVBIC work group creating recommendations on *Progressive Return to Activity Following Mild Traumatic Brain Injury*.
- **Product development:**
 - Finalizing brochures for return to driving after mild traumatic brain injury (TBI) for SMs and Family as volunteer, for use by Rehabilitation and Reintegration Division (R2D), Office of The Surgeon General- Army. Intent is to post to R2D website and distribute print versions at military TBI conferences. UM Students will be invited to research stakeholder response toward improved 2nd version 2013-14.
 - *Driving Screening, Treatment, and Referral for Generalist Occupational Therapists: Clinical Recommendations for Clients Following Traumatic Brain Injury*, by All Branches Occupational Therapy Consortium (ABOTC) has been sent for review by R2D.
- **Refereed publications:**
 - Zinzow, HM, Brooks, J, Stern, EB (Accepted with revisions). Driving-related anxiety in recent combat veterans: Prevalence, cues, and mental health correlates
 - Radomski, MV, Weightman MM, Davidson LF, Finkelstein M, Goldman S, McCulloch K, Roy TC., Scherer M, Stern EB (Accepted with revisions). Development of a Measure to Inform Return to Duty Decision-Making after Mild Traumatic Brain Injury, *Military Medicine*.
- **Non refereed publications: None**
- **Presentations:** # indicates if another individual was presenter
 - Stern, EB (2012) *Challenges Post-Deployment: A New Perspective on Distracted Driving*. Texas Distracted Driving Summit, presented by USAA in association with the Texas Department of Transportation and Shriners Hospitals for Children. San Antonio, TX. Invited paper.
 - Stern, EB (2012). *Assessment Protocols for Combat Veterans and Driving: A tour of resources and current projects*. Driving Through the Lifespan: Evidence and Practice Steering the Way. American Occupational Therapy Association, Annual Meeting, Indianapolis, IN. Refereed Institute.
 - # Radomski, M.V, McCulloch, K., Goldman, S., Weightman, M. , Davidson, L.F., Roy, T., Stern, E.B. (2011). Development of a Dual- and Multi-task Protocol to Inform Military Return to Duty Decisions, American College of Rehabilitation Medicine: Progress in Rehabilitation Research Conference, Augusta GA. Refereed Podium paper.
 - # Radomski, M.V, McCulloch, K., Goldman, S., Weightman, M. , Davidson, L.F., Roy, T., Stern, E.B., Antczak, A. (2011) Development of a Performance-based Rehabilitation Assessment to Inform Return to Duty Decision-making for Military Personnel with Mild Traumatic Brain Injury. 3rd Federal Interagency Conference on Traumatic Brain Injury (TBI). Washington DC. Refereed Symposium.

- **Interviewed or featured in public press/web/TV/radio:**
 - USAA (April 24, 2012) Interviewed about findings mentioned in *Returning Warriors Driving Safety Report 2012*, United Services Automobile Association cited my research. Followed by interviews by:
 - <http://www.latimes.com/business/la-fi-0424-autos-veteran-driver-20120424,0,3253943,print.story>
 - <http://atwar.blogs.nytimes.com/2012/04/24/insurer-details-higher-risks-for-drivers-after-deployment/>
 - <http://www.usatoday.com/news/military/story/2012-04-24/returning-troops-accidents/54499262/1>
 - http://www.cnbc.com/id/47152779/Returning_Troops_Face_Traffic_Safety_Risks_USAA_Study_Shows_Accidents_increased_by_13_percent_after_deploymen_t
 - <http://mobile.bloomberg.com/news/2012-04-24/vets-car-crash-risk-rises-after-deployment-usaa-says>
 - <http://www.stripes.com/report-car-accidents-more-common-after-deployments-1.175335>
 - <http://online.wsj.com/article/PR-CO-20120424-900021.html#printMode>
 - <http://auto.lapresse.ca/actualites/nouvelles/201205/09/01-4523602-retour-difficile-des-soldats-sur-les-routes.php>
 - Turner, S (February, 2012). *Minnesota News Network – radio distribution of interview*
 - Dao, J (January 10, 2012). Back From War, Fear and Danger Fill Driver's Seat. *The New York Times*, p A1. Picked up by following in whole or part:
 - <http://www.military.com/news/article/erratic-driving-an-increasing-problem-among-returning-vets.html>
 - <http://www.theledger.com/article/20120113/NEWS/120119730?p=2&tc=pg>
 - http://www.denverpost.com/nationworld/ci_19716526
 - <http://www.louisville-injury-lawyers.com/2012/01/driving-woes-of-kentucky-war-vets-peers-tied-to-combat-service.shtml>
 - http://www.dailynews.com/ci_19716526
 - <http://www.afba.com/About-AFBA/News/News/article/PTSD-may-manifest-itself-in-trouble-behind-the-wheel.aspx>
 - <http://www.post-gazette.com/pg/12011/1202733-84-0.stm?cmpid=nationworld.xml>
 - http://www.mercurynews.com/health/ci_19715155
 - <http://www.gjel.com/blog/ptsd-affecting-veterans-behind-the-wheel.html>
 - <http://www.paloalto.va.gov/features/ptsd.asp>
 - <http://www.ndtv.com/article/world/back-from-war-fear-and-danger-fill-driver-s-seat-165831>
- **Refereed Research Posters:**
 - Goldman SB, McCulloch K, Davidson LF, Stern EB, Radomski MV (2011) Development of a Dual- and Multi-task Protocol to Inform Military Return to Duty Decisions. Annual Conference of American Congress of Rehabilitation Medicine (ACRM-ASNR) Atlanta, Georgia
 - Goldman SB, Davidson LF, Stern EB Radomski MV (2011) Development of an Assessment to Detect Performance Deficits Under Dual-Task Conditions for Military Personnel with Mild TBI: A Multidisciplinary Collaboration. American Occupational Therapy Association Annual Conference, Philadelphia. Research Poster.
- **Funding:**
 - ORISE Faculty Fellowship: To develop policies, procedures, and best practices related to driving for returning Soldiers post-deployment to Operation Enduring Freedom and Operation Iraqi Freedom. **Fellow: Stern EB.** Ended within this year's report time.

CONCLUSION: The study's 1st site is distributing surveys.. Pls Stern and Rockwood continue to work to access 2 additional sites. Survey data are being received, entered, and stored safely.

REFERENCES:

Riley-Chiabotti L, Hieb A, Welle L, Stern EB (2008) From Willmar/St Paul To Iraq/Afghanistan: Report of two current studies of Minnesota drivers. Minnesota Occupational Therapy Association, St Cloud, MN.

Stern, E (2009) Post-deployment Driving Behaviors and Driving-related Anxieties". Driving Assessment Conference, Defense Centers of Excellence (DCoE) for Psychological Health and Traumatic Brain Injury. Washington, DC.

Polzin J, Wenker K, Stern EB (2009) Personal and Experiential Factors Associated with Driving Reintegration of Soldiers Post-deployment from OIF/OEF. MOT Defense, University of Minnesota, Minneapolis, MN.

Christensen E, Escobar O, Riess J, Stern EB (2009). Comparison of Self-Reported Driving Behaviors and Anxieties of OIF/OEF Soldiers at 30, 60, and 90 days Post-Deployment. MOT Defense, University of Minnesota, Minneapolis, MN.

Killgore, W. D. S., Cotting, D. I., Thomas, J. L., Cox, A. L., McGurk, D., Vo, A. H., et al. (2008). Post-combat invincibility: Violent combat experiences are associated with increased risk-taking propensity following deployment. *Journal of Psychiatric Research*, 42, 1112-1121

APPENDICES: NONE

SUPOPRTING MATERIALS: USAA Warrior Report



RETURNING WARRIORS

Driving Safety Report 2012

Summary

USAA conducted a study focusing on private passenger vehicle driving experiences of USAA-member military personnel over a three-year period (January 2007 through February 2010), which included 171,000 deployments to various overseas locations. The research findings show an appreciable increase in reported at-fault accidents for military members upon return from deployment.

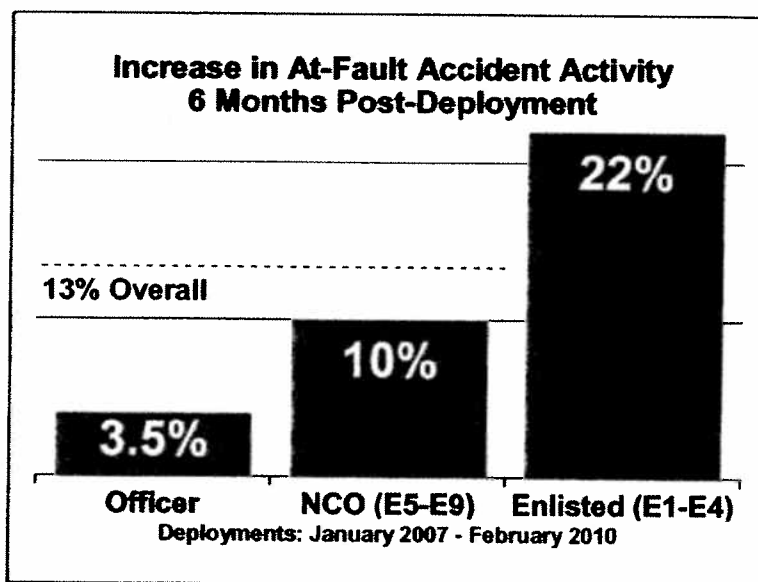
USAA has shared its research with each military branch's safety center commanders. USAA has also shared the study with academics and traffic safety experts and has taken steps to make USAA members aware of the behind-the-wheel risks for returning troops.

Study findings

The study revealed a 13 percent increase in at-fault accidents for troops within the first six months of returning from deployment. Further analysis highlights significant differences between military ranks. The chart below presents the increase in at-fault accidents by rank groups.

Other findings:

- The increase in at-fault accidents was greatest for Army veterans, whose at-fault accidents increased by 23 percent, followed by Marines at 12.5 percent, Navy at 3 percent and Air Force at 2 percent.
- Most accidents were caused by "losing control of the vehicle," according to drivers.
- Accidents attributed by drivers to "objects in the road" increased more dramatically after deployment than any of the other 12 causes USAA tracked for the study.
- The increase in at-fault accidents was most dramatic for younger drivers, with drivers younger than 22 experiencing a 25 percent increase in at-fault accidents, while drivers older than 29 only saw a 7.5 percent increase.
- Drivers with three or more deployments experienced 36 percent more at-fault accidents, drivers with two deployments saw 27 percent more and drivers with one deployment had an increase of 12 percent.
- Individuals with longer deployments were generally more likely to be involved in at fault accidents.



Bringing driving behaviors home

USAA's Returning Warriors data does not include information about behaviors that contributed to the increase in at-fault accidents, because such information isn't captured in claims reporting. However, USAA has been working with military organizations and experts who have studied post-deployment behaviors. Professor Erica Stern of the University of Minnesota has also studied the driving experiences of returning soldiers as part of a regional study and has found "carryover" driving behaviors that were potentially lifesaving in deployment but risky on civilian roadways, such as reluctance to stop at intersections or driving at inappropriate speeds.



Professor Stern surveyed service members about their most recent 30 days of American driving after returning from deployment and found that, of those surveyed, 30 percent reported being told that they drove dangerously. Half said they became anxious when other cars approached quickly or when they got boxed in on the road while 20 percent said they were anxious when driving in general. In comparison, none of the non-deployed service members reported that they were anxious when driving in general.

Professor Stern is currently seeking military installations that might be willing to complete a nationwide survey. The survey needs responses from both service members who have been deployed to Iraq or Afghanistan and those who have not. As part of the effort to help ease the transition from military to homefront driving, a division in the Office of The Surgeon General (Army) offers brochures to assist soldiers and their families. The family brochure includes a table (below) showing driving behaviors learned in combat and how they might continue at home.

In Combat	At Home
Drives as far as possible from road edge to avoid IEDs.	Drives in middle of road, straddling lanes.
Changes direction and lanes unexpectedly, especially at tunnels or underpasses where insurgents might be waiting.	Weaves through traffic. Does not signal turns, merges or lane changes. Avoids or changes lanes at underpasses and tunnels.
Always moving. Does not stop for traffic or people. Always has right of way.	Anxious when stopped. Rolls through traffic lights and stop signs. Does not yield right of way to other vehicles.
Speeds as fast as the lead vehicle in a convoy.	Drives over posted speed limit.
Hypervigilant of roadside elements.	Overtly attentive to roadside elements.

Source: Office of The Surgeon General (Army)

Methodology

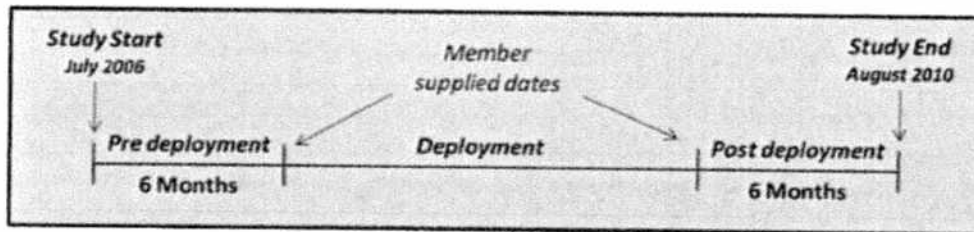
USAA members generally notify us before being deployed because we offer our members several options to either reduce their premiums or coverage if the vehicle is stored. At times, several thousand members will notify us of planned deployments each month. Members who did not notify us of deployments are not represented in the data.

In order to set a common baseline for comparison, driving behavior for each member in the study was evaluated for the six months prior to deployment. The number of at-fault accidents occurring in this period was compared to the member's experience upon returning home from deployment. An accident was considered at-fault if the member's fault was determined to be greater than 50 percent. The post-deployment experience was evaluated for up to 18 months to identify when and if driving behavior returned to pre-deployment levels. The study considered 171,000 deployments by 158,000 USAA members between January 2007 and February 2010.

Key data elements included:

- Deployment dates (supplied by our members).
- Member attributes (rank, age, etc.).
- Traditional insurance- related driving activity (accident history, violations, etc.).

Deployment Data Collection



* Comparison is between pre and post deployment driving experience

A deployment was considered for the study only if the member had auto coverage for at least six months leading up to deployment and for at least six months upon returning from deployment. The 37 months of deployments provided a steady volume of departures and returns to evaluate month over month and help mitigate any seasonality effects.

The cohort study, a type of longitudinal study, was conducted to determine if there was a difference before and after deployment. The difference, if any, was addressed through a statistical paired "t-test." The paired t-test is a standard statistical technique to detect if there has been a significant change between two time points, or before and after a treatment (deployment).

Disclaimers

The study did not account for:

- Long-term shifts in the overall driving environment.
- Activity other than reported at-fault accidents.
- Whether the member was deployed to a combat or noncombat setting.
- USAA members who obtained auto insurance less than six months prior to deployment, or individuals who dropped their USAA auto insurance within six months of returning from deployment.
- The impacts of deployments prior to the study period. USAA's study only considered deployments within the three-year study period.