



**NATIONAL CENTER FOR
TELEHEALTH & TECHNOLOGY**

a DCoE Center

Mobile Technologies: A “Smart” Connection to Psychological Health and TBI Care

Robert Ciulla, Ph.D.
Greg M. Reger, Ph.D.

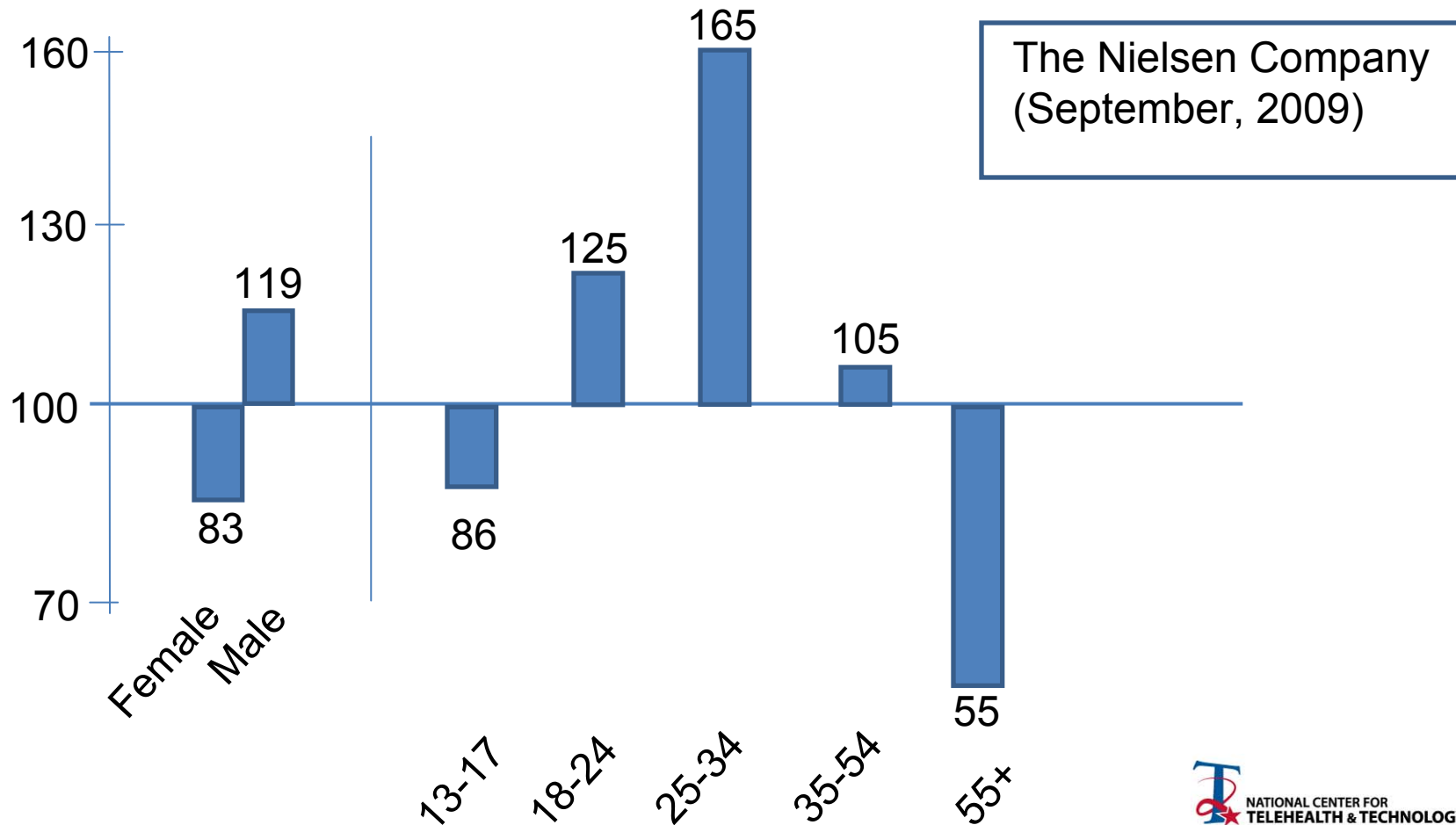
T2 Vision

Technology to Make People Healthy

Our Nation's Warriors, Veterans, and their Families will have improved lives through access to and use of tested interventions to prevent, treat & mitigate the adverse psychological health and TBI sequelae of war.

Mobile Technologies: New Opportunities to Support

- Age and gender of those using mobile devices



Mobile Technologies: New Opportunities to Support



Mobile Technologies: New Opportunities to Support

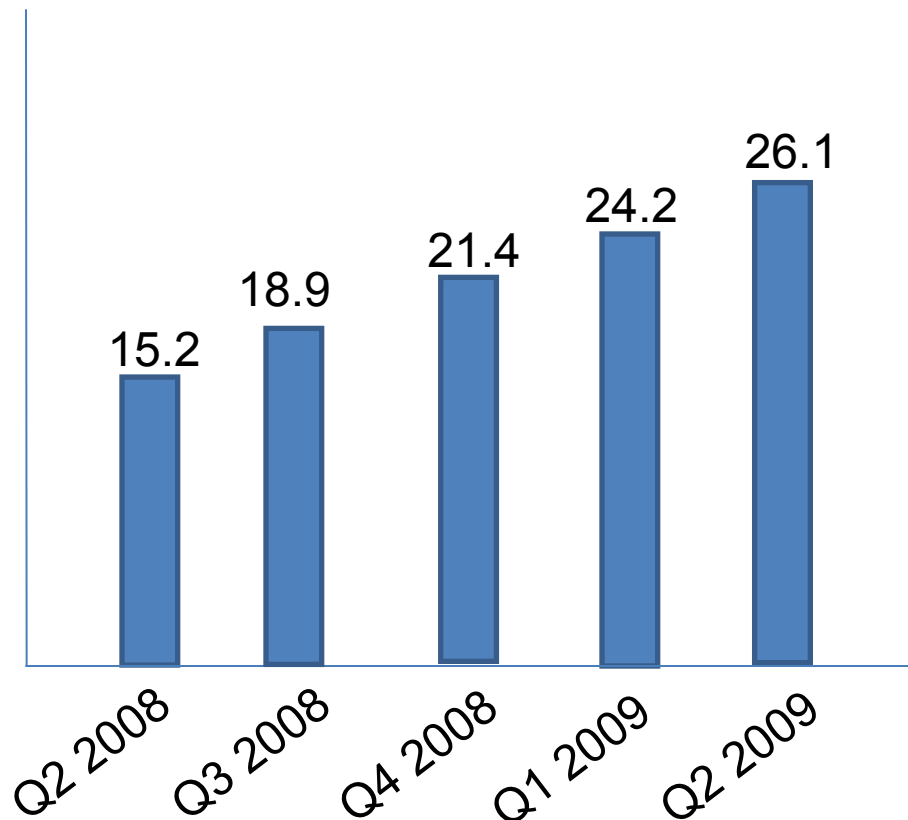
- Age and gender of the enlisted Army – 86% Male



68% Age < 29

Mobile Technologies: New Opportunities to Support

- Smartphone Subscribers in Millions



The Nielsen Company
(September, 2009)

Mobile Technologies: New Opportunities to Support

- “Always-on” support and tools
- Access “on-the-go”



Mobile Technologies: New Opportunities to Support

- Cross-platform development increases choice and user-preference



Blackberry OS



Linux



iPhone OS 3.1.3



Windows Mobile 7

Mobile Technologies: New Opportunities to Support

- Wireless, enduring cross-situational connectivity



Mobile Technologies: New Opportunities to Support

- Access across regions and time zones



Mobile Technologies: New Opportunities to Support

- New capabilities = new tools to help



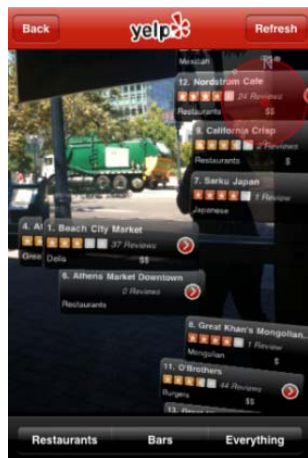
Camera lens viewing

+

GPS and Compass Functionality

=

“Augmented Reality” Apps



2008 RAND Study

- Among Operation Enduring Freedom/Operation Iraqi Freedom (OEF/OIF) Veterans, rates of post traumatic stress disorder (PTSD), major depression, and probable traumatic brain injury (TBI) are relatively high, particularly when compared with the general U.S. civilian population.
- A telephone study of 1,965 previously deployed individuals sampled from 24 geographic areas found substantial rates of mental health problems in the past 30 days, with **14 percent screening positive for PTSD and 14 percent for major depression. A similar number, 19 percent, reported a probable TBI during deployment.**
- Major depression is often not considered a combat-related injury; however, our analyses suggest that it is highly associated with combat exposure and should be considered as being along the spectrum of post-deployment mental health consequences.

Invisible Wounds of War: Psychological and Cognitive Injuries, Their Consequences, and Services to Assist Recovery.
Editors: Terri Tanielian and Lisa H. Jaycox. http://www.rand.org/pubs/monographs/2008/RAND_MG720.pdf.

Stigma and Barriers to Care

- 2004 Study: Of service members who met screening criteria for a mental disorder, **only 23 to 40 percent reported having received professional help in the prior year.**
- Concerns were voiced about being stigmatized and about other barriers to accessing and receiving mental health services.*

* Combat Duty in Iraq and Afghanistan, Mental Health Problems, and Barriers to Care. Charles W. Hoge, M.D., Carl A. Castro, Ph.D., Stephen C. Messer, Ph.D., Dennis McGurk, Ph.D., Dave I. Cotting, Ph.D., and Robert L. Koffman, M.D., M.P.H. NEJM, Volume 351:13-22, July 1, 2004, Number 1.



TROUBLE ADJUSTING TO HOME LIFE?

GET SOME HELP **afterdeployment.org**
A Wellness Resource for the Military Community

Adjusting to life after deployment can be difficult for service members, families and veterans. **afterdeployment.org** provides self-care solutions for common post-deployment problems.

Challenges

- **The Military Environment**
 - High overall operational tempo
 - Mobile → Service access
 - Barriers to care interfere with seeking services
 - Stigma, confidentiality, security clearance
- **The Service Member**
 - PH / TBI issues-15-20%+ OIF/OEF
 - Since Oct '01: OIF/OEF 61% (17-29); 77% high school only
 - Computer knowledgeable

The Couch



Army 'Go Mobile Program'

"A Portal in Your Pocket"

Army's Go Mobile puts big computing power into soldiers' pockets

Input from soldiers helped in development of system that incorporates smart phones and AKO portal

By [Trudy Walsh](#) Dec 11, 2009



The Army's ranks these days are filled with a new kind of soldier — tech-savvy and sophisticated, people who grew up playing with PlayStations and Nintendo the way earlier generations played with pop guns and Erector Sets.

Army officials are tapping into the ingenuity of its young workforce and responding to their predisposition for smarter gadgets at the same time by developing an array of Go Mobile devices — new communications and conferencing devices that can fit into a soldier's pocket while going easy on the service's pocketbook.

That effort reached a new milestone in late October with the approval of an initial set of smart phones that, with other pocket-sized accessories, offers a way for soldiers to access the [Army Knowledge Online portal](#), a repository of online information, distance-learning tools, e-mail and other resources for 2.6 million Army users. The Web-based service is now part of a broader service known as Defense Knowledge Online.

Go Mobile gear

Take a look at the [Army's Go Mobile devices](#), including smartphones, video goggles, portable projectors, printers, solar chargers and more.

<http://fcw.com/articles/2009/12/11/army-go-mobile-kit-fits-portal-in-a-pocket.aspx>

Industry Research (Gartner, Inc.)

- By 2013, **mobile phones will overtake PCs** as the most common Web access device worldwide.
- By 2014, over 3 billion of the world's adult population will be able to transact electronically **via mobile or Internet technology.**
- Within five years, 70 percent of collaboration and communications applications designed on PCs will be modeled after user experience lessons from **smartphone collaboration applications**
- Websites not optimized for the **smaller-screen formats** will become a market barrier for their owners — much content and many sites **will need to be reformatted/rebuilt.**

<http://www.gartner.com/it/page.jsp?id=1278413>

Cell Phones

- Scheduling and reminder capabilities



Handheld Media Players

- Evidence-based tools and standardized content



Smart Phones

- Immediate self-management of mild symptoms
- Immediate two-way contact with support systems during crisis



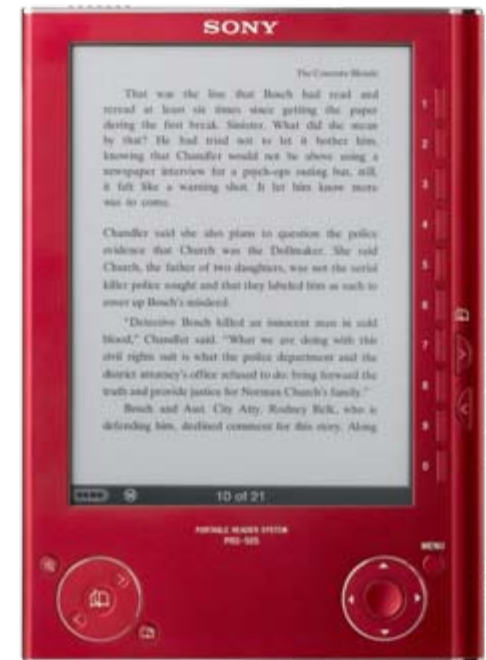
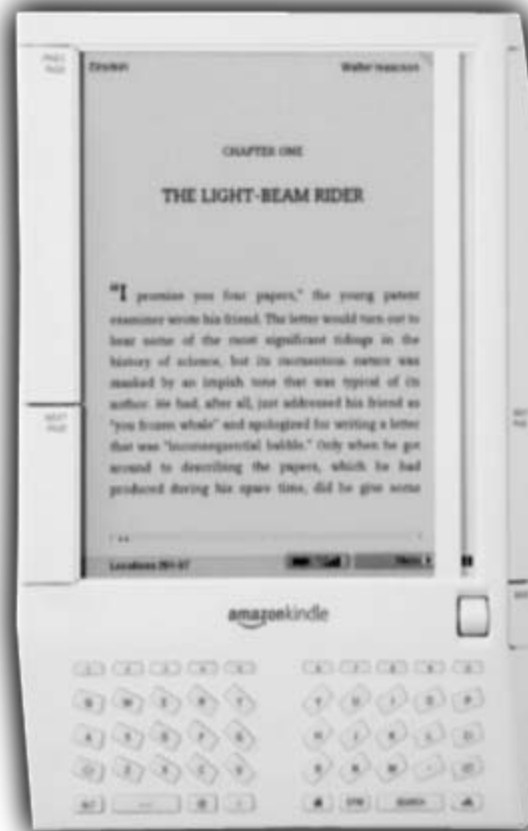
Netbooks

- Mitigates logistical barriers, supports treatment commitment



eReaders

- Personalized and individually-paced content



Tablets

- Real-time assessments (vs. retrospective assessments)



Tools / Apps

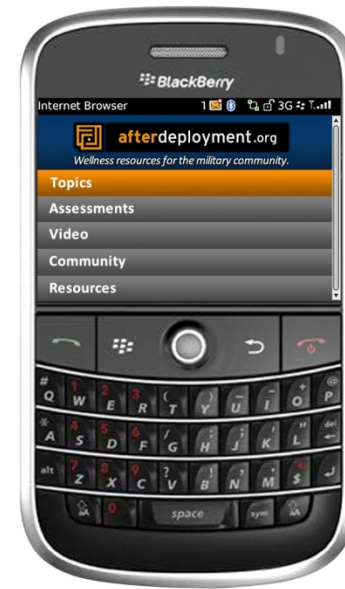
- Mobile version of *afterdeployment.org* (*mobileAD.org*)
- Mobile Automated Tools and Outcome Measures (*mobileATOM*)*
- Topical Apps (*webApps*)
- Short Message Service (*SMS*)
- Simulations (*gameApps*)
- Podcasting: *“There & Back.”*

*formerly, Automated Behavioral Health Clinic (ABHC)

Mobile *afterdeployment.org* (ADm.org)

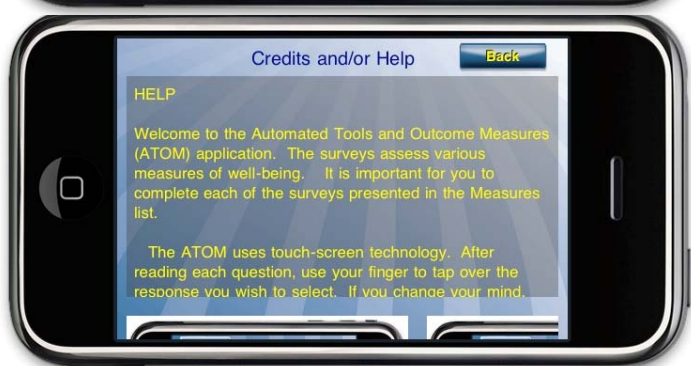
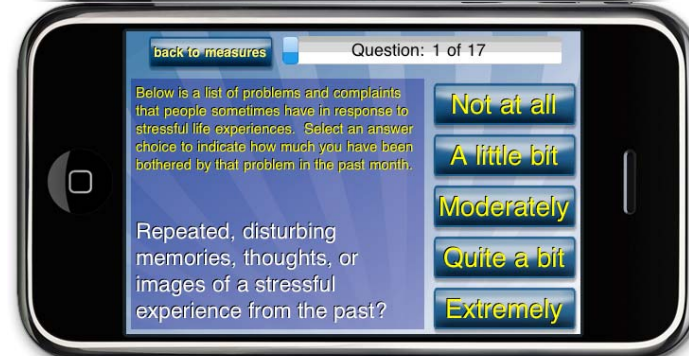
Mobile *afterdeployment.org*

Web servers can detect if a page request is from a desktop or mobile device. Most of today's smartphones (Blackberry, iPhone, Droid) have web browsers onboard.

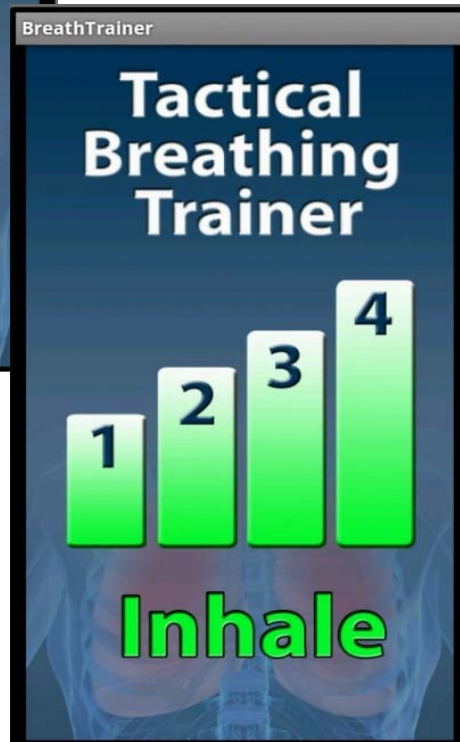
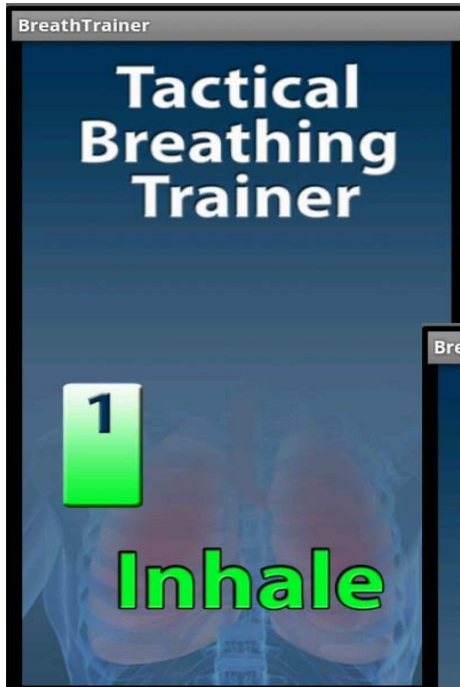


Mobile ATOM (ATOMm)

(Automated Tools and Outcome Measures)

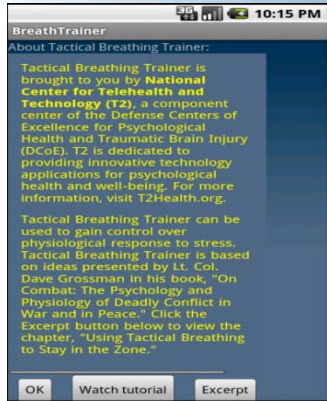


webApps: Tactical Breathing

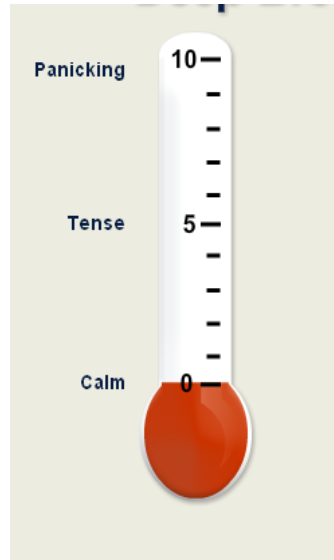
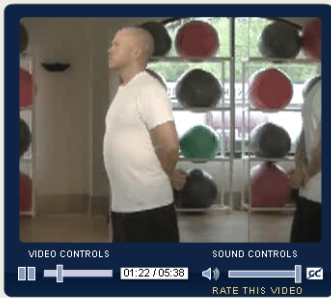


- 'Hip-pocket' accessibility
- Anonymous, private, stigma-free
- Assessment/ ongoing self-monitoring
- Self-paced rehearsal:
 - Anxiety reduction prior to public speaking; relaxation exercise prior to bedtime
- Cognitive rehabilitation (memory drills)
- User-determined data management
- Augment providers' clinical practice

Breathing Trainer: Future Iterations



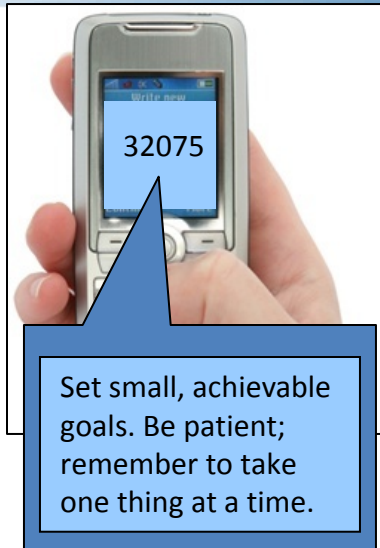
Deep Breathing Exercise



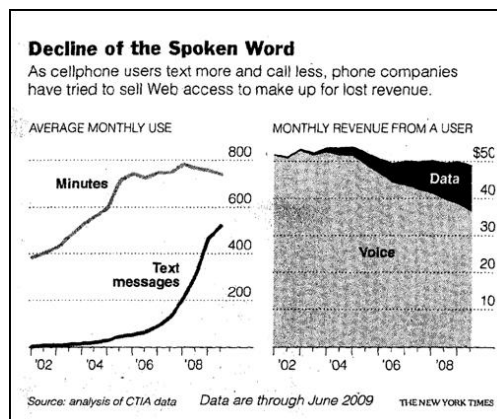
In the last month, how often have you been upset because of something that happened unexpectedly?	Never <input type="radio"/>	Almost never <input type="radio"/>	Sometimes <input type="radio"/>	Fairly often <input type="radio"/>	Very often <input type="radio"/>
In the last month, how often have you felt that you were unable to control the important things in your life?	Never <input type="radio"/>	Almost never <input type="radio"/>	Sometimes <input type="radio"/>	Fairly often <input type="radio"/>	Very often <input type="radio"/>
In the last month, how often have you felt nervous and "stressed"?	Never <input type="radio"/>	Almost never <input type="radio"/>	Sometimes <input type="radio"/>	Fairly often <input type="radio"/>	Very often <input type="radio"/>
In the last month, how often have you felt confident about your ability to handle your personal problems?	Never <input type="radio"/>	Almost never <input type="radio"/>	Sometimes <input type="radio"/>	Fairly often <input type="radio"/>	Very often <input type="radio"/>
In the last month, how often have you felt that things were going your way?	Never <input type="radio"/>	Almost never <input type="radio"/>	Sometimes <input type="radio"/>	Fairly often <input type="radio"/>	Very often <input type="radio"/>
In the last month, how often have					

- Video Tutorial
 - Video guide
- Stress Assessment
 - Brief stress *self-assessment* with feedback; graphical tracking of scores over time
- Stress “thermometer” (visual analogue)
 - quick pre/post-exercise metric
- Options:
 - *Background/skins; additional visual images* (e.g., candle flickering, beach scene, expanding/collapsing balloon)
 - Audio – *additional voices* for guides, natural *ambient sounds* (e.g., rain, birds chirping, pan flute)
 - *Adjust pace/speed* – Can slow down the rate of the breathing exercise to better fit user’s preferences
 - *Increase/decrease repetitions* – user can adjust the number of breathing cycles to suit needs
- Biofeedback

Short Message Service (SMS) - Texting



- Simple to use and available to all cell phone users
- Computer / Internet access not required
- Access to various wellness materials:
 - Health tips
 - Crisis numbers
 - Inspirational quotes
 - Quizzes
 - News & Announcements
 - Appointment reminders



52.5% Active Duty enlisted and 60.2% of Active Duty enlisted spouses are in the age range of the most common "texters".

"SMS text messaging is the most widely used data application on the planet, with 2.4 billion active users, or 74% of all mobile phone subscribers sending and receiving text messages on their phones" [Wikipedia]

"People are talking less on their mobile phones, and texting instead. In the first half of this year, the average wireless customer sent 518 texts a month and made 220 phone calls." [NY Times, 15 Nov 09]

Simulations (*gameApps*)



Podcasting

- *afterdeployment.org* piloted its first podcast 25 NOV 2009
- Audio introduced by subject expert followed by service members' and families' personal stories
- Current episodes: depression, PTSD, anger management

There & Back



afterdeployment.org
Category: Personal Journals
Language: English

Free

THERE & BACK
afterdeployment.org

PODCAST DESCRIPTION

afterdeployment.org is a Department of Defense website developed by the National Center for Telehealth and Technology, and the Defense Centers of Excellence for Psychological Health and Traumatic Brain Injury. The programs in this series, entitled There & Back, are intended to assist service members and their loved ones in managing the challenges that are often faced following a deployment.

[SEE ALL PODCASTS](#) 

[WEBSITE](#) 

[REPORT A CONCERN](#) 

[TELL A FRIEND](#) 

LISTENERS ALSO SUBSCRIBED TO

Name	Time	Artist	Release Date	Description
1 Learning about Depression	00:05	afterdeployment.org	11/25/2009	Service members talk about their experiences with depre

PH / TBI Service Delivery in the 21st Century

- “Efforts to address the problem of stigma and other barriers to seeking mental health care in the military should take into consideration outreach, education, and ***changes in the models of health care delivery...***”

Combat Duty in Iraq and Afghanistan, Mental Health Problems, and Barriers to Care. Charles W. Hoge, M.D., Carl A. Castro, Ph.D., Stephen C. Messer, Ph.D., Dennis McGurk, Ph.D., Dave I. Cotting, Ph.D., and Robert L. Koffman, M.D., M.P.H. NEJM, Volume 351:13-22, July 1, 2004, Number 1.

Face-To-Face Psychotherapy



Web-Based

The screenshot displays the homepage of **afterdeployment.org**, a website dedicated to providing wellness resources for the military community. The site features a dark blue header with navigation links for "Service Members", "Veterans", "Families", and "Providers", along with a "sign in" option. The main navigation bar includes "Home", "Topics", "Assessments", "Videos", "Community", and "Resources", accompanied by social media icons for Twitter and Facebook, and a "Feedback" link. A search bar is prominently displayed in the center of the header.

Below the navigation, a grid of 18 topic-based icons is presented, each with a representative image and a label: Post-Traumatic Stress, Depression, Life Stress, Families & Friendships, Work Adjustment, Physical Injury, Anger, Sleep, Alcohol & Drugs, Families with Kids, Spirituality, Health & Wellness, Anxiety, Resilience, Military Sexual Trauma, Stigma, mild Traumatic Brain Injury, and Tobacco. To the right of the search bar, contact information is provided: "LOCATE CHAT CALL", "Outreach Center 866.966.1020", and "National Suicide Hotline 800-273-TALK (800-273-8255)".

A central banner features the slogan "Real Strength in Action" with a link to watch videos from the Real Warriors campaign, and "REAL WARRIORS • REAL BATTLES REAL STRENGTH". Below this, the "Assess Yourself" section lists categories like Post-Traumatic Stress, Depression, Stress, Anger, Alcohol & Drug Use, Social Support, Post-Deployment Support, Marital Satisfaction, Friendship Scale, Hope, and Caregiver Stress. An "Assessment Video" section is also present. A "Health Tip" box offers advice: "Physical activity is one of the most potent pain relievers. Staying active distracts your mind and reduces the attention you can devote to your pain." with a link to a "Printable Version (PDF)".

At the bottom, there are sections for "Podcast" (Add the There & Back podcast) and "News Foods" (The US Army today finalized the various aspects related to TBI & PTSD treatment centers). A footer contains "Featured Sites" with logos for various organizations, "Behavior Centers of Excellence" with their respective logos, and copyright information: "© 2008 TeleHealth & Technology. All Rights Reserved." and "Contact Us | Links | Privacy | Feedback | Terms of Use | Sitemap".

Virtual Reality



Virtual Worlds



Artificial Intelligence



Multiple Delivery Options



'Virtual Handheld Clinic'



Questions

Contact

- **Greg Reger, Ph. D.**
(253) 968-2910 | greg.reger@us.army.mil
- **Robert Ciulla, Ph. D.**
(253) 968-2849 | robert.ciulla@us.army.mil

T2health.org

afterdeployment.org