

The heavy psychological toll on firefighters

By Chris G. Caulkins, MPH, MA, ABD

Having served in fire and EMS for over two decades, I—like many of you—am largely a product of the fire service. We put others before ourselves, make order out of chaos, and have a front row seat to tragedy. Make no mistake about it; our exposure to psychological trauma happens on a regular, if not daily, basis.

One-fourth of US adults are diagnosed with a mental illness, while it is estimated that 50% have a mental illness, but have not been—or will not be—diagnosed. I, myself, have posttraumatic stress disorder (PTSD), depression, and anxiety. Given that anywhere from 7-37% of firefighters—depending on which study you read—have developed PTSD in the last year, I am far from alone. In comparison, within the last year, 3.5% of the US population was diagnosed with PTSD. Depression and anxiety are also frequently associated with PTSD. Researchers, who surveyed 34,340 EMS providers, found that approximately 6% of us are experiencing mild to extreme depression, anxiety, and stress. Unspecified trauma and stressor-related disorder happens when a person meets some, but not all, criteria for PTSD that exerts a negative effect on their life. Acute stress disorder happens shortly after the trauma and may last up to a month, after which PTSD is diagnosed. Many responders will not reveal their mental health difficulties, with 55% saying supervisors would treat them differently, 45% saying co-workers think of them as weak, and 34% believing they will not get promotions. I, personally, would prefer to have the firefighter in the engine, police officer in the squad car, or pilot—I write while 31,000 feet over Colorado—in the cockpit, who is being successfully treated for psychological trauma or suicidal ideation, rather than remaining untreated and “stuffing” it.

Psychological trauma results from exposure to death, serious trauma, or sexual violence. These traumas may have occurred to us personally, been witnessed happening to others, or been heard of in an unexpected and violent situation. Trauma, not unlike improper lifting, may happen after one event or repeated exposures. Not everyone exposed to trauma will develop a psychiatric disorder. Three firefighters can respond to the same incident, with one unscathed, one profoundly impacted, and another not immediately affected, but having added to his later cumulative trauma. Often, the factor that tips the balance is personal identification with a

victim—like a firefighter responding to a victim the same age as her own child. Another factor may be a genetic predisposition, which only manifests when the exposure to a stressful event has the right “ingredients” to unlock the disorder. On average, the brain does not fully develop until the mid-20s. Because of this delay, the younger firefighter may be more impulsive, have impaired emotional management, and may be more susceptible to trauma. With psychological trauma, the hippocampus, which regulates storing and retrieving of memories, often shrinks, as well as the emotion-regulating prefrontal cortex. This allows the amygdala to take over, unchecked, putting the responder into a difficult place to control fight, flight, or freeze reaction. With proper therapy, such as cognitive processing therapy (CPT), prolonged exposure (PE) therapy or eye movement desensitization and reprocessing (EMDR) therapy, the hippocampus may build up again, allowing trauma to become manageable and for one to function well again. After receiving EMDR for three months, I moved from constant intrusive thoughts and suicidal ideation to having none. Results may vary and others may need different types of treatment.

The worst-case outcome of trauma is suicide. In my review of Minnesota death records from 1994-2016, over 50 fire departments have had at least one firefighter die by suicide. The four most common illnesses attributed to suicide are major depressive disorder (MDD), borderline personality disorder (BPD), nicotine dependence, and PTSD. Cultural factors may also contribute to the toxic ingredients necessary for a firefighter to die by suicide. Cowboy and firefighting culture have an amazingly common set of beliefs, values, and customs. When conducting research in the “suicide belt” of the US—the Intermountain West—I found cowboy culture is a major factor that discourages help seeking behavior, makes one feel alone in their pain, and encourages dangerous coping skills, like use of alcohol and risk-taking behavior.

Trauma can also have a positive outcome, known as post-traumatic growth (PTG). PTG generally co-exists with PTSD and results when one takes the sum of their experiences and feels rewarded by using them to help others. PTG may provide a source of meaning and purpose in life—important for suicide prevention—and result in

(Psychological toll continued on page 28)

Psychological toll...

(continued from page 11)

emotional growth.

We in the fire service must take steps to recognize psychological trauma in co-workers and ourselves, establish a supportive culture of understanding and help seeking, and realize that we are ineffective in caring for others if we do not first help ourselves. The MnFire confidential peer support line is 1-888-784-6634 and the National Suicide Prevention Hotline is 1-800-273-8255. You are valuable. You are needed. We are not alone.

****Please note an editorial decision to remove citations and references had been made. Please contact Chris for a copy of this article with citations and references intact.**

Chris has 25 years of EMS experience, 15 years of firefighting, 21 years in EMS and fire education, and over 13 years in suicidology. Chris is the executive director of the Strub Caulkins Center for Suicide Research (SCCSR) and has researched, presented, and published on suicide at a state, national, and international level. Chris may be contacted at c.caulkins@suicidresearch.org. You may follow the SCCSR on Facebook at <https://www.facebook.com/StrubCaulkins> or visit us on the web at www.suicidresearch.org. ❀

**For more
information
on upcoming
conferences
go to
msfca.org**

Minnesota winter...

(continued from page 12)

probe in the bladder or the esophagus. We try to actively and rapidly rewarm them from “inside out” to avoid several complications including core afterdrop. Active internal rewarming often involves warmed intravenous fluid or bathing sterile body cavities in the chest or abdomen with warmed fluid. If hypothermia is severe (core temperature < 28°C / 82.4°F) or the patient is unstable or in cardiac arrest, standard internal rewarming sometimes isn’t fast enough.

Warming the blood outside of the body, or extracorporeal rewarming, is the most efficient way to rescue an unstable or arrested patient with hypothermia. While extracorporeal rewarming was once done only in the operating room by opening the patient’s sternum for cardiopulmonary bypass (similar to open heart surgery), we now have the ability to do partial cardiopulmonary bypass at the bedside in the Emergency Department using a portable extracorporeal membrane oxygenation (ECMO) circuit.

ECMO is an exciting advance in emergency life support which is particularly well-suited to severe hypothermia. ECMO drains 3-5 liters per minute of blood from the patient via a catheter in a large, central vein, warms the blood while adding oxygen and removing carbon dioxide (doing much of the work of the lungs), and finally returns the blood to the aorta at flow rates that can perfuse vital organs such as the brain. In fact, in the configuration used to rewarm hypothermic patients, ECMO allows physicians to stop CPR while awaiting return of spontaneous circulation as it can replace heart and lung function while rewarming the patient at 4-6°C per hour or more.

ECMO is available only at select referral centers which has implications for the triage and transport of patients with hypothermic cardiac arrest. In fact, experts now recommend that select hypothermic patients with a favorable prognosis

be preferentially transported to an ECMO center for extracorporeal rewarming (9, 10). In our experience over the last two winters at Hennepin County Medical Center, we have used ECMO to rewarm five hypothermic patients in cardiac arrest from an initial core temperature of 21°C (69.8°F) and 2.5 hours of CPR, on average, with 3 (60%) surviving neurologically-intact.

1. Alexander, Kevin, and Matt Lynch. 2017. “Every State, Ranked by How Miserable Its Winters Are.” *Thrillist*. January 3, 2017. <https://www.thrillist.com/travel/nation/states-with-the-worst-winters-worst-us-states-for-winter>.

2. Harlow, Tim. 2017. “Worst Winters in the Country? You Betcha, They’re Here in Minnesota.” *Star Tribune*. January 9, 2017. <http://www.startribune.com/worst-winters-in-the-country-you-betcha-they-re-here-in-minnesota/409775805/>.

3. Myers, John. 2017. “Minnesota Winters Are the WORST. So Says Thrillist, Which Ranked Them.” *Twin Cities*. *Twin Cities*. January 4, 2017. <http://www.twincities.com/2017/01/04/minnesota-winters-are-the-worst-so-says-thrillist-which-ranked-them/>.

4. Strapazzon, Giacomo, Emily Procter, Peter Paal, and Hermann Brugger. 2014. “Pre-Hospital Core Temperature Measurement in Accidental and Therapeutic Hypothermia.” *High Altitude Medicine & Biology* 15 (2). online.liebertpub.com/104-11.

5. Khorsandi, Maziar, Scott Dougherty, Neil Young, Dean Kerslake, Vincenzo Giordano, Robert Lendrum, William Walker, Vipin Zamvar, Ivan Yim, and Renzo Pessotto. 2017. “Extracorporeal Life Support for Refractory Cardiac Arrest from Accidental Hypothermia: A 10-Year Experience in Edinburgh.” *The Journal of Emergency Medicine* 52 (2):160-68.

6. Zafren, Ken, Gordon G. Giesbrecht, Daniel F. Danzl, Hermann Brugger, Emily B. Sagalyn, Beat Walpoth, Eric A. Weiss, et al. 2015. “Hypothermia Evidence, Afterdrop, and Guidelines.” *Wilderness & Environmental Medicine* 26 (3). [wemjournal.org/439-41](http://www.wemjournal.org/439-41).

7. Meyer, Marie, Nathalie Pelurson, Ebrahim Khabiri, Nils Siegenthaler, and Beat H. Walpoth. 2014. “Sequela-Free Long-Term Survival of a 65-Year-Old Woman after 8 Hours and 40 Minutes of Cardiac Arrest from Deep Accidental Hypothermia.” *The Journal of Thoracic and Cardiovascular Surgery* 147 (1). jtcvsonline.org/e1-2.

8. Kieboom, J. K., H. J. Verkade, J. G. Burgerhof, J. J. Bierens, P. F. van Rheeën, M. C. Kneyber, and M. J. Albers. 2015. “Outcome after Resuscitation beyond 30 Minutes in Drowned Children with Cardiac Arrest and Hypothermia: Dutch Nationwide Retrospective Cohort Study.” *BMJ* 350 (February). bmj.com/h418.

9. Brown DJ, Brugger H, Boyd J, Paal P. Accidental hypothermia. *N Engl J Med*. 2012;367(20):1930-1938.

10. Paal P, Gordon L, Strapazzon G, et al. Accidental hypothermia-an update : The content of this review is endorsed by the International Commission for Mountain Emergency Medicine (ICAR MEDCOM). *Scand J Trauma Resusc Emerg Med*. 2016;24(1):111. ❀

The Heavy Psychological Toll on Firefighters

Chris G. Caulkins, MPH, MA, ABD

Having served in fire and EMS for over two decades, I—like many of you—am largely a product of the fire service. We put others before ourselves, make order out of chaos, and have a front row seat to tragedy. Make no mistake about it; our exposure to psychological trauma happens on a regular, if not daily, basis.

One-fourth of US adults are diagnosed with a mental illness (Substance Abuse and Mental Health Services Administration [SAMHSA], 2014), while it is estimated that 50% have a mental illness, but have not been—or will not be—diagnosed (Centers for Disease Control and Prevention [CDC], n.d.). I, myself, have posttraumatic stress disorder (PTSD), depression, and anxiety. Given that anywhere from 7-37% of firefighters—depending on which study you read—have developed PTSD in the last year (Berger et al., 2012; Del Ben, Scotti, Chen, & Fortson, 2006), I am far from alone. In comparison, within the last year, 3.5% of the US population was diagnosed with PTSD (Kessler et al., 2012). Depression and anxiety are also frequently associated with PTSD. Researchers, who surveyed 34,340 EMS providers, found that approximately 6% of us are experiencing mild to extreme depression, anxiety, and stress (Bentley, Crawford, Wilkins, Fernandez, & Studnek, 2013). Unspecified trauma and stressor-related disorder happens when a person meets some, but not all, criteria for PTSD that exerts a negative effect on their life (American Psychiatric Association [APA], 2013, p. 290). Acute stress disorder happens shortly after the trauma and may last up to a month (p. 281), after which PTSD is diagnosed (p. 284). Many responders will not reveal their mental health difficulties, with 55% saying supervisors would treat them differently, 45% saying co-workers think them weak, and 34% believing they will not get promotions (University of Phoenix, 2017). I,

personally, would prefer to have the firefighter in the engine, police officer in the squad car, or pilot—I write while 31,000 feet over Colorado—in the cockpit, who is being successfully treated for psychological trauma or suicidal ideation, rather than remaining untreated and “stuffing” it.

Psychological trauma results from exposure to death, serious trauma, or sexual violence (APA, 2013). These traumas may have occurred to us personally, been witnessed happening to others, or been heard of in an unexpected and violent situation. Trauma, not unlike improper lifting, may happen after one event or repeated exposures. Not everyone exposed to trauma will develop a psychiatric disorder. Three firefighters can respond to the same incident, with one unscathed, one profoundly impacted, and another not immediately affected, but having added to his later cumulative trauma. Often, the factor that tips the balance is personal identification with a victim—like a firefighter responding to a victim the same age as her own child. Another factor may be a genetic predisposition, which only manifests when the exposure to a stressful event has the right “ingredients” to unlock the disorder (McKeever & Huff, 2013; Tiegel, 2017). On average, the brain does not fully develop until the mid-20s (Pujol, Vendrell, Junqué, Martí-Vilalta, & Capdevila, 1993). Because of this delay, the younger firefighter may be more impulsive, have impaired emotional management, and may be more susceptible to trauma (Giedd, 2008; Yurgelun-Todd, 2008). With psychological trauma, the hippocampus, which regulates storing and retrieving of memories, often shrinks, as well as the emotion-regulating prefrontal cortex. This allows the amygdala to take over, unchecked, putting the responder into a difficult place to control fight, flight, or freeze reaction. With proper therapy, such as cognitive processing therapy (CPT), prolonged exposure (PE) therapy or eye movement desensitization and reprocessing (EMDR) therapy, the hippocampus may build up again, allowing trauma to become manageable and for one to function well again. After receiving EMDR for three months,

I moved from constant intrusive thoughts and suicidal ideation to having none. Results may vary and others may need different types of treatment.

The worst-case outcome of trauma is suicide. In my review of Minnesota death records from 1994-2016, over 50 fire departments have had at least one firefighter die by suicide. The four most common illnesses attributed to suicide are major depressive disorder (MDD), borderline personality disorder (BPD), nicotine dependence, and PTSD (Bolton & Robinson, 2010; Goldsmith, Pellmar, Kleinmann, & Bunney, 2002; Richard-Devantoy, Emilie, Sébastien, Phillipe, & Fabrice, 2012). Cultural factors may also contribute to the toxic ingredients necessary for a firefighter to die by suicide. Cowboy and firefighting culture have an amazingly common set of beliefs, values, and customs. When conducting research in the “suicide belt” of the US—the Intermountain West—I found cowboy culture is a major factor that discourages help seeking behavior, makes one feel alone in their pain, and encourages dangerous coping skills, like use of alcohol and risk-taking behavior (Caulkins, 2014).

Trauma can also have a positive outcome, known as posttraumatic growth (PTG, Tedeschi & Calhoun, 1996). PTG generally co-exists with PTSD and results when one takes the sum of their experiences and feels rewarded by using them to help others (Tedeschi & Calhoun, 2004). PTG may provide a source of meaning and purpose in life—important for suicide prevention (American Association of Suicidology, 2013; Frankl 1959/2006)—and result in emotional growth.

We in the fire service must take steps to recognize psychological trauma in co-workers and ourselves, establish a supportive culture of understanding and help seeking, and realize that we are ineffective in caring for others if we do not first help ourselves. The MnFire confidential

peer support line is 1-888-784-6634 and the National Suicide Prevention Hotline is 1-800-273-8255. You are valuable. You are needed. We are not alone.

Chris has 25 years of EMS experience, 15 years of firefighting, 21 years in EMS and fire education, and over 13 years in suicidology. Chris is the executive director of the Strub Caulkins Center for Suicide Research (SCCSR) and has researched, presented, and published on suicide at a state, national, and international level. Chris may be contacted at

c.caulkins@suicideresearch.org. You may follow the SCCSR on Facebook at

<https://facebook.com/StrubCaulkins> or visit us on the web at www.suicideresearch.org.

References

- American Association of Suicidology. (2013). *Psychological autopsy certification program participant manual*. Washington, D.C.: Berman, A. L
- American Psychiatric Association. (2013). *Diagnostic and statistical manual for the mental disorders* (5th ed.). Washington, D.C.: Author.
- Bolton, J., & Robinson, J. (2010). Population-attributable fractions of axis I and axis II mental disorders for suicide attempts: findings from a representative sample of the adult, noninstitutionalized US population. *American Journal of Public Health, 100*(12), 2473-2480. doi:10.2105/AJPH.2010.192252
- Bentley, M. A., Crawford, J. M., Wilkins, J. R., Fernandez, A. R., & Studnek, J. R. (2013). An assessment of depression, anxiety, and stress among nationally certified EMS professionals. *Prehospital Emergency Care, 17*(3), 330-338. doi:10.3109/10903127.2012.761307
- Berger, W., Coutinho, E. S. F., Figueira, I., Marques-Portella, C., Luz, M. P., Neylan, T. C., Marmar, C. R., & Mendlowicz, M. V. (2012). Rescuers at risk: A systematic review and meta-regression analysis of the worldwide current prevalence and correlates of PTSD in rescue workers. *Society of Psychiatry and Psychiatric Epidemiology, 47*, 1001-1011.
- Caulkins, C. G. (2014). *Suicide in the Intermountain West: A Syndemic in Park County Wyoming?* (Master's thesis). Retrieved from ProQuest Dissertations and Thesis Database Open. (UMI No. 1528221)

Centers for Disease Control and Prevention. (n.d.). *CDC mental illness surveillance*. Retrieved from https://www.cdc.gov/mentalhealthsurveillance/fact_sheet.html

Del Ben, K. S., Scotti, J. R., Chen, Y., & Fortson, B. L. (2006). Prevalence of posttraumatic stress disorder symptoms in firefighters. *Work & Stress*, *20*(1), 37-48.

Frankl, V. E. (1959/2006). *Man's Search for Meaning*. Boston, MA: Beacon Press.

Giedd, J.N. (2008). The teen brain: Insights from neuroimaging. *Journal of Adolescent Health*, *42*(4), 335–43. doi:<http://dx.doi.org/10.1016/j.jadohealth.2008.01.007>

Goldsmith, S. K., Pellmar, T. C., Kleinman, A. M., & Bunney, W. E. (eds.). (2002). *Reducing suicide: A national imperative*. Washington, D. C.: The National Academies Press.

Kessler, R. C., Petukhova, M., Sampson, N. A., Zaslavsky, A. M., & Wittchen, H. (2012) Twelve-month and lifetime prevalence and lifetime morbid risk of anxiety and mood disorders in the United States. *International Journal of Methods in Psychiatric Research*, *21*(3), 169-184.

McKeever, V. M. & Huff, M. E. (2013). A diathesis-stress model of posttraumatic stress disorder: Ecological, biological, and residual stress pathways. *Review of General Psychology*, *7*(3), 237-250. doi:[10.1037/1089-2680.7.3.237](https://doi.org/10.1037/1089-2680.7.3.237)

Pujol, J., Vendrell, P., Junqué, C., Martí-Vilalta, J. L., & Capdevila, A. (1993). When does brain development end? Evidence of corpus callosum growth up to adulthood. *Annals of Neurology*, *34*(1), 71-75.

Richard-Devantoy, S., Emilie, O., Sébastien, G., Phillipe, C., & Fabrice, J. (2013). Distinct alterations in value-based decision-making and cognitive control in suicide attempters:

Toward a dual neurocognitive model. *Journal of Affective Disorders*, 151(3), 1120-1124.
doi:10.1016/j.jad.2013.06.052

Substance Abuse and Mental Health Services Administration. (2014). *Substance use and mental health estimates from the 2013 National Survey on Drug Use and Health: Overview of findings*. Retrieved from <https://www.samhsa.gov/data/sites/default/files/NSDUH-SR200-RecoveryMonth-2014/NSDUH-SR200-RecoveryMonth-2014.htm>

Tedeschi, R. G. & Calhoun, L. G. (2004). Posttraumatic growth: Conceptual foundations and empirical evidence. *Psychological Inquiry*, 15(1), 1-18.

Tedeschi, R. G. & Calhoun, L. G. (1996). The posttraumatic growth inventory: Measuring the positive legacy of trauma. *Journal of Traumatic Stress*, 9(3), 455-471.

Tiegel, I. M. (2017). Diathesis-stress models for understanding physiological and psychological effects of stress. In S. Wadhwa (Ed.), *Stress in the modern world: Understanding science* (pp. 36-44). Santa Barbara, CA: Greenwood.

University of Phoenix (2017). Majority of first responders face mental health challenges in the workplace. Retrieved from http://www.phoenix.edu/about_us/media-center/news/uopx-releases-first-responder-mental-health-survey-results.html

Yurgelun-Todd, D. (2007). Emotional and cognitive changes during adolescence. *Current Opinion in Neurobiology*, 17(2), 251-7. doi:http://dx.doi.org/10.1016/j.conb.2007.03.009