

Executive Summary: Health Impact Review of SHB 1655

Providing Industrial Insurance Coverage for Stress-caused Mental Disorders and Disabilities of
Members of the Law Enforcement Officers' and Firefighters' Retirement System
(2017-2018 Legislative Sessions)

This review assumes that SHB 1655 may result in some Law Enforcement Officers' and Fire Fighters' Retirement System (LEOFF) members filing industrial insurance claims for stress-related mental conditions or disabilities and that some of those claims will be accepted. This in turn would lead to the use of mental health services. Evidence indicates that use of mental health services has the potential to improve mental and physical health outcomes and decrease health disparities by occupation.

BILL INFORMATION

Sponsors: Representatives Lovick, Holy, Griffey, Hayes, Sells, Doglio, Stokesbary, Frame, Irwin, Fitzgibbon, Pike, Fey, Goodman, Pollet, Stanford

Summary of Bill:

- Provides that the exclusion for stress-caused mental conditions or disabilities from industrial insurance occupational disease does not apply to members of the Law Enforcement Officers' and Fire Fighters' Retirement System (LEOFF).

HEALTH IMPACT REVIEW

Summary of Findings:

This review assumes that if the current exclusion for stress-caused mental conditions or disabilities from industrial insurance occupational disease no longer applies to members of the LEOFF that this would result in some members filing claims and that some portion of those claims would be accepted. This in turn would lead to the use of mental health services and time-loss benefits. This informed assumption is based on discussions with staff from the Department of Labor and Industries (L&I) Safety & Health Assessment & Research for Prevention Program (SHARP), LEOFF, and the Washington State Council of Fire Fighters (WSCFF).

This Health Impact Review found the following evidence regarding the provisions in SHB 1655:

- Strong evidence that increasing use of mental health services among LEOFF members experiencing stress-caused mental health conditions and disabilities would likely lead to improved mental and physical health outcomes.
- Strong evidence that improving health outcomes for LEOFF members would likely decrease health disparities by occupation.

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Health Impact Review of SHB 1655
Providing Industrial Insurance Coverage for Stress-caused Mental Disorders and
Disabilities of Members of the Law Enforcement Officers’ and Firefighters’ Retirement
System

February 9, 2018

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Introduction and Methods

A Health Impact Review is an analysis of how a proposed legislative or budgetary change will likely impact health and health disparities in Washington State (RCW 43.20.285). For the purpose of this review ‘health disparities’ have been defined as the differences in disease, death, and other adverse health conditions that exist between populations (RCW 43.20.270). This document provides summaries of the evidence analyzed by State Board of Health staff during the Health Impact Review of Substitute House Bill 1655 ([SHB 1655](#)) from the 2017-2018 legislative sessions.

Staff analyzed the content of SHB 1655 and created a logic model depicting possible pathways leading from the provisions of the bill to health outcomes. We consulted with experts and contacted stakeholders with diverse perspectives on the bill. State Board of Health staff can be contacted for more information on which stakeholders were consulted on this review. We conducted objective reviews of the literature for each pathway using databases including PubMed and Google Scholar.

The following pages provide a detailed analysis of the bill including the logic model, summaries of evidence, and annotated references. The logic model is presented both in text and through a flowchart (Figure 1). The logic model includes information on the strength of the evidence for each relationship. The strength-of-evidence has been defined using the following criteria:

- **Not well researched:** the literature review yielded few if any studies or only yielded studies that were poorly designed or executed or had high risk of bias.
- **A fair amount of evidence:** the literature review yielded several studies supporting the association, but a large body of evidence was not established; or the review yielded a large body of evidence but findings were inconsistent with only a slightly larger percent of the studies supporting the association; or the research did not incorporate the most robust study designs or execution or had a higher than average risk of bias.
- **Strong evidence:** the literature review yielded a large body of evidence on the relationship (a vast majority of which supported the association) but the body of evidence did contain some contradictory findings or studies that did not incorporate the most robust study designs or execution or had a higher than average risk of bias; or there were too few studies to reach the rigor of ‘very strong evidence’; or some combination of these.
- **Very strong evidence:** the literature review yielded a very large body of robust evidence supporting the association with few if any contradictory findings. The evidence indicates that the scientific community largely accepts the existence of the association.

The annotated references are only a representation of the evidence and provide examples of current research. In some cases only a few review articles or meta-analyses are referenced. One article may cite or provide analysis of dozens of other articles. Therefore the number of references included in the bibliography does not necessarily reflect the strength-of-evidence. In addition, some articles provide evidence for more than one research question so they are referenced multiple times.

Analysis of SHB 1655 and the Scientific Evidence

Summary of relevant background information

- According to RCW 51.08.142 industrial insurance claims for mental conditions or mental disabilities caused by stress, including Posttraumatic Stress Disorder (PTSD), are not currently allowed under the definition of occupational disease. However, the Washington State workers' compensation system has previously accepted claims that have PTSD as an allowed diagnosis along with certain injuries.¹
- In 2013, the *Diagnostic and Statistical Manual of Mental Disorders Fifth Edition (DSM-5)* updated the diagnostic definition of PTSD expanding indirect exposures by adding criterion A4: "repeated or extreme exposure to aversive details of the traumatic event(s) (e.g., first responders collecting human remains; police officers repeatedly exposed to details of child abuse)."^{2,3}

Summary of SHB 1655

- Provides that the exclusion for stress-caused mental conditions or disabilities from industrial insurance occupational disease does not apply to LEOFF members.

Health impact of SHB 1655

This review assumes that SHB 1655 may result in some LEOFF members filing industrial insurance claims for stress-related mental conditions or disabilities and that some of those claims will be accepted. This in turn would lead to the use of mental health services and time-loss benefits. Evidence indicates that use of mental health services and time-loss benefits has the potential to improve mental and physical health outcomes and decrease health disparities by occupation.

Pathways to health impacts

The potential pathways leading from the provisions of SHB 1655 to decreased health disparities are depicted in Figure 1. We have assumed that if the exclusion for stress-caused mental conditions or disabilities from industrial insurance occupational disease does not apply to members of the LEOFF that this would result in some members filing claims (some of which would be accepted), which would then result in their use of mental health services and time-loss benefits. This informed assumption is based on discussions with staff from the SHARP program, LEOFF, and WSCFF. There is strong evidence that increasing use of mental health services among LEOFF members experiencing stress-caused mental health conditions and disabilities would likely lead to improved mental health⁴⁻¹¹ and physical health outcomes.^{10,12,13} There is strong evidence that improving health outcomes for LEOFF members would likely decrease health disparities by occupation.^{2,12,14-20}

Due to time limitations we only researched the most direct connections between the provisions and health outcomes and did not explore the evidence for all possible pathways. For example, potential pathways that were not researched include:

- Evidence for how increased use of mental health services among LEOFF members may affect interactions with the communities they serve which in turn could affect community health.
- Evidence for how increased use of mental health services among members may affect the health of their families.
- Evidence for how potential use of time-loss benefits through workers' compensation could result in financial stability and subsequent impacts on health.

Magnitude of impact

Washington State has an estimated 17,019 firefighters and law enforcement officers, who average 14.7 years of service.¹ SHB 1655 would amend the definition of occupational disease for LEOFF members to include “mental conditions and mental disabilities caused by stress.” This broad, undefined category of conditions makes it difficult to assess how many members may benefit from additional industrial insurance coverage (L&I, personal communication, February 2018). Using limited available prevalence and reporting data specific to PTSD, L&I estimates that 1,700 current LEOFF members (10% of workforce) have PTSD; 650 current members (38% of those with PTSD) report having PTSD; and, if this legislation passes, 40 members would report with PTSD annually.¹ This specific analysis does not account for any other stress-caused mental health condition for which a claim could be filed under the proposed definition of an occupational disease. Therefore, this may underestimate the number of claims that could be filed as a result of SHB 1655.

Logic Model

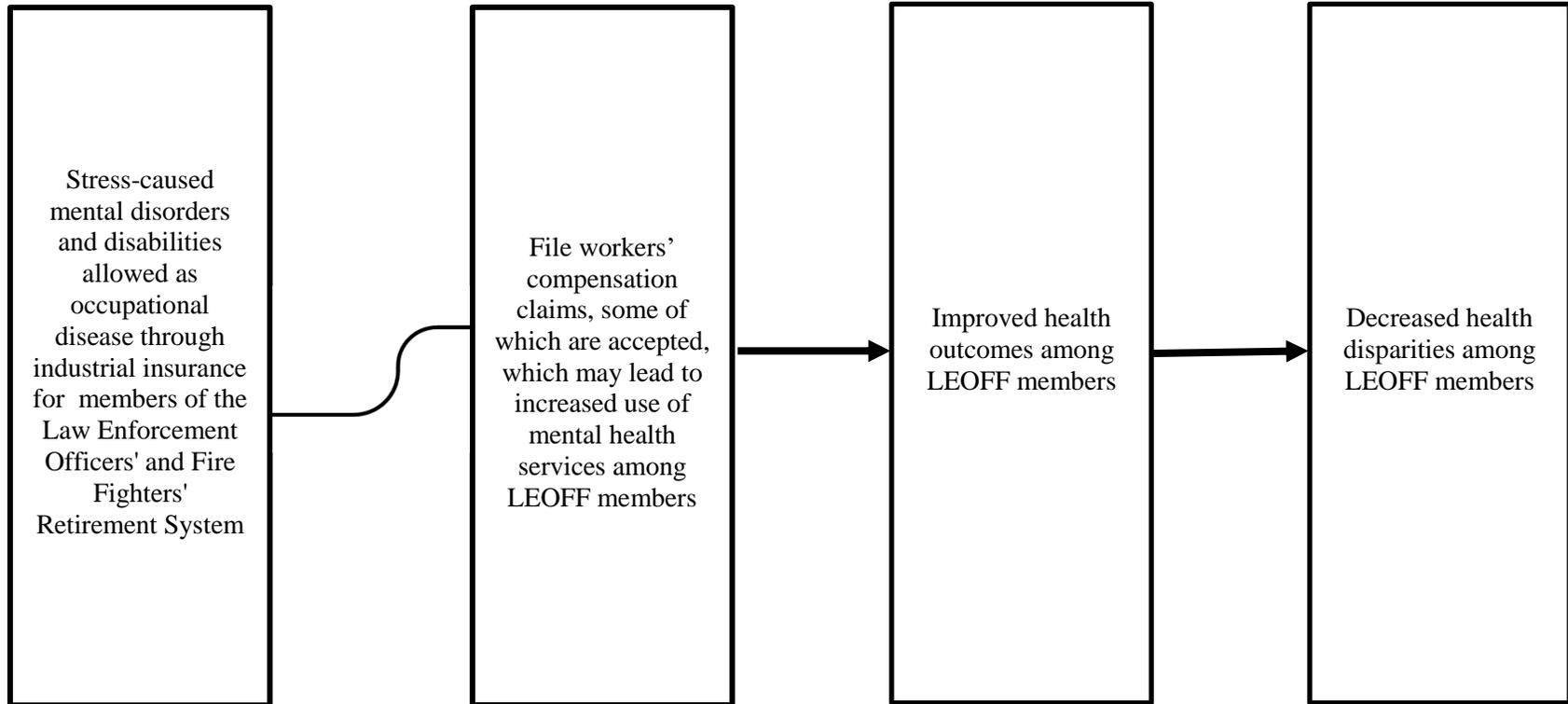
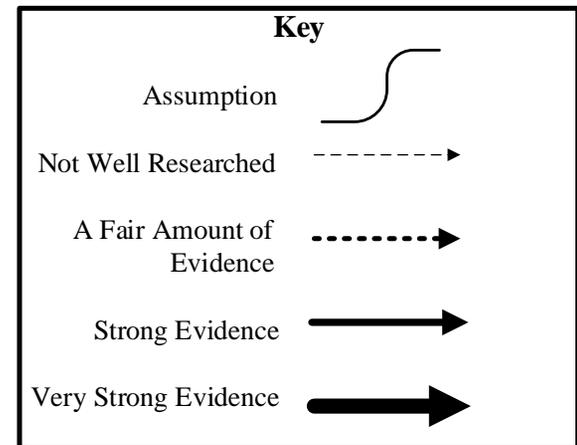


Figure 1
Substitute House Bill 1655
Providing Industrial Insurance Coverage for
Stress-caused Mental Disorders and
Disabilities of Members of the Law
Enforcement Officers' and Fire Fighters'
Retirement System



Summaries of Findings

Will allowing industrial insurance claims for stress-caused mental disorders and disabilities for LEOFF members result in filed and accepted claims and increased use of mental health services?

We have made the informed assumption that if LEOFF members are allowed to file industrial insurance claims for stress-caused mental conditions and mental disabilities that some number of individuals will file claims and some of those claims will be accepted. The addition of “mental conditions and mental disabilities caused by stress” to allowable occupational diseases for LEOFF members will enable those with mental health conditions (e.g., PTSD) that originate from cumulative exposures to work-related trauma to file workers compensation claims.² According to research by SHARP, the prevalence of PTSD in the LEOFF population “is estimated to be 10% and the presumed reporting rate for those in the 10% is 38%²¹, as not all with PTSD are willing to report it.”^{1,22} We anticipate that allowing mental health related claims may result in an increase in reporting rates due to education efforts by the Department of Retirement Services, the WSCFF, and the Washington Council of Police and Sheriffs (Michael White, personal communication, February 2018). There is strong evidence that stigma associated with mental health issues and treatment acts as a barrier to help-seeking and help-offering behavior. A large body of evidence has found that internalized or self-stigma is associated with decreased likelihood of having accessed mental health care in the past, decreased intent to seek care in the future, and higher barriers to care.^{6,14,23,24} Michael White, Legislative Liaison at WSCFF indicated that incorporating stress-related claims into workers compensation may help improve perceptions within the population about the legitimacy of mental health conditions and seeking treatment (personal communication, February 2018).

We have also made the informed assumption that allowing claims for stress-caused mental health conditions will likely increase the use of mental health services and time-loss benefits among LEOFF members. Estimating the potential impact of SHB 1655 on first responders’ use of mental health services is challenging due to privacy concerns and the stigma associated with accessing mental health treatment, particularly among this population (Michael White, personal communication, February 2018). While specific data is unavailable, officials anticipate that the recognition of stress-caused mental health conditions as workplace injuries/illnesses may help overcome this stigma, particularly that stemming from the workplace culture, and may increase the likelihood that members will seek treatment either through the workers’ compensation system or through their personal health insurance. Additionally, access to time-loss benefits may provide a level of economic stability necessary for some members to pursue a claim and seek treatment. Although currently excluded from workers compensation claims, a subset of the population may be accessing mental health treatment for work-related mental health conditions through their personal health insurance (Michael White, personal communication, February 2018). Despite the benefits of filing through workers compensation, individual members may instead choose to pursue treatment using personal insurance for a variety of reasons (e.g., personal privacy and stigma). SHB 1655 may prompt some LEOFF members who have not previously used mental health services, perhaps due to perceived stigma, to seek treatment.

Currently, industrial injury requirements necessitate mental health claims pertain to a single critical event and be filed within one year of the event. This restricts access for those whose

conditions result from multiple exposures and for those who are diagnosed more than a year after the event. While SHB 1655 would reduce these barriers, it's unknown whether employees who file claims may face increased scrutiny from employers. Some employers believe that workers' compensation claims can be abused and may take action (e.g., hire private investigators) to document potential cases of claims abuse (Michael White, personal communication, February 2018).

By officially recognizing stress-caused mental health conditions as workplace injuries/illnesses, SHB 1655 may prompt some LEOFF members who have not previously used mental health services, perhaps due to perceived stigma, to seek treatment.

Will increased use of mental health services among LEOFF members for stress-caused mental conditions and disabilities lead to improved health outcomes?

There is strong evidence that increasing use of mental health services among LEOFF members for stress-caused mental conditions and disabilities may lead to improved health outcomes. There is very strong evidence for the efficacy of some mental health treatments and interventions. The American Psychological Association has indicated a commitment to evidence-based psychological practices.⁴ There is also a growing body of literature supporting the positive association between early detection and treatment and improved outcomes.^{5,6} Note that this does not indicate that all treatments are effective, but rather that evidence-based treatments are available.^{4,7} A systematic review of 24 behavioral randomized clinical trials for individuals with co-occurring alcohol/drug use and PTSD found that study participants in both experimental and control conditions (e.g., 12-step facilitation sessions, supportive counseling) improved significantly over time on substance use disorder (SUD) and PTSD outcomes.⁷ Findings suggest that “people with SUD/PTSD can benefit from a variety of treatment options, including standard SUD care.”⁷ Additionally, findings of a systematic review of 9 randomized clinical trials evaluating the efficacy of pharmacologic treatment suggest that “individuals with alcohol use disorder (AUD) and comorbid PTSD can safely be prescribed medications used in non-comorbid populations and patients improve with treatment.”⁸ Another systematic review found evidence that individuals who experience comorbid physical or mental impairments seem to be at higher risk for non-remission and should be identified early to prevent chronic PTSD.⁹ Evidence also indicates that delaying mental health treatment is associated with longer time to symptom remission once treatment is started, less effective recovery, greater likelihood of relapse, and worse overall outcomes.^{5,6}

Epidemiological studies consistently demonstrate the co-occurrence of PTSD with specified mental and behavioral health disorders. Evidence suggests about 84% of those with PTSD may have comorbid conditions including substance use; feeling shame, despair, and hopelessness; employment problems.¹¹ Evidence cited in a 2017 review suggests an estimated 13% of people with PTSD also have generalized anxiety disorder diagnoses.¹⁰ According to the National Comorbidity Survey in the U.S., men with PTSD had 6.9 times the odds of having a major depressive episode (95% confidence interval [95% CI] = 4.4, 11) and had 5.9 times the odds of generalized anxiety disorder (95% CI = 2.6, 13) than men without PTSD.¹⁰ Similarly, women with PTSD had 4.1 times the odds of a major depressive episode (95% CI = 3.1, 5.4) and had 2.8 times the odds of generalized anxiety disorder (95% CI = 3.1, 5.4) than women without PTSD.¹⁰ Additionally, Substance Use Disorder (SUD), encompassing both use and dependence of alcohol

and/or drugs, is a third widely accepted comorbidity of stress disorders. The National Comorbidity Survey also found that men with PTSD had 2.1 times the odds of alcohol abuse or dependence (95% CI = 1.1, 3.7) and 2.9 times the odds of drug abuse and dependence (95% CI = 1.5, 5.8) than men without PTSD. Among women, the odds of alcohol abuse and dependence for those with PTSD was 2.5 (95% CI = 1.8, 3.5) and the odds of drug abuse and dependence was 4.5 (95% CI = 3.1, 6.4) compared to those without PTSD.

There is also a growing body of literature that suggests PTSD, and potentially other stress disorders, is associated with physical health outcomes.^{10,12,13} There is a strong base of evidence that PTSD is associated with cardiovascular disease (CVD)^{10,12,13} and coronary heart disease.²⁵ Within the general population, people diagnosed with PTSD have 3.4 times the odds of heart failure than those without a PTSD diagnosis.¹⁰ However, an international review of stress disorders and comorbidities found conflicting evidence as to whether stress disorders are associated with either cancer or gastrointestinal (GI) disorders, despite the plausible biological mechanisms for this association.¹⁰ For example, a population-based study in Western Australia found no increased incidence of any type of cancer among individuals “diagnosed with stress or anxiety disorders, compared to the general population.”¹⁰ The author notes that methodological differences across studies may account for the conflicting results.

In summary, there is strong evidence that increasing use of mental health services, specifically those which address PTSD and associated stress disorders, among LEOFF members experiencing stress-caused mental conditions and disabilities, has the potential to improve mental health outcomes as well as some physical health outcomes for this population.

Will improved health outcomes lead to decreased health disparities among law enforcement officers and firefighters?

There is strong evidence that improving health outcomes for LEOFF members will reduce health disparities experienced by that population. Unpublished claims data from 2013 to 2015 from the Washington State Department of Labor and Industries indicate that the workers’ compensation claims rate for firefighters and law enforcement officers is two to three times higher than the general state working population (L&I, email, February 2, 2018). One research study from Illinois noted that the incidence of work-related injuries among firefighters is four times higher than the incidence among private industry workers.¹⁵ Similarly, a national study of emergency medical service (EMS) workers found that EMS workers have higher rates of work-related injury than the general working population, with a rate of 8.6 emergency department-treated injuries per 100 full-time employees compared to 2.1 emergency department-treated injuries among all workers 18 years and older.¹⁶ Study authors also noted that nonfatal occupational injuries among EMS workers result in a rate of lost work days three times higher than all private-industry workers.¹⁶

Evidence shows that first responders experience poor mental health outcomes.^{2,12,14,17-19} Multiple studies have found that PTSD is the most common mental health condition experienced by first responders.^{14,17,18,20} Studies suggest that first responders experience PTSD at a rate of 8% to 32%, which is higher than the 4% prevalence rate of PTSD among the general population.^{12,17,18} Evidence indicates that life events prior to experiencing a traumatic event or incident, the role

first responders play during a traumatic event or incident, and organizational environment predict the likelihood of experiencing PTSD.¹⁸

PTSD also contributes to high rates of chronic health concerns among first responders, including sleep-related disorders^{12,26} and cardiovascular disease.^{12,13,26} A systematic review of work-related stress on the health of paramedics reported that 80% of people with PTSD report sleep difficulties, which may result in higher body mass index and increased risk of cardiovascular disease.¹² A national survey of 6,933 firefighters found that more than half of firefighters report sleep disturbances, and 37.2% of firefighters screened positive for a common sleep disorder, including sleep apnea, insomnia, shift work disorder, and restless leg syndrome.²⁶ Firefighters with a sleep disorder were also more likely to report chronic health outcomes, including cardiovascular disease.²⁶ Cardiovascular disease is the leading cause of duty-related death for firefighters, accounting for 45% of on-duty fatalities.¹³ A number of job-related factors increase firefighters' acute and chronic risk for cardiovascular disease, including: inadequate physical activity, smoke exposure, noise, shift work, sleep deprivation, poor dietary patterns, occupational stress, PTSD, and high job demand.¹³ Although the prevalence of sleep disorders and cardiovascular disease have been documented among first responders, there is mixed evidence about whether these rates differ from rates in the general population.^{13,27}

In addition, data on suicide by occupational group show that, for female workers, protective service workers (including police officers and firefighters) have higher rates of suicide than any other occupational group.²⁸ One systematic review evaluating suicidal thoughts, attempts, and deaths among police officers, firefighters, emergency medical technicians, and paramedics concluded that there is mixed results about whether suicide rates are higher among first responders compared to the general population.²⁷ The review noted 10 potential factors that may increase the risk of suicide for first responders, including: occupational hazards, access to firearms, elevated pain tolerance, sleep disturbances and erratic schedules, stigma of using mental health services, focus on helping others, holding multiple high-risk jobs, number of years in service, size of department, and concurrent or past military service.²⁷

In summary, there is evidence that firefighters, law enforcement officers, and other first responders experience higher rates of injury and illness, including mental health disorders. Therefore, improving mental and physical health outcomes for this population has the potential to decrease health disparities.

Other considerations

We also explored the potential financial impact that SHB 1655 may have on cities and counties in Washington. We did not include this pathway in the logic model on page four of this review because the potential impacts to cities and counties have not been well researched. We did not identify any studies that analyzed the impact of adding an allowable condition under workers compensation on city and county financial obligations, potential layoffs, or public safety.

Annotated References

1. Management Washington State Office of Financial. Multiple Agency Fiscal Note Summary and Individual State Agency Fiscal Notes.2017.

This document compiles fiscal notes specific to HB 1655 from the Department of Retirement Systems (DRS), Department of Labor & Industries (L&I), the Law Enforcement Officers' and Fire Fighters' (LEOFF) Plan 2 Retirement Board, and the State Actuary. According to L&I's fiscal note, LEOFF estimates the exposed workforce is 17,019 firefighters and law enforcement officers and they average 14.7 years of service. According to research by the Safety and Health Assessment & Research for Prevention Program (SHARP), the prevalence of PTSD in this workforce is estimated to be 10% and the presumed reporting rate for those in the 10% is 38%, as not all with PTSD are willing to report it.

2. Levin Andrew P., Kleinman Stuart B., Adler John S. DSM-5 and Posttraumatic Stress Disorder. *The Journal of the American Academy of Psychiatry and the Law*. 2014;42(1):46-58.

The American Psychiatric Association's (APA) Diagnostic and Statistical Manual of Mental Disorders (DSM) is the handbook used by healthcare professionals in the United States as the authoritative guide to the diagnosis of mental disorders. The 5th Edition, DSM-5, includes a new chapter, "Trauma- and Stress-Related Disorders," which discusses PTSD, acute stress disorder (ASD), adjustment disorders (AD) separately from the anxiety disorders (e.g., panic disorder and social phobia). DSM-5 expands indirect exposures by adding A4: "repeated or extreme exposure to aversive details of the traumatic event(s)." Examples include first responders who collect human remains and police officers who are repeatedly exposed to details of child abuse. Authors note, the "Diagnostic Features" section provides no further explanation of A4. The "Prevalence" section "contains an oblique reference to A4, stating, 'Rates of PTSD are higher among veterans and others whose vocation increases the risk of traumatic exposure (e.g., police, firefighters, emergency personnel)[.]'" While not clearly stated, the criterion suggests that "therapists and social service workers, as well as legal professionals, such as public defenders, prosecutors, and judges, who regularly encounter crime scene details of homicide and domestic violence, could develop PTSD." While compensation for mental-mental claims has been limited in some states to "sudden, unexpected exposure", researchers conclude that criterion A4 provides support for regarding cumulative work-related exposures to trauma as qualifying injuries. The authors note that, "DSM-5 is the first edition of the Manual to identify vocational responsibilities explicitly as potential qualifying traumatic experiences that could precipitate PTSD." They suggest that this could result in PTSD being recognized in workers compensation claims, and could raise questions about whether PTSD should be included under disability accommodations. The authors predict an increase in claims due to the expansion of qualifying events and potential impacts on disability and workplace accommodations.

3. Association American Psychiatric. Posttraumatic Stress Disorder. American Psychiatric Association;2013.

The American Psychiatric Association defines PTSD as a trauma- and stress-or-related disorder due to exposure to actual or threatened death, serious injury, or sexual violation. They define exposure as a situation in which an individual "directly experiences the traumatic event,

witnesses the traumatic event in person, learns that the traumatic event occurred to a close family member or close friend, or experiences first-hand repeated or extreme exposure to aversive details of the traumatic event." Updates made to the APA's "Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition" (DSME-5) specifically state that repeated work-related trauma may result in PTSD, including the type of reoccurring trauma encountered by police officers and first responders.

4. American Psychological Association. Evidence-Based Practice in Psychology: APA Presidential Task Force on Evidence-Based Practice.2006.

The American Psychological Association (APA) created a policy indicating that the evidence-base for a psychological intervention should be evaluated using both efficacy and clinical utility as criteria. The Association President appointed the APA Presidential Task Force on Evidence-Based Practice and the task force published this document with the primary intent of describing psychology's commitment to evidence-based psychological practices. This document, though, also references many research articles providing evidence for the efficacy of a number of psychological treatments and interventions. The reference list for this document highlights the growing body of evidence of treatment efficacy from the 1970s through 2006. Note that this does not indicate that all treatments are effective, but rather than there is a very large body of evidence supporting that evidence-based treatments are available.

5. Boonstra N. Klaassen R. Sytema S. Marshall M. De Haan L. Wunderink L. Wiersma D. Duration of untreated psychosis and negative symptoms - A systematic review and meta-analysis of individual patient data. *Schizophrenia Research*. 2012;142(1-3):12-19.

Boonstra et al. conducted a comprehensive review of the literature on duration of untreated psychosis (DUP) and negative symptoms (an absence of expected emotions and behaviors such as social withdrawal and difficulty expressing emotions) published between 1992 and 2009. They identified 28 studies which met their inclusion criteria. Boonstra et al. then contacted the authors of those studies and obtained individual patient data from 16 of the studies, leading to a total sample size of 3,339. They found that shorter DUP was significantly associated with less severe negative symptoms at baseline and at short and long term follow-up (up to eight years). The association was strong and persistent and showed no signs of diminishing with longer follow-up. They found that for participants with a DUP of less than nine months, DUP and negative symptoms were positively associated while for those patients with a longer DUP negative symptoms were not associated linearly. This indicates that a reduction in DUP may have a greater impact for someone with a DUP less than nine months than for someone with a DUP greater than nine months. The average DUP of participants was over 15 months. The authors indicate that these findings support arguments for early detection and intervention, but also caution that these data indicate association not causation.

6. Franz Lauren Carter Tandra Leiner Amy S. Bergner Erin Thompson Nancy J. Compton Michael T. Stigma and treatment delay in first-episode psychosis: a grounded theory study. *EIP Early Intervention in Psychiatry*. 2010;4(1):47-56.

Franz et al. cite evidence in their introduction that a longer duration of untreated psychosis (DUP) is associated with longer time to symptom remission once treatment is started, less effective recovery, greater likelihood of relapse, and worse overall outcomes. The also cite

evidence that early treatment is associated with decreased suicidality and negative symptoms. The researchers conducted interviews with participants and conducted both qualitative and quantitative analysis. Participants included African American patients hospitalized in the southeastern United States for a first episode of schizophrenia-spectrum disorder and their relatives. The sample included ten patients and 12 of their relatives. The researchers identified a number of themes from these interviews. Participants indicated that society's reaction toward those dealing with mental health issues was very negative and that society then initiates both social distancing and negative labeling. Many participants also expressed fear that having their family member formally diagnosed with a mental illness would create an official label that would be associated with negative stereotypes. The researchers also found that eight of the 10 patients had very high thresholds for initiating treatment (such as violent or suicidal behavior or contact with the police). Relative participants made comments expressing that they weren't paying attention to, hid, or were in denial about the signs or didn't realize the severity of their family member's symptoms. The authors conclude that these comments indicate that stigma associated with mental health issues may be serving as a barrier to accessing treatment and to may be increasing DUP.

7. Simpson Tracy L., Lehavot Keren, Petrakis Ismene L. No Wrong Doors: Findings from a Critical Review of Behavioral Randomized Clinical Trials for Individuals with Co-Occurring Alcohol/Drug Problems and Posttraumatic Stress Disorder. *Alcoholism: Clinical and Experimental Research*. 2017;41(4):681-702.

This systematic review includes relevant behavioral randomized clinical trials (RCTs) that evaluated PTSD-oriented exposure-based treatments, addiction-focused treatments, and coping-based treatments that do not involve exposure to trauma memories. Researchers identified 24 behavioral RCTs: 7 exposure based, 6 addiction focused, and 11 coping based. Control conditions varied by study, but all participants received some type of care whether initiated on their own or accessed through the study (e.g., 12-step facilitation sessions, substance use disorder [SUD] treatment as usual, healthy lifestyle curriculum sessions, supportive counseling). The majority of studies found that participants in both the experimental and control conditions improved significantly over time on SUD and PTSD outcomes. None of the studies found "significant between-group differences in both SUD and PTSD outcomes favoring the experimental treatment." Findings indicate interventions that integrate exposure-based PTSD treatment and behavioral SUD treatment are associated with better PTSD outcomes than SUD care. Authors conclude that results suggest that people with SUD/PTSD can benefit from a variety of treatment options, including standard SUD care.

8. Petrakis Ismene L., Simpson Tracy L. PTSD and Alcohol Use Disorder: A Critical Review of Pharmacologic Treatments. *Alcoholism: Clinical and Experimental Research*. 2017;41(2):226-237.

This systematic review identified 9 relevant randomized clinical trials (RCTs) that evaluated the efficacy of pharmacotherapy for individuals diagnosed with alcohol use disorder (AUD) and PTSD. Authors categorized studies as (1) those that evaluated first line treatments for PTSD [3 studies], (2) those that evaluated medications to target AUD [4 studies], and (3) those that evaluated medications hypothesized to be effective in targeting alcohol consumption as well as PTSD symptoms [3 studies]. One study was counted twice as it evaluated both a medication to

treat PTSD and one to treat AUD. All but one study reviewed found that PTSD symptoms and drinking outcomes improved significantly over time. No one agent showed clear evidence of efficacy in this comorbid group. Authors note that conflicting results may be due in part to differences in study populations (gender distribution, military status) and other potential confoundings including severity and chronicity of illness, type of trauma experienced, other comorbid diagnoses, concomitant psychotropic medications, and whether additional resources were available (e.g., sober housing and robust addiction counseling services). However, findings suggest that "individuals with AUD and comorbid PTSD can safely be prescribed medications used in non-comorbid populations and patients improve with treatment."

9. Steinert C., Hofmann M., Leichsenring F., et al. The course of PTSD in naturalistic long-term studies: High variability of outcomes. A systematic review. *Nordic Journal of Psychiatry*. 2015;69(7):483-496.

This systematic review summarizes available findings on the prospective, naturalistic long-term course of PTSD and its predictors. Although PTSD is one of the most frequent mental disorders, with a lifetime prevalence of 8%, its long-term course is largely unknown. Researchers note that "prospective studies investigating various samples of traumatized populations reported PTSD remission rates that ranged between 35% and 66% after 3-36 months." While these findings suggest that a considerable portion of individuals with PTSD recover over time, others experience chronic PTSD, lasting several years. Twenty-five studies were reviewed with a total of 24 cohorts of adult participants (n=10,500); 14 cohorts with observer-assessed PTSD at baseline and 10 with probable PTSD. Researchers found methodology and participant populations varied between studies. Those focusing on patient populations with observer assessed PTSD found that between 18% and 50% of patients experienced a stable recovery within 3-7 years. Findings suggest that individuals who lack social support as well as experience comorbid physical or mental impairments seem to be at elevated risk for non-remission and should be identified early to prevent chronic PTSD.

10. Gradus Jaimie L. Prevalence and prognosis of stress disorders: a review of the epidemiologic literature. *Clinical Epidemiology*. 2017;2017(9):251-260.

This review summarizes the literature on stress disorders (International Classification of Diseases, 10th Edition) including acute stress reaction, PTSD, adjustment disorder, and unspecified stress reactions and the common psychiatric and somatic consequences of these disorders. Epidemiological literature consistently demonstrates the co-occurrence of PTSD and depression. Additionally, evidence suggests an estimated 13% of people with PTSD also have generalized anxiety disorder diagnoses. In the National Comorbidity Survey in the US, men with PTSD had 6.9 times the odds of having a major depressive episode (95% confidence interval [95% CI] = 4.4, 11) and had 5.9 times the odds of generalized anxiety disorder (95% CI = 2.6, 13) than men without PTSD. Women with PTSD had 4.1 times the odds of a major depressive episode (95% CI = 3.1, 5.4) and have 2.8 times the odds of generalized anxiety disorder (95% CI = 3.1, 5.4) than women without PTSD. Using cross-sectional data, the National Epidemiologic Survey on Alcohol and Related Conditions found that those with PTSD had 2.7 times the odds of major depression and 4.3 times the odds of having any anxiety disorder (95% CI = 3.8, 4.8) than those without PTSD. Substance abuse and dependence (alcohol and drug) is a third widely accepted comorbidity of stress disorders. In the National Comorbidity Survey, "men with PTSD

had 2.1 times the odds of alcohol abuse or dependence (95% CI = 1.1, 3.7) and 2.9 times the odds of drug abuse and dependence (95% CI = 1.5, 5.8) than men without PTSD." Among women, "the odds of alcohol abuse and dependence for those with PTSD was 2.5 (95% CI = 1.8, 3.5) and the odds of drug abuse and dependence was 4.5 (95% CI = 3.1, 6.4) compared to those without PTSD." There is a strong base of evidence that PTSD is associated with cardiovascular disease (CVD), particularly among male U.S. veterans and in the general population. The association between CVD and other anxiety disorders is less well studied. Within the general population, people diagnosed with PTSD have 3.4 times the odds of heart failure than those without a PTSD diagnosis. There is conflicting evidence as to whether PTSD is associated with cancer and gastrointestinal (GI) disorders. The author concludes that stress disorders have potentially detrimental health outcomes for those living with these disorders.

11. Javidi H, Yadollahie M. Post-traumatic stress disorder. *International Journal of Occupational and Environmental Medicine*. 2011;3(1):2-9.

This review provides an overview of evidence pertaining to PTSD. It focuses on work-related PTSD, its risk factors, and comorbidity. Authors find work-related PTSD is common among health and social services, deployers in combat-specific occupations, journalist, police officers, firefighters, and emergency service workers. The review estimates the prevalence of PTSD among rescue workers to be between 10% and 20%. One cited study found the prevalence of PTSD among police officers, firefighters, and emergency service workers ranged from 6% to 32%. Approximately 84% of those with PTSD may experience comorbid conditions including alcohol or drug abuse; feeling shame, despair, and hopeless; physical symptoms; employment problems; divorce; and violence. PTSD may also contribute to the development of other disorders (e.g., panic disorder, social phobia, major depressive disorder, substance abuse/dependency, alcohol abuse/dependency, conduct disorder, and mania).

12. Hegg-Deloye S., Brassard P., Jauvin N., et al. Current state of knowledge of post-traumatic stress, sleeping problems, obesity and cardiovascular disease in paramedics. *Emerg Med J*. 2014;31(3):242-247.

Hegg-Deloye et al. completed a systematic review of 25 articles to examine the impact of work-related stress on the health of paramedics. Overall, they found that paramedics experience both acute and chronic stress indicators (including increased levels of cortisol and epinephrine), which increases their risk for cardiovascular disease. They also concluded that paramedics experience high rates of PTSD, sleep disorders, and obesity. Based on studies included in the review, the authors found that the rate of PTSD among emergency workers may be as high as 20%, compared to 5% in the general population. In addition, data show that more than 80% of people with PTSD report sleep difficulties, which may result in higher body mass index and increased risk of cardiovascular disease.

13. Soteriades E. S., Smith D. L., Tsismenakis A. J., et al. Cardiovascular disease in US firefighters: a systematic review. *Cardiol Rev*. 2011;19(4):202-215.

Cardiovascular disease is the leading cause of duty-related death for firefighters, and accounts for 45% of on-duty fatalities. The authors state that heart disease and hypertension account for 6% to 10% of firefighters' workers compensation claims annually in one large city. The review notes a number of factors that increase firefighters' acute and chronic risk for cardiovascular

disease, including: inadequate physical activity, smoke exposure, noise, shift work, sleep deprivation, poor dietary patterns, occupational stress, PTSD, and high job demand. In addition, many firefighters have underlying cardiovascular disease risk factors. For example, studies have shown that 10%-18% of firefighters are current smokers, 20%-30% of firefighters have hypertension, and 40% of firefighters are obese. Although the prevalence of cardiovascular disease among firefighters is well-documented and most states have workers compensation laws that “presume” cardiovascular disease among firefighters is occupationally-related, Soteriades et al. found mixed evidence on whether firefighters are at an elevated lifetime risk of cardiovascular disease as compared to the general population. The authors do not provide a description of methods, outline inclusion or exclusion criteria, or give a total number of articles included in the review.

14. Skogstad M., Skorstad M., Lie A., et al. Work-related post-traumatic stress disorder. *Occupational Medicine*. 2013;63:175-182.

Authors conducted a systematic review of available research on occupational groups that are at particular risk of developing work-related post-traumatic stress disorder (PTSD). Researchers identified 140 eligible articles that met the following criteria: 1) evaluated occupational-related PTSD, 2) study population consisted of non-military or 9/11 affected personnel, 3) workers experienced direct traumatic exposure, 4) highest scientific quality, and 5) published in peer-reviewed journals. Findings indicate that occupational groups such as police officers, firefighters, and ambulance personnel are at increased risk of experiencing stressful events that make them more likely to suffer from PTSD, reported prevalence of <10%, ~20%, and ~20%, respectively. One systematic review analyzed found uniformed personnel to exhibit an unwillingness to seek help for psychological problems; authors state this may be related to a 'macho culture', which includes "denial and/or a constant pressure to control emotions and a desire to appear efficient." Authors conclude that "[m]ental health problems prior to the traumatic event and weak social support increase the risk of PTSD." Prevention of work-related PTSD includes "a sound organizational and psychosocial work environment, systematic training of employees, social support from colleagues and managers, and a proper follow-up of employees after a critical event."

15. Walton S. M., Conrad K. M., Furner S. E., et al. Cause, type, and workers' compensation costs of injury to fire fighters. *American journal of industrial medicine*. 2003;43(4):454-458.

Walton et al. examined data from workers compensation claims in northeastern Illinois between 1992 and 1999 for firefighter injuries. Overexertion accounted for most (31%) non-fatal injuries among firefighters, with most overexertion injuries due to strains and sprains. The mean workers compensation cost for overexertion-related injuries was \$9,715. The authors note that the incidence of work-related injuries among firefighters is four times higher than the incidence among private industry workers.

16. Reichard A. A., Marsh S. M., Tonozzi T. R., et al. Occupational Injuries and Exposures among Emergency Medical Services Workers. *Prehosp Emerg Care*. 2017;21(4):420-431.

Reichard et al. analyzed data collected by the National Institute for Occupational Safety and Health as part of the National Electronic Injury Surveillance System (NEISS-Work). They completed interviews with 572 emergency medical service (EMS) workers between 2010 and 2014 with a response rate of 37%. The authors conclude that EMS workers have higher rates of work-related injury than the general working population. They found that EMS workers have a rate of 8.6 emergency department-treated injuries per 100 full-time employees, compared to 2.1 emergency department-treated injuries among all workers 18 years and older. They also note that nonfatal occupational injuries among EMS workers result in a rate of lost work days three times higher than all private-industry workers. Body motion injuries and exposure to harmful substances accounted for the most non-fatal occupational injuries to EMS workers.

17. Berger W., Coutinho E. S., Figueira I., et al. Rescuers at risk: a systematic review and meta-regression analysis of the worldwide current prevalence and correlates of PTSD in rescue workers. *Social psychiatry and psychiatric epidemiology*. 2012;47(6):1001-1011.

Berger et al. completed a systematic review in attempt to determine the worldwide prevalence of PTSD among rescue workers. They reviewed over 800 articles and included 28 studies with a total of 20,424 rescue workers in meta-regression modeling to determine the rate of PTSD across first responders. Overall, they found that the prevalence of PTSD among rescue workers is 10%, which is higher than estimates of PTSD in the general population. They found some differences in prevalence rates by continent and type of first responder. For example, they found that ambulance workers had higher rates of PTSD than firefighters or police officers.

18. Kleim Birgit, Westphal Maren. Mental health in first responders: A review and recommendation for prevention and intervention strategies. *Traumatology*. 2011;17(4):17-24.

The authors provide a review of mental health conditions among first responders. They found that PTSD is the most common mental health condition experienced by first responders. Their review included articles evaluating PTSD among various groups of first responders under various work conditions. The authors found that PTSD rates among first responders range 8% to 32%, which is higher than the prevalence rate of 4% among the general population. The review noted that life events prior to experiencing a traumatic event or incident, the role first responders play during a traumatic event or incident, and organizational environment predict the likelihood of experiencing PTSD. In addition, social support may serve as a protective factor.

19. Corneil W., Beaton R., Murphy S., et al. Exposure to traumatic incidents and prevalence of posttraumatic stress symptomatology in urban firefighters in two countries. *Journal of occupational health psychology*. 1999;4(2):131-141.

Urban firefighters are at risk for PTSD due in part to their exposure to duty-related trauma. This study compared duty-related trauma exposures and the prevalences of posttraumatic stress in U.S. and Canadian firefighters. Both samples reported relatively numerous and frequent posttrauma symptoms, and the rates of self-reported PTSD prevalence did not differ significantly. However, analysis of departmental records for respondents' previous year on duty revealed significant differences in both frequencies and categories of traumatic incident exposures. Some of the vulnerability and moderating risk factors associated with PTSD caseness

differed between the U.S. and Canadian samples. Potential explanations for the observed differences in risk factors for PTSD in these 2 firefighter samples are considered.

20. **Geronazzo-Alman L., Eisenberg R., Shen S., et al. Cumulative exposure to work-related traumatic events and current post-traumatic stress disorder in New York City's first responders. *Comprehensive psychiatry*. 2017;74:134-143.**

This cross-sectional study examines the cumulative exposure to work-related traumatic events (CE) and past-month PTSD outcomes and depression among 209 New York City first responders. The sample included 32 emergency medical technicians, 99 firefighters, and 78 police officers. Traumatic exposures were measured using the Critical Incident History Questionnaire (CIHQ), which is tailored to first responder occupational exposures and estimates an event's severity based on appraisal independent of prior experience of the event. CIHQ allows researchers to measure the severity of exposure in two ways: 1) by summing the respondent's own severity ratings (for each incident); and 2) by summing the average severity rating in the sample. The analysis found all indexes were significantly and differently associated with PTSD. However, associations with depression were non-significant. Authors conclude that work-related CE is specifically associated with PTSD and recommend focusing on the variety of exposures as a potential strategy to predict PTSD in first responders.

21. **Kessler Ronald C., Zhao Shanyang, Katz Steven J., et al. Past-Year Use of Outpatient Services for Psychiatric Problems in the National Comorbidity Survey. *The American Journal of Psychiatry*. 1999;156(1):115-123.**

Kessler et. al present nationally representative descriptive data from the National Comorbidity Survey³⁸ on 12-month use of outpatient services for psychiatric problems. The analysis used DSM-III-R diagnoses. Data indicate the prevalence of PTSD among the study population (8,098 individuals ages 15 to 54 years old) is 3.9% (SE=0.4), and of those with PTSD 38.3% report using any services (i.e., health care services [general medicine, specialty mental, any] or services in other sectors [human services and self-help]).

22. **Statistics Bureau of Labor. Survey of occupational injuries and illnesses in cooperation with participating state agencies (Table R45). U.S. Department of Labor; 2010.**

The Bureau of Labor and Statistics reported that occupational injuries involving anxiety, stress, and neurotic disorders occurred at a rate of approximately 0.3% in the private sector in 2010. Anxiety, stress, or neurotic disorders accounted for 2,610 occupational injuries out of 933,200 total occupational injuries involving days away from work. Of these, 520 were attributed to acute post-traumatic anxiety, and 50 were considered chronic post-traumatic anxiety.

23. **Conner Ko Copeland V. C. Grote N. K. Koeske G. Rosen D. Reynolds C. F. rd Brown C. Mental health treatment seeking among older adults with depression: the impact of stigma and race. *The American journal of geriatric psychiatry : official journal of the American Association for Geriatric Psychiatry*. 2010;18(6):531-543.**

Conner et al. conducted telephone interviews with randomly selected participants who screened positive for mild to moderate depressive symptoms. They interviewed 449 adults but only included the data for older adults in this analysis (n=248). They intentionally oversampled

African American participants. In the telephone interview they assessed perceived public stigma and internalized stigma in relation to mental health as well as history of mental health treatment, intention to seek treatment, and attitudes toward mental health services. Over 40% of the participants reported feeling depressed, down, or hopeless at least half of the days over the past two weeks, and 85% reported having been in a depressed mood for at least several days. The researchers found that African American participants had significantly more negative attitudes toward mental health services than their white counterparts (moderate effect size). In addition, negative attitudes about mental health treatment were significantly associated with having never sought mental health treatment. Therefore African American participants were significantly less likely to have ever sought mental health treatment than white participants (despite similar rates of depressive symptoms). The data also indicated that while African Americans did not report significantly different levels of perceived public stigma than their white counterparts, they were significantly more likely to experience internalized mental health stigma than white participants. In addition, internalized stigma partially mediated the relationship between race and attitudes toward seeking treatment. In summary, the researchers found significant relationship between race and level of internalized stigma, between internalized stigma and attitudes toward seeking mental treatment, and between these attitudes and having never sought mental health services. The data also indicated that, contrary to the expectations of the researchers, higher levels of internalized stigma were actually associated with an increased level of intent to seek mental health treatment. The participants with higher internalized stigma scores were also more likely to report severe depressive symptoms though, so the researchers speculated that it may be the severity of their depression which increased both their internalized stigma and their intent to seek care.

24. **Pietrzak Rh Johnson D. C. Goldstein M. B. Malley J. C. Southwick S. M. Perceived stigma and barriers to mental health care utilization among OEF-OIF veterans. *Psychiatric services (Washington, D.C.)*. 2009;60(8):1118-1122.**

Pietrzak et al. drew participants from the first two waves of the Connecticut Operation Enduring Freedom in Afghanistan and Operation Iraqi Freedom (OEF-OIF) Veterans Needs Assessment Survey. They only had a response rate of 27% (n=272). The survey included questions to assess stigma, barriers to care, substance abuse, and psychiatric disorders. Participants who screened positive for a psychiatric disorder scored higher on the stigma scale and on the barriers-to-care scale and were also more likely to endorse the stigma items and barriers-to care items than their counterparts. The authors also found that negative beliefs about mental health care and lack of unit support were significant predictors of both increased stigma and barriers-to-care scores. For example agreement with statements such as “therapy is a sign of weakness” were associated with increased stigma and higher barriers to accessing care. Participants with negative beliefs about mental health care were less likely to have received care (both counseling and medication services) in the six months prior to the survey.

25. **Player Marty S., Peterson Lars E. Anxiety Disorders, Hypertension, and Cardiovascular Risk: A Review. *International Journal of Psychiatry in Medicine*. 2011;41(4):365-377.**

This review of evaluates available evidence of the associations between hypertension, coronary heart disease (CHD), and anxiety disorders and their contribution to morbidity to patients.

Findings from several studies indicate an association between PTSD and CHD. Authors cite a study of randomly sampled male Vietnam veterans (n=4,328) free of heart disease at baseline. Of the 15-year follow-up period, those with PTSD had a 2.25 higher risk of heart disease mortality than those without PTSD. Similarly, a prospective cohort study of psychological factors in adults with cardiovascular disease (CVD) found patients with PTSD reported higher numbers of symptoms, physical limitations, and lower quality of life than those without PTSD. Authors also cite studies that indicate PTSD may have an important effect on diabetes and diabetes outcomes. Investigators conclude prospective cohort studies assessing the links between anxiety disorders and the development of CHD provide the strongest evidence for the association.

26. Barger L. K., Rajaratnam S. M., Wang W., et al. Common sleep disorders increase risk of motor vehicle crashes and adverse health outcomes in firefighters. *Journal of Clinical Sleep Medicine*. 2015;11(3):233-240.

Barger et al. note that heart attacks and motor vehicle crashes are the leading causes of death among firefighters, and that sleep disorders increase the risk of both conditions. This study surveyed 6,933 firefighters from 66 different U.S. fire departments to determine the prevalence of common sleep disorders. Participating fire stations were selected based on size of the department and a number of other criteria. Firefighters completed validated sleep disorder screening tools as well as a confidential health and safety survey. The authors note that the study has some limitations, including that respondents were limited to career firefighters and a number of variables were based on self-report information. Overall, Barger et al. found that more than half of firefighters report sleep disturbances, and 37.2% of firefighters screened positive for a common sleep disorder, including sleep apnea, insomnia, shift work disorder, and restless leg syndrome. Of firefighters screening positive for a common sleep disorder, over 80% had received no formal diagnosis or treatment. Firefighters with a sleep disorder were twice as likely to report a motor vehicle crash [Adjusted odds ratio 2.00, 95% CI 1.29-3.12, p=0.0021]. They were also significantly more likely to report chronic health outcomes, including cardiovascular disease [AOR 2.37, 95% CI 1.54-3.66, p<0.0001], diabetes [AOR 1.91, 95% CI 1.31-2.81, p=0.0009], depression [AOR 3.10, 95% CI 2.49-3.85, p<0.0001], and anxiety [AOR 3.81, 95% CI 2.87-5.05, p<0.0001]. Firefighters that had a sleep disorder were also more likely to self-report poor health. Of participating firefighters, more than half were overweight or obese.

27. Stanley I. H., Hom M. A., Joiner T. E. A systematic review of suicidal thoughts and behaviors among police officers, firefighters, EMTs, and paramedics. *Clinical Psychology Review*. 2016;44:25-44.

Stanley et al. completed a systematic review of 63 quantitative studies evaluating suicidal thoughts, attempts, and deaths among police officers, firefighters, emergency medical technicians (EMTs), and paramedics. Overall, they concluded that first responders are at an elevated risk for suicide. Although some evidence showed mixed results about whether suicide rates were higher among first responders compared to the general population, the authors noted that first responders often undergo psychological screening before starting service and that you would expect to see lower suicide rates among this group. Based on their review, Stanley et al. noted 10 potential factors that may increase the risk of suicide for first responders, including: occupational hazards, access to firearms, elevated pain tolerance, sleep disturbances and erratic schedules, stigma of using mental health services, focus on helping others, holding multiple

high-risk jobs, number of years in service, size of department, and concurrent or past military service. They note a gap in research looking specifically at whether PTSD contributes to suicide risk among first responders.

28. **LiKamWa-McIntosh Wendy, Spies Erica, Stone Debora M., et al. Suicide Rates by Occupational Group- 17 states, 2012. *Morbidity and Mortality Weekly Report (MMWR)*. 2016;65(25):641-645.**

In 2012, suicide was the 10th leading cause of death for individuals over 16 years of age. Centers for Disease Control and Prevention evaluated data from the 2012 National Violent Death Report System from 17 states to compare suicide rates by occupational group. Suicide rates were highest for females working in protective service occupations, which includes law enforcement officers and firefighters.