EXTRAORDINARY DUTIES
EXTRAORDINARY STRESSORS

ASSESSING THE NEED AND POTENTIAL FOR INNOVATIVE APPROACHES TO FIRST RESPONDERS’ STRESS INJURIES

Contact: Dr. Laura Niemi (laura.niemi@utoronto.ca)
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ROADMAP

We present a two-tiered examination of operational stress injury (OSI), including posttraumatic stress disorder (PTSD), in first responders and public safety personnel, as part of the Ontario Ministry of the Solicitor General multifaceted review endeavor.

In Tier 1, we describe background and current approaches to OSI/PTSD that suggest the potential for innovative approaches to prevention and treatment of OSI/PTSD in first responders. In Tier 2, we take into account unique occupational features inherent to different first responder groups (firefighters, police, EMS/EMT, corrections, coroners and forensics) and, where possible, how their differing stressors might suggest differing approaches to OSI/PTSD prevention and treatment. As such, this document is not intended as an exhaustive overview of the OSI/PTSD clinical literature within the first responder population, nor is it meant to comprehensively cover each of the first responder occupation groups (e.g., this is not an exhaustive documentation of historic and current PTSD treatment for police officers, firefighters, EMTs or any other first responder group).

We conclude by synthesizing the research, which collectively suggests that effective response to stress in first responders broadly supports resilience factors and addresses occupation-specific stressors.
Introduction

The years between 2000 and 2010 are sometimes referred to as the “decade of darkness” within the Canadian military. That time period saw extremely high rates of mental illness and stress injury among Canadian peacekeepers, yet the framework available to address these issues was insufficient (English, 2012). The lack of structural support for veterans’ mental recovery in the early 2000s was compared in the Canadian Military Journal to a time when PTSD and other stress-related injuries were not known as such, but as “Not yet diagnosed – nervous” (English, 2012). As the author went on to explain:

“It was only after a public outcry about the treatment of wounded soldiers and veterans, particularly those suffering from OSIs during the Decade of Darkness, that the CF began to rediscover many of the lessons of 1918” (English, 2012).

In 2001, the Operational Stress Injury Social Support (OSISS) program began, in 2002, the first Operational Stress Injury (OSI) Clinic was opened by the Canadian Forces, and since then the term OSI and the importance of the treatment of OSIs have been more and more accepted in Canada (Richardson, Darte, Grenier, English & Sharpe, 2008). Moreover, in the years since then several more OSI clinics have opened in various locations across the country. An ongoing effort has been made to take a systems approach to operational stress-related challenges among members and veterans of the Canadian military.

Of note to the population of first responders, issues of stigma were pivotal in the adoption of the term Operational Stress Injury and expansion to the term to Posttraumatic Stress Injury. We briefly review this trajectory next, followed by procedural challenges for the use of these terms and statistics on the prevalence of operational stress injuries in first responders.

Stigma and “injury” terminology. Even towards the end of the “decade of darkness”, within the general population, stigma remained problematic: a 2009 Ontario Health Survey of over 6,000 respondents found that 50% would be embarrassed for their family or friends to find out they were seeking psychological help (Jagdeo, Stein, Cox & Sareen, 2009). Recent research has found that stigma is an even greater problem among emergency and public safety workers than the general population (Haugen, McCrillis, Smid, & Nijdam, 2017). For instance, one study found that 85% of police officers surveyed would avoid disclosing to their colleagues that they have mental health issues (Stuart, 2017). Moreover, 62% expected to be the target of discrimination at work if they disclosed this information. One officer ironically described taking time off to seek psychological help as “career suicide” (Stuart, 2017). Stigma is all the more important for first responders given that first-responder professions tend to be male-dominated and stigma is exacerbated among male-dominated professions (Kim et al., 2018; Clement et al., 2015).

Notably, qualitative data illustrates that referring to these struggles as injuries as opposed to disorders has made a positive difference for officers when it comes to matters of stigma (Canadian Senate Subcommittee on Veterans’ Affairs, 2015). Similarly, despite its limitations, outcomes suggest that use of the term Operational Stress Injury with first responders alleviates some of the stigma of experiencing and seeking support for mental illness and stress on the job.
**Posttraumatic Stress Injury (PTSI).** In an analogous fashion, American first responders have begun using “injury” rather than disorder, i.e., Posttraumatic Stress Injury, appreciating the implied impermanence of the condition:

“[name] was diagnosed with PTSD after responding to the 1999 mass shooting at Columbine High School. But he prefers to call it PTSI, because the term ‘injury’ suggests the ‘disorder’ is curable.”

As the aforementioned first responder put it:

“It’s OK to get professional help. You can be cured and go back to being an effective firefighter.”

(Galante, 2017)

The first responder’s statement conveys the importance for well-being of maintaining a view of the condition as something that can be overcome. The use of *injury* in the terms OSI and PTSI supports this. As a state typically understood to heal over time or to be curable with intervention, an injury implies more personal control than a disorder, which does not carry those same qualities. More intuitively, as argued by two psychiatrists petitioning the APA to change the label “PTSD” to “PTSI” (quoting the retired Vice-Chief of Staff of the US Army), the word “disorder” implies weakness; calling it an injury instead would significantly reduce reluctance to seek help (Ochberg & Shay, 2012).

While PTSI is still not in the DSM, its use is increasing in frequency. It is referred to by the government of Canada as a subcategory of OSI (Public Safety Canada, 2018). The US-based Global PTSI Foundation was formed in 2009; two years in, the organization known as Chicago Medical Innovations changed their name to the Global PTSI Foundation [http://globalptsifoundation.org] to emphasize their goal that post-traumatic stress not necessarily be a permanent condition.

**Challenges.** Clearly, a potential benefit to first responders and public safety personnel from such terms as PTSI and OSI exists in their emphasis on a recovery endpoint. Although minimization of variation in terminology would be preferable from a bureaucratic and scientific perspective, from a health and wellness perspective, the specialized terminology has the potential to offset even greater problematic outcomes for first responders (and, by extension, communities).

Insight into this possibility will be better obtained through detailed examination of the effects of the introduction of OSI (and PTSI, internationally) labels on symptom reporting, and treatment-seeking.

The key challenge will be balancing the trade-off: there is a need to prevent nomenclature issues from affecting important procedural and scientific matters -- comparative research, program evaluation, and long-term statistical tracking. There is also a need to prevent a “decade of darkness” for first responders and to ensure first responders feel comfortable seeking treatment. First responders face more stigmatizing conditions compared to the average person seeking mental health treatment, on top of more extreme scheduling and mental/physical demands compared to the average desk worker. The combined effects of these stressors are discussed throughout this document and demonstrated in the statistics that follow in Tables 1 and 2.
While these statistics indicate that the risk of stress injury among officers in public safety occupations is high, this does not mean first responders should be “pathologized”. Instead, organizations can take a strengths-based approach by confronting the risks faced by first responders head on and working to build in organizational supports. Given the nature of their occupations, involving exposure to a combination of critical incidents and chronic stressors (Part 6), first responders will continue to manage these risks and require organization partnership. Stigma-reducing nomenclature is an example of a successful team effort, as is acknowledgment that first responders are the ultimate evaluators of any programs designed to address and reduce first responders’ stress injury risk.
Part 2. Clinical/Counseling Understanding and Treatment of PTSD

In this section, we give an overview of the clinical understanding of Posttraumatic Stress Disorder (PTSD) and describe the clinical and counseling approaches to PTSD treatment (Lancaster, Teeter, Gros, & Back, 2016) and first responders and with the general population. We begin by reviewing the symptoms of PTSD. We briefly describe early models of PTSD and then provide a more detailed description of the predominant model of PTSD: the cognitive model (Ehlers & Clark, 2000; Lancaster, Rodriguez, & Weston, 2011). We then discuss current treatment options and introduce a model and corresponding treatment program (Litz et al., 2009) that address the unique forms of trauma (e.g., moral injury) involved in the complex situations faced by first responders and those in similarly stressful occupations (e.g., veterans).

Clinical Characteristics of PTSD

PTSD is characterized by four types of symptoms. (1) Intrusion symptoms involve having recurrent, involuntary, and distressing memories of the event. (2) Avoidance is when the person avoids all thoughts, feelings, objects, people, or places that remind them of the trauma. (3) People with PTSD also experience changes in cognition and mood. For example, people may have difficulty remembering details from the event and may experience a persistently depressed mood. Lastly, (4) people with PTSD often experience changes in arousal (e.g., sleeping difficulties, trouble concentrating) and reactivity (e.g., increased irritability, hypervigilance). PTSD is diagnosed when these symptoms are present and causing significant distress and impairment more than one month after a person either directly or indirectly experiences, witnesses, or learns about the trauma.

Clinical Psychology Models of PTSD

Early on, social-cognitive models (Janoff-Bulman, 1989) posited that symptoms of PTSD occur when the person cannot reconcile the traumatic event with their fundamental beliefs about the world (e.g., “life is fair”) or about the self (e.g., “I am capable”). The 2-factor theory of PTSD (Keane, Fairbank, Caddell, Zimering, & Bender, 1985) described a process by which PTSD symptoms develop in two parts: first, during the traumatic event, environmental and sensory cues present at the time become associated with the negative emotions the person is experiencing. Later, encountering these cues again can evoke strong, distressing emotional responses. Second, these negative associations persist because the person avoids the trauma-related cues and thus avoids learning new, less distressing, associations with those cues. Emotional processing theory (Foa & Riggs, 1993) proposed a similar process in which the person’s reluctance to remember and experience the emotions associated with the traumatic event interferes with their emotional processing of the event.

In 2000, Ehlers and Clark proposed a cognitive model of PTSD which has since been widely accepted as one of the primary theories used to understand PTSD (Lancaster et al., 2011). This theory posited that PTSD occurs when people process a traumatic event and/or the conditions surrounding the event in a way that produces a sense of chronic threat. This threat can be external (e.g., “the world is scary”) or internal (e.g., “I am incapable of achieving my goals”).

A sense of chronic threat is created through two mechanisms: (1) negative appraisals, and (2) memory of the event. For example, a person can have negative appraisals of their behavior during the trauma (e.g., “I was too weak to fight back”) or their reaction to the trauma afterwards (e.g., “I am going crazy”).
Regarding memory, people with PTSD often have difficulty recalling specific details about their trauma and incorporating the traumatic experience into their understanding of themselves. At the same time, people with PTSD often involuntarily experience intrusive sensory memories of the traumatic event, usually triggered by aspects of their environment that consciously or unconsciously remind them of the event.

The sense of chronic threat is maintained through various maladaptive behavioral strategies and cognitive processing styles. For example, engaging in safety behaviors (e.g., avoiding driving after being in a motor vehicle accident) limits opportunities to change negative appraisals (e.g., “Driving is dangerous”). Avoiding thinking about the traumatic event prevents opportunities to engage in elaboration and thus form a more organized memory of the event.

These different clinical models over the last several decades share common threads. One of them is the recognition that people who are struggling with PTSD also tend to avoid thinking about the traumatic event, which perpetuates its extremely distressing qualities. Most of the treatments for PTSD counteract this tendency, in a range of forms and with varying levels of intensity.

**Psychotherapy Treatments for PTSD**

A comprehensive review of the clinical and counseling approaches available for PTSD is beyond the scope of this review. Organizations such as the International Society for Traumatic Stress Studies (ISTSS) and the National Registry of Evidence-based Programs and Practices (NREPP) have compiled and evaluated an extensive array of PTSD therapies, some of which will be discussed below. In superscript throughout this document, the ISTSS rating of each intervention can be found.

- **S/SR**: strong/standard recommendation
- **IE**: insufficient evidence to recommend
- **EE**: emerging intervention
- **NA**: not available

These ratings are based on the evaluation system of the International Society for Traumatic Stress Studies, which employs three categories of criteria: 1) quality, 2) effectiveness, and 3) other factors. Quality refers to the Grading of Recommendations, Assessment, Development, and Evaluations (GRADE) framework, in which the evidence supporting the intervention is ranked by determining whether it is likely that the true effect is similar to the estimated effect in a study (Siemieniuk & Guyatt, 2019). A strong recommendation requires an effectiveness threshold wherein the results met the clinical importance definition for PTSD symptom change with clinical importance defined based on both the magnitude of change and the quality and strength of the evidence (International Society for Traumatic Stress Studies, 2019.).

Broadly, treatment approaches for PTSD that involve interventions on cognitive processing are prototypical. The evidence suggests that cognitive-behavioral therapy (CBT) S/SR, or a combination of CBT and psychodynamic therapy IE (i.e., classic “talk” therapy) is effective – findings indicate its effectiveness for first responders specifically as well (Haugen, Evces, & Weiss, 2012). Based on findings that connect PTSD symptom severity to negative appraisals (Kleim et al., 2013), interventions on cognition tend to emphasize elaborating on and integrating memory of the traumatic event into the context of one’s life before and after the event, modifying problematic appraisals, and reducing dysfunctional behavioral and cognitive strategies. The benefit of these interventions is supported by recent research (Lloyd et al.,
Recent work also indicates that CBT administered online or via telephone is effective (Belsher et al., 2015), suggesting online CBT programs may be an effective way to treat first responders with PTSD. Of note, the online CBT program for Canadian public safety personnel (University of Regina, 2018) under development by The University of Regina’s Canadian Institute for Public Safety Research and Treatment might reach more participants, given the ability of web-based interventions to reach more people with lower cost and without the hassle of a commute.

Exposure therapy, which involves incremental, therapist-guided recollection of traumatic memories in a safe environment with concurrent practice of emotion regulation, is another known effective PTSD treatment (Lancaster et al., 2016; Rothbaum & Schwartz, 2002). Treatments using this method include prolonged exposure therapy (McLean, Asnaani, & Foa, 2015; Powers, Halpern, Ferenschak, Gillihan, & Foa, 2010) and eye movement desensitization and reprocessing (EMDR) therapy (Jeffries & Davis, 2013; Shapiro & Maxfield, 2002), both of which have been found to significantly decrease PTSD symptoms (Zalta et al., 2014). Exposure therapy and Cognitive Processing therapy have also been shown to be particularly effective forms of treatment for veterans with PTSD when compared to EMDR and stress management therapy (Haagen, Smid, Knipscheer, & Kleber, 2015).

Therapies tailored to the needs and characteristics of first responders have several features in common. For example, they focus on the importance of making sense of the trauma in the context of one’s job and the rest of one’s life (i.e., “meaning-making”; Haugen, Splaun, Evces, & Weiss, 2013). Additionally, therapy for first responders often begins with psychoeducation — briefly learning about PTSD and psychotherapy. Psychoeducation prepares the participant for treatment and reduces the sense that the participant is alone in having PTSD symptoms (Fay, Kamena, Benner, & Buscho, 2006; Gersons, Carlier, Lamberts, & van der Kolk, 2000).

New Directions in Understanding and Treatment of PTSD: Moral Injury

A large area of recent work on the understanding and treatment of PTSD, thus far focused on military personnel, describes the contribution of moral injury in the development and persistence of symptoms. Moral injury involves, briefly, “perpetrating, failing to prevent, bearing witness to, or learning about acts that transgress deeply held moral beliefs and expectations” (Litz et al., 2009, p. 700). In these incidents, emotional responses might include inappropriate guilt, shame, anger, and alienation.

At the VA Boston Healthcare System, Litz and colleagues address moral injury in military personnel (e.g., Gray et al., 2012; Litz et al., 2009), chiefly focusing on an exposure-based psychosocial intervention called adaptive disclosure. This treatment involves education about moral injury, exposure-based processing of events, examination of self-relevant implications of the traumatic experience, and fostering reparation and self-forgiveness. Adaptive disclosure has been found to be an effective method to reduce PTSD symptomology for US active-duty marines and Navy Corps personnel (Gray et al., 2012; Laifer, Amidon, Lang, & Litz, 2015; Litz et al., 2009).

Whereas most PTSD psychotherapies are administered as hourly sessions once a week over the course of up to sixteen weeks (Gersons et al., 2000), Gray and colleagues (2012) significantly reduced PTSD symptoms with the adaptive disclosure method in six weekly sessions; 90 minutes each. This briefer, although intensive, therapy format may have advantages in accessibility for first responders.

Ontarian researchers and clinicians already approach PTSD in first responders from a moral injury framework. The “Project Trauma Support” (PTS) program (Dentry, Joannou, Besemann, & Kriellaars,
2017) involves immersive treatment that incorporates modalities beyond cognitive processing, to ensure that the damage from the traumatic experience is addressed in a holistic, meaningful way. More research is needed on this and other approaches to moral injury with larger sample sizes, and a control / waitlist group.

Moral injury has the potential to be addressed in a comprehensive treatment approach that fits with first responders’ chronic stress exposure (see Tier 2) – for example, at a PTS residential stay; in the adaptive disclosure 6-week in-person program; and in ongoing CBT online.


Part 3. Biological & Neurological Monitoring of Stress and PTSD

Across a variety of emergency services, there has been a movement of late towards using pattern recognition and analysis technology to monitor first responders for biological and neurological signs of stress. Furthermore, advances in neuroscience, cardiovascular medicine, and bioengineering have converged into a promising new area of research and innovation that seeks to define “digital phenotypes” for stress disorders (Bourla, Mouchabac, & El Hage, 2018).

First, we will describe the outcome variables most commonly used to represent physical and mental stress (“stress indicators”), as well as the research that informs these neurological and biological indicators. From there, we will detail several technologies that use these indicators and outcomes to efficiently and accurately monitor stress. Some of these are already in use among first responders and other professionals, while others are still in the process of pilot-testing and validation. Finally, we describe how biological and neurological feedback can be used to reduce stress symptoms.

Established and Emerging Technologies for Monitoring Stress and Stress Disorders

Recent patents have been published for devices with the potential to biometrically monitor or diagnose stress disorders. Other technologies of this nature are already well-tested in first responder populations and are presently on the market.

Hexoskin® is known as a “smart textile” and consists of a skin-tight vest to be worn underneath one’s uniform while on the job, or underneath one’s clothing while sleeping (Phillips, Beach, Cathey, Lockert & Satterfield, 2017). Hexoskin has sensors that monitor breathing rate, breathing volume, heart rate, and heart rate variability (Phillips et al., 2017). Heart rate variability (HRV) is a well-known biological indicator of stress generally, as well as for PTSD (Khanade & Sasangohar, 2017). Hexoskin has been validated in a variety of different professional populations including firefighters, police officers, and emergency room physicians (Salar, Capanoglu, Sherman, Sesek, & Davis, 2017; Summerfield, 2017; Slamon, Penfil, Nadkarni & Parker, 2018).

Seeking earlier treatment and prevention of PTSD – even before the symptoms fully manifested – Pollard et al. (2015) set out to identify protein biomarkers® through development of a biological assay that could test for PTSD regardless of whether patients were exhibiting clinically significant impairment. Pollard and colleagues (2015) found that lower-than-normal levels of P-11 mRNA or protein are predictive of suicidal PTSD, whereas higher-than-normal levels are associated with non-suicidal PTSD, bipolar, or major depressive disorder (MDD), in a study of suicidal & non-suicidal PTSD patients, and healthy controls. They developed procedures and kits to test for P-11 among other proteins (see Table 3) associated with PTSD and possible suicidality. One important note is that while these proteins were found to be biological predictors of the disorder, the expression of a given gene to code for such proteins may be due to epigenetics as opposed to having been present since birth; directional causation is not being inferred.

Focusing on the exaggerated auditory startle response®, another very specific biological indicator of stress often seen in those with PTSD, Cakmak (2019) designed and patented a tool to capture the extent of the response through eye-blink magnitude. The device is fairly simple, requiring only one electrode sensor to measure eye-blink responses. White noise bursts are administered through headphones to elicit startle eye-blink responses. Cakmak (2019) aims to assess this symptom of PTSD and achieve an inexpensive way of diagnosing PTSD. Limitations of startle measurement for diagnosis include potential
Multimodal PTSD monitoring systems (Rozgic et al., 2014) combining EEG, skin conductance, ECG, speech, and even head motion patterns are merging many of the available biological and neurological monitoring tools. In research validating their approach, Rozgic and colleagues (2014) found that the system demonstrated its PTSD diagnostic capabilities best when participants viewed trauma-relevant stimuli presented as images with a corresponding audio recording (compared to generic positive or relevant stimuli). While this may be a promising diagnostic system, it was difficult for participants with more severe PTSD to view the trauma-relevant stimuli. This is something to keep in mind when implementing such techniques more broadly (i.e., frequency and matters related to follow-up support).

Video-only measurement of heart rate represents a less intrusive mode of biomonitoring employing the Euler video magnification method to observe micro-movements in the skin (Holt, Jones, & Washington, 2016). This enables HRV – one of the most well-recognized predictors of stress and PTSD – to be analyzed via cameras likely to be already present in many workplaces for security purposes. This tool has a substantial drawback: it can only detect micro-movements consistently in light-skinned people (Holt et al., 2016). If this is remedied, this methodology has the potential to be useful in unobtrusively monitoring stress levels in police and correctional officers.

Finally, Kaklauskas et al. (2014) have developed a biometric advisory system for helping people deal with the aftermath of a disaster. The parameters of the system include many of the well-known PTSD predictors (heart rate, skin conductance, skin temperature) as well as blood pressure and pupil dilation. The system matches the biological indicators with user-input self-assessments. These data are tracked graphically and numerically and linked to a medical professional who works with the person to come up with a corresponding plan.

Conclusion: Technologies for Measuring Stress. Technologies such as Hexoskin are already in use by first responders to efficiently monitor their physiological indicators of stress in real time. New, more targeted tools for prevention, diagnosis, and monitoring will soon be made more widely available. These not only predict the presence or absence of a stress disorder, but – in the case of acute post-disaster stress – its intensity and tips for appropriate solutions (Kaklauskas et al., 2014), and – in the case of PTSD – its likelihood of accompanying suicidality (Pollard et al., 2015). Furthermore, systems have been developed which can flag possible PTSD before the symptoms become clinically severe, allowing for preventative action to be taken. The next section describes biofeedback and neurofeedback, types of bio/neuromonitoring that allow people to understand their bodies and brains, usually to prevent symptoms.

Biofeedback and Neurofeedback as Treatment for PTSD

Biofeedback involves receiving information about one’s biological processes in real time and intervening upon those processes indirectly through techniques such as breathing and visualization. Presently, biofeedback can target body temperature, skin conductance, breathing rate, and heart rate (Morina et al., 2012; Polak et al., 2015). It has begun to target – promisingly for PTSD – Heart Rate Variability (HRV) (Wahbeh & Oken, 2013; Pyne et al., 2019; Schuman & Killian, 2019; D’Souza et al.,
Heart rate variability biofeedback has been found to make a difference in PTSD symptoms (when administered either post-deployment or pre-deployment; Pyne et al., 2019). An increasing number of first responder-focused mental health interventions have used biofeedback with beneficial effects either alone or in combination with other therapies (See Table 4).

**Neurofeedback** (NFB)\(^E\), wherein the patient receives information about their own brain waves, can be administered via EEG (electroencephalogram) or by fMRI (functional magnetic resonance imaging). fMRI can target more localized areas in the brain, but EEG is by far more affordable and less risky, predictably.

In one example of a neurofeedback session (there are many forms), a participant might spend a half an hour listening to music with EEG sensors on. During this session, the neurofeedback received might be visual or auditory. The feedback occurs when the brain waves begin to slip into more maladaptive patterns (overly heightened activation, for instance, in the case of anxiety). In active NFB, the person might respond to the feedback with relaxation or slower breathing. In more passive NFB, the process is more immersive, and the video or music conveys the feedback. For example, with the Muse headband (where the EEG sensors are sewn into the headband so that no setup is required) which connects to an iPad app showing an ocean, the ocean appears stormy when the brain is hyperalert. Focusing on calming the ocean can indirectly quiet the neural activity without mental effort (Krigolson, 2017).

Neurofeedback and biofeedback are best used *in conjunction* with therapy as opposed to as an alternative. Psychotherapy is the first-line treatment for PTSD; reflecting with a therapist about what is learned from experiencing agency over one’s symptoms during biofeedback will improve the fit of this modality within the overall treatment plan. However, as biofeedback and neurofeedback devices become more common on the market and less expensive, they may become significantly more affordable than therapy, and thus perhaps something people could use to facilitate stress reduction while on the waitlist for OHIP-covered therapy. Furthermore, biofeedback may prove a valuable initial step for those who have internalized stigmatizing beliefs about going to therapy, who do not feel ready for it, or who do not have the time to do CBT homework. Neurofeedback does not require the same level of time commitment or vulnerability as therapy but has been shown to make a significant difference in PTSD symptoms (van der Kolk et al, 2016; Reiter et al, 2016; Gapen et al., 2016; Neerincx, Kallen, & Brouwer 2010).

**Feasibility of Biological and Neurological Monitoring in Public Safety Personnel**

Advances in biological and neurological monitoring have increased accuracy in measuring stress. Devices such as Hexoskin are already used by first responders to monitor physiological indicators (see Table 3). Other technologies are emerging and becoming much more widely available. For example, the biometric advisory system being developed by Kaklauskas et al. (2014) allows for more targeted prevention by using biological indicators accompanied by user-input self-assessments (see Table 3). However, this type of monitoring requires costly technical infrastructure and is not as mobile as other devices. As neurofeedback and biofeedback devices become more affordable, they may become an option for those looking to supplement standard-of-care treatment and track their biological stress indicators in real time. Developments in biometric monitoring and neurofeedback are promising, yet their applicability to public safety personnel varies depending on the occupational group.

Accessibility in terms of cost is a barrier that is likely to differ across occupational groups and across the *type* of officer within a group. For example, as will be discussed in Tier 2, Ontario firefighters are mostly
volunteers (Ontario’s Ministry of Community Safety and Correctional Services, 2019), and while volunteer firefighters are covered under the amended Workplace Safety and Insurance Act to claim PTSD as a result of their work without prior need for proof, more rural departments will not all be able to provide the same access to more complex and costly technologies. Similarly, corrections facilities tend to be placed outside affluent communities and will likely face more constraints than other groups. The issue of how to make the right tools available to the public safety workers most in need will likely require an understanding that “one size does not fit all.”

Occupation-specific implementation and environmental constraints are also important to consider. Hexoskin has been tested in a variety of occupational groups, including firefighters and police officers and benefits from being worn under clothing. Devices that allow neurofeedback monitoring to be done at home or during a break, such as with the Muse headbands are useful for their portability. However, monitoring that requires a connection to a smartphone or Bluetooth device may not be suitable for first responders who are prohibited from carrying such devices while on duty. Furthermore, not all first responders’ have a “typical” work environment, nor one that may have an appropriate space to engage with mindfulness activities. Ideally, officers should have access to a safe, stressor-free environment, where there is no stigma about using these devices. It is crucial to assess the receptiveness of first responders (survey polling) and feasibility of these technologies (pilot testing) before implementing any of these technologies into a mental health program.
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<td>Pollard et al., 2015</td>
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</tr>
<tr>
<td>EEG analysis</td>
<td>Anxiety</td>
<td>Patients with PTSD; patients with high stress levels; healthy controls</td>
<td>Rozgic et al., 2014</td>
<td>EEG based neurofeedback devices (such as Muse)</td>
</tr>
<tr>
<td></td>
<td>Stress</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>PTSD</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EMGs and facial muscle behaviour</td>
<td>PTSD diagnosis</td>
<td>Nurses who served in Vietnam and witnessed death/violence</td>
<td>Carson et al., 2000</td>
<td>fEMG sensors (commonly used in VR)</td>
</tr>
<tr>
<td>Auditory startle response</td>
<td>PTSD</td>
<td>Patients with PTSD</td>
<td>Camak, 2019</td>
<td>Eyeblink response monitor</td>
</tr>
</tbody>
</table>
Part 4. Clinical Approaches to OSI/PTSD Among Public Safety Personnel

In this section, we summarize the latest research (within the last 10 years) on clinical approaches to addressing PTSD/OSI among first responders and public safety workers. We present Table 4 listing mental health programs demonstrated to be effective internationally. Current research shows that working with public safety personnel on stress-management, building resiliency, improving general well-being, and improving coping skills can effectively help first responders prevent stress injury and rehabilitate after critical incidents. The research describes a range of successful strategies, including relaxation and mindfulness techniques, cognitive restructuring of maladaptive thoughts, biofeedback monitoring, and eclectic approaches that combine modalities.

Measures. Measures serving as stress indicators in these studies include surveys such as the Personal and Organizational Quality Assessment (POQA) Survey (Barrios-Choplin & Atkinson, 1996), the Police Stress Questionnaire (PSQ; McCreary and Thompson, 2006), and the General Health Questionnaire (Banks et al., 1980). Numerous physiological stress indicators are used, such as blood pressure, heart rate, cholesterol levels, and stress hormones in the blood. In addition, researchers examine changes in organizational-level measures of success such as suicide rates and healthcare costs.

Incorporating biological measurement of Heart Rate Variability and Heart Rate Coherence were important techniques in many studies. As one paper expressed, the researchers felt it important to incorporate objective biological methodologies into their stress measurement because of a known tendency for public safety officers to under-report their stress levels (Skogstad, Fjetland, & Ekeberg, 2015). HRV-based biofeedback gives participants a way to react and adjust in real time to objective physical measurements of their stress levels. As this has been shown to be successful and the majority of programs geared towards first responders do not have a biofeedback component, this is an interesting potential growth area for OSI treatment, as discussed in Part 3.

Therapeutic Approaches. Various police and military departments in Canada, the United States, and Europe have begun programs aimed specifically at improving mental health in the workplace and both preventing and alleviating OSIs. These programs are quite diverse when it comes to their approaches. While some used biological methods, others are based in a range of therapeutic methods including general psychoeducation to recognize risk signs, relational psychology, web-based supportive interventions, positive psychology (i.e. a strengths-based, preventative focus), and cognitive behavioral therapy (see Table 4).

Several of the current clinical trials on OSI/PTSD treatment among first responders involve exposure therapy, a technique frequently used to treat PTSD wherein patients are exposed to their trauma stimuli while practicing emotion regulation (see Part 2). This is an active area, where participants underwent image-based exposures, imaginal exposures, audio-taped imaginal exposures, and eventually in-vivo exposures (Difede et al., 2007; Arnetz et al, 2009; Arnetz et al, 2013).

Other techniques have involved mindfulness-based cognitive therapy (MBCT) and mindfulness-based stress reduction (MBSR). Importantly, many of the programs did not use mental illness terminology but rather a strengths-based approach to keep the focus on self-improvement rather than labelling.

Case Example. Promoting resilient officers (Shakespeare-Finch et al., 2014; Shochet et al, 2011) is a program that has so far been implemented among Australian police officers in training to promote
resilience and stress management. The program focuses on building participants' strengths through group sessions on themes like: “Positive self-talk”, “Drawing strength from adversity”, and “Promoting positive relationships”.

_Mindfulness skills_ are integrated into each session. Throughout the program a large focus is on finding solutions that work within the context of officers’ professions. Following seven in-person sessions, there are two online refreshers, including relaxation exercises and reminders of key concepts.

Notable features of this program, given that stigma is typically such a barrier to treatment, is its _lack of medical terminology_ and the fact that it does not differentiate between officers who may be suffering more than others. For everyone involved, the goal is to use a combination of CBT and relational skills to overcome personal barriers and move forward in a positive direction. This program shares with the Ontarian “Project Trauma Support” (described in Part 2) a focus on group support, meaning and values, and healing moral injury (see Table 4).

**Organizational Approaches.** Vicarious Trauma is defined as exposure to traumatic events of others and is identified as an “inevitable occupational challenge for the fields of victims services, emergency medical services, fire services, law enforcement, and other allied professionals,” (Office for Victims of Crime, 2019). A vicarious trauma-informed approach does not simply focus on the aftermath of an extreme incident but on the _accumulation_ of persistent exposure to traumatic events, which is linked with suicide ideation (Chae & Boyle, 2013). This cumulative stress occurs within an organizational context which may have the power to mitigate the effects. Chae & Boyle (2013) mention work-related stress among police officers can be exacerbated by struggles with administrative inefficiency and poor management, finding operational and organizational stressors to be predictors of suicidality. Approaching the issue of first responder mental health in the context of the full organization may seem a daunting task, but researchers have been developing programs to assist in the evaluation of organizational strengths and weaknesses.

**Case example.** The Vicarious Trauma Toolkit (VTT) developed by the U.S. Department of Justice seeks to address both acute and chronic stress as a result of exposure to trauma. The toolkit focuses on organizational strategies for dealing with trauma exposure across five categories:

1. _Employee Empowerment and Work Environment_
2. _Leadership and Mission_
3. _Management and Supervision_
4. _Staff Health and Wellness_
5. _Training and Professional Development._

The toolkit is intended for use by law enforcement, fire services, emergency medical services, and victims’ services organizations. It includes a Vicarious Trauma Organizational Readiness Guide (VT-ORG), which helps organizations determine their current capacities and identify strengths and gaps as vicarious trauma-informed organizations using a standardized tool. Vicarious trauma and organizational approaches to its treatment also inform a variety of peer support programs and crisis hotlines, which will be discussed in more detail in Tier 2.
<table>
<thead>
<tr>
<th>Training Name</th>
<th>Citations</th>
<th>Populations Examined</th>
<th>Core Components</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mindfulness-Based Stress Reduction</td>
<td>Christopher et al., 2016; Johnson et al., 2014; Stanley &amp; Jha, 2009;</td>
<td>US police officers</td>
<td>Mindfulness skills training</td>
<td>Improved cognitive functioning and positive emotions</td>
</tr>
<tr>
<td>Mindfulness-Based Mind Fitness</td>
<td>Kearney et al., 2013; Omid et al., 2013; Anderson et al., 2015</td>
<td>US marines, US veterans</td>
<td>Info &amp; skills that promote stress resilience</td>
<td>Improved heart and breathing rate after a stressful simulation</td>
</tr>
<tr>
<td>Training</td>
<td></td>
<td>Finnish SWAT team police officers</td>
<td>Concrete applications for the operational environment</td>
<td>Decrease in occupational stress, fatigue, burnout, difficulties in emotion regulation</td>
</tr>
<tr>
<td>Imagery-Based Prevention Program</td>
<td>Arble et al., 2017; Arnetz et al., 2009; Arnetz et al., 2013</td>
<td>US police officers in training, Swedish police</td>
<td>Led by senior officers</td>
<td>Better overall physical &amp; mental health</td>
</tr>
<tr>
<td></td>
<td></td>
<td>officers in training, Swedish special forces</td>
<td>Practice relaxation techniques before and after audio exposure to a hypothetical traumatic scenario</td>
<td>More adaptive coping strategies</td>
</tr>
<tr>
<td></td>
<td></td>
<td>officers in training</td>
<td></td>
<td>More reduction in bio-markers of stress after a stressful simulation</td>
</tr>
<tr>
<td>Promoting Resilient Officers (PRO)</td>
<td>Shakespeare-Finch et al., 2014; Shochet et al., 2011</td>
<td>Australian police officers in training</td>
<td>Led by officers with psychological training</td>
<td>Inc. post-traumatic growth</td>
</tr>
<tr>
<td>Program</td>
<td></td>
<td></td>
<td>Strength-focused: does not use the term “mental illness”</td>
<td>No change in PTSD symptoms</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Integrates CBT and interpersonal therapy</td>
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<td></td>
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<td></td>
<td>2-hour weekly sessions over 7 weeks</td>
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<td></td>
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<td></td>
<td>Resilience, stress management, cognitive restructuring</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td>Includes homework between sessions and online refreshers after training</td>
<td></td>
</tr>
<tr>
<td>Together for Life, a Suicide</td>
<td>Mishara &amp; Martin, 2012</td>
<td>Canadian police officers</td>
<td>Training on how to identify &amp; help officers at risk for suicide</td>
<td>Officers reported being more knowledgeable about suicide risk factors &amp; more comfortable</td>
</tr>
<tr>
<td>Prevention Program</td>
<td></td>
<td></td>
<td>Police counseling service</td>
<td>helping an officer at risk</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Telephone hotline</td>
<td>79% dec. in police suicides over 11 years</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Publicity campaign</td>
<td></td>
</tr>
<tr>
<td>Power to Change Performance</td>
<td>McCraty, Atkinson, Lipsenthal, &amp; Arguelles</td>
<td>US correctional officers</td>
<td>Training in emotion self-regulation techniques</td>
<td>Improvements in cardiovascular measures of stress (e.g., blood pressure,</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>5 training modules over two</td>
<td></td>
</tr>
<tr>
<td>Stress and Health Risk Reduction Program</td>
<td>2009</td>
<td>consecutive days</td>
<td>Developed by the Institute of HeartMath</td>
<td>Dec. in psychological distress</td>
</tr>
<tr>
<td>----------------------------------------</td>
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<td>----------------------------------------</td>
<td>-----------------------------</td>
</tr>
<tr>
<td>Coherence Advantage resilience and performance enhancement training</td>
<td>McCratty &amp; Atkinson, 2012</td>
<td>US police officers</td>
<td>Three 4-hour classroom sessions over the course of a month</td>
<td>Developed by the Institute of HeartMath</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Training to promote physical, emotional, spiritual, and mental resilience</td>
<td>Included HRV coherence biofeedback training</td>
</tr>
<tr>
<td>Project Trauma Support (PTS) program</td>
<td>Dentry, Joannou, Besemann, &amp; Kriellaars, 2017</td>
<td>Canadian military/veterans and first responders (police officers, firefighters, paramedics)</td>
<td>Six-day residential course (Tay River Reflections Medical Spa in Perth, Ontario)</td>
<td>Multi-modalities: physical therapy; meditation; group psychotherapy, breath work, art therapy, labyrinth exploration, music therapy, equine assisted learning, and high ropes adventure team building</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Moral injury focus</td>
<td>Ceremony, tradition, values clarification</td>
</tr>
<tr>
<td>Web-Based Scalable Intervention</td>
<td>Brondolo et al., 2017</td>
<td>US medical examiner personnel</td>
<td>Development of a scalable, web-based intervention to dec. symptoms of depression and posttraumatic distress in medical examiners</td>
<td>Self-paced intervention modules tailored to the specific job demands of medical examiners</td>
</tr>
</tbody>
</table>

Note: inc.= increase, dec.=decrease, CBT=cognitive behavioural therapy
Suicide prevention initiatives across occupational first responder groups

Several suicide prevention initiatives addressed to first responder occupation groups, or used by first responder organizations, have responded to the specific needs of this population (see Table 5).

The Columbia Protocol. Involving six direct questions that can be integrated into an organizational or individual intervention plan, The Columbia Protocol gauges a person’s risk of self-harm and establishes their immediate safety (Columbia Lighthouse Project, 2018). The questions are as follows:

1. “Have you wished you were dead or that you could go to sleep and not wake up?
2. Have you actually had thoughts about killing yourself?
   a. If yes:
3. Have you thought about how you might do this?
4. Have you had any intention of acting on these thoughts? *
5. Have you started to work out or worked out the details of how to kill yourself? **

The final question addresses planning, and is always advised:

6. “Have you done anything, started to do anything, or prepared to do anything to end your life? **”

(* A “yes” to these questions indicates high risk).

The protocol includes specific prompts and clarifications to support at-risk persons in responding, and gives specific instructions on how best to help, depending on the severity of the risk (Columbia Lighthouse Project, 2018).

Peer-support. Because of the specificity of stressors to occupations, as well as the fact that affirmation is more meaningful from a peer, occupation-specific services are an invaluable resource. This is especially the case when the stakes are highest: when a first responder is in acute crisis and a danger to themselves. For instance, copline.org is an international mental health hotline for police officers in crisis; it puts strong emphasis on 100% confidentiality, which is vital given the ongoing role of stigma. The line is answered by retired police officers who have been trained in crisis intervention and peer support by mental health professionals. Furthermore, police officers’ families can also call the hotline, whether out of concern for a loved one or due to their own distress relating to their family member’s occupation. This aspect allows for a more holistic type of help given the relational issues that come with such high-risk work (to be discussed further in the next section).

Occupation-specific helplines exist for other professions too (see Table 5). The fire/EMS helpline is run by firefighters and provides crisis support to firefighters, EMTs, and their families. Moreover, the organization “Reviving Responders” (http://www.revivingresponders.com/needhelpnow) keeps a list of different occupation-specific hotlines as well as mental health professionals with specific knowledge of first responders’ work. Some examples of services they reference include: Cop 2 Cop, a hotline answered by retired police officers who have been trained either as peer support workers or as – in some cases – clinical social workers. Another hotline – “Sharing the Load” – is specifically for volunteer firefighters, which is invaluable given the specific set of stressors this group faces (described above).
Table 5.
Suicide Prevention Initiatives

<table>
<thead>
<tr>
<th>Initiative</th>
<th>Target Audience</th>
<th>Core Components</th>
</tr>
</thead>
<tbody>
<tr>
<td>Columbia Protocol</td>
<td>General public</td>
<td>List of six questions to ask those in distress to gauge risk of self harm</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Does not need to be administered by a mental health professional</td>
</tr>
<tr>
<td>Coponline.org (1-800-267-5463)</td>
<td>Police officers</td>
<td>International mental health hotline</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Line is answered by retired police officers trained in crisis intervention</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Family members can also call the hotline for their own mental health, or</td>
</tr>
<tr>
<td></td>
<td></td>
<td>out of concern for a loved one</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Strong emphasis on confidentiality</td>
</tr>
<tr>
<td>Firefighter/EMS Hotline</td>
<td>Firefighters and</td>
<td>Run by firefighters to provide crisis support to other firefighters, EMTs,</td>
</tr>
<tr>
<td>(1-888-731-FIRE) (3473)</td>
<td>EMS</td>
<td>and their families</td>
</tr>
<tr>
<td>Reviving Responders</td>
<td>First Responders</td>
<td>Lists various occupation-specific hotlines</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Provides list of mental health professionals with specific awareness of</td>
</tr>
<tr>
<td></td>
<td></td>
<td>first responders' work</td>
</tr>
<tr>
<td>Cop 2 Cop 1-866-COP-2COP</td>
<td>Police officers</td>
<td>Hotline answered by retired police officers</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Officers are trained as peer support workers or as clinical social workers</td>
</tr>
<tr>
<td>Sharing the Load (1-888-731-3473)</td>
<td>Volunteer firefighters</td>
<td>Caters to specific needs and stressors faced by volunteer firefighters</td>
</tr>
<tr>
<td>Boots on the Ground (1-833-677-2668)</td>
<td>Police officers, firefighters, EMS, and corrections officers in Ontario</td>
<td>Provides confidential peer support available 24/7</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Members answering the phone have received peer support and suicide</td>
</tr>
<tr>
<td></td>
<td></td>
<td>prevention training</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Provides in person peer support 24/7 in the GTA, hopes to expand</td>
</tr>
<tr>
<td></td>
<td></td>
<td>across the province in the future</td>
</tr>
</tbody>
</table>
Part 5. Prevention in Canadian Provinces and Municipalities

In this section, we summarize current OSI/PTSD prevention and treatment efforts in Canada, when possible presenting evidence regarding the efficacy of these efforts.

In April of 2016, the Ontario government passed the Supporting Ontario’s First Responders Act. This Act made two key revisions to the Workplace Safety and Insurance Act:

1. First responders will no longer have to prove their PTSD diagnosis is work-related. [to make it easier for first responders to receive government-funded PTSD treatment.]
2. The Ministry of Labour requires all organizations employing first responders (e.g., municipal fire, police, and emergency services) publish a PTSD prevention plan. [To date, 638 prevention plans have been submitted to the Ministry of Labour.]

Organizations were provided with evidence-based recommendations regarding PTSD prevention plans from several sources to assist them in their writing. For example, “FirstRespondersFirst.ca”, an education website run by Public Services Health and Safety Association (PSHSA) and the Ministry of Labour Ontario provide a number of resources regarding PTSD prevention, including a program framework and a template to be submitted to the Ministry of Labour. Moreover, the Mental Health Commission of Canada (MHCC) provides guidelines for the practice and training of peer support, a key feature in many of the submitted PTSD prevention plans. MHCC has published a “National Standard of Canada for Psychological Health and Safety in the Workplace” along with an online toolkit to help organizations implement this Standard. The Center for Addiction and Mental Health (CAMH) also provides a needs and capacity assessment for organizations working to address PTSD among their employees.

Accordingly, the municipal and provincial PTSD prevention plans for first responders submitted to the Ontario Ministry of Labour are comprehensive and detail many services and programs. Critical Incident Stress Debriefing/Critical Incident Response teams (recommended by Guenthner, 2012) provide psychological debriefings with a mental health professional for persons involved in a “critical incident,” as well as follow-up support and interventions. Peer support teams are made up of trained employees who provide social support to colleagues and help reduce the stigma surrounding mental illness. These plans include general provisions as well, such as increased access to Employee and Family Assistance Programs (EFAP), extended healthcare benefits to cover psychological services, organizational webpages providing mental health resources, and increased availability of chaplain and staff psychologist services.

One limitation of the Supporting Ontario’s First Responders Act is that although organizations are required to submit PTSD prevention plans, there are no mandates for monitoring and evaluating the plans (Ontario First Responders Act, 2016). Hence, most municipalities do not report program evaluations (Toronto Fire Services and Ontario Corrections are exceptions in that they indicate data collection and program evaluation as part of their PTSD prevention plans). Lack of evaluation reporting makes it difficult to understand how to best help municipalities and which municipalities are most effectively utilizing scientific knowledge about OSI/PTSD. There are a few programs that have been evaluated, which we will now describe.

A single-session federal training program called The Working Mind First Responders (TWMFR, formerly known as the Road to Mental Readiness) is being implemented in several municipalities (e.g., Barrie Police Services, Pickering Fire Services, Toronto Fire Services) as well as at the Ontario and Toronto
Police Colleges. The goal of the program is to reduce mental health stigma, and improve work performance, mental health outcomes and resiliency of first responders. Interestingly, the empirical evidence so far (Carleton et al., 2018) suggests the program mainly reduces mental health stigma.

As previously described, peer support teams and crisis-focused psychological intervention programs (e.g., Critical Incident Stress Debriefing/Critical Incident Response teams) are a key feature of many municipal PTSD prevention plans. However, a recent blue paper by Beshai and Carleton (2016) reviewed the literature evaluating these types of programs worldwide and found no clear empirical evidence indicating that these programs either positively or negatively impact mental health outcomes for first responders. The authors stress the need for more scientific evaluation of peer support and psychological intervention programs to improve understanding of the efficacy of such programs. A 2016 report from the federal government’s Standing Committee on Public Safety and National Security also highlighted the importance of conducting empirical research on PTSD treatment and prevention that involves collecting data on the efficacy of mental health programming.

Strathcona County Emergency Services’ (SCES) efforts to promote mental health resiliency and recovery are an example of a municipality seeking out findings from scientific research to create, monitor, and evaluate programming and resources to support the mental health of first responders (SCES, 2017). SCES began by doing a thorough assessment of their current programs and resources. They next developed a list of specific, measurable, and realistic goals, working with academic and scientific collaborators to coordinate evaluation of their proposed programs so that they would have access to peer-reviewed methodology. SCES promoted stigma reduction internally through trainings, promotional materials, and emails educating employees about the importance of mental health care and how to access that care at SCES. They increased employees’ access to evidence-based care by employing a staff psychologist and increasing mental health benefits through Employee and Family Assistance Programming, Disability Management, and increased extended healthcare coverage. SCES also implemented a Peer Support Team and a Critical Incident Stress Management (CISM) Team. Team members received extensive training to facilitate the success of these programs. SCES’ program evaluation results indicate reductions in mental health stigma and increases in help-seeking behavior.

The Montreal Police Service (MPS) aimed to reduce police suicide rates with a well-implemented program – that was also thoroughly evaluated – (Mishara & Martin, 2012) called “Together for Life” in 1996. This program involved training for all units regarding how to identify and help officers at risk for suicide; implementation of a police counseling service; a telephone hotline; and a publicity campaign involving posters, brochures, and newspaper articles.

MPS evaluated this program in 2000-2001 by sending survey packets to all officers. Officers reported feeling more knowledgeable about how to recognize suicide risk and more comfortable approaching and offering support to an officer experiencing mental health difficulties. Officers expressed appreciation for the increased mental health resources. Supervisors who reported intervening with an officer in crisis (43% of supervisors) reported taking steps like making adjustments to the officer’s work load and referring the officer to the police counseling service. In 2008, MPS solicited data from the local coroner’s office regarding the number of police suicides in the 12 years before the program started (1986-1996) and in the 11 years after the program started (1997-2008). MPS found a 79% decrease in police suicides from before the program (14 suicides) to after the program (4 suicides).
TIER 1 CONCLUSION

In Tier 1, we reviewed the background of operational stress injury and PTSD, as well as the current state and future directions for prevention and treatment of OSI/PTSD in first responders. The research indicates that successful support for first responders incorporates sensitivity to the practical dimensions of work/life balance and social support that reduces stigma. Notably, a range of treatment programs have emerged in recent years to address OSI in these ways, using innovative methods, including bio/neuromonitoring, and sometimes mobile devices. The demanding schedules and chronic stressors faced by public safety personnel suggest that treatment incorporating a range of modalities is fitting.

Next, in Tier 2, we examine research on public safety personnel in specific occupations (i.e., firefighters, police, EMS/EMT, corrections, coroners and forensics) that indicates these groups do not necessarily have the same clinical needs. Underpinning these differences are work-related and relational stressors that vary across these occupational groups.
Part 6. Mental Illness and Health Variables Across and Within Occupational Groups

Mental Illness and Health Variables Across Occupational Groups

Sources of Stress Injuries

Critical Incidents. Direct trauma is only one of many factors associated with developing a mental disorder or being seriously distressed (Carleton et al., 2019). Moreover, only a partial association is found between exposure to traumatic events and positive mental illness screenings: not everyone who experiences a traumatic incident develops PTSD. While critical incidents can be a significant source of stress across occupational groups, they might not be the most important sources of stress within these different groups. Critical incident stressors, and how they differ from chronic daily hassles, will be discussed in detail in Part 7.

Operational/Organizational Stress. Other sources of stress play a significant role in the mental health of PSP. For example, highlighting the minimal role of critical incidents for mental health outcomes across civilian and uniformed police officers, rates of mental health disorders for civilian police employees are similar to rates for uniformed police officers who experience many more critical incidents. In addition, even though they see fewer critical incidents, civilian police employees screen higher for anxiety disorders (Carleton et al., 2018). Chronic work-related operational and organizational stressors will be described in Part 7.

Relational Stress. Positive and supportive relationships are wellness variables expected to increase resiliency and lower risk for mental health disorders (Afifi et al., 2016; Meng & D’Arcy, 2012). The association between common-law relationships or marriages and mental health is well-established in the general population (Afifi et al., 2016). Although relationships, by and large, extend many protective effects against mental distress, there is competing evidence regarding how relationships interact with mental health risk factors and further research is warranted (Berger et al., 2007; Berger et al., 2012). In one study suggesting the negative effects of PSP work experiences on their families, loved ones, and colleagues (Ricciardelli et al., 2018), participants described experiencing significant stress as they watched their colleagues attempt to cope with psychological stress. Witnessing this deterioration was described as increasing feelings of hopelessness and fatalistic attitudes (Ricciardelli et al., 2018). Important nuances in the role of relational stressors will be fully described in Part 8.

Age. Rates of positive screens for a potential mental disorder increase with first responders’ age and years of service (Carleton et al., 2018; Geronazzo-Alman et al., 2017): longer-serving PSP may find that resilience is harder to maintain over time.

Gender. It is difficult to study the role of gender in first responder mental health outcomes, as women hold so few of the positions in these careers; e.g., less than a quarter of front-line law positions in Canada (Young Women in Public Safety Internship Program, 2018). Moreover, women are generally more likely to report mental disorders (McLean et al., 2011; Meng & D’arcy, 2012; Romans, Cohen, & Forte, 2011). Thus, inflated numbers for women relative to men might reflect (1) men’s failure to report or (2) women’s accurate reporting. Men’s underreporting seems likely since previous findings indicate male police officers underreport mental illness symptoms to protect their capacity to serve (Berger et al., 2012). Taking these limitations into account, some research indicates slightly higher reporting of mental distress for female first responders. One study showed that 51.7% of the women in a sample of public
safety personnel were screened positively for a recent mental disorder, as compared to only 41% of men PSP (Carleton et al., 2018). Additionally, women working as municipal/provincial police and firefighters were particularly likely to screen positively for a recent mental disorder.

It is thus important to investigate the presence of any distinct systemic variables that disproportionately affect women PSP when designing mental health programs. On the other hand, some meta-analyses indicate that there is no association between gender composition and the prevalence of PTSD in public safety personnel, as the rigorous training and specific selection criteria for PSP could forestall gender-related differences (Berger et al., 2012). Further research is essential for all occupational groups in order to produce evidence-based PTSD prevention programs.

Positive Screenings for Mental Illness Symptoms

As indicated in Tables 1 and 2 of this report, approximately one-fifth of Canadian firefighters, police, correctional staff, and paramedics screen positive for clinically-significant levels of PTSD symptoms in the last twelve months, with concerning proportions particularly in the case of correctional staff and paramedics. With the caveat that the individual occupational groups face very unique demands (see Parts 7 & 8 of this document; Carleton et al., 2019), one study published in the Canadian Journal of Psychiatry in 2018 estimates that the overall frequency of positive screens for mental disorders across PSP is approximately 44.5% (Carleton et al., 2018). This number suggests a range of serious mental health risks for PSP as well; however, it cannot be directly compared to the frequency of diagnosed mental disorders in the general Canadian population, which is about 10.5% (Statistics Canada, 2012). Indeed, differences in sampling and data collection between studies often limits comparison across PSP and the general public; another setback in understanding mental illness risk in relation to the general population is the need for more analyses and clear reporting on the rich, available data that has already been collected.

Substance Abuse, Addiction, and Other Forms of Mental Distress

Substance abuse and addiction are a problematic source of stress injury for many PSP. Substance use might occur as a means of self-medicating the symptoms of untreated trauma, and in some cases, PTSD (Flannery, 2015). When this is the case, the recommended concurrent treatment of substance use and trauma may doubly challenge PSP as they cope with increased intensity of PTSD symptoms and new sobriety (Flannery, 2015). There are individual differences in propensity to struggle with substance abuse which will be discussed in the next sections of this report.

First responders face many other complex forms of mental distress that are not easily summarized here. One report describes an assortment of negative emotions and beliefs – anger, depression, irritability, distrust, seclusion, self-marginalization, low self-esteem, and feelings of worthlessness -- that first responders attribute to a less than robust response from their workplace as far as provisions of adequate mental health care (Ricciardelli et al., 2018).
Mental Illness and Health Variables Within Occupational Groups

Firefighters. Self-reporting of mental disorders for firefighters is low compared to other public safety occupations (c.f., police, next): between 5.1% to 20.2% (Carleton et al., 2018). However, firefighters have been found to exhibit the highest frequencies of alcohol use disorder (AUD) (Carleton et al., 2018; Vargas de Barros, Martins, Saizt, Bastos, & Ronzani, 2013). This pattern suggests norms among firefighters involving the use of alcohol as a coping mechanism for stress and/or explicitly downplaying symptoms of mental illness (Carleton et al., 2018; Flannery, 2015). Some research has found that occupation-specific risk factors for developing mental health disorders for firefighters include personal life challenges, relationship struggles, the aftermath of a callout for suicide death, and fewer years of service (Henderson, Van Hasselt, LeDuc, & Couwels, 2016). Further relational factors that affect firefighters’ ability to cope with stress are explored in Part 8 of this report.

It is important to attend to the differing mental health risks of volunteer firefighters compared to career firefighters, as most of Ontario’s firefighters are volunteers (Ontario’s Ministry of Community Safety and Correctional Services, 2019). A major Canadian study indicates that volunteer firefighters more frequently met the criteria for seasonal affective disorder and some personality disorders; however, they less frequently met criteria for PTSD, AUD, and major depressive disorder (Carleton et al., 2018). This pattern contrasts with that seen in the United States. In the United States, compared to volunteers, full-time firefighters showed lower levels of AUD, while volunteer firefighters exhibited higher levels of depression, post-traumatic stress, and suicidal symptoms (Stanley, Boffa, Hom, Kimbrel, & Joiner, 2017). These volunteers also cited more structural barriers to mental health care, including cost and availability of resources (Stanley et al., 2017). It is crucial to take into account the communities in which full-time and volunteer firefighters work when designing and implementing mental health interventions.

Police. Self-reporting of mental disorders for municipal/local police officers is comparatively low among public safety occupations, from 5.8% to 19.6% (see Tier 1.1.; and Carleton et al., 2018), similar to firefighters. The RCMP has been found to have the lowest frequencies of alcohol use disorder (AUD) when compared to other PSP. Police officers also show some of the lowest prevalence rates for PTSD when compared to other first responders (Berger et al., 2012; Carleton et al., 2018). However, police officers are known to underreport psychological problems compared to other rescuers for fear that they will be judged as unfit to perform their job responsibilities (Berger et al., 2012). These issues are especially problematic given the fact that police officers are at an increased risk for suicidal thoughts and behaviors, in comparison to the general population (Stanley, Hom, & Joiner, 2016).

Lastly, data indicate that municipal/local police, RCMP, and civilian police should be addressed uniquely when creating programs addressing mental health. Municipal/local police may have more access to structural and social support due to regular urban deployment. RCMP members are more likely to be located in isolated or rural areas where access to such support is less feasible (Marmar et al., 2006; Prati & Pietrantoni, 2010). This disparity is especially apparent in Northern and Indigenous communities where isolation and limitations in health and social services are more pronounced (CAMH, 2018).

EMT/EMS. A recent meta-analysis estimated the prevalence rate for PTSD among EMS workers was 11% (5% co-occurring with depression, 15% with anxiety), and 27% for general psychological distress (Petrie et al., 2018). These very high rates (cf., prevalence rates for the general population = 1.1%
(range 0.2 – 3.8%; Yehuda et al., 2015) are consistent with other research demonstrating very high rates of PTSD and an elevated risk for suicidal thoughts and behaviors in emergency medical professionals (Berger et al., 2012; Stanley et al., 2016). This occupational group is exposed to particularly high rates of human suffering for which they report often feeling responsible (Carleton et al., 2018; Johnson & Segesten, 2004). The repeated exposure to traumatic events combined with a causal understanding of the trauma involving personal responsibility may influence the prevalence of PTSD (Carleton et al., 2019; Litz et al., 2009).

Because of the complex and chronic nature of the trauma, trans-diagnostic approaches may be helpful when creating mental health initiatives within the emergency services. For example, services that address the depression, anxiety, and general psychological distress in addition to PTSD may be most appropriate for paramedics (Petrie et al., 2018).

**Corrections.** Correctional officers have been found to report the highest rates of mental disorders among those working in the public safety occupations (54.6 %) (Carleton et al., 2018). It is speculated that one reason for these very high rates is sourced in the populations and environments served by correctional officers. Correctional officers interact with incarcerated populations in environments that are hypothesized to convey a particularly high risk for development of stress injury (Carleton et al., 2018). Additionally, some correctional officers (such as women, black employees, and day & swing shift officers) could face increased vulnerability for PTSD in the corrections environment (James & Todak, 2018).

Correctional officers' organizational stressors (Part 7) and relational stressors (Part 8) will be discussed in detail in subsequent sections of his report. In general, however, research regarding the overall mental health and wellness variables of this population is lacking. This occupational group is suffering severe mental distress and is vital to public safety. Addressing this gap in knowledge will aid in forming an effective mental health support strategy.

**Coroners & Forensics.** The mental health of the occupations including coroners and forensics is a relatively neglected area in the academic literature, compared to the other public safety occupations. One recent study suggests coroners are more at risk for developing PTSD after a critical incident (Flannery & Greenhalgh, 2018). The authors propose that the psychological impact of the incident appeared to be similar, regardless of response tasks executed onsite. However, other evidence has indicated that different job titles matter: more intense mental and physical health symptoms were reported in coroners, along with other groups including investigators, and clerical and administrative staff, after a critical incident (Brondolo et al., 2012).

Most forensic training does not include training to cope with the emotional demands of the profession. Yet, major stressors are encountered, such as anxiety about contamination and interacting with distressed families. Working with distressed family survivors impacted by critical incidents is a known to exacerbate PTSD (Flannery & Greenhalgh, 2018). Just like other first responders, coroners and forensic workers express concern regarding their physical safety and mental health after exposure to potentially traumatic and disturbing events.
Part 7. Work-Related Stressors Within First Responder Occupations

In the following sections, we review two categories of stressors that are common across public safety personnel: major critical incidents and the surprisingly deleterious daily hassles. These are commonly experienced by first responders across occupations. We then discuss duty-related and external stressors unique to occupations as a result of their varied roles and responsibilities.

Critical Incidents. A major duty of first responders across occupations is attending to traumatic and disturbing events. The American Psychology Association (APA) defines a critical incident as an event in which “the person experienced, witnessed, or was confronted with... actual or threatened death or serious injury or a threat to the physical integrity of self or others,” (Liberman et al., 2002).

Critical incidents come in a range of forms. Many studies have identified the intense traumatic effects of attending to particular sorts of critical incidents. For example, critical incidents in which a child is the victim of sexual abuse, violence, or death (either accidental or intentional) and any infant-related incidents are often reported by PSP as the most stress-inducing situations they face (Regembal et al., 2015). Attending the scenes of suicides or other adult fatalities can also induce significant stress, as reported by forensic professionals, police, and firefighters (e.g. Brondolo et al., 2012; Brown & Campbell, 1990; Regambal et al., 2015).

The process of communication with distressed relatives of victims of violence as well as with legal entities is identified in the literature as a significant source of potentially traumatic stress for police, forensics professionals, and coroners (Chae & Boyle, 2013; Coleman et al., 2016; Office for Victims of Crime, 2019). Responding to mass fatalities and major disasters is a separately reported traumatic stressor; the cumulative effect of multiple incidents can predict higher risk of PTSD (Berger et al., 2012; Geronazzao-Alman, 2017; Wilson, 2015).

Furthermore, many PSP face the direct threat of violence or injury, which constitutes a critical incident. Police officers report that arresting a violent person or participating in violent confrontations is a significant source of stress (Brown & Campbell, 1990). Correctional staff similarly fear violence and injury in their physical work environment, which is correlated with symptoms of stress (Armstrong & Griffin, 2004). Emergency medical personnel often face threats, aggression, and violence, which may contribute to emotional exhaustion and high turnover rates within this occupation (Adriaenssens, De Gucht, & Maes, 2015).

Daily Hassles. Everyday occupational stressors, termed “daily hassles,” are more significant contributors to first responder stress and mental well-being than critical traumatic incidents, according to self-report measures (Larsson, 2016; Reynolds & Wagner, 2007). Daily hassles include the stress of shift work (Brown & Campbell, 1990), work-life imbalance (Collins & Gibbs, 2003) and lack of clarity and control on the job (Kop & Euwema, 2001; Regambal et al., 2015).

In general, employees in demanding positions with little control over their work have a higher risk of common mental disorders (Padyab, Backteman-Erlanson, & Brulin, 2016). Concerningly, the perception of a lack of support from those higher up the organizational hierarchy is a challenge expressed by Canadian firefighters, who report a lack of appreciation that contributes to feelings of stress and inadequacy at work (see Part 8; Sommerfield et al., 2017). Other research finds similar dissatisfaction with the support provided by the senior ranks in police officers (Collins & Gibbs, 2003). Police officers are also likely to identify the specific stressor of having to work with a “low level of authority and a high level
of responsibility” (Reynolds & Waggoner, 2007). This feature was prominent in “the most distressing event they experienced at work”: approximately 55% of police reported having little or no control over the event (Regambal et al., 2015). Likewise, emergency room nurses noted that their work conditions tended to change considerably within a short time frame (Adriaenssens et al., 2015). This volatility was significantly related to emotional exhaustion, a key component of burnout (Adriaenssens et al., 2015).

**Work-related Stressors: Firefighters**

**Critical Incidents.** The key responsibilities of firefighters, including suppressing fires, providing medical care, directing rescue efforts, controlling crowds, and recovering bodies, expose firefighters to critical incidents while at work (Del Ben, Scotti, Chen & Fortson, 2006). Firefighters report that witnessing death during these incidents is a significant source of stress, like other public safety officers (Del Ben et al., 2006). In addition to these duties, firefighters also have the responsibility of performing vehicle extrications, medical aid calls, and dealing with hazardous materials, all of which increase exposure to critical incidents at work (Henderson et al., 2016). Furthermore, Beaton and colleagues (1998) found that experiencing a fellow firefighter’s death is significantly distressing for firefighters, who rely on a team-based approach to tackle fires in most structures. Additionally, firefighters rank experiencing an injury themselves – particularly one that brings into question their ability to continue their firefighting career – as extremely stressful (Beaton et al., 1998).

**Daily hassles.** Firefighters report that a number of daily, chronic stressors affect their mental and physical health, including lack of sleep or sleep irregularity as a result of shift work (Duran, Woodhams & Bishop, 2018). Additionally, firefighters report feeling overworked and overwhelmed with the additional duties they must take on, such as educating children. Completing a large amount of paperwork was similarly identified as a daily stressor for most firefighters (Duran et al., 2018).

**External stressors – Public perception.** Firefighters in Canada and the US are generally non-controversially viewed as heroes. However, this is not the case globally. Recently the Grenfell fire, for instance, demonstrated that the public perception can turn on any occupational category – even firefighters are vulnerable to attacks from the media.

In the wake of the Grenfell Tower fire in London where 72 lives were lost, public scrutiny was at a peak. The London Fire Brigade’s evidence was heard at a time of peak public outrage and engagement with the case. Therefore, they received the most intense and hostile scrutiny; some of the vital underlying issues (sources of latent error, e.g., problems with the building’s structure and safety, outdated policy) would be dealt with at the end of the process when the outrage died down (Booth, 2019).

Indeed, one of the primary criticisms upon the London Fire Brigade has been on their use of the “stay put” policy: not evacuating all at once. Some firefighters and officers maintain that a different strategy could have allowed for more expedient evacuation and lives saved (Booth, 2018a, 2018b). The reasoning for the strategy employed was to a) avoid trampling which also ends lives and b) avoid fire spread by opening all doors at once, creating a chimney effect (Sullivan, 2018). Tony Sullivan – a firefighter who responded to the Grenfell fire – argues that not using the ‘stay put’ policy would have resulted in even greater loss of life. Moreover, some stayed put because they had no way of leaving given the conditions.

“There were no means of communicating with residents. There were no means of warning them because there wasn’t an integrated alarm system. If they opened their doors and were confronted
with 400, or 600, degree heat, then no amount of wishful thinking from armchair amateurs would change the conditions.” (Sullivan, 2018).

This disagreement has been a point of contention both between the public and the London Fire Brigade, and between firefighters within the Brigade. The stress not only of critical incidents, but of the undoubtedly necessary yet exhausting inquiries into these tragic incidents is significant.

Finally, negative publicity is not the only way in which public perception has been a stressor for firefighters. After 9/11, firefighters were (understandably) celebrated as epitomizing heroism, much to the discomfort of many firefighters who were only just coming to terms with the trauma they had experienced that day. Freedman (2004) interviewed firefighters in the aftermath of the disaster and the resulting data pointed to the following themes:

“Although the appreciation they received was welcomed, what they regarded as this ‘over-heroized’ state became an additional burden to their already overloaded psychological and emotional state… Having to experience their collective sense of loss on a public stage invaded their intimacy.” (Freedman, 2004).

One firefighter tired of being put on a pedestal summed it up: “That’s your job… We are all better off as human beings” (Freedman, 2004).

Work-related Stressors: Police

Critical Incidents. Police are uniquely placed as first responders because they are exposed to stressors that are endemic to other PSP occupations. For example, their exposure to actual threat of injury or death while at work is much like military personnel, while the frequency at which they assist victims of violence or witness death and injury is much like that of emergency medical service (EMS) workers (Liberman et al., 2012). The most stressful critical incidents experienced by police include the death of a fellow officer in the line of duty, killing someone in the line of duty, and exposure to injured or dead children (Brown & Campbell, 1990; Liberman et al., 2012). One Peel Regional Police Officer addressed the stress from frequent exposure to critical incidents (March 7, 2019) by saying that:

“There comes a time when all of this starts to drag - you realize that you're always seeing the worst parts of humanity, people's problems, you're babysitting adults, dealing with death, dangerous situations, dealing with things most people would prefer to never deal with in their life, on a daily basis.”

Daily hassles. Perhaps surprisingly, routine operational stressors are ranked as more stressful for most officers than critical incidents. This may be because critical incidents are perceived to be a requirement of the job and because of their lower frequency (Liberman et al., 2012). Comparable levels of mental illnesses have been found between civilian police employees and police officers, illustrating the significance of daily hassles as a cause of stress (Carleton et al., 2018).

Routine police duties, such as attending to hoax calls, completing paperwork, and appearing in court are reportedly a significant cause of stress (Tuckey, Winwood, & Dollard, 2012; Brown & Campbell, 1990). Additionally, cumulative routine work exposure has been associated with increased presence of nightmares for police officers, suggesting that exposure to daily stressors as a police officer has a significant effect on sleep quality (Neylan et al., 2002).
Female officers face unique challenges in comparison to their male counterparts, which is “directly attributable to how their gender identity ‘fits’ within the organizational and cultural contexts of policing” (Agocs, Langan, & Sanders, 2015).

As Ontario Provincial Police Association President Rob Jamieson put it recently when responding to after the suicide of within the Ontario Provincial Police force: “We sacrifice ourselves piece by piece in the name of keeping our communities safe” (March, 2019)

Here we will summarize some of the most significant and often reported daily hassles.

- **Shift Work.** Police officers often rank the stress of changing work shifts as one of the most stressful components of their work (Liberman et al., 2002). Police officers working afternoon and night shifts report a higher number of work-related stressors than those working solely during the day (Ma et. al., 2015). This disparity may be attributed to differences in content across shifts, in which those who work later in the day experience more physical/psychological threat while at work (Ma et. al., 2015).
  - Shift work is also particularly stressful for policewomen who are mothers in Ontario, as they often take on most of the burden for scheduling childcare and activities around their shift work (Agocs et al., 2015).

- **Work overload/underload.** Police officers report that they often have little or no control over their workload (Collins & Gibbs, 2003). While some studies emphasize the negative effects of feeling overworked, Kop & Euwema (2001) find that work underload is also a significant cause of stress for many officers.

- **Insufficient resources.** Working in an environment with high demands, insufficient resources, and perceived staff shortages is associated with burnout in police officers (McCarty, Aldirawi, Dewald, & Palacios, 2019).

**External stressors – Public perception.** Police have been facing a crisis in public perception (Nix, Wolfe, & Campbell, 2018), whereby officers in commanding positions, when surveyed, have generally stated that “citizens have become less compliant, more resistant, and more likely to assault police officers over the last two years” (Nix et al., 2018). A central issue, particularly in the United States, has been police brutality against people of colour, specifically, the killing of unarmed black men by police.

Marginalized voices have come to forefront, as have numerous studies and measures of biases and stereotypes. Most famously, studies using measures such as the Implicit Association Test (IAT) show that many people have subconscious implicit negative associations regarding certain groups (Greenwald, 1998). This can be a result of their upbringing in a society in which these groups are still marginalized and stereotyped.

In cognitive psychology, it is often said that one’s *first thought* is a result of one’s upbringing or implicit biases, and one’s *second thought* – the consciously chosen one – reflects who the person really is. The average person might subconsciously believe a certain stereotype but has plenty of opportunity to override it before acting upon it. Police officers are often put in situations where they have to make a split-second decision and there is simply not sufficient time for cognitive reappraisal, or for “second thoughts” to intervene.

This is a complex issue that should be addressed with an eye to nuance, informed by evidence-based techniques from the field of cognitive science as well as by the lived experiences of marginalized people.
and police officers. Vilifying police officers and, in doing so, exacerbating any pre-existing tensions between the police and the community, is arguably a counterproductive approach.

In the context of first responder mental health, the marked deterioration in public perception has had severe effects on the levels of stress involved with policing (Nix et al., 2018; Bayerl & Soynov, 2016). Having to work amidst a suspicion that people believe police officers do not have the public’s best interests at heart adds to the barriers which police officers must overcome in order to do their jobs, both through effects on stress levels and through effects on police-community relations. As an Ontario police psychologist (March 7, 2019) put it,

“There’s a lot of onslaught from the public, the media, and it is vicious, … often completely inaccurate. I keep thinking, how can they take this – how can they handle that in addition to all the exposures they have? And they’re trying to help the same public who is accusing them of all this and not really having much respect.”

Public backlash against the police ultimately does the community at large a disservice, as we recently saw when an Amber Alert notification was sent to the phones of Ontarians late at night on Thursday, February 14, 2019. Hundreds of people, disgruntled at having been awoken by the alarm, opted to call 911 to complain about the inconvenient intrusion. This not only showed contempt for the time-sensitive attempt to locate the missing girl, but also burdened the emergency response system with over 300 frivolous 911 calls. As one police sergeant (March 7, 2019) put it,

“We’ve got armchair quarterbacks and people judging us – the Amber Alert that happened last week, most of the public was supportive of it but some people were annoyed. How have people become so desensitized? And then 3 missing boys this weekend, and everyone was asking why there wasn’t an amber alert. You’re damned if you do, damned if you don’t. You’re constantly criticized.”

What is the solution? To the extent that stereotyping and biases are negatively affecting community relations, implicit bias training may improve matters not only by making it clear to the public that steps are being taken for change to occur at an institutional level, but moreover by getting at the root of the problem. This method of training was recommended by President Obama’s Task Force on 21st Century Policing and has since then been implemented in many cities across the United States (Zapotosky, 2016). A similar training has been made compulsory in Toronto. Recent findings suggest that there is still room for improvement (McCue, 2018; OHRC, 2018). Making implicit bias training mandatory across Ontario rather than just in Toronto may be helpful. Furthermore, cities such as Saskatoon - where relations between police and Aboriginal people have been notoriously strained - have started mandatory Aboriginal awareness training programs for police officers, as well as making a point of hiring more Indigenous officers over the past ten years (McCue, 2018; OHRC, 2018). Furthermore, examining ways in which more dialogue can be opened between police and marginalized communities so as to increase mutual understanding and respect may be a promising avenue. Focus groups and dialogical qualitative research could contribute significantly to opening lines of communication.
Work-related Stressors: EMS/EMT

Critical Incidents. 100% of surveyed EMS/EMT staff report being exposed to traumatic events, which, as reviewed earlier, can have substantial impact on mental health (Donnelly, 2012). Emergency room nurses are frequently exposed to traumatic experiences, such as threat, aggression, and violence at work, in addition to death and suffering (Adriaenssens et al., 2015).

Daily hassles. Emergency staff encounter chronic organizational and operational stressors including tension with colleagues and reduced decision-making control and power. One study of emergency room nurses found surprisingly high turnover rates of up to 36%; researchers cited volatile work conditions, lack of social support, and poor communication as predictors of emergency nurse well-being (Adriaenssens et al., 2015). Emergency staff morale and job satisfaction is also reduced by conflict with supervisors and administration (Beaton et al., 1993). Emergency staff also reported these chronic stressors alongside a variety of other negative outcomes including fatigue, burnout, alcohol use, and PTSS (Donnelly, 2012).

Researchers note that burnout rates among paramedics might not be accurate and might be sourced in their wide scope of responsibility and work with more critical patients, and/or a “healthy worker effect”, where EMT’s suffering from burnout had left their positions and were not surveyed (Crowe et al., 2018). Weekly call volume, certification level, and years of experience were associated with all the dimensions of burnout among both surveyed populations (Crowe et al., 2018).

Work-related Stressors: Correctional Staff

Critical Incidents. Correctional staff include medical staff, officers, and managers. These staff work in a stressful environment with threats of critical incidents, work-related violence, and trauma on the job. One study comparing human services occupations found that while prison and probation service personnel actually reported relatively low frequencies of work-related violence; however, they reported the highest rates of PTSD, as well as the strongest links between work-related violence and PTSD among the examined human services occupations (Andersen et al., 2019). The findings suggest powerful effects from the particular incidents of violence on correctional officers’ mental health. Additionally, critical incidents have been strongly linked to sleep problems among correctional staff, many of whom sleep less than 2 hours between shifts and report constant fatigue (James, Todak, & Best, 2017).

Furthermore, correctional officers face trauma related to the deaths of inmates in their custody. Wright et al. (2006) studied the effect of incidents of self-inflicted death in custody on PTSD in corrections officers and found a PTSD incidence rate of minimally 36.7% among officers who recently dealt with a death in custody. Focusing on corrections officers who did exhibit PTSD, previous experience of suicide was the only mediating variable of the incident’s traumatic impact (Wright et al., 2006). Interestingly, factors otherwise theorized to mediate stress, such as optimism and individual problem-solving style, did not have significant mediating effects in this study (Wright et al., 2006). However, other research has demonstrated that protective factors might reduce the impact of critical incidents on PTSD for corrections officers, including satisfactory job assignments and positive relationships with colleagues and supervisors (James & Todak, 2018).

Daily hassles. Similar to the workplace settings for police, correctional facilities often have strict hierarchies and rigid bureaucracies—combined with intense job demands and perceptions of having little
control over their jobs, this creates many possible sources of stress for correctional staff (Finney et al., 2013; Lambert et al., 2019). In the literature, these issues have been studied under the concept of “job resources”, the lack of which is an important contributor to job stress. Job resources include input in decision making, role clarity, a sense of being effectively trained, and instrumental communication, which entails clarity and transparency about organizational and procedural processes (Lambert et al., 2019). A dearth of role clarity can contribute to a reduced sense of professional worth and, eventually, burnout. Conversely, the presence of job resources can reduce job stress (Finney et al., 2013).

Rank matters as well: correctional officers tend to experience more job stress than their supervisors (Finney et al., 2013). Correctional staff may also be subject to overload of job demands with limited time and resources (Lambert et al., 2019). A 2017 report of the Toronto South Detention Centre found that staff shortages are a significant cause of inmate stress and negatively impact correctional officer morale (CAB Report 2016). Overcrowding of inmates has also been found to lead to increased levels of job stress, impaired performance, and fear of inmates in corrections officers (Martin, Lichtenstein, Jenkot, & Forde, 2012).

Work-related Stressors: Coroners and Forensics

Critical Incidents. Forensic staff and coroners have harrowing jobs working closely with crime scene evidence and deceased bodies, resulting in frequent exposure to critical incidents. One of the most common potentially traumatic events is to interact with accidental infant deaths and young children who are victims of violence (Coleman et al., 2016; van der Ploeg et al., 2003). Among coroners and administrative personnel, a severe source of stress reportedly arises from having to communicate with the distressed family of the deceased after critical incidents (Brondolo et al., 2012; Coleman et al., 2016). Though these interactions are not directly linked to PTS symptoms, they are significantly associated with depressive symptoms, which can lead to PTSD and are often comorbid with PTSD (Flannery & Greenhalgh, 2018). Family interactions can also exacerbate the effect of cumulative traumatic exposure, which has been linked to PTSS (Coleman et al., 2016). An important issue is then a lack of adequate training to carry out these distressing communicative tasks, which can translate to increased psychological distress (Brondolo et al., 2008).

Daily Hassles. Daily stressors for coroners and forensics personnel include significant worries about picking up infectious diseases on the job and bringing them home. This fear is especially prevalent among autopsy workers (Brondolo et al., 2012). Moreover, forensics doctors, in relation to other health professionals, perceive a lack of clarity concerning their job, which has been found to contribute to psychological strain and job stress (Lambert et al., 2019).
Part 8. Relational Stressors Within First Responder Occupations

In addition to the work-related stressors addressed in Part 7, first responders deal with various relational stressors stemming from interactions with (a) society/the public, (b) their organizations, and (c) their families. These ‘invisible’ stressors are important to examine as they contribute to feelings of isolation and are part of issues related to work/life balance, marriage/partnership, community acceptance, and meaning-making. Relational stress in first responders has been examined extensively, but not consistently, across the occupational categories. For example, stress within organizations, stress stemming from external interactions in the community, and stress stemming from familial interactions have received focus to a different extent across firefighters, police, EMS, correctional workers, and in coroners and forensics. The findings available reveal complex stressors and variability among and within occupational groups.

Relational stressors among Firefighters

Organizational/External interactions. Firefighters form very close relationships and strong “brotherhood” bonds with each other. These positive team relations reportedly have a protective effect against work-related stress (Young et al., 2014). However, the tight-knit relationships can also have unexpected consequences on firefighter mental health. Firstly, team conflict was identified as a source of stress for most firefighters (Duran et al., 2018). Furthermore, as firefighter peer groups are so tight-knit, mental health professionals are often perceived as “outsiders” and not trusted (Henderson et al., 2016). This dynamic coupled with firefighter-specific stigmatization of reporting mental health problems could lead to many firefighters avoiding diagnosis and thus treatment. Furthermore, these close interpersonal relationships may be a cause of the high degree of distress faced by firefighters when a co-worker is injured or dies in a duty-related incident. The norms and stigma against mental illness and professional treatment makes instances of peer suicide especially detrimental to each firefighter’s mental health as they feel unable to share their feelings or seek professional help (Henderson et al., 2016).

Firefighters also report that the internal hierarchy of fire departments is a significant source of stress. Some firefighters have reported not feeling valued in their organization, as management is “quick to discipline and slow to praise.” Other firefighters felt that the hierarchical organization of fire departments contributes to their feelings of powerlessness, as captains make decisions for the team and set the tone of the shift (Sommerfield et al., 2017). Issues with lack of role clarity extends to interactions with other first responders. Firefighters often attend emergencies with EMT and report that relations with EMT are a source of friction. Firefighters might feel underutilized in incidents involving ambulance attendants, which stems from a lack of clarity between the distinctions in their roles (Sommerfield et al., 2017).

Dealings with the public during critical incidents can be distressing. One firefighter described how the public often take pictures and videos of emergencies rather than listening to the instructions of firefighters, contributing to a feeling that the public does not respect firefighters’ work (Duran et al., 2018). In the aforementioned firefighter’s words, “They think it’s like we are not doing anything serious or it’s not a serious job, but it is really distracting and disturbing,” (Duran et al., 2018).
**Familial interactions.** Many firefighters identify work-life balance as their most significant source of stress, reporting that they do not have enough time for family or leisure (Duran et al., 2018). One UK firefighter reported that:

“I am unable to make up for holidays and festivals due to my job commitments. I have no time for a social life, honestly. At times, it gets difficult for me to have a balance between my work and my home,” (Duran et al., 2018).

Single participants were more satisfied with their life outside of work, suggesting that firefighters with families may struggle more to cope with concurrently managing different sets of responsibilities.

**Relational stressors among Police**

**Organizational interactions.** As discussed in Part 7 on organizational stressors, police work shares many of the same acute stressors found in medical or military work done on the front lines (Shane, 2010). However, recent studies point to organizational factors having equal if not greater influence on the stress police face (Shane, 2010). The relational factors within organizations are crucial sources of stress: police departments are structured in ways that can inhibit autonomy, flexibility, and employees’ participation in decisions that affect them (Shane, 2010).

However, the camaraderie that often exists between police officers can be a protective factor against accumulation of trauma and stress, given that socially supportive environments play an important role in increasing resilience to traumatic events (Padyab et al., 2016). On the other hand, the tight-knit nature of police culture can also result in harassment from peers and superiors when officers do not conform (CAMH, 2018).

**External interactions.** Being a police officer involves dealing with difficult members of the public while managing the responsibility of legitimate use of force. This duty is reported as a significant of stress. Police officers are expected to solve difficult problems in the community with minimal or no force, adopting a service-oriented approach (Kop & Euwema, 2001). At the same time, police officers have a duty-bound monopoly on the use of force and must occasionally use it in the form of hitting, pushing, or shooting in difficult situations, worsening tensions with communities and ultimately increasing the risk of harm police officers face at work (Kop & Euwema, 2001). It is unsurprising, given the tension between the use of force and accountability to communities, that “troubled conscience” is a common factor associated with depersonalization and emotional exhaustion, the two principal components of burnout (Padyab et al., 2016).

Burnout is also associated with negative mood and negative perceptions of civilians’ actions, which could affect officers’ capacity for problem-solving, as well as making them less tolerant of stressful situations (Kop & Euwema, 2001). Potentially fraught interactions with members of the general public also require police officers to take on varied roles, suppressing or faking emotions based on the social context. The resulting stress from frequent difficult interactions with the general public has been identified as a predictor of burnout in law enforcement officers (McCarty et al., 2019). An Ontario police psychologist (March 7, 2019) discusses such numbing as an indicator of the potential need for intervention:
“When I educate people during my safeguard meetings, I tell them that all emotions are okay but if there is a prolonged period of numbness then come see me because that’s a sign of trouble.”

Police who interact with Indigenous, small town, or rural communities face additional challenges in cases where they are attempting to exercise authority amid higher rates of poverty, crime, mental illness, substance abuse, and family disruption compared to the general population (CAMH, 2018). Communities as a whole can suffer from inadequate or even a complete lack of health and social services, plus administrative and financial challenges can be significant sources of stress because of tripartite agreements funding police services (CAMH, 2018). Working within Indigenous communities requires working in a relational context of mistrust in police that has resulted from a legacy of colonization. As a result, tension in police-community relations can be a significant source of stress for officers. While Indigenous officers may face fewer challenges in promoting cooperation and gaining acceptance, they too might face the challenge of policing their own relatives (CAMH, 2018). Furthermore, officers in Indigenous and rural communities work in relatively isolated circumstances. Officers may be expected to take on multiple roles, travel for long distances, in extreme environmental conditions, and with little or no backup or support (CAMH, 2018).

**Familial interactions.** The demands of police work on home life are frequently cited as a source of stress (Collins & Gibbs, 2003). For instance, some officers report facing difficulties establishing a life outside of the job or finding time to manage life outside of work; these challenges were associated with higher rates of burnout (McCarty et al., 2019). Physical exhaustion in male police officers can make it more physiologically taxing to interact with their spouses and resolve marital conflicts. Moreover, job stress can be harmful to marital relations in that it may cause greater emotional distance and disconnectedness, factors which are associated with marital distress and dissolution (Roberts & Levenson, 2001). An Ontario police psychologist (March 7, 2019) described a way in which this stressor can manifest particularly for male police officers:

*“Male officers tell me their female spouses are mad at them because they don’t talk about things. One of them was blaming himself because his relationship ended – but I told him, you were taught to guard your emotions and not show them, because you can’t on the job, and now you’re getting blamed for that.”*

Policewomen, on the other hand, report carrying the “lion’s share” of the domestic labour, such as cooking, cleaning, finances, child care, and scheduling. As a result, policewomen who are mothers report managing the burden of domestic responsibilities rather than spending time with their children on their days off, which is a significant source of stress and emotional exhaustion (Agocs, Langan, & Sanders, 2015). Interestingly, even when both spouses are police officers of the same rank and pay, policewomen reported taking a greater share of the household duties and feeling a correspondingly heightened level of stress. This demonstrates the gendered nature of stressors related to work-life balance experienced by police officers (Agocs, Langan, & Sanders, 2015). Working as a police officer also influences parenting, as the identities of being a mother and a police officer are often presented as incompatible (Agocs, Langan, & Sanders, 2015).
Relational stressors among EMS/EMT

Organizational / External interactions. EMS/EMT are required to provide intense emotional labour when dealing with the injured people (Blau et al., 2012). Specifically, "surface acting", or the act of expressing emotions on the surface without actually feeling these emotions (i.e. such as expressing sympathy when one does not believe it is deserved) requires emotional labour to suppress actual feelings. This was found to negatively impact self-reported health and job satisfaction, as well as significantly contribute to work exhaustion (Blau et al., 2012).

Paramedics report their day-to-day interactions with physicians and nurses to be a significant stressor (Bowron & Todd, 1999). Some reported conflict with administration resulting in decreased work morale (Beaton & Murphy, 1993) and a lack of social support and communication within one’s immediate team (Adriaenssens et al, 2015). Some paramedics reported instances of social harassment from colleagues, which in many cases played a substantial role in burnout (Adriaenssens et al, 2015). Furthermore, a wide array of studies shows that paramedics experience violence from patients and others on a regular basis (Holland, 2008). This type of incident is so common in fact that many paramedics accept it as “a part of the job”, albeit one which they admit elicits feelings of anger and irritation -- a considerable stressor when considering it is added onto an already extremely stressful set of responsibilities (Holland, 2008).

Familial Interactions. A study of 89 couples each including a paramedic showed that paramedics often face difficulties shedding their work stress once at home; due to the incident-packed nature of their jobs, they are prone to ruminating on work-related worry (King, 2013). These findings were consistent with previous research showing that paramedics’ rumination increased tension within their romantic relationship only insofar as the paramedic’s spouse responded by withdrawing -- in short, withdrawal was an important moderating factor (DeLongis et al., 2010). The author discussed the support his findings provide for the importance of collaborative coping:

“The withdrawal of one’s spouse may allow rumination to continue uninterrupted, worsening as a result [...] When they withdrew less, however, their partners’ rumination had no significant impact on their marital tension. Again, the value of a collaborative response to stress is bolstered.” (King, 2013).

Relational Stressors Among Correctional Officers

Organizational interactions. Similar to other public safety occupations, organizational stressors are deleterious to psychological well-being for correctional officers. In Quebec, correctional officers reported increased psychological distress when colleague support was low and harassment and intimidation occurred at work (Bourbonnais, Jauvin, Dussault, & Vézina, 2007). Among Dutch prison workers, harassment and unwanted sexual attention was associated with PTSD for certain correctional officer personality profiles (Bogaerts et al., 2012). In another study, while correctional officers were more stressed than administrative staff on site, the most stressful factors were not related to their specific job characteristics but rather to “daily hassles” (see Part 7) including overload, low pay, and conflict with superiors (Keinan & Maslach-Pines, 2007). Overall, relational stressors among co-workers are a notable source of psychological distress in this public safety occupational group.
Traumatic or violent interactions with inmates are also linked to PTSD among correctional officers (Boudoukh et al., 2013). Variables that increased the likelihood of PTSD among correctional staff include high levels of stress and emotional exhaustion, which are characteristics of burnout (Boudoukh et al., 2013). A possible relational mechanism driving the link between burnout and PTSD that has been theorized as follows: inmates take out grievances and frustrations on correctional staff and correctional staff become emotionally exhausted. This, coupled with operational stressors and friction in the workplace, develops into burnout, which saps psychological resources and makes traumatic events more injurious and increases the risk of PTSD (Boudoukh et al., 2013). This burnout-PTSD link is further supported by studies on parole and probation officers. Officers with larger caseloads (more supervisees who have mental health issues themselves) experience higher levels of depressive symptoms (Gayman, Powell, & Bradley, 2018). These symptoms were explained by their level of emotional exhaustion (Gayman et al., 2018).

**Family Relations.** Work-family conflict occurs when the one’s role in their family and their workplace are somehow incompatible (Lambert et al., 2006; Obidoa et al., 2011). For many correctional personnel, work/family conflict can affect job stress and job satisfaction. For example, when strain from work causes friction at home, this friction becomes a new job stress (Lambert et al., 2006). Interviews with prison officers and their spouses reveal that officers find it difficult to step out of their job, even at home. The officer adapts to become a more cautious and routinised person (Crawley, 2002).

One officer expressed, “[my] wife says I’ve changed for the worse - that the job’s made me more suspicious” and another, “[you] become pre-occupied with routines. Routines are drilled into you at training. I never used to be always on at the kids before [I transferred from administration to discipline grades]” (Crawley, 2002, 283).

**Relational Stressors Among Coroners**

**Organizational /External interactions.** Studies conducted with Australian coroners reveal a certain necessary mindset of resilience, impartiality, and disassociation conceivably required to deal with the stress and potential traumatizing aspects of the job (Trabsky & Baron, 2016). In some cases, coroners may be implicated by others, which can be an emotional and stressful situation (Tait, Carpenter, Quadrelli, & Barnes, 2016). Coroners must walk an uncomfortable line between unemotionality when making decisions and accurately perceiving emotional reactions from others (Tait et al., 2016). It is unclear in these studies if this difficult emotional management definitively leads to psychological stress; however, this is an interesting area for future research.

When dealing with bereaved families, coroners have to deliver information in the worst possible context. Many coroners are not trained in how to tactfully handle these difficult conversations (Riches, 1998; Emery, 1972; Matthews et al., 2016). To add to this, they are often perceived negatively from the outset due to what the nature of their work entails; an autopsy involves mutilation, delays funeral arrangements, and in some cases, interferes with religious tradition (Brown, 1990). Many family members believe the deceased has suffered enough and that nothing good can come of the investigation since they are already dead (Brown, 1990). In cases of murder, coroners are sometimes accused of being overly
evidence-oriented and lacking sensitivity, particularly in limiting parents’ access to the bodies of murdered children (Riches, 1998). In one case the parent

“... felt that her son had been de-personalized. His social status had been transformed from that of person into ‘a body of evidence’. Apart from her inability to get close to him, she also felt humiliated by the police and court officers, which appeared to relegate her to a marginal relationship with him” (Riches, 1998).

Other parents have expressed a desire for coroners to pick up on unspoken cues regarding wishes they felt unable to articulate surrounding access to and care of their child’s body. This exceeds the training of a coroner. Perhaps unsurprisingly, a growing sentiment among coroners is that they increasingly walk a line between serving an administrative role and a therapeutic one (Tait & Carpenter, 2013). A study involving semi-structured interviews with coroners found that many reported experiences such as the following:

“I often engage the family and will say, ‘I’m thinking along these lines. What’s your view?’ Sometimes if you carry the families with you, it’s more cathartic - it’s totally wrong, but it’s a more cathartic experience for them” (Tait & Carpenter, 2013).

Other coroners similarly indicated a focus on helping families gain understanding, closure, and an ability to move on (Tait & Carpenter, 2013). This is a significant emotional burden for coroners to take on, not only because they are not trained as grief counsellors but because sometimes making the proceedings easy on the family poses a conflict of interest; a particularly contentious issue arises in the case of suicide (Biddle, 2003). A coroner’s inquest into such an event is draining and traumatizing for the bereaved, especially when gruesome and disturbing evidence is involved. Tait and Carpenter (2013) discuss how “coroners are often placed under significant pressure throughout the proceedings by the deceased’s family not to bring in a finding of suicide.”

Furthermore, even in situations where the cause of death is clearly suicide, the family sometimes expect or hope that the inquest will result in “a meaningful and acceptable account of the death” (Biddle, 2003), and are frustrated with the coroners when – as in many cases – no such meaningful narrative emerges.

The above-mentioned pressures on coroners, and the possibility that they may result in an underreporting of suicides, have serious epidemiological implications. As such, coroners and statisticians often find themselves at odds within academic debates (Tait & Carpenter, 2013; Harrison et al., 2009; Walker, Chen, & Madden, 2008). Moreover, coroners and forensics workers differ on professional perspective. Namely, coroners are guided by the legal aspects of the situation; forensic workers are more scientifically-oriented (Neuilly, 2013). More research should be conducted examining issues of professional identity for coroners, the competing pressures they face from the public and from their profession, and how these interactions may affect their stress levels.
Part 9. Resilience and Meaning

Meaning is a common theme in discussions of resilience factors and coping strategies for trauma (Southwick & Charney, 2012; Burnett & Wahl, 2015). Before discussing it in detail, however, a few distinctions must be made. Firstly, there is a difference between finding personal meaning and fixating with too much specificity on making sense of the senseless. For example, literature on grief (i.e. Mancini & Bonanno, 2006) discusses the highly maladaptive nature of excessive focus on finding meaning in a traumatic death. Secondly, meaning-making will be discussed as a protective factor against a variety of types of stressors, and the specifics of its role will vary depending on the nature of the stressor. The main types of stressors for first responders identified throughout Tier 2 include critical incidents, daily hassles, and relational stressors. Accordingly, we will discuss meaning in relation to each of these categories.

Meaning and daily hassles

Exhaustion stemming from daily hassles can be a barrier to a sense of purpose and to feelings of resilience. In emergency room nurses, the cumulative effects of feeling compassion for patients can trigger compassion fatigue, in which they are unable to process the emotions associated with traumatic events and begin to experience difficulty feeling empathy (Schmidt & Haglund, 2017). Resilience is an important moderator of compassion fatigue. Resilient people tend to develop secure attachments with others, effectively engage in the support of others, and demonstrate their commitment; additionally, resilient people are both more likely to view stressors as opportunities and tend to recognize their personal limitations (Schmidt & Haglund, 2017). Moreover, a study on caregivers found that a sense of meaning (i.e. positive beliefs about caregiving and the self as a caregiver) was significantly related to depression and self-esteem scores (Noonan & Tennstedt, 1997). This suggests that promoting opportunities to find meaning or make sense of an experience is important for promoting psychological well-being in workers routinely exposed to difficult situations (Phelps et. al., 2009). The factors connecting meaning to resilience indicate links to a range of beliefs about the self and others, and also about the mission. An Ontario police psychologist (March 7, 2019) elaborates:

“One of the most important factors that our research tells us about in resiliency is meaning… when police officers in particular lose their faith in what they’re doing, the meaning of it all, that’s when they have the most serious crisis. That’s the most serious crisis.”

There is a paucity of research into the specifics on the relationship between meaning, resilience, and daily hassles among first responders, specifically. However, a detailed statistical analysis of this among other factors in a sample of older adults in the general population showed a variety of relevant interactions (Gyorgy, 2015).

- When included in the model, a sense of meaning of life and satisfaction with life explained the variance in levels of suicidality not already been explained by common suicide risk factors;
- A sense of meaning of life was associated with lower depression scores;
- Even when risk factors and depression levels were controlled for, satisfaction with life and meaning in life were significantly negatively correlated with thoughts of suicide.

The authors theorize:
“These findings suggest that even though an individual may possess one or more risk factors and experience an accumulation of daily hassles, one might draw upon multiple internal sources of resilience including meaning in life and life satisfaction, to help prevent or alleviate thoughts of suicide” (Gyorgy, 2015).

Replicating this study in a first responder population would provide useful information upon which to base strategies for mitigating the effects of daily hassles on first responder quality of life.

**Meaning and critical incidents**

Most research on meaning-making focusing on first responders concerns resilience in the face of critical incidents, including natural disasters, warfare, and terror attacks. For instance, Freedman (2004) conducted 900 pages’ worth of qualitative interviews with first responders in the aftermath of 9/11. Extending a well-known theory of PTSD that posits that avoidance of trauma-related stimuli reinforces its disturbing nature by preventing the patient from establishing new, non-threatening associations (see Tier 1 for further discussion of models of PTSD), Freedman’s demonstrated how avoidance had implications for meaning as well.

Suppression of traumatic memories – “a person’s use of a self-protective, ‘cotton-wool’ type of defense”, Freedman proposed, not only delays the development of new associations with the threatening stimuli but delays the incorporation of the event into the patient’s meaningful narrative, thus promoting further suffering (2004). This is currently an uncontroversial perspective on recovery after traumatic incidents in a variety of therapeutic approaches. A fire chaplain trained in counseling described the role of meaning in resilience and recovery, as part of an individualized process:

“It really has to do with whether people can attach meaning to what happened – not necessarily control but meaning. If they can make meaning of this, that is really spiritual work, not from the pulpit, but from within themselves.” (Freedman, 2004).

**Meaning and relational stressors**

Moving beyond the individual first responder, restorative meaning is also viewed as something that must be co-constructed at some level. For example, the idea of restorative rhetoric in crisis response emphasizes the importance of meaning-making for resilience at a community level.

“People in a state of crisis and anxiety are in need of discourse that can help them make sense of the horror and chaos at hand, and that can also lessen the trauma” (Hyde, 2005).

Researchers have used the example of Hurricane Katrina to illustrate how a dialogical approach to resilience-building is all the more important in situations where the casualties occurred within a specific social context and disproportionately affected marginalized groups. They emphasized the need for leadership in times of distress and the complex interpersonal component essential to this way of building resilience:

“Restorative rhetoric shifts post-crisis communication from reducing the offensiveness of the occurrence and maintaining a positive image, to facilitating dialogue between the public and crisis leaders, and helping victims and the general public to make sense of the crisis event” (Griffin-Padgett & Allison, 2010).
The authors further describe their model of crisis sense-making as vitally being dynamic, transactive and nonlinear (Griffin-Padgett & Allison, 2010). While this may not seem to be directly related to first responder resilience per se, in light of the complexity of relational stressors first responders face and the depth of their effects on the responders’ wellbeing (Part 8), this dialogical take on building resilience appears a promising investment.

An Ontario police staff-sergeant interviewed (March 7, 2019) shared that an important factor in her resilience was maintaining her ability to see meaning in the small things – in daily interactions. Whether she could make a difference in the life of a member of the public or in the life of a colleague who was struggling, she explained, “... it’s about being relentless, making some small difference every day and that’s where I get my satisfaction.”

Strong interpersonal relationships outside of the profession can also contribute to a sense of meaning for first responders and improve resilience to stressors. Certainly, first responders often benefit from tight social circles as a result of shared crisis experiences with their colleagues, which contribute to a sense of purpose in the work. While first responders are often perceived as hero-like or beyond human, in reality, people working in these occupations must also continually find meaning in their role beyond their occupation. One first responder said that, “a positive, loving environment at home,” is a significant source of resilience and strength to face challenges at work (Crowe et al., 2017). A former paramedic from Calgary cared for horses to manage her PTSD, saying that, “it gave me a sense of purpose because they were relying on me to get up and look after them… so they also gave me a safe place to be myself,” (quoted in Rieger, 2019).

We have found that the resilience and strength afforded by the practice of pursuing meaning-making is best summed up by the Ontario police staff-sergeant interviewed for this report (March 7, 2019). She explained, with her characteristically balanced perspective:

“I have no regrets, because you get so bummed out, frustrated, so many challenges, but when you get to the end of your career you look back and go, wow, it was so worth it, I wouldn’t trade any of that – it was worth all the laughter, the crying, the stress, and the friendships you develop. You gain another family when you become a police officer.”
CONCLUSION

The findings of this review suggest that there is a need and a rich potential for innovative approaches to improve the health and well-being of Canadian first responders. First, incorporation of biological and neurological monitoring of stress indicators into clinical treatment plans has the potential to greatly increase measurement accuracy. Second, ensuring that finer-grained differences between occupational groups, as reported here, are taken into account during development of prevention, treatment, and resilience support programs will increase the effectiveness and significance of these programs.

The evidence indicates that, by and large, first responders are strongly affected by the chronic nature of stressors that comprise their essential job duties, not only by critical incidents. Promising approaches for preventing stress injuries in Canadian first responders broadly involve enabling regular self-monitoring of bodily stress signals, and promotion of resilience through peer and organizational supports that let first responders continually find meaning in the extraordinary things they do every day.
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