Research on Occupational Stress Injury

Among Public Safety Personnel

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Purpose

- To provide an overview of key findings from research conducted on occupational stress injury among public safety personnel.

Why this Matters

The well-being of Ontario's public safety personnel, the people who ensure the safety and security of our communities, is paramount. Occupational stress injuries are tremendously harmful and disruptive to individuals, families, the workplace and communities.

"When someone is suffering from post-traumatic stress disorder, not just one person is impacted. If you throw a rock into the water, you have this big ripple effect. Often you see that in people who are suffering from post-traumatic stress disorder; it affects their wife, their children, or whoever that happens to be"
(Healthy Minds, Safe Communities).

Definitions

Public safety personnel (PSP): a term that broadly encompasses front-line personnel who ensure the safety and security of Canadians across all jurisdictions (Public Safety Canada, 2019).

The terminology used to describe mental health struggles is important as certain terms can perpetuate stigma. Therefore, avoid mental illness terminology and use strengths-based terminology that focuses on self-improvement (Niemi and Leone, 2019).

Occupational Stress Injury (OSI): any persistent psychological difficulty experienced as a result of operational duties including but not limited to depression, anxiety, addictions, chronic pain and post-traumatic stress disorder (CIPSRT, 2018)*.

Post-Traumatic Stress Injuries (PTSI): is a non-clinical term encompassing a range of mental health injuries, including PTSD, anxiety and depression (Public Safety Canada, 2019).

Post Traumatic Stress Disorder (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. Symptoms include recurrent, involuntary memories, avoiding reminders of the trauma, changes in cognition and mood and changes in arousal (e.g., sleeping difficulties) and reactivity (e.g., hypervigilance).

Cognitive Behaviour Therapy (CBT): a form of psychotherapy that includes techniques that aim to help individuals by addressing and changing their thoughts, beliefs and/or behaviour (ISTSS, 2018).

Psychoeducation: learning about mental disorders (such as PTSD) and psychotherapy; prepares the participant for treatment and reduces sense of aloneness (Niemi and Leone, 2019).

Exposure Therapy: involves incremental, therapist-guided recollection of traumatic memories in a safe environment with concurrent practice of emotion regulation (Niemi and Leone, 2019).

*While CIPSRT uses the term "Operational Stress Injury", this research uses the term "Occupational Stress Injury".

Acronyms

CBT – Cognitive Behaviour Therapy
CFS – Centre for Forensic Science
CIHR – Canadian Institute for Health Research
EMDR – Eye Movement Desensitisation and Reprocessing
ISTSS – International Society for Traumatic Stress Studies
MHCC – Mental Health Commission of Canada
MMA – Mobile Medical Application
OCC – Office of the Chief Coroner
OFM – Office of the Fire Marshal
OFPS – Ontario Forensic Pathology Science
OMP – Ontario Municipal Police
OPP – Ontario Provincial Police
OSI – Occupational Stress Injury
PSP – Public Safety Personnel
PS – Peer Supporter
PTSD – Post-Traumatic Stress Disorder
PTSI – Post-Traumatic Stress Injury

Executive Summary

Research on occupational stress injury among Canadian military personnel became an area of focus in the 2000s due to extremely high rates of mental illness and stress injury among veterans (Niemi and Leone, 2019). Comparatively, research on OSI among public safety personnel is a relatively new area of study with few conclusive answers. Even less mature is the evaluation of tools, programs and supports that can effectively be leveraged to support public safety personnel and their organizations in improving mental health outcomes.

In addition to the 4 research projects undertaken by the Ministry of the Solicitor General, other seminal research papers were considered to better understand the issue and its impacts on public safety personnel.

Key findings include:

- Stress is complex and direct trauma is only one of several factors that contribute to the development of an OSI; other factors include operational stress related to everyday routine and relational stress including relationships with the general public.
- Correctional officers, police officers, firefighters, fire investigators, coroners and forensic pathologists/scientists experience stressors that are common across occupations, as well as stressors unique to each profession.
- A small number of treatments (such as cognitive behaviour therapy) are known to effectively treat OSIs. Limited evidence is available on the effectiveness of most programs and tools.
- Prevention and resiliency oriented programs and tools are never a replacement for face-to-face counselling with a medical professional.
- Programs and tools that appear to be promising in preventing OSIs (but have not yet been conclusively shown to have a positive impact) include peer support programs, online cognitive behaviour therapy, mobile medical applications and neurological monitoring.
- Treating OSIs is costly; studying whether early treatment is more cost effective would be beneficial.
- As we continue to advance our understanding of the causes of and treatments for OSI we are hampered by the lack of mental health and addictions data available.

Building a better understanding of the optimal use of resources to prevent and treat OSI is critically important to delivering a cost-effective system that adapts to individuals needs.

Context

Public safety personnel (PSP), including police officers, coroners, forensic pathologists, fire investigators, forensic scientists and correctional officers, are routinely exposed to a wide range of potentially traumatic events as a function of the jobs they do to protect and serve the community*. Research has shown that PSP are at significantly higher risk for screening positive for mental disorders such as anxiety, depression, and post-traumatic stress disorder (PTSD) than broader society (Carleton et al., 2017). These disorders incurred during operational duties are also known as occupational stress injuries (OSIs).

Under the Mental Health and Addictions Strategy, a multi-year federal-provincial agreement, funding was provided to the Ministry of the Solicitor General in 2018 to build on the existing evidence-base to better understand what programs/supports frontline public safety personnel (police, coroners, forensic pathologists, forensic scientists, correctional employees and fire investigators) need to prevent and address traumatic mental stress incidents and PTSD.

Working with ministry staff and academics, the Research, Analytics and Innovation Branch developed an OSI research strategy and oversaw the development of 4 research papers that will contribute to an emerging knowledge base. These papers, along with others, support the Ministry's efforts to shed light on and undertake work to better support PSPs. The points of intervention are central to the research and ensure that supports are applied at the right time for the organization and the individual:

Prevention

Interventions that prepare personnel to cope with stress and advance the development of mental health and addictions standards.

Resilience

Interventions that increase individual resilience by strengthening coping abilities and reducing barriers to treatment.

Rehabilitation

Interventions that are adaptive and support the rehabilitation of injured personnel.

Both research undertaken by the ministry and other seminal works has been organized into 3 sections to facilitate knowledge translation.

*Relevant to the work of the Ontario Ministry of the Solicitor General.

Lived Experience

"My family took a lot of the brunt of my anger and of my sicknesses… Any of my anger or discomfort, I would yell at them, I would blame my wife for everything… The mental stress I had downloaded on my family. They had to carry me and they took the brunt of all my behaviors [at home] and then I would go to work, I put the uniform on and put on a show and made it look like I was okay and continue and make sure no one knew"
(Marin, 2012).

"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"
(Niemi and Leone, 2019).

"When something traumatic happens at an institution, there's quite often the sense of 'I need to be strong. I can't tell anybody what I'm feeling at nighttime or when I'm home with my family'"
(Sol Gen OSI Bulletin Special Issue, 2019).

"I truly enjoy my job, however, I did not realize how isolating it can feel to hear intimate details about someone's life and not be able to share them with those to whom I'm closest…I did not realize how frightening it would be to be verbally assaulted by a client time and time again over the phone and then to have him physically and verbally assault me in a location where I should have been safe…I did not expect to find dark humour in situations that most would be disgusted with, and then question my morals as a result"
(Sol Gen OSI Bulletin Special Issue, 2019).

"The spouse of an officer on leave for PTSD had to resort to anti-depressants to cope with what her husband was going through. Another said living with her husband "was like going from chaos, to insanity to craziness. That whole summer, you just never knew from one minute to the other what was going to happen"
(Marin, 2012).

Calls for Action – The Cost of Trauma

Occupational stress injuries are tremendously expensive and disruptive to the workplace, individuals, families, and communities. From the Ontario Government's (the payer) perspective, the costs of an OSI include:

Direct Costs

Healthcare (including professional services provided by a health care practitioner, services provided by or at hospitals and health facilities, drugs and extraordinary transportation costs to obtain health care) and payment of compensation.

Indirect Costs

Lost productivity due to presenteeism (unwell while at work) and absenteeism, the cost of backfilling a position and the cost of increased stress and sick leave within the PSP's closest work colleagues.

Example

In a small city like Kingston, Ontario, one firefighter* who is off work with PTSD may attend an 8 week residential program costing about $40,000 (considered the direct cost). However, when indirect costs are considered, such as the cost of backfilling the position, the annual cost to the workplace alone is approximately $380,000 (Cramm et al., 2019).

It should be noted that there are additional costs that are burdensome to society which are not considered in the payer perspective. These include:

- Lost income arising from patients' inability to work
- Increased child care costs associated with treatment
- Decreased spousal employment to allow for caregiving

*Though firefighters are not under ministry jurisdiction, this cost analysis is referenced because of its' relevance and the lack of cost analysis for other occupations.

When to Invest

Points of Intervention:

State of PSP:

Feeling Well	Feeling Off	Crisis Situation/ Off-work
Volunteer run peer support programs or free mobile medical applications.	An hour of counselling treatment per week for 16 wks (Niemi and Leone, 2019) - $800 to $3,840	8 week residential treatment program - $40,000

Different programs/tools target PSP at different points of wellness. It is possible that investing in programs/tools that promote prevention or resilience against OSIs could support the minimization of costs associated with OSI, and could prevent suffering.

Refer to Appendix A for additional information on WSIB legislation.
Source: (Cramm et al., 2019).

Ministry of the Solicitor General Research Undertaken

These papers, funded under the Mental Health and Addictions Strategy, build a more robust evidence base that will support decision makers and address gaps in the literature, such as an analysis of challenges concerning the measurement of OSI and common/unique stressors across occupations. Through ongoing discussions with researchers as well as ministry experts, other seminal research has been gathered and included in this synthesis.

Interventions for the Prevention and Management of OSI in First Responders: An Overview of Reviews
Lead Researcher: Andrea Tricco, St. Michael's Hospital
- An overview of the academic literature regarding existing prevention and management interventions of OSI in PSP.

An Exploratory Assessment on Mobile Health and First Responder Peer Support Networks
Lead Researcher: Flora Matheson, St. Michael's Hospital
- An exploratory assessment of prevailing technological tools and peer support strategies that may be of value to PSP in the prevention, intervention and treatment of OSIs.

Scoping Analysis for the Development of an Evidence Base to assist in Decision Making – Operational Stress Injuries in Public Safety Personnel
Lead Researcher: Heidi Cramm, Queen's University
- A feasibility study to identify routinely collected administrative occupational health-related data, using the fire sector as a case example as well as an inventory of data related to OSI collected by the ministry.

Extraordinary Duties, Extraordinary Stressors: Assessing the Need and Potential for Innovative Approaches to First Responder's Stress Injuries
Lead Researcher: Laura Niemi, University of Toronto
- A two-tiered examination of OSI; a description of current and emerging approaches to OSI (from a clinical science perspective) and a comparison of stressors across occupations.

Caveats/Limitations

Research on occupational stress injury among PSP is a relatively new area; the Canadian military focused on research in this field beginning in the 2000s (Niemi et al., 2019). Due to the newness of this field there are a few caveats to keep in mind:

- The research summarized in this presentation is only a portion of the work that exists in this field. The findings in this report back are not only based on the 4 research papers, but also include other seminal papers in the area.
- Findings for each of the occupations varies; there was little research specific to coroners, forensic pathologists, forensic scientists and fire investigators but many papers focused on police officers and firefighters.
- The field of OSI research is still very much in its infancy though much attention and funding is currently focused on it. This is creating a lot of noise in this area and resulting in competing evidence.
- Limited longitudinal evidence for the tools and programs discussed is available. Caution should be used in leveraging recommendations and adopting tools without further study.
- Though the voice of public safety personnel was not explicitly part of the research, efforts have been made to reflect the voices of individuals.
- There is a lack of consensus on the definitions of stress injury. While "occupational stress injury" is the term used throughout this document, no formal definition has been arrived at.

Occupational Stress Injury Research Approach

Overarching Goals to Address MH&A:

Prevent and/or effectively address mental health (MH) and addictions related to impacts on public safety personnel and those interacting with the justice system.

Research Objective:

Provide an evidence base to support public safety personnel (police, coroners, forensic pathologists, fire investigators and correctional employees) with the best in-class programs and tools to prevent and address OSI.

Points of Intervention:

Prevention

Interventions that prepare personnel to cope with stress and support the development of MHA standards.

Resilience

Interventions that increase individual resilience by strengthening coping abilities and reducing barriers to treatment.

Rehabilitation

Interventions that are adaptive and support the rehabilitation of injured personnel.

Understanding OSI

Research that provides a comprehensive understanding of the causes and experience of OSI among public safety personnel:

- Extraordinary Duties, Extraordinary Stressors: Assessing the Need and Potential for Innovative Approaches to First Responder's Stress Injuries. (Niemi and Leone 2019). *
- Interventions for the prevention and management of occupational stress injury in first responders: an overview of reviews. (Antony, et al 2019). *
- Mental Disorder Symptoms among Public Safety Personnel in Canada. (Carleton et al. 2012).
- Ontario Ombudsman Report - In the Line of Duty. (Marin, 2012).
- MCSCS Employee Occupational Stress Survey, Part 1 Summary. (Sol Gen, 2018).
- Ontario Provincial Police Mental Health Strategy: Our People, Our Communities. (OPP, 2015).

Measuring and Monitoring OSI

Research that supports the development of metrics to monitor OSI among public safety personnel:

- Scoping Analysis for the Development of an Evidence Base to Assist in Decision Making- Operational Stress Injuries in Public Safety Personnel. (Cramm, et al., 2019). *
- Healthy Minds, Safe Communities: Supporting our Public Safety Officers Through a National Strategy for Operational Stress Injuries. (Canadian Federal Government, 2016).
- Supporting Canada's Public Safety Personnel: An Action Plan on PTSI. (Public Safety Canada, 2019).

"*" denotes papers funded by the MHA strategy. Refer to Appendix B for paper summaries.

Programs and Tools to support public safety personnel

Research that increases knowledge of programs and tools available to prevent and treat OSI:

- An Exploratory Assessment on Mobile Health and First Responder Peer Networks. (Baker and Matheson, 2019). *
- Peer Support and Crisis-Focused Psychological Intervention Programs in Canadian First Responders: Blue Paper. (Beshai and Carleton 2019).
- A Literature Review on Stress Reactions in Correctional Employees in Correctional/Youth Services/Facilities and Offices. (Cotton et al., 2012).
- Post-Traumatic Stress Disorder Prevention and Treatment Guidelines: Methodology and Recommendations. (ISTSS, 2018).
- Program Effectiveness, Statistics and Applied Research: Critical Incident Stress Management (CISM) Program Evaluation. (Fernane, 2017).

Understanding OSI

Occupations of Focus in this Research

Historically, first responders were known as firefighters, police officers and EMS. There are a number of font-line personnel who ensure the safety and security of communities who were not included in the term "first responder"; therefore, the term "public safety personnel" has been adopted as it encompasses all relevant front-line occupations.

Correctional Officers

Correctional officers ensure the security and safety of incarcerated populations and support their rehabilitation. They provide care, monitoring and supervision. They regularly watch for signs that the safety of others or security of the institution might be at risk. When necessary, they take appropriate security measures.

Police Officers

Police officers provide essential services to ensure the safety and security of the public. This includes duties such as investigating crimes, patrolling highways and waterways, providing air support for search and rescue, and providing security services.

Fire Investigators

Fire investigators investigate the origin, cause and circumstances of approximately 600 provincial interest fires (including explosions and large fires) per year. A team of less than 50 individuals deliver this operational mandate. They are engaged in heavy caseloads dealing with consequences of high-risk critical incidents involving fire death and serious injury that are often carried through the judicial process of criminal proceedings and inquests. Fire investigators are frequently required to travel throughout the province, including call-outs during the night.

Coroners, Forensic Pathologists

Ontario's coroners are fee-for-service physicians with specialized training in the principles of death investigation. The findings are used to generate recommendations to help improve public safety. The majority of coroner's are full-time physicians working as coroner's part-time.

Registered forensic pathologists perform autopsies ordered by coroners and regularly provide expert witness testimony.

Forensic Scientists

Forensic scientists conduct scientific investigations in cases involving injury or death in unusual circumstances and in crimes against persons or property. They also prepare legally admissible evidence for law enforcement officers, attorneys, coroners, etc., by scientific examination of physical objects and materials.

Determinants of OSI

Stress is complex; direct trauma is only one of many factors associated with the development of an OSI. There are a variety of operational and relational stressors that can significantly impact the lives of PSP. Some stressors are common across occupations, and some are unique to an occupation. The following slide outlines common and unique stressors.

Critical Incidents
events in which the person experienced, witnessed or was confronted with actual or threatened death or serious injury of self or others.

Operational Stress
also known as "daily hassles", are related to everyday routine functions of the occupation.

Relational Stress
stems from organizational, familial and/or external (societal) relationships.

Culture of Stigma

Stigma regarding mental injury persists and can be a barrier to accessing treatment. Misconceptions are numerous, including the belief that those with mental injury are violent or weak. For public safety personnel in particular, there is a fear that mental injury can lead to workplace discrimination. For instance, personnel are often fearful that a diagnosis of a mental health injury will make colleagues view the individual as unfit for the job (Niemi and Leone, 2019).

Vicarious Trauma

Vicarious trauma occurs when an individual is exposed to another person's traumatic event. It is an inevitable occupational challenge for fire services, law enforcement, emergency medical services, victims services and related professions. The challenge with vicarious trauma is the accumulation of persistent exposure to traumatic events over time (Niemi and Leone, 2019).

Source: (Niemi and Leone, 2019).

Common and Unique Stressors

	Common Stressors Across Occupations	Correctional Officers	Police Officers	Fire Investigators	Coroners, Forensic Pathologists, Forensic Scientists
Critical Incidents	• Exposed to threat of injury or death • Sustaining an injury • Assisting victims of violence • Witnessing death and injury • Exposure to evidence from critical incidents	• Potential for inmate violence - one might have to intervene or physically overpower an inmate • Injury or death of inmates in custody	• Experiencing assaults • Being threatened with a weapon • Any near-death experience • Use of lethal force • Disaster or multi-casualty accidents • On- or off-duty death of a fellow employee • Any work-related highly emotional event	• Dealing with consequences of high-risk critical incidents involving fire death and serious injury • Attending post mortems	• Regularly see disturbing and upsetting subject matter • Often interact with accidental infant deaths or young children who were victims of violence
Operational Stressors	• Shift work – results in irregular sleep patterns; certain shifts may be more dangerous as content of work can change throughout the day • Lack of role clarity –resulting in confusion or frustration • Lack of control on the job – causing feelings of being undervalued and powerless • Lack of capacity /overtime – may lead to burnout or carrying out of inappropriate roles • Career exposure – decades in the same role/area diminishes resilience	• Overcrowding of inmates – impaired performance, fear of inmates, increased job stress • Overwhelmed by job demands - limited time and resources • Dichotomy of roles – provide a safety/security function as well as a rehabilitation function • Emotionally demanding work • Inefficient or incorrect task completion	• Responsibility of legitimate use of force balanced with accountability to communities • Hoax calls • Completing paperwork • Appearing in court • Physical exhaustion • Certain officers may be required to travel throughout the province • Exercising authority over marginalized or isolated areas or areas in which you are a community member • Little back up in remote areas	• Liaising with other personnel at scenes (police, anthropologists) • Attending court proceedings as an expert witness • Large amount of travel – unpredictable schedule	• Interacting with distressed families • Remaining emotionally removed during an investigation • Anxiety about contamination of evidence • Concern about contracting infectious diseases • No closure because personnel do not follow cases • Appearances in court as an expert witness
Relational Stressors	• Conflict with colleagues or superiors – particularly stressful in close knit environments where colleagues ensure each others' safety • Negative publicity – public criticism can have serious negative impacts on morale, stress of being filmed by the public, etc.	• Difficulty switching off from the job at home • Lack of transparent conflict resolution • Lack of trust of information from management	• Emotional distance and disconnectedness from family members • Dealing with public – people not following instructions • Difficulty switching off from the job at home	• Large amount of travel – frequently away from family • Isolation – fire investigators are spread throughout the province, casual debriefing not possible	• Difficulty switching off from the job at home • Anxiety as cases have similar elements to home circumstances

Source: (Niemi and Leone, 2019).

Right Intervention at the Right Time

OSI impacts people in different ways and at different severities. Not all people will find the same situation traumatic – sometimes an individual will not realize past trauma until a different experience brings it up. PSP need tools to ensure they can develop coping mechanisms for stress and have supports to turn to when they begin to feel off.

Feeling Well

- Peer support programs
- CISM
- Mobile Medical Applications
- Online CBT
- Biometric and Neurological Monitoring

Feeling Off

Crisis Situation/ Off-work

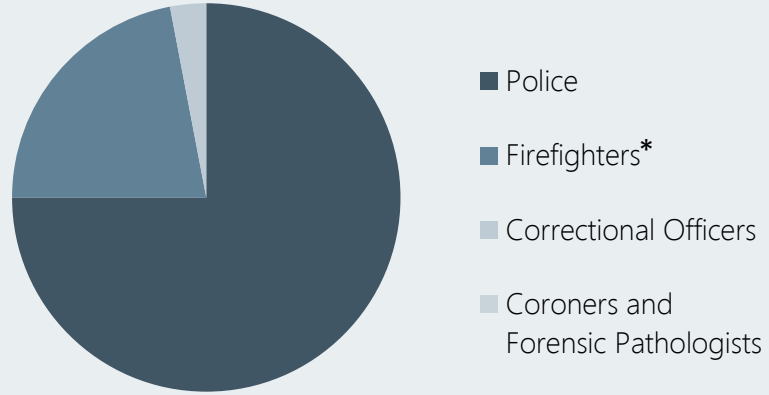
- Cognitive Behaviour Therapy (with and without a trauma focus)
- Cognitive Processing Therapy
- EMDR
- Prolonged Exposure Therapy
- Present Centered Therapy
- Narrative Exposure Therapy

Programs/Tools

There are a plethora of programs and tools available to help prevent and treat occupational stress injuries. Studies evaluating the effectiveness of programs have predominantly focused on the tri-sector occupations (fire, police and EMS). As shown by the chart below, very few studies focused on programs for correctional officers, coroners or forensic pathologists.

The following section provides an overview of existing treatments as well as their effectiveness. The programs and tools have been organized into two categories:

Focus of Studies by Occupation



*Firefighters were not an explicit focus of the ministry's research, however, there is a significant amount of academic literature on this occupation and OSI. Source: (Communication with Dr. Julie Devlin; Antony et al., 2019)

Measure/ Monitor

Current State

Researcher's continue to advance our understanding of the causes of and treatments for OSIs. However, progress has been hampered by the little mental health and addictions data available; an observation shared by researchers across the country and the Canadian Federal Government. Without accurate data, we cannot understand the extent of the problem, we cannot identify evidence based interventions and we cannot monitor progress.

There are a variety of challenges associated with the collection of mental health and addictions data among PSP that include:

Cost – data collection is time consuming and expensive.

Sensitivity – PSP are fearful of this information being used against them in the workplace.

Indicators – researchers are working to understand what information needs to be monitored. Possible measures include suicide rates and healthcare costs (Niemi and Leone, 2019).

Current Discourse

"There is currently a lack of research and baseline data on the mental health and well-being of public safety personnel" (Government of Canada PTSI Action Plan, 2019).

"There is an acute lack of data on suicide in Canada, hampering researchers ability…Research highlights the fact that effective suicide prevention strategies must be evidence-based; something we cannot achieve without accurate, timely and accessible data" (Toronto Star, 2019).

Source: (Public Safety Canada, 2019).

Potential Data Sources

A study undertaken by Dr. Cramm of Queen's University undertook a study of the fire sector to identify all sources of data relevant to the measurement of OSI. The following health markers could be collected across public safety occupations and could provide an opportunity to develop a more informed perspective on OSI across occupations:

Information	Source
• Sick for more than 3 days	➢ Medical note
• Attendance Management	➢ Digital record of personnel who may need additional services
• Injury on the job	➢ WSIB form 8
• Medical clearance to return to work	➢ Medical form B
• Non-WSIB injury or illness	➢ Form completed by healthcare provider
• Modified Duties	➢ Healthcare form
• Occupational health in HR	➢ Changes in medical information, beneficiaries, address, etc.

Refer to Appendix C for a list of OSI related data held by the ministry.

Source: (Cramm et al., 2019).

Programs/ Tools

Prevention/Resiliency Programs/Tools

These programs and tools focus on maintaining wellness among PSP by helping them cope with stress. Furthermore, evidence is not conclusive on whether these programs/tools are effective.

Limited Evidence on Effectiveness*

Neurofeedback
Involves real-time displays of brain activity that are used to help individuals train (self-regulate) their brain activity.

MMAs
Mobile medical applications deliver point-of-case resources via a mobile phone. These resources include clinical and/or self-assessments, counselling services, psychoeducation, skill development exercise and therapeutic homework.

Peer Support Programs
Peer support programs bring together people who share similar roles or life experiences, facilitating the provision of advice, validation, sense of belonging and community.

CISM
Critical Incident Stress Management is a comprehensive program of activities for traumatic event exposure ranging from preparedness training to recommendations for follow-up interventions.

Yoga
An interactive practice of body postures, breathing and meditation that aims to increase awareness and facilitate mindfulness and acceptance.

Physical Exercise
Programs that involve aerobic activities such as walk/jobs and circuit weight training.

Nature Adventure Therapy
Programs may include physical therapy, meditation, group psychotherapy, breath work, art therapy, labyrinth exploration, equine assisted learning and high ropes adventure.

Mindfulness Based Stress Reduction
Aims to help individuals experience traumatic-memories without significant distress by facilitating acceptance of them. It includes meditation practice, mindful awareness practice and its application to real-life situations.

* Evidence for these interventions is lower quality and/or lacks certainty of effect.

Refer to Appendix D for an overview of studies evaluating the effectiveness of prevention programs.

Source: (Niemi and Leone, 2019; ISTSS, 2019).

Peer Support Programs

Peer support programs bring together people who share similar roles or life experiences, facilitating the provision of advice, validation, sense of belonging and community. Support may take the form of one-on-one or group meetings with peer supporters, crisis phone lines and/or education sessions. Peer supporters are typically trained for their role, with mental health professionals acting as supervisors. Evidence of the effectiveness of these programs is emerging, however these programs are not a replacement for professional counselling.

Strengths

May:

- Increase mental health and well-being of members
- De-stigmatize mental health issues
- Improve crisis intervention management
- Increase employee morale and camaraderie
- Increase referrals to professional mental health care

Peer support programs are cost-effective and provide a unique opportunity to receive affirmation from peers.

Considerations

May:

- Be detrimental by requiring disclosure of thoughts, feelings and emotions
- Exacerbate distress
- Focus on crisis management instead of wellness
- Lack consistency across programs/peer supporters
- Be a lack of personnel awareness/interest in program (may be due to stigma)
- Have minimal health professional involvement

Peer supporters may lack training.

Refer to Appendix E and F for program examples.
Additional Resource: MHCC's Guidelines for Practice and Training of Peer Support

Recommended Practices:

1. Goals of peer support – overall psychological and physical well-being (not just addressing traumatic incidents).
2. Selection of peer supporters - need significant experience in the field, respect from colleagues, and to be subject to rigorous selection process.
3. Training and accreditation - supporters should receive thorough training on essential skills (e.g., active listening, psychological care) and participate in continuous accreditation.
4. Mental health professionals - program should be overseen by mental health service providers.
5. Role of peer supporters – supporters need to know who to contact for referrals or advice and be respectful of confidentiality doctrines.
6. Access to peer supporters - peer support programming should be the first point of contact following a critical incident. Employees should autonomously select their peer supporter.
7. Looking after peer supporters - establish appropriate work hours and provide access for peer supporters to a mental health service provider.
8. Program evaluation - regular evaluation by an independent evaluator.

Source: (Baker and Matheson, 2019; Beshai and Carleton, 2019).

Critical Incident Stress Management

CISM is a comprehensive program of activities for traumatic event exposure ranging from preparedness training to recommendations for follow-up interventions. These programs can take a variety of forms, and may not have all of the described components.

CISM Components	
Pre-incident education and trauma immunization	Set expectations, improve coping and stress management skills in anticipation of a crisis.
Demobilization, On-scene support processes	Post-crisis decompression, opportunity to inform and consult (done in large groups/organization).
Defusing	Within 12 hrs post-crisis, involves symptom mitigation, possible closure, and is a triage opportunity (done in small groups).
Critical Incident Stress Debriefing (CISD)	CISD usually occurs in a group setting of up to 20 individuals and is conducted by a facilitator. It includes discussion of the facts of the event, and thoughts, reactions and symptoms from the event. Also involves teaching of coping skills and re-entry to everyday functioning.
One on one crisis intervention	Symptom driven, work towards symptom mitigation, provide referral if needed.
Family and other significant support programs	Foster support and communication, symptom mitigation, closure if possible, referral if needed. Can include provision of spiritual or faith based support.
Follow-up programs/Referrals	Assess mental status, access higher level of care if needed.

Peer Support Programs vs. CISM

CISM puts greater focus on addressing traumatic incidents while peer support programs focus on general wellness. Programs focused on debriefing after a traumatic incident have raised concerns:

- Single-session debriefings can push people to share more than they normally would (Baker and Matheson, 2019).
- The facilitator is often external, an individual who is considered an outsider by PSP (Baker and Matheson, 2019).
- It is possible that the sessions could result in the modeling of dysfunctional thoughts and emotions as opposed to adaptive ones (Cotton, 2013).
- Among groups of individuals who will need to testify about the incident, a debriefing session could alter memory (Cotton, 2013).

Fernane (2017) conducted a review of the CISM program in Ontario corrections and found under-use of pre-incident training and post-incident follow-up. There were also concerns regarding under use of the incident debriefing sessions, as supervisor's are responsible for flagging a critical incident.

Emphasis is now being placed on the need for proactive programs focused on wellness (such as peer support groups), not programs only responding to critical incidents. The benefits of individuals who understand each others experiences is also being highlighted in research.

Sources: (Baker and Matheson, 2019; Cotton et al., 2012; Fernane, 2017; Beshai and Carleton, 2019).

Mobile Medical Applications

Mobile Medical Applications (MMAs) deliver point-of-case resources via a mobile phone. These resources may include clinical and/or self-assessments, counselling services, psychoeducation, skill development exercise and therapeutic homework. MMAs offer a wide range of interactive activities such as mood charting, journaling, mental health symptom tracking, thought logs and cognitive behaviour therapy.

Benefits

- Easily accessible (cost-effective, no travel, insurance, or registered clinician required)
- Support consistent practice of skills learned in therapy (exercises, reminders, etc.)
- Treatment homework (self-monitoring) can be done in real-time, as emotions are being felt
- Provide feedback on exercises completed (summary stats, recommendations, etc.)
- Avoid stigma of face to face treatment
- Provide psychoeducation (can be provided before face-to-face treatment is started)
- Opportunity for between session video meetings with healthcare professional
- After treatment completion, can provide treatment refresher, may reduce likelihood of relapse
- Notify family/friends in event of a crisis
- More relatable to user experience than traditional diagnosis
- Engaging (multimedia, audiovisual, game concepts)
- Can connect to biofeedback sensors
- Allow for connectivity with social support network

Considerations

Quality Standards	• MMAs are not a replacement for face-to-face interventions. • MMAs are largely unregulated but claim to address a variety of complex problems. • Evidence that CBT administered online is effective, is only emerging now.
Privacy and Security	• Unauthorized access to or physical misplacement of mobile device is a risk due to personal data; MMAs often lack privacy policies.
Safety Standards	• Consumers may mistakenly expect immediate responses from clinicians regarding reported content; dangerous in crises.
Technical Problems and Usability Issues	• Phone issues (battery failure, loss of network connection, inactive content, data or SMS charges), app navigation issues (mobile illiteracy), screen size.

Examples

When locating trust-worthy MMAs look for those that have been established by public health agencies or examine the developer's credentials. The CIHR and the Canadian federal government have recommended expanded use of MMAs.

- *PTSD Coach* received high satisfaction from veterans in a residential treatment program.
- *CBT-iCoach* noted improved sleeping patterns and reduced cannabis use among veterans.
- *Provider Resilience,* a self-assessment tool from the National Centre for Telehealth and Technology, seeks to reduce compassion fatigue and service provider burnout.

Source: (Baker and Matheson, 2019).

Online Cognitive Behaviour Therapy Programs

There is emerging evidence that internet-based Cognitive Behaviour Therapy (CBT) programs can effectively address symptoms of anxiety, depression and even PTSD. These intervention are self-directed and highly accessible (as they are cost effective and do not require travel). Below are two programs, one that is currently active and another that is underdevelopment.

BounceBack® reclaim your health | TOLL-FREE: 1·866·345·0224

The Canadian Mental Health Association, a non-profit based in Ontario, has developed ***BounceBack®: Reclaim your health***, a free skill-building program designed to help adults and youth 15+ manage symptoms of depression and anxiety.

BounceBack offers two forms of help:

1. *BounceBack Today*: online videos in a variety of languages that provide practical tips for managing mood, sleeping better, building confidence, increasing activity, problem solving, and healthy living.

2. *BounceBack* telephone coaching: an educational and motivational guided self-help program provided through telephone coaching and workbooks (available in a variety of languages).

    - A referral is required in order to participate so that healthcare professionals can match the patient's needs with the right support.

    - The program involves three to six telephone coaching sessions focused on one of 20 workbook topics. Example topics include: being assertive, changing extreme and unhelpful thinking and overcoming sleep problems.

For more information please visit this link: https://bouncebackontario.ca/bounceback-for-clients/

University of Regina

Public Safety Canada and the University of Regina: Online CBT Program - under development

- The University of Regina's Canadian Institute for Public Safety Research and Treatment (CIPSRT) will receive $10 million over 5 years, starting in 2018-19, to work with Public Safety Canada to develop an Internet-based Cognitive Behavioural Therapy pilot.

- This pilot will be a means of providing greater access to care and treatment for public safety personnel across Canada.

- This will help address barriers to obtaining access to mental health supports for public safety personnel in rural and remote areas.

Source: (ISTSS, 2018).

Biometric/Neurological Monitoring

These tools are not a replacement for face-to-face counselling but provide additional opportunities for PSP to develop stress coping mechanisms.

Biofeedback

Treatment where the individual receives information about their biological processes in real-time and intervenes upon those processes indirectly through techniques such as breathing and visualization.

- Presently, biofeedback can target body temperature, skin conductance, breathing rate, heart rate and is beginning to target heart rate variability.
- Heart rate variability biofeedback has been found to make a difference to PTSD symptoms.

Neurofeedback

Treatment where the individual wears sensors to measure their brain waves and intervenes when the brain falls into maladaptive patterns (heighted activation for anxiety) with techniques such as relaxation or slowed breathing. A video/music may be used to convey the brain's activity.

Example session: An individual wears the muse headband, which measures their brain waves and conveys this information to the user through a video of the ocean. When the brain falls into a maladaptive pattern, the user will see the ocean begin to get stormy so they know they need to use their coping techniques.

Refer to Appendix G for a discussion of biometric indicators.

Benefits

- Real-time, objective monitoring of physiological indicators of stress
- Can predict the presence/absence of a stress disorder
- Able to measure the intensity of the stress reaction
- Can provide tips for appropriate treatments
- Possible to detect symptoms before they become clinically severe (possible for preventative action to be taken)

Considerations

This is an emerging area as evidence of the effectiveness of this treatment is lower quality and/or the certainty of the effect is in question. Therefore, the ISTSS currently states there is insufficient evidence to recommend these tools.

The cost of these tools is currently a barrier as these are emerging technologies. Furthermore, not all devices are mobile, therefore, not as appropriate for certain PSP due to environmental constraints.

Source: (Niemi and Leone, 2019).

Early Psychosocial Interventions for PTSD

This slide outlines treatments that fall outside of the ministry's mandate and would generally be applied once medical treatment is being sought.

	Emerging Evidence*			Insufficient Evidence to Recommend**	
Single Session	**Group 512 PM** is based on debriefing but supplemented with cohesion training exercises, for example playing games that need team co-operation.	**EMDR** Targeted traumatic memories are considered in terms of an image, the associated cognition, the associated affect and body sensation. These four components are then focused on as bilateral physical stimulation occurs (eye movements, taps or tones).		**Individual Psychoeducation/Self-help** Psychoeducation provides individuals with information about traumatic stress reactions, PTSD and how to manage them.	**Group Debriefing**
Multiple Session	**Self-guided Internet Based Interventions *(prevention/ intervention)*** This approach uses internet-based programmes to treat PTSD sufferers using CBT approaches. Use of the intervention is self-directed.	**Brief Dyadic Therapy *(prevention)*** This sub-group consists of brief CBT based therapies delivered dyadically with the aim of improving communication and fostering a shared approach to addressing psychological and practical difficulties.	**Structured Writing** Individual undertakes guided homework based writing assignments about their trauma, including thoughts and feelings.	**Internet Virtual Reality Therapy *(intervention)*** This involves trauma focused CBT delivered through a virtual reality therapy room, rather than face-to-face.	**Telephone-Based CBT *(prevention)***

* "emerging" recommendation is made for interventions with lower quality of evidence and/or certainty of effect.
**"insufficient evidence" recommendation was made when there was an absence of evidence of effectiveness or ineffectiveness.

Source: (Niemi and Leone, 2019; ISTSS, 2019).

Psychological Treatments for PTSD

This slide outlines treatments that fall outside of the ministry's mandate and would generally be applied once medical treatment is being sought.

Strong Recommendation*

Cognitive Processing Therapy
Focuses on the evaluation and modification of problematic thoughts that have developed following the traumatic experience(s).

Cognitive Therapy***
Focuses on the identification and modification of negative appraisals, behaviours and beliefs that lead the PTSD sufferer to overestimate current threat (fear) or feel guilt and shame.

EMDR***
Targeted traumatic memories are considered in terms of an image, the associated cognition, the associated affect and body sensation. These four components are then focused on as bilateral physical stimulation occurs (eye movements, taps or tones).

Standard Recommendation**

CBT with a Trauma Focus***
Includes all therapies that aim to change thoughts, beliefs and/or behaviour. Typically involves homework and includes psycho-education, exposure work, cognitive work and more general relaxation/stress management; the relative contribution of these elements varies. Remains effective if offered in groups and or online.

CBT without a Trauma Focus
A group of therapies that use a variety of non-trauma focused techniques such as: stress management, emotional stabilisation, relaxation training, breathing retraining, positive thinking and self-talk, assertiveness training, thought stopping and stress inoculation training.

Prolonged Exposure
Using a verbal narrative technique, the traumatic experience is recounted in detail, it is recorded and listened to on a repeated basis with the goal of habituation. Real-life repeated exposure to avoided and fear-evoking situations, that are now safe but associated with the trauma, is undertaken, again with the aim of habituation.

Present Centred Therapy
Targets daily challenges encountered by PTSD sufferers as a result of their symptoms. Includes psychoeducation about the impact of PTSD symptoms, the development of effective strategies to deal with day-to-day challenges and homework to practice newly developed skills.

Narrative exposure therapy
A coherent, chronological, autobiographical narrative of the individual's life is developed, that includes their traumatic experiences. The therapist facilitates emotional processing through the use of cognitive-behavioural techniques.

*a "strong" recommendation was made when there was at least reasonable quality of evidence and the highest certainty of effect.
**a "standard" recommendation was made when there was at least reasonable quality of evidence and lower certainty of effect.
***can be used as an early intervention, for individuals with emerging traumatic stress symptoms.
Refer to Appendix H for an overview of studies evaluating rehabilitation treatments.

Source: (Niemi and Leone, 2019; ISTSS, 2019).

Ministry of the Solicitor General Programs related to OSI

OPP

The OPP Mental Health Strategy was published in 2015. The OPP has a dedicated research psychologist on staff, as well as a Wellness Unit which administers a variety of programs and supports for OPP staff and their families:

- Critical Incident/Stress Response Peer Support Teams - also provide access to the Community Referral List and the trauma clinician.
- Community Referral List - list of experienced fee for service mental health professionals.
- Employee/Family Liaison (EFL) - support members/families with administrative processes.
- Wellness Programs: Road to Mental Readiness Training, 'Not myself Today' anti-stigma campaign, Psychological Health and Wellbeing program (includes Wellness Checks, Post-Critical Incident Checks, and a research baseline), Thrive Fitness and Wellness (wellness liaisons, health assessments, coaching and more).
- Early Intervention Program

Corrections

- An Employee Wellness Strategy is currently in place.
- Support for employees that have experienced a critical event at work is available through the Critical Incident Stress Management program.
- Employee training programs were piloted in the spring; program evaluation is currently underway. Stress Resiliency Training System, one of the two programs, included the measurement of heart rate and heart rate variability (using a sensor) while the participant played a video game with increasingly stressful situations.
- An education program will potentially be piloted in fall 2019.

Centre for Forensic Science

- A wellness personnel is currently investigating programming options to support the development of a wellness strategy

Office of the Chief Coroner/Ontario Forensic Pathology Service

- Launched an employee wellness committee (currently active)
- Offer courses on mental illness and are exploring expanding the offering
- A survey assessing the prevalence of OSI among death investigation personnel is in progress and is expected to be finished by the end of the summer

Office of the Fire Marshal

- An operational stress management team made up of 4 peer supporters is currently active

*All employees in the Ontario Public Service have access to confidential professional counselling through the Employee/Family Assistance Program.

Ministry of the Solicitor General OSI Roundtable

On May 29th, 2019, a number of researchers and Ministry personnel involved in public safety occupations gathered to discuss and validate the findings of the research undertaken by the Research, Analytics and Innovation Branch. The following are key insights from that meeting:

- Programs solely responding to critical incidents can re-traumatize individuals; programs should focus on overall wellness.
- Neurofeedback and biometric monitoring tools lack evidence of effectiveness.
- Resiliency is currently the responsibility of the individual, and when they are not able to be resilient, it is their "fault". Resiliency must be built into organizational culture.
- The individual and organization should share accountability for resiliency. The organization needs to be aware of the stressors the individual is experiencing and needs to be able to intervene early.
- Failing to rapidly match personnel with the right interventions can lead to serious detrimental impacts, especially in situations of crisis.
- Stigma regarding mental illness persists and can be a barrier to accessing treatment. The development of relationships between personnel and individuals who support wellness can circumvent this issue.
- Cost analysis often takes the perspective of the payer when deciding which types of costs to include. However, the payer perspective might underestimate the broader societal costs, which include a full range of social opportunity costs.

Appendix

Table of Contents

A summary of the contents of the appendix.

Appendix A – WSIB Legislative Framework

The *Supporting Ontario's First Responders Act (PTSD), 2016* established law that:

- full, part-time and volunteer fire fighters,
- fire investigators,
- police officers,
- members of an emergency response team,
- paramedics,
- emergency medical attendants,
- ambulance service managers,
- workers in a correctional institution,
- workers in a place of secure custody or place of temporary detention,
- workers involved in dispatch

are entitled to benefits under the insurance plan for PTSD arising out of and in the course of the worker's employment. The PTSD is presumed to have arisen out of and in the course of the worker's employment, unless the contrary is shown. The Act also established the requirement that all organizations employing first responders (as defined in section 14) publish a PTSD prevention plan and that this be overseen by the Ministry of Labour.

https://www.ontario.ca/laws/statute/S16004

The *Workplace Safety and Insurance Act, 1997* governs a no-fault insurance system for work-related injuries and diseases; the system is managed by the WSIB. Key points in the legislation related to the cost-benefit analysis include:

Insured injuries
13 (1) A worker who sustains a personal injury by accident arising out of and in the course of his or her employment is entitled to benefits under the insurance plan.

Entitlement to health care
33 (1) A worker who sustains an injury is entitled to such health care as may be necessary, appropriate and sufficient as a result of the injury and is entitled to make the initial choice of health professional for the purposes of this section.

Arrangements for health care
(2) The Board may arrange for the worker's health care or may approve arrangements for his or her health care. The Board shall pay for the worker's health care.

Payments for loss of earnings
43 (1) A worker who has a loss of earnings as a result of the injury is entitled to payments under this section beginning when the loss of earnings begins. The payments continue until the earliest of,
(a) the day on which the worker's loss of earnings ceases;
(b) the day on which the worker reaches 65 years of age, if the worker was less than 63 years of age on the date of the injury;
(c) two years after the date of the injury, if the worker was 63 years of age or older on the date of the injury;
(d) the day on which the worker is no longer impaired as a result of the injury. 1997, c. 16, Sched. A, s. 43 (1).

https://www.ontario.ca/laws/statute/97w16#BK53

Appendix B – Summary of Papers Reviewed

Interventions for the prevention and management of occupational stress injury in first responders: an overview of reviews. (Antony, et al 2019).
- An overview of the academic literature regarding existing prevention and management interventions of OSI in PSP.

An Exploratory Assessment on Mobile Health and First Responder Peer Networks. (Baker and Matheson, 2019).
- An exploratory assessment of prevailing technological tools and peer support strategies that may be of value to PSP in the prevention, intervention and treatment of OSIs.

Peer Support and Crisis-Focused Psychological Intervention Programs in Canadian First Responders: Blue Paper. (Beshai and Carleton 2019).
- Evaluated the effectiveness of peer support and crisis-focused psychological interventions through a literature review and survey analysis.

Mental Disorder Symptoms among Public Safety Personnel in Canada. (Carleton et al. 2012).
- Conducted and analyzed a nation wide survey to determine the prevalence of OSIs among PSP across Canada.

A Literature Review on Stress Reactions in Correctional Employees in Correctional/Youth Services/Facilities and Offices. (Cotton et al., 2012).
- Described the unique stressors experienced by correctional officers. Included a discussion of CISM vs peer support programs.

Scoping Analysis for the Development of an Evidence Base to Assist in Decision Making- Operational Stress Injuries in Public Safety Personnel. (Cramm, et al., 2019).
- A feasibility study to identify routinely collected administrative occupational health-related data, using the fire sector as a case example as well as an inventory of data related to OSI collected by the ministry.

Healthy Minds, Safe Communities: Supporting our Public Safety Officers Through a National Strategy for Operational Stress Injuries. (Canadian Federal Government, 2016).
- Summary of discussions with experts regarding the state of OSI in Canada, as well as an outline of the federal government's plan to move forward.

Program Effectiveness, Statistics and Applied Research: Critical Incident Stress Management (CISM) Program Evaluation. (Fernane, 2017).
- Conducted an evaluation of the CISM program in Ontario's correctional institutions.

Post-Traumatic Stress Disorder Prevention and Treatment Guidelines: Methodology and Recommendations. (ISTSS, 2018).
- Comprehensive guidelines for use of PTSD treatments. The effectiveness of the treatments were evaluated through the review of previously completed randomized controlled trials.

Ontario Ombudsman Report - In the Line of Duty. (Marin, 2012).
- An investigation into how the OPP and Ministry of the Solicitor General have addressed OSI affecting police officers; recommendations were included.

Extraordinary Duties, Extraordinary Stressors: Assessing the Need and Potential for Innovative Approaches to First Responder's Stress Injuries. (Niemi and Leone 2019).
- A two-tiered examination of OSI; a description of current and emerging approaches to OSI (from a clinical science perspective) and a comparison of stressors across occupations.

MCSCS Employee Occupational Stress Survey, Part 1 Summary. (Sol Gen, 2018).
- Summary statistics and high level observations from the correctional employee survey.

Ontario Provincial Police Mental Health Strategy: Our People, Our Communities. (OPP, 2015).
- Outline of the OPP's strategy to address OSI; included a discussion of measurement.

Supporting Canada's Public Safety Personnel: An Action Plan on PTSI. (Public Safety Canada, 2019).
- An outline of the Canadian Federal Government's plan to address PTSI among PSP. Included a discussion of terminology as well as current data limitations.

Appendix C - Ministry of the Solicitor General Data Points (HR)

Area	Variable	Definition
Strategic Business Unit	General HR Data	Position information, date hired, previous positions held, etc. (Source: WIN)
	Employee Status	The last employee status over the past 30 days (i.e. actively working, leave or long term protection plan). (Source: WIN)
	Sick Time	Average sick time usage (in days and hrs) over previous fiscal year, calendar year and quarter aggregated by job code and division. Micro data not available. (Source: WIN)
	Reasons for Absence	Categories for an absence that include short term sick plan paid and unpaid, WSIB leave paid and unpaid, Special compassionate leave, bereavement leave, etc. (Source: WIN)
	Employee Engagement Survey	Survey of all OPS staff regarding topics such as hiring practices, direct supervision, leadership practices, safe and healthy workplace, work-life balance, support and tools, organizational communication, workplace morale, etc.
Centre for Employee Health, Safety and Wellness	Employee and Family Assistance Program	Two aggregated usage reports are provided by Morneau Shepell, one to community safety and one to correctional services, regarding: • EFAP services utilization rate • EFAP services accessed • Top counselling issues • Top work-life issues • Workplace learning sessions • Outside services utilization rate • Emerging issues
	Extended Benefits Usage	Total cost by extended benefit category for the Ontario Public Service as a whole.
WSIB	Workplace Injuries	Available by occupation (provided by WSIB): • Number of approved/pending/denied WSIB claims • Number of claims per 100,000 people • Average number of days and working hours lost • WSIB costs (in-year and carry over) Accessible through WIN: • Number of claims filtered by type (how the individual was injured), etc. Claim categories related to mental health are PTSD, chronic mental stress and traumatic mental stress. The number of return to work plans not tracked.

Appendix C continued - Ministry Data Points (Operational Areas)

Area	Variable	Definition
Office of the Chief Corner/ Ontario Forensic Pathology Service	Case Tracking	Case numbers as an aggregate are available but the type of case is not tracked.
	Baseline Survey	Conducting a survey of OCC/OFPS, including coroners and pathologists, regarding the presence of depression, anxiety and PTSD.
Centre for Forensic Science	Workshop Attendance	Attendance lists of who attended the offered wellness workshop are available.
	Case Information	Number of cases by crime type by laboratory for varying time periods. Includes average turnaround time in days as well as the percentage breakdown of the turnaround time of cases (less than 30 days, 60 and 90 days and greater than 90 days).
Office of the Fire Marshal	FIRS (Fire Investigation Reporting System)	Formal system used to track cases (the fires that have occurred in the province that require investigation and the investigators assigned to those cases).
	Daily Updates	Operations supervisor sends out an email every morning and evening with a summary of the fires in the province and where investigators have been dispatched.
Ontario Provincial Police	Program Utilization	Aggregate utilization rates are available for the various wellness programs offered by the OPP that include peer support groups, fitness programs, and wellness-focused support offered to members.
	Case Tracking	The OPP uses a police records management system to support their work with electronic records of calls and incidents across the province. This system includes information on the types of calls each member would attend

Appendix D - Studies Evaluating Resiliency Programs

Program Type	# of Studies Reviewed	Type of Experiments	Groups Studied	Summary of Findings
Physical and mental health education/ Training	11 studies Length: 1 to 24 months N: 42 – 1,189	• 9 Randomized Controlled Trials, • 2 Quasi-experiments	• Police, • Firefighters, • Correctional Officers	• Sessions on healthy living can improve healthy eating and reduce alcohol/tobacco use. • Encouraging exercise can reduce stress and improve wellbeing. • One study found sleep education can reduce disability days and another found no impact. • While yoga reduced stress, it produced mixed feelings among personnel.
Trauma prevention/ resilience building	5 studies Length: 2 to 12 months N: 18 – 62	• 3 Randomized Controlled Trials • 1 Quasi-experimental • 1 Observational	• Police • Police Recruits • Firefighter Recruits	• Programs teaching police recruits strategies to cope with stress resulted in reduced stress and substance use. • Mindfulness training in police improved psychological outcomes.
Stress Management Training	7 studies Length: 1 to 18 months N: 18 to 664	• 5 Randomized Controlled Trials • 1 Quasi-experimental • 1 Observational	• Police • Civilian personnel	• Stress management programs (trauma awareness, relaxation training, coping skills training, etc.) produced mixed results as they were found to reduce stress and anxiety, produce no impact, produce no lasting impact and increase tobacco use.
Suicide Prevention Program	4 studies Length: 5 months to 12 years N: 3,810 to 10,000	• 3 Quasi-experimental • 1 Descriptive (not evaluative)	• Police • Firefighters	• Two programs had a significant impact on the reduction of suicides among police while another program for prevention of suicides among firefighters had no impact.
Shift Work	8 studies Length: 7 days to 1 year N: 15 - 343	• 2 Randomized Controlled Trials • 6 Quasi-experimental	• Police • Firefighters	• Different combinations of work hours and schedules were compared across studies. Certain combinations improved blood pressure, alertness, sleep patterns and job satisfaction and some had no impact.
Social Support/ Integration	8 studies Length: 2 days to 9 years N: 20 to 2,943	• 7 Observational • 1 Case Report	• Police • Firefighters	• The relationship between social or supervisory support and mental health outcomes was studied. Higher levels of social support and/or supervisory support acted as a protective factor for personnel during stressful events, improved work satisfaction and reduced psychological strain.

Note: "N" refers to sample size.

Source: (Antony et al., 2019)

Appendix E - Peer Support Program Examples

Peer Support Program	Jurisdiction, Founding, Targeted PSP	24 hr crisis phone line?	Education?	Referral services?	Meetings with peer supporters (PS) ?	Unique Features
POPPA	New York, 1996, Police	Yes	Yes; about available resources	Yes	Yes, one on one	2 PS and 1 clinician are dedicated to education. There are 2 phone lines, 1 for active officers, 1 for retirees
Cop-2-Cop	New Jersey, 2000, Police	Yes	Yes; about available resources	Yes	Yes	PS are retired officers who are licensed social workers. One of the most comprehensive programs available (Beshai and Carleton, 2019).
Together For Life	Montreal, 1997, Police	Yes	Yes; campaign focused on suicide prevention	Yes	No	Train officers, supervisors and union reps to identify risk and make referrals
Fire Dep. Suicide Prevention Program	Houston, 1993, Fire	No	Yes; 3 presentations on awareness and prevention	No	No	9 active duty firefighters make up the Suicide Prevention Team
Fire Dep. Suicide Postvention Standard Operating Procedure	New York City, No Date, Firefighters	No	Yes; staff are informed of resources when they are informed of their colleagues suicide	Yes, services are organized after a suicide	Yes	The procedure employs best practices after the occurrence of a suicide. Includes use of peer counsellors and check-ins with supervisory staff.
Priority One	Queensland, 1992, EMS	Yes	Yes; mental health resiliency education is offered	Yes	Yes	Peer program takes proactive approach, pairing PSs with students. Psychological debriefing, chaplaincy service also offered
Road 2 Mental Readiness	Canada, 2013, All	No; it's a course	Yes; education regarding symptoms and tools/supports	Self-assessment tool provided	No; it's a course through MHCC	Course providing tools and resources related to OSI for personnel, leadership and trainers.
West Coast Post-Trauma Retreat	California, 2001, All	No; it's a retreat	Yes; education about coping techniques	No; it's a retreat	Yes	5-day treatment program in a remote location; heavily reliant on peer supporters.
Operation Restore	Florida, 2013, All	No; it's a retreat	Yes; education about coping techniques	No; it's a retreat	No; with accredited clinicians	3.5 day retreat that provides various psychological treatments.

Source: (Baker and Matheson, 2019).

Appendix F – First Responders First
Public Services Health and Safety Association (PSHSA)

#FIRSTRESPONDERSFIRST

PSHSA launched the "First Responders First PTSD Resource Toolkit" in 2016. This toolkit was developed in partnership with MOL in response to the enactment of the "Supporting Ontario's First Responders Act", which required all organizations employing first responders develop and publish PTSD prevention plans.

First Responders First offers resources and services to help the first responder community develop comprehensive PTSD prevention plans that include management of crises through to implementation of best practices. The PTSD Resource Toolkit includes the components:

1. Prevention: Develop policies and procedures that will address PTSD in the workplace and work to prevent PTSD through the use of education on the causes, risk factors, signs and symptoms of PTSD.

2. Intervention: Formulate strategies that both recognize and respond to first responders who may be experiencing PTSD through the use of intermittent screening protocols. Managerial staff members should have a comprehensive understanding of the strengths and weaknesses of available Employee Assistance Programs (EAPs) and should be aware of external resources.

3. Recovery and Return to Work: Identifies methods first responder organizations can implement to support recovering employees who remain at work as well as employees returning from a leave of absence. Methods include providing modified work duties and creating comprehensive return to work plans.

To date, 638 PTSD prevention plans have been submitted to the Ministry of Labour. While comprehensive and detailed, a shortcoming of the plans is the lack of commitment to monitoring or evaluating the effectiveness of programs.

Source: (Baker and Matheson, 2019 and Niemi and Leone, 2019).

Appendix G - Biometric/Neurological Indicators

Stress indicators are outcome variables used to represent mental/physical stress; can be used as objective measures of stress.

Stress Indicator	Description	Outcome	Available Technologies
Heart Rate Variability	Variation in the time interval between heart beats.	• PTSD	Biometric Advisory System, Euler's Video, Hexoskin
Skin conductance	Variation in the skin's ability to conduct electricity due to changes in moisture.	• PTSD • Stress	Biometric Advisory System
Body temperature	Measure of body's ability to generate and get rid of heat.	• PTSD • Stress	Biometric Advisory System
Blood pressure	The pressure of blood on the walls of blood vessels.	• Acute stress	Biometric Advisory System
Pupil size	…	• Acute stress	Biometric Advisory System
Biomarkers at the molecular level	Protein biomarkers that are predictive of PTSD and suicidality.	• PTSD • Suicide attempts	Biological Assay Procedure
EEG analysis	Analysis of the electrical activity of the brain.	• PTSD • Stress • Anxiety	Muse Headband
EMGs and facial muscle behaviour	Analysis of the electrical activity produced by skeletal muscles.	• PTSD	fEMG sensors
Auditory startle response	A reflex caused by auditory stimuli.	• PTSD	Eyeblink response monitor

Complement to Treatment

There is a movement towards use of pattern recognition technology to monitor PSP for biological and neurological signs of stress. This is particularly valuable as this population tends to under-report levels of stress.

Description of Available Technologies

Biometric Advisory System: monitors a variety of stressors.

Euler's Video Magnification method: uses video-only to measure heart rate variability, but is still under development as it currently only functions for light-skinned people.

Biological Assay Procedure: analyzes protein biomarkers predictive of PTSD and suicidal tendencies.

Muse Headband: neurofeedback device that music conveys the feedback (example is muse headband with picture of the ocean)

fEMG sensors: sensors placed on the face to monitor electrical activity of skeletal muscles.

Eye blink Response Monitor: measures the magnitude of an eye blink when the individual hears a loud noise.

Hexoskin: a "smart textile" that is a skin-tight vest worn underneath one's uniform while on the job or underneath one's clothing while sleeping to monitor heart rate variability.

Source: (Niemi and Leone, 2019).

Appendix H - Studies Evaluating Rehabilitation Treatments

Program Type	# of Studies Reviewed	Type of Experiments	Groups Studied	Summary of Findings
Counseling/ Debriefing Therapy	16 studies Length: 1 month to 6 years N: 1 to 859	• 4 Randomized Controlled Trials • 6 Non-Randomized Controlled Trials • 5 Observational • 1 Case Report	• Police • Firefighters • Prison Guards	• Critical incident stress debriefing was found to reduce psychological strain, have no impact and increase PTSD symptoms. • CBT was found to improve welling while exposure-based therapy and cognitive restructuring decreased PTSD symptoms. • Brief Eclectic Psychotherapy (combo of CBT and other treatments) improved PTSD symptoms and return to work.
Drug Therapy	3 studies Length: 3 to 8 months N: 1 to 17	• 1 Randomized Controlled Trial • 2 Case Reports	• Police • Firefighter	• Melatonin was found to improve sleep among police officers. • Prazosin reduced insomnia and nightmares in one firefighter. • Carbamazepine and sodium valproate improved PTSD symptoms.
EMDR Therapy	3 studies Length: 1 to 6 months N: 6 to 62	• 1 Observational • 1 Randomized Controlled Trial • 1 Case Report	• Police • Firefighters	• EMDR was found to significantly reduce PTSD symptoms.
Exposure Therapy	1 study Length: 6 months N: 1	• Case Report	• Police	• Resulted in long-term relief from PTSD symptoms.
Medical Monitoring Therapy	1 study Length: 8 years N: 4,035	• 1 Observational	• Police	• Police officers who attended the classes were more likely to be resilient to PTSD symptoms.
Writing Therapy	1 study Length: 3 weeks N: 67	• 1 Randomized Controlled Trial	• Police	• Writing about personal emotions reduced levels of stress and anxiety.

Note: "N" refers to sample size.

Source: (Antony et al., 2019)

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Researcher Biographies

Andre Marin, Former Ombudsman of Ontario and former director of the SIU.

Dr. Andrea Tricco, is a scientist and director of the Knowledge Synthesis Team in the Knowledge Translation Program of St. Michael's Hospital.

Cristina Leone, is a research associate in a clinical neurofeedback laboratory at the University of Toronto.

Dr. Dianne Groll, Associate Professor of Psychiatry and Psychology at Queen's University. Dr. Groll's primary research interest is in patient outcomes and observational studies. She collaborates on military and veterans mental health research in conjunction with the Canadian Forces, and with the OPP and municipal police forces examining the incidence of Operational Stress Injuries in those populations. She teaches research methodology to the Psychiatry Residents, and is involved with medical undergraduate teaching through the Critical Appraisal course.

Dr. Flora Matheson, PhD Scientist at St. Michael's Hospital, conducts research on social marginalization and the social determinants of mental health, illicit drug use, alcohol consumption, problem gambling and crime with a gender lens.

Dr. Heidi Cramm, Assistant Professor at Queen's University, her research focuses on military family health, with an emphasis on mental health. Heidi is also the Head of Knowledge Translation for the Canadian Institute for Military and Veteran Health Research (CIMVHR). She primarily teaches in the occupational therapy program (occupational therapy with children, the lived experience of disability, advanced clinical reasoning, and critical inquiry projects).

Jesmin Antony, is a research coordinator of the knowledge synthesis team of the knowledge translation program of St. Michael's Hospital.

Dr. Julie Devlin, Research Psychologist with the Ontario Provincial Police.

Dr. Laura Niemi, PhD, Assistant Professor of Social Psychology and Global Justice at Munk School of Global Affairs and Public Policy. Began work at the University of Toronto in 2018 and teaches at the Trudeau Centre for Peace, Conflict and Justice. Prior to arriving at the University of Toronto, she completed research fellowships at Duke University and Harvard University. She received her Ph.D. in Social Psychology and Social Neuroscience from Boston College. Dr. Niemi's research investigates topics including moral values, stigma and blame, and the neuroscience of fairness.

Megan Edgelow, Lecturer at Queen's University. Her research interests include mental illness, military and Veterans health, time use and occupational engagement. Teaching responsibilities include the psychosocial dimensions of occupation, applied community development, therapeutic relationships and therapeutic groups.

Dr. Thomas Rotter, Associate Professor at Queens University**.** Research focus is on program evaluations (system level), clinical research projects, knowledge translation research in quality improvement, including clinical pathways in acute care and primary care settings. Thomas has a specific interest in process evaluations in implementation research, quantitative research, and mixed methods. Other research areas are knowledge synthesis (Cochrane and JBI reviews), and knowledge translation (e.g., clinical pathways, surgical checklist).

Dr. Rose Ricciardelli, Professor of Sociology, the Coordinator for Criminology, and Co-Coordinator for Police Studies at Memorial University of Newfoundland. Areas of research are Institutional and Community Corrections, Masculinities, Desistance from Crime, Social Health, Correctional and Police Officers

Victoria Baker, PhD student at the University of Toronto. Dedicated to researching first responder operational stress and well-being.

Victoria Carmichael, Research Manager of the Social Psychiatry Research and Interest Group at the Douglas Mental Health University Institute.

Dr. Dorothy Cotton, PhD is a registered psychologist who holds degrees from McGill, Purdue and Queen's University. Her areas of practice include clinical and correctional/forensic psychology. She worked for over 25 years in a psychiatric hospital, including acting as chief psychologist and director of the forensic program. She also has extensive experience in the federal correctional system.

Stephanie Fernane, Program Effectiveness Analyst, Program Evaluation at the Ministry of the Solicitor General.