

# PARAMEDIC SECTOR RISK ASSESSMENT AND ROOT CAUSE ANALYSIS PROJECT

## REPORT 1: RISK ASSESSMENT FINDINGS

Prepared by:

Maryam Khan

Health & Safety Consultant, Emerging Markets

[mkhan@pshsa.ca](mailto:mkhan@pshsa.ca)

416.254.6528

Tanya Morose

Director, Prevention, Retention & Engagement

[tmorose@pshsa.ca](mailto:tmorose@pshsa.ca)

905.872.0840

Public Services Health & Safety Association

4950 Yonge Street, Suite 1800, Toronto, ON M2N 6K1

March 31, 2022



## TABLE OF CONTENTS

Executive Summary .....	3
Introduction and Rationale .....	5
Paramedic Injury Data.....	5
Scope.....	6
Methodology .....	6
Project Timelines.....	8
Findings.....	8
Table 1: Combined Top 10 Hazards Rated by Employer and Worker Representatives.....	9
Table 2: Top 10 Hazards Rated by Employer Representatives .....	10
Table 3: Top 10 Hazards Rated by Worker Representatives.....	11
Table 4: Comparison and Congruence between Employer and Worker Group Ratings.....	12
Workshop Feedback .....	13
Passion for Paramedicine and Appreciation for Role of the Paramedic.....	13
Collaboration, Empowerment, Shared Learning and Risk Quantification .....	13
Common Provincial Risks and Differences in Risk Perception.....	14
Education and Training.....	14
Workplace Violence and Mental Health.....	14
Ministry of Health .....	14
Next Steps.....	14
Acknowledgements.....	16
Appendix A: Paramedic Injury Data.....	18
Appendix B: All Rated Hazards.....	22
References .....	32



## EXECUTIVE SUMMARY

Public Services Health & Safety Association (PSHSA) conducted a risk assessment workshop as part of the Paramedic Risk Assessment and Root Cause Analysis project. The risk assessment was completed in Fall 2021 utilizing a “by the industry, for the industry” approach. Sector representatives included land and air ambulance as well as representatives serving urban, rural and remote communities. The sector and industry experts who participated in the risk assessment workshop represented the following organizations:

- Canadian Union of Public Employees
- Conestoga College, Canadian Institute for Safety Wellness and Performance
- County of Lennox and Addington, Emergency Services
- Greater Sudbury Paramedic Services
- Naotkamegwanning First Nation EMS
- Oneida Nation Paramedic Services
- Ontario Ministry of Health, Emergency Health Regulatory and Accountability Branch
- Ontario Ministry of Health, Emergency Health Program Management and Delivery Branch
- Ontario Ministry of Labour, Training and Skills Development, Occupational Health and Safety Branch
- Ontario Ministry of Long-Term Care
- Ontario Public Service Employees Union, Ambulance Division
- Ornge
- SIEU Healthcare
- Unifor Local 1359 and Local 2002
- University of Waterloo, Department of Kinesiology
- York Region Paramedic Services

The risk assessment began with all sector stakeholders, subject matter experts and Ministry representatives submitting a list of all hazards they perceived paramedics faced in the workplace. These were then consolidated and categorized into 26 main hazard categories (e.g., musculoskeletal disorders, personal protective equipment, ambulance design, workplace violence, psychosocial hazards). In the end, the group identified a total of 105 hazards.

Following an open discussion of the hazard and any supporting evidence on the impact of the hazard in subsequent working group sessions, the stakeholders individually and anonymously rated each of the hazards’ associated risk level using an online voting system. The stakeholders ranked both the likelihood and consequence of the hazard to determine overall risk rating for all hazards. Sector representatives voted to identify 48 high risk, 54 medium risk and 3 low risk hazards. There was an important level of congruence between the employer and worker groups in that there was 70% agreement in the top ten hazards rated by employer and worker representatives.

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*There was agreement in 70% of the top 10 hazards rated by employer and worker representatives.*

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- PTSD (post-traumatic stress disorder) injuries were identified as the top hazard.
- Ambulance design hazards were identified twice in the top ten: inability to use seat belts during patient care while the vehicle is in motion (2<sup>nd</sup>) and general design of the ambulance (8<sup>th</sup>).
- Equipment concerns were identified with respect to types of equipment: usage of portable radios, communications by Central Ambulance Communications Centre (CACC) and cell phone use (3<sup>rd</sup>) as well as the reliability of the CACC radio system (6<sup>th</sup>).
- Workplace violence-related hazards were ranked in 4<sup>th</sup> and 5<sup>th</sup> place: overall paramedic safety, including support in exigent circumstances when paramedics respond to calls for service, followed by violence and abuse in the workplace.
- Safety concerns due to traffic were identified twice in the top ten: vehicle collisions (7<sup>th</sup>) and standardizing roadway protections across the province and use of traffic protection plans while paramedics are working on the roadway (10<sup>th</sup>).
- Worker sleep-related fatigue was identified as the 9<sup>th</sup> hazard.

The EMS (Emergency Medical Services) Section 21 Sub-Committee reviewed the top ten hazards which resulted from the risk assessment and selected the top identified hazard – Post-traumatic stress disorder – to be explored in the second component of the project: the root cause analysis. The risk statement that will outline the scope of the RCA is “exposure to events that can lead to potential psychological harm occurs in the paramedic sector, and can seriously impact the worker, their families, the public and the service”.

The root cause analysis was completed from January to March 2022. In this second phase of the project, the scope of work included land and air ambulance paramedics and Central Ambulance Communication Centre (CCAC) ambulance communication officers. PSHSA secured a balance of perspectives for the root cause analysis workshop, including worker and employer representatives from Indigenous, rural, urban, and remote paramedic services, individuals with lived experience, clinicians, and Ministry of Health Representatives.

Findings of both the risk assessment and root cause analysis will be published on PSHSA.ca.



## INTRODUCTION AND RATIONALE

The purpose of the Paramedic Risk Assessment and Root Cause Analysis project is to support the sector in preventing injury and illness by identifying the occupational health and safety hazards that paramedics are most exposed to, understanding the associated risks and root causes that are fundamental to their elimination and control, and developing solutions to mitigate risk.

The two-part, industry-led project uses a “by the industry, for the industry” approach and represents a collaborative effort among sector representatives (labour and employer), paramedic networks, industry experts, health and safety professionals and Ministry representatives across Ontario.

The results of the Risk Assessment and Root Cause Analysis will better inform future prevention efforts and programming for the paramedic sector. The “for the industry, by the industry” approach will also increase engagement with the sector. A sector-specific commitment to addressing the unique health and safety hazards is an expected outcome based on the results of applying this process in other high-risk sectors.

Public Services Health & Safety Association (PSHSA) conducted the risk assessment and root cause analysis for the paramedic sector following the process developed by the Ministry of Labour, Training and Skills Development and included in the 2021-26 *Prevention Works* Strategy (Figure 1).

PSHSA completed the risk assessment in Fall 2021. This report is a summary of the findings of the risk assessment.

The second component of this project, the root cause analysis, will be completed in early 2022.

### To achieve Objective 1, the OHS system will engage in the following activities:

Build system capacity to conduct risk assessments and identify root cause of workplace injuries, illnesses and fatalities. Use risk assessment and root cause analysis findings (and other evidence where necessary) to target prevention, compliance and enforcement initiatives and focus on the OHS system.

**Why we are doing it:** Risk assessments and root cause analysis are effective ways of identifying, targeting and controlling high-risk workplace hazards.

Figure 1: *Excerpt from Ministry of Labour, Training and Skills Development's 2021-26 Prevention Works Strategy (Prevention Works - Ontario's Occupational Health and Safety System in Action, 2021)*

## PARAMEDIC INJURY DATA

Paramedic services are represented by Schedule 1 and Schedule 2 employers. From a WSIB premium perspective, paramedic service jobs are one of the highest risk occupations within PSHSA's sectors under the former rate group framework. Schedule 1 employers (rate group 590) have high premiums and increasing injury counts. In 2018 and 2019, premiums for rate



group 590 were \$7.90 per \$100 payroll. With the WSIB's transition to NAICS codes, Schedule 1 employers' premiums have decreased, which reduces the financial impact of workplace injuries for some paramedic services (Schedule 1 only). To our knowledge, this change to rate groups has not impacted the frequency and severity of occupational injuries for all paramedic services, nor is there an economic impact for Schedule 2 employers.

The paramedic sector also has high rates and risk of work-related mental health injury as evidenced by:

- WSIB data
- Research – Dr. R. Nicholas Carleton and the PSHSA/Conference Board of Canada Occupational Stress Injury Resiliency (OSIR) Index
- COVID-19 pandemic
- Workplace violence

Refer to Appendix A for detailed information on injury data from the paramedic sector.

## SCOPE

To support the paramedic sector in preventing injury and illness among paramedics, PSHSA conducted a risk assessment workshop in Fall 2021. This work was completed following the Ministry of Labour, Training and Skills Development's risk assessment and root cause analysis workshop framework. During the risk assessment workshop, PSHSA worked with sector representatives to identify hazards and rate the associated risk. The focus of the risk assessment workshop was on the occupation of paramedics (including community paramedics) providing patient care and did not explicitly focus on other aspects of the pre-hospital care system, such as CACC, logistics or other roles in the paramedic service organization. The project included Indigenous land and air ambulance services in rural, urban and remote areas of the province.

Only worker and employer representatives participated as voting members. PSHSA, Ministry, academic and other participants observed as non-voting members. Participants represented and participated with a view to the sector, and not their individual organizations.

## METHODOLOGY

The guiding principles for participating in the workshop were:

- Engagement: Process involves people who may be affected by the decisions it makes or can influence the implementation of its decisions
- Empowerment: Process characterizes willingness to provide a platform for decision making with key stakeholders
- Diversity: Process encourages and welcomes diversity of thought, experiences, skills and talents of participants of all ages, genders, races and sexual orientations
- Inclusion: Process provides an environment where all individuals are treated fairly and respectfully, and given equal access to opportunities, resources and accommodation where they might otherwise be excluded from participating





Prior to the risk assessment workshop, all voting and non-voting participants were contacted by the project lead and asked to complete a list of workplace hazards affecting frontline paramedics. The hazards provided by all stakeholders were then compiled and categorized into 26 main hazard categories (e.g., musculoskeletal disorders, personal protective equipment, ambulance design, workplace violence, psychosocial hazards). After filtering for duplicates and out of scope hazards, a total of 105 hazards were identified.

Following an open discussion involving all stakeholders on each hazard and any supporting evidence of the impact of the hazard, the worker and employer representatives individually and anonymously rated each of the hazards' associated risk level using an online voting system. The representatives ranked both the likelihood and consequence of the hazard to determine the overall risk rating for all hazards (Figures 2 and 3).

Likelihood		Consequence	
Rating	Description	Rating	Description
<b>Almost Certain (5)</b>	<b>Unwanted event is almost certain to happen in the next year</b> (or 90% or greater chance of occurrence)	<b>Extreme (5)</b>	<b>Fatality or permanent disability</b> (or extreme impact/importance)
<b>Very Likely (4)</b>	<b>High probability for unwanted event to occur in the next year</b> (or between 50-90% chance of occurrence)	<b>Major (4)</b>	<b>Serious event/critical injury or critical illness</b> (or major impact/importance)
<b>Likely (3)</b>	<b>It is possible for unwanted event to occur in the next year</b> (or between 20-50% chance of occurrence)	<b>Moderate (3)</b>	<b>Temporary disability (lost time): injury/illness</b> (or moderate impact/importance)
<b>Unlikely (2)</b>	<b>Low probability for unwanted event to occur in the next year</b> (or between 5-20% chance of occurrence)	<b>Minor (2)</b>	<b>First aid treatment (no lost time)</b> (or minor impact/importance)
<b>Rare (1)</b>	<b>Very low probability for unwanted event to occur in the next year</b> (or less than 5% chance of occurrence)	<b>Low (1)</b>	<b>No injury or illness</b> (or negligible impact/importance)

Figure 2: Risk Assessment Risk Rating Definitions



	Risk Rating				
	Critical	High	Moderate	Low	
	20.00 ≤ 25.00		12.00 ≤ 19.99	5.00 ≤ 11.99	0.00 ≤ 4.99
Likelihood	Almost Certain (5)	5	10	15	20
	Very Likely (4)	4	8	12	16
	Likely (3)	3	6	9	12
	Unlikely (2)	2	4	6	8
	Rare (1)	1	2	3	4
	Low (1)	Minor (2)	Moderate (3)	Major (4)	Extreme (5)
	Consequence				

Figure 3: Risk Rating Matrix

## PROJECT TIMELINES

The project was first proposed to the EMS Section 21 Sub-Committee in June 2021. The bulk of the risk assessment work was completed in Fall 2021. Results of the risk assessment were presented to the workshop participants and the EMS Section 21 Sub-Committee in January 2022. The report detailing results and findings of the risk assessment were published and shared with the sector in April 2022. (See Figure 4 for an illustrated timeline.)

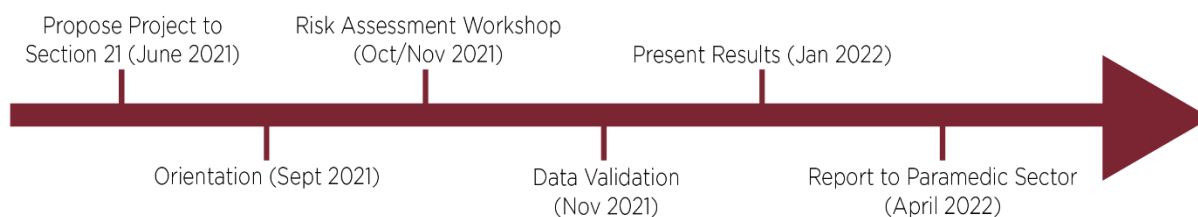


Figure 4: Risk Assessment Workshop Project Timelines

## FINDINGS

Tables 1 to 4 summarize the top ten hazards rated by employer, worker and all voting members (employer and worker representatives). Of the 105 hazards voted on, no hazards were rated critical, 48 were rated high, 54 were rated medium and 3 were rated low. See Appendix B for detailed risk ratings on all identified hazards.





There was an important level of congruence between the employer and worker groups in that there was 70% agreement in the top ten hazards rated by employer and worker representatives. Psychosocial was the top-rated hazard category. Four hazard categories – ambulance design, equipment, workplace violence and safety incidents related to traffic – appeared twice in the final list of top ten hazards.

**TABLE 1: COMBINED TOP 10 HAZARDS RATED BY EMPLOYER AND WORKER REPRESENTATIVES**

Rank	Hazard Category	Situation/condition that could result in injury/illness	Risk Rating
1	Psychosocial	Post-Traumatic Stress Disorder (PTSD) injuries	19.13
2	Ambulance Design	Inability to use seat belts during patient care while vehicle is in motion	19.00
3	Equipment	Portable Radios, Communication CACC, Cell Phones	18.40
4	Workplace violence	Overall safety of the paramedics Support in exigent circumstances when paramedics respond to calls for service.	18.03
5	Workplace violence	Violence and abuse in the workplace	17.33
6	Equipment	CACC Radio system – system reliability	17.00
7	Safety - Traffic	Vehicle collisions	16.97
8	Ambulance Design	General design of the ambulance	16.67
9	Fatigue	Worker sleep related Fatigue	16.67
10	Safety - Traffic	Roadway protections should be standardized across the province and traffic protection plans. Refer to Construction Projects Regulation (s67(4)-(6)), Industrial Establishments Regulation (s20) and OTM (Ontario Traffic Manual) Book 7.	16.61



**TABLE 2: TOP 10 HAZARDS RATED BY EMPLOYER REPRESENTATIVES**

Rank	Hazard Category	Situation/condition that could result in injury/illness	Risk Rating
1	Equipment	Portable Radios, Communication CACC, Cell Phones	19.50
2	Equipment	CACC Radio system – system reliability	18.78
3	Fatigue	Driver Fatigue /impaired driving	18.53
4	Ambulance Design	Inability to use seat belts during patient care while vehicle is in motion	18.33
5	Workplace violence	Violence and abuse in the workplace	18.00
6	Psychosocial	Post-Traumatic Stress Disorder (PTSD) injuries	17.36
7	Workplace violence	Overall safety of the paramedics Support in exigent circumstances when paramedics respond to calls for service.	17.33
8	Safety - Traffic	Vehicle collisions	17.25
9	Safety - Traffic	Roadway protections should be standardized across the province and traffic protection plans. Refer to Construction Projects Regulation (s67(4)-(6)), Industrial Establishments Regulation (s20) and OTM (Ontario Traffic Manual) Book 7.	17.25
10	Fatigue	Worker sleep related Fatigue	16.67



**TABLE 3: TOP 10 HAZARDS RATED BY WORKER REPRESENTATIVES**

Rank	Hazard Category	Situation/condition that could result in injury/illness	Risk Rating
1	Psychosocial	Post-Traumatic Stress Disorder (PTSD) injuries	20.94
2	Ambulance Design	Inability to use seat belts during patient care while vehicle is in motion	19.50
3	Workplace violence	Overall safety of the paramedics Support in exigent circumstances when paramedics respond to calls for service.	18.75
4	Ambulance Design	General design of the ambulance	18.75
5	Chemical	Exposure – opioids/chemical	18.06
6	Equipment	Portable Radios, Communication CACC, Cell Phones	17.33
7	Psychological	Increased psychological stresses during COVID pandemic	17.25
8	Safety - Traffic	Vehicle collisions	16.67
9	Workplace violence	Violence and abuse in the workplace	16.67
10	Fatigue	Worker sleep related Fatigue	16.67



**TABLE 4: COMPARISON AND CONGRUENCE BETWEEN  
EMPLOYER AND WORKER GROUP RATINGS**

Employer			Worker		
Rank	Hazard Category	Situation/condition that could result in injury/illness	Rank	Hazard Category	Situation/condition that could result in injury/illness
1	Equipment	Portable radios, communication CACC, cell phones	1	Psychosocial	PTSD injuries
2	Equipment	CACC radio system – system reliability	2	Ambulance Design	Inability to use seat belts during patient care while vehicle is in motion
3	Fatigue	Driver fatigue impaired driving	3	Workplace Violence	Overall safety of the paramedics
4	Ambulance Design	Inability to use seat belts during patient care while vehicle is in motion	4	Ambulance Design	General design of the ambulance
5	Workplace Violence	Violence and abuse in the workplace	5	Chemical	Exposure – opioids/chemical
6	Psychosocial	PTSD injuries	6	Equipment	Portable radios, communication CACC, cell phones
7	Workplace Violence	Overall safety of the paramedics	7	Psychosocial	Increased psychological stresses during COVID
8	Safety - Traffic	Vehicle collisions	8	Safety - Traffic	Vehicle collisions
9	Safety - Traffic	Roadway protection should be standardized across the province	9	Workplace Violence	Violence and abuse in the workplace
10	Fatigue	Worker sleep related fatigue	10	Fatigue	Worker sleep related fatigue

## WORKSHOP FEEDBACK

Following the risk assessment workshop, an evaluation survey was sent to all participants. Responses were received from 14 participants: six worker representatives, five employer representatives, two Ministry representatives and one academic representative.

- 71% of respondents agreed or strongly agreed with the statement: “There was an increase in my knowledge or awareness of how to prevent workplace injuries, illnesses and fatalities as a result of participating in the risk assessment workshop”.
- 71% of respondents agreed or strongly agreed with the statement: “There was an increase in my skills in applying hazard and risk controls as a result of participating in the risk assessment workshop”.
- 79% of respondents agreed or strongly agreed with the statement: “The risk assessment workshop helped me to learn more about health and safety”.
- 100% of respondents agreed or strongly agreed with the statement: “The risk assessment workshop covered the majority of high, medium and low risk hazards experienced by paramedics in the workplace”.

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*“Workshops like this are valuable...[they allow] for discussion and brainstorming on how risks, no matter how big or small, affect day-to-day operations and working in the paramedicine field.”*

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When asked about the most important learnings from participating in the risk assessment workshop, participants’ responses revealed the following themes.

## PASSION FOR PARAMEDICINE AND APPRECIATION FOR ROLE OF THE PARAMEDIC

Participants noted the passion they have for the profession and paramedicine in Ontario. Participants who do not work directly in paramedic services (Ministry and academic representatives) reported learning about the work paramedics do on a daily basis, the need for better protections and the need for the government to recognize these points.

## COLLABORATION, EMPOWERMENT, SHARED LEARNING AND RISK QUANTIFICATION

Participants valued the opportunity to collaborate, voice ideas, learn from others and share risk mitigation strategies and solutions used in other services. It was empowering to participate in the workshop, hear about challenges and solutions experienced in other services and collect data to quantify risks.



## COMMON PROVINCIAL RISKS AND DIFFERENCES IN RISK PERCEPTION

Participants noted collective concerns from all parties, and that local issues are often provincial issues. They felt that paramedic voices and concerns are finally being taken seriously and that efforts are underway to appropriately characterize the occupational hazards that paramedics are exposed to on a daily basis.

While most risks are universal across the province in the paramedic profession, there is a variety of independent views and opinions. There are some disparities in service delivery and risk perception due to regional factors (e.g., remote/rural/urban, northern/southern Ontario, land/air). One example given was the regional differences and increasing frequency and severity of workplace violence incidents due to assaults and weapons.

## EDUCATION AND TRAINING

Participants reported a need for greater education on health and safety issues in the paramedic profession to prevent future injuries and illness, both physical and psychological.

## WORKPLACE VIOLENCE AND MENTAL HEALTH

The need for supports addressing workplace violence towards paramedics and paramedic mental health was identified. In larger urban centers, an increase in frequency and severity of workplace violence incidents due to assaults and weapons was identified. Respondents identified paramedic mental health as a priority for investigation, assessment, intervention, program development and management due to the risk of losing paramedics approaching “crisis” levels as a result of acute and cumulative stress, self-harm, suicide and PTSD. One respondent suggested that ongoing mental health strategies for paramedics should be treated like Continuing Medical Education (CME).

## MINISTRY OF HEALTH

Respondents expressed concern regarding Ministry of Health policies, procedures and equipment as well as the ability to address occupational health and safety concerns with the Ministry of Health.

## NEXT STEPS

In January 2022, a workshop was held with the EMS Section 21 Sub-Committee where the committee reviewed the top ten hazards which resulted from the risk assessment and selected the top identified hazard – Post-traumatic stress disorder – to be explored in the second component of the project: the root cause analysis. The risk statement that will outline the scope of the root cause analysis is: “exposure to events that can lead to potential psychological harm in the paramedic sector, and can seriously impact the worker, their families, the public and the service”. The scope of this work will include land and air ambulance paramedics and Central Ambulance Communication Centre (CCAC) ambulance communication officers. PSHSA will seek to secure a balance of perspectives for the root





cause analysis workshop, including worker and employer representatives from Indigenous, rural, urban, and remote paramedic services, individuals with lived experience, clinicians, and Ministry of Health Representatives.

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*The risk statement that will outline the scope of the root cause analysis is: “exposure to events that can lead to potential psychological harm in the paramedic sector, and can seriously impact the worker, their families, the public and the service”.*

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The root cause analysis was completed from January to March 2022. Findings will be published on PSHSA.ca.



## ACKNOWLEDGEMENTS

PSHSA would like to acknowledge the support of our funder and prevention system partner, the Ministry of Labour, Training and Skills Development.

The EMS Section 21 Sub-Committee have been enthusiastic supporters of the Risk Assessment and Root Cause Analysis project from its inception. We appreciate the support of the committee members who offered their perspectives on scope of work and shared their industry connections to ensure the project participants captured the different perspectives across Ontario's paramedicine sector.

PSHSA would like to express our appreciation to the employer, worker, Ministry, and industry representatives for their participation in the risk assessment. We appreciate the perspectives that the participants brought to the project and the thoughtful and passionate discussion on hazards that impact Ontario's land and air paramedics. This project could not have been completed without the contributions of the following individuals:

### Employer Representatives

- S. Blake, Deputy Director, Nootkamegwanning First Nation EMS
- M. Roney, Deputy Chief, Greater Sudbury Paramedic Services
- M. Schjerning, Chief, Emergency Services, County of Lennox and Addington
- J. Smith, Chief Flight Paramedic, Ornge
- J. Watts, Deputy Chief, York Region Paramedic Services
- S. Wilkinson, Superintendent, Oneida Nation Paramedic Services

### Worker Representatives

- R. Bennett, Unifor Local 1359, Paramedic, Sault Ste Marie Paramedic Services
- D. Doran, OPSEU (Ontario Public Service Employees Union) Ambulance Division, Paramedic, Frontenac Paramedic Service
- I. Nash, CUPE Ambulance Committee of Ontario (CACO) Health and Safety Representative, CUPE (Canadian Union of Public Employees), Paramedic, Essex-Windsor EMS
- C. Stolte, SEIU Healthcare (Service Employees International Union), Paramedic, Lambton EMS
- B. Tansley, Paramedic, Nootkamegwanning First Nation EMS
- P. Zanon, Unifor Local 2002, Paramedic, Ornge

### Ministry and Industry Representatives

- M. Bay, Emergency Health Regulatory and Accountability Branch, Ministry of Health
- S. Fischer, Department of Kinesiology, University of Waterloo
- J. Jeaurond, Occupational Health and Safety Branch, Ministry of Labour Training and Skills Development
- C. MacDonald, Policy Advisor, Programs Policy & Modernization Branch, Ministry of Long-Term Care
- S. O'Neil, Emergency Health Program Management and Delivery Branch, Ministry of Health



- A. Yazdani, Canadian Institute for Safety Wellness and Performance, Conestoga College Institute of Technology & Advanced Learning

PSHSA Representatives

- C. Joli-Coeur, Health and Safety Consultant
- M. Khan, Health and Safety Consultant
- T. Morose, Director Prevention, Engagement and Retention for Public Safety, Health and Community Care
- H. Van hulle, Vice President, Client Outreach, Stakeholder and Government Relations



## APPENDIX A: PARAMEDIC INJURY DATA

Paramedic services are represented by Schedule 1 and Schedule 2 employers. From a WSIB premium perspective, paramedic service jobs are one of the highest risk occupations within PSHSA's sectors under the former rate group framework. Schedule 1 employers (rate group 590) have high premiums and increasing injury counts. In 2018 and 2019, premiums for rate group 590 were \$7.90 per \$100 payroll. With the WSIB's transition to NAICS codes, Schedule 1 employers' premiums have decreased, which reduces the financial impact of workplace injuries for some paramedic services (Schedule 1 only). To our knowledge, this change to rate groups has not impacted the frequency and severity of occupational injuries for all paramedic services, nor is there an economic impact for Schedule 2 employers.

Figures 5 and 6 illustrate the count of lost time injury (LTI) and no lost time injury (NTLI) claims by injury types for Ontario's paramedics (Schedule 1 and 2).

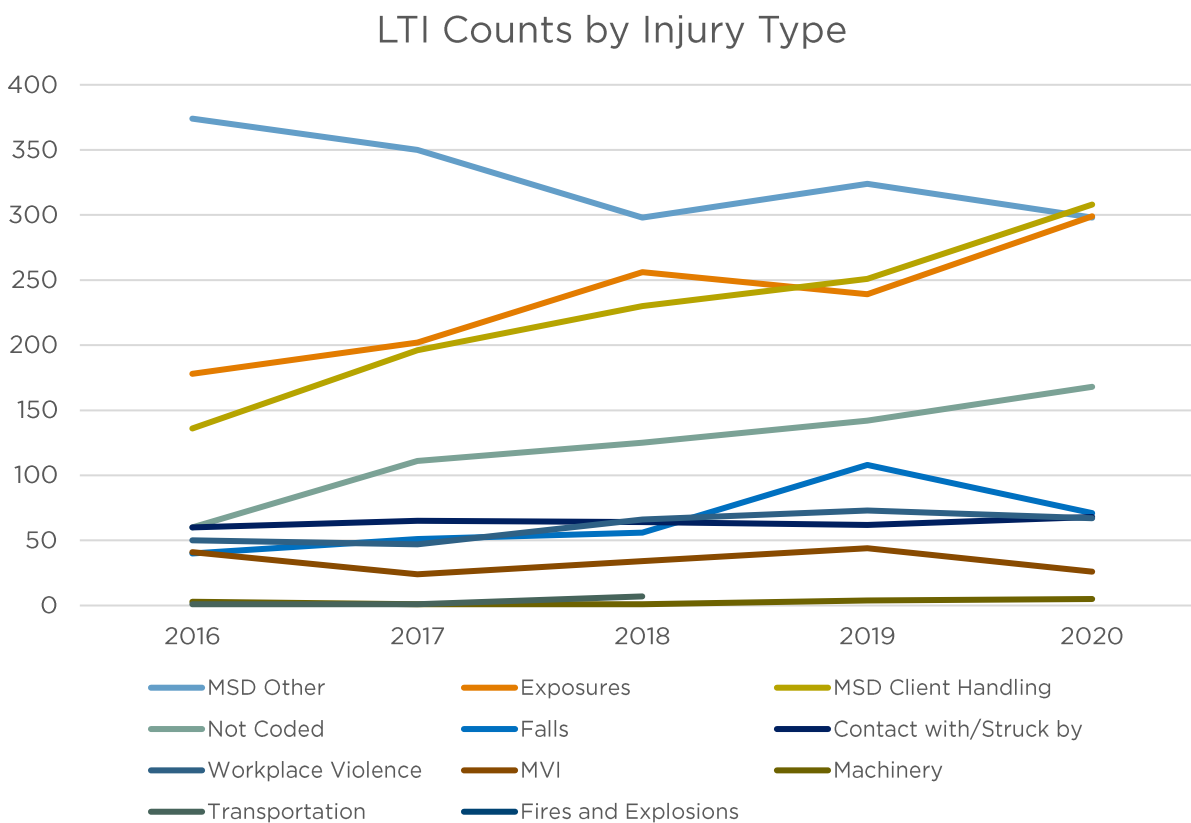


Figure 5: Lost Time Injury Counts by Injury Type for Ambulance Attendants and Other Paramedical Occupations, 2016-2020

Source: WSIB Enterprise Information Warehouse (EIW) - Claim Cost Analysis Schema  
October 2021 snapshot



Historically, musculoskeletal disorders associated with non-client handling tasks accounted for a sizable proportion of injuries to paramedics. With the investment in power stretchers and power loading systems, there has been a decline in the annual lost time injury count. Over the same period, the count of lost time injuries due to musculoskeletal disorders associated with client handling as well as exposures (which include mental health claims) have increased significantly. Injuries attributed to workplace violence have almost tripled from 24 in 2015 to 72 in 2019.

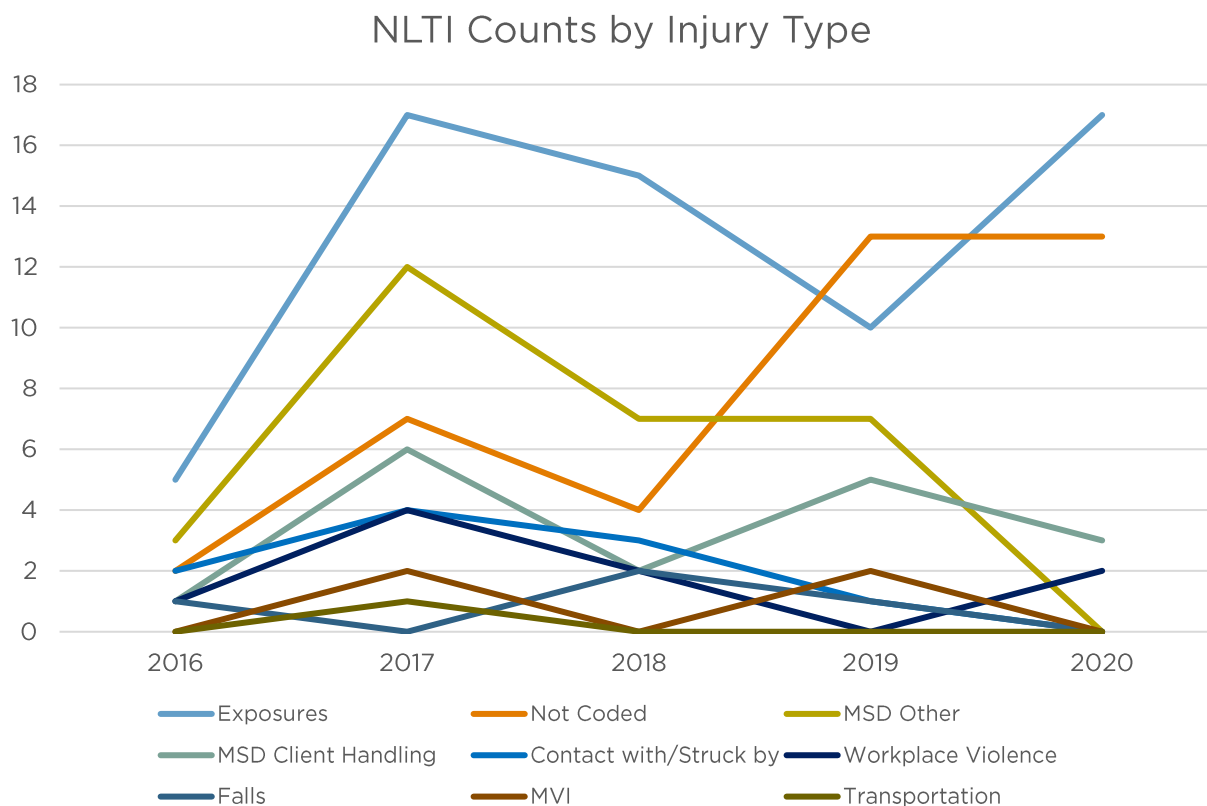


Figure 6: No Lost Time Injury Counts by Injury Type for Ambulance Attendants and Other Paramedical Occupations, 2016-2020

Source: WSIB Enterprise Information Warehouse (EIW) - Claim Cost Analysis Schema  
October 2021 snapshot

The paramedic sector has high rates and risk of work-related mental health injury as evidenced by:

- WSIB data
- Research – Dr. R. Nicholas Carleton and the PSHSA/Conference Board of Canada Occupational Stress Injury Resiliency (OSIR) Index
- COVID-19 pandemic
- Workplace violence



Past research has found that public safety professionals report much higher levels of mental health problems (44.5% screen positive for one or more mental health disorders) and suicidal behaviours (e.g., ideation, planning, and attempts) than are found in the general population (Carleton et al., 2017).

Paramedic service organizations are working on the frontlines of the COVID-19 pandemic. Evidence is also being presented that COVID-19 may have lasting effects on mental health, particularly among frontline workers. A commentary published by the Public Health Agency of Canada highlights the likeliness that the “new stressors [of COVID-19] may mean that public safety personnel need additional resources” to support mental health as a result of “repeated exposures to potentially psychologically traumatic events (PPTe) and significant occupational stressors like staffing shortages, insufficient resources and fatigue”, which can put increase strain on public safety personnel (Heber et al., 2020). The commentary highlights the need for healthy coping, maintaining routines, healthy social connections, just-in-time training and communications as needs to be addressed during and following the pandemic.

The Conference Board of Canada and Public Services Health & Safety Association partnered to create a non-diagnostic screening tool to assess occupational stress injury (OSI) risks among first responders and frontline healthcare workers in Canada. The Occupational Stress Injury Resilience (OSIR) index is a non-diagnostic survey tool that could assess the risk of OSI among first responder populations.

From June to October 2020, 620 survey responses were received from healthcare and public safety professionals. Of the respondents, 21% were paramedics (n=133). Figure 7 illustrates the OSIR Index scores by profile and profession. Approximately 60% of paramedics had lower OSIR index scores which indicates less resilience and greater vulnerability for OSI. Individuals in the challenge category of response are typically experiencing chronic feelings of work and life distress or are struggling, while those in the concern are experiencing some degree of concern and unwanted stress (Florko et al., 2021).



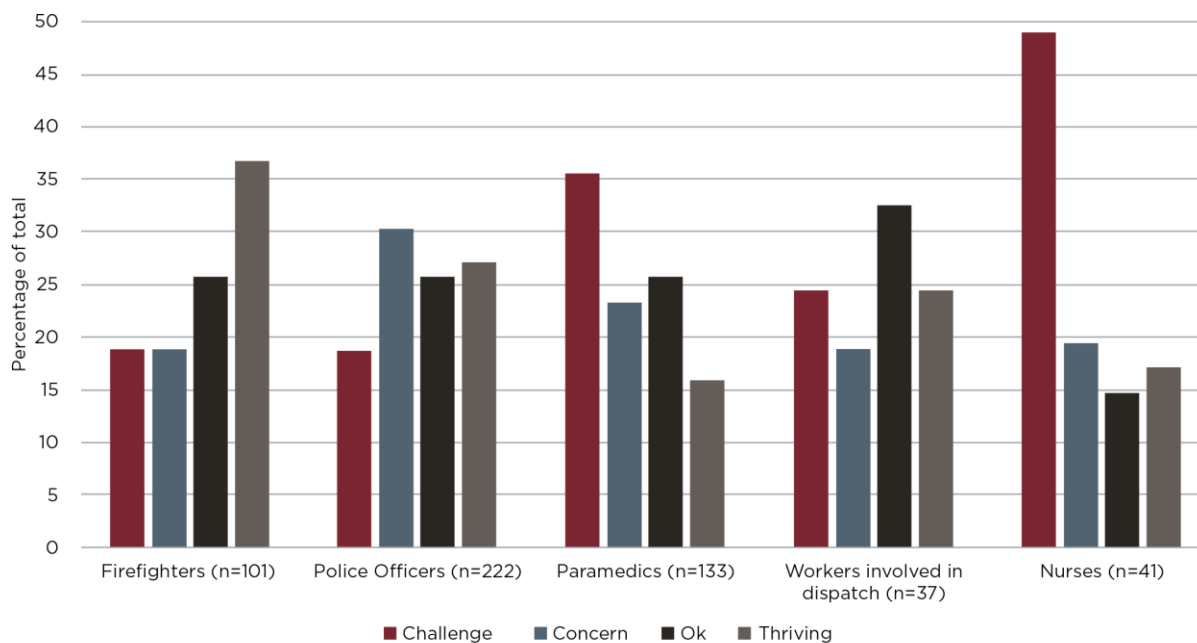


Figure 7: Percentage of First Responders by OSIR Profile by Vocation

Lastly, paramedics are often confronted with a range of abusive behaviours when responding to calls for service. Peel Regional Paramedic Service has launched a first-of-its-kind violence reporting system to enable medics to log abuse when it happens and generate comprehensive data about these occurrences for the service (Isai, 2020). The Paramedic Chiefs of Canada have also identified violence as a significant issue facing paramedics and have issued a position statement of zero tolerance for physical and verbal abuse against paramedics (Paramedic Chiefs of Canada).



## APPENDIX B: ALL RATED HAZARDS

All hazards identified and rated in the risk assessment by workshop participants (105 in total) are listed below in the order they were discussed. [Risk ratings](#) are on a scale from one to 25. The “Employer” column represents the ratings by all employer representatives, the “Worker” column represents the rating by all worker representatives, and the “All Participants” column represents the cumulative rating of both employer and worker representatives.

Sequence	Hazard Category	Situation/condition that could result in injury/illness	Risk Rating		
			Employer	Worker	All Participants
1	PPE	Lack of ability to communicate between patient compartment/driver cab while maintaining proper infection control	11.08	11.67	11.38
2	PPE	PPE shortages and/or misuse. Desire for standard glove thickness that is designed for patient care and bodily fluids.	11.08	10.86	11.00
3	Ambulance Design	General design of the ambulance	14.67	18.75	16.67
4	Ambulance Design	Access/egress of ambulance (e.g., height of steps, lack of wheelchair/stair chair accessibility)	8.00	10.00	8.97
5	Ambulance Design	Interior height	11.61	8.97	10.25
6	Ambulance Design	Sharp safety while moving	9.44	8.44	8.94
7	Ambulance Design	Inability to use seat belts during patient care while vehicle is in motion	18.33	19.50	19.00



Sequence	Hazard Category	Situation/condition that could result in injury/illness	Risk Rating		
			Employer	Worker	All Participants
8	Ambulance Design	Lack of quality front-facing headlights during operation (competing lights in traffic, inclement weather)	8.97	10.00	9.48
9	Ambulance Design	Interior exhaust discharge location (non-HEPA filter)	5.42	8.50	6.88
10	Ambulance Design	IV and other drawer issues where some drawers open while the vehicle is in motion	3.89	1.17	2.33
11	Ambulance Design - MSD	Working in the rear compartment of the ambulance	8.44	12.25	10.28
12	Infection Prevention and Control	Disease transmission from spitting or inflicting harm via needle stick injuries	15.33	15.33	15.34
13	Infection Prevention and Control	Proper disinfection of ambulance post-contamination	10.03	13.33	11.65
14	Infection Prevention and Control	Standardized approach to infectious disease management	11.11	9.50	10.29
15	Equipment	CACC radio system - coverage	16.67	15.33	15.99
16	Equipment	CACC radio system - system reliability	18.78	15.28	17.00
17	Equipment	CACC radio system - ergonomics	11.67	7.08	9.24
18	Equipment	CACC radio system - radio access	10.39	14.00	12.14
19	Equipment	Portable radios, Communication CACC, cell phones	19.50	17.33	18.40
20	Equipment	Base paging systems	7.50	12.22	9.72



Sequence	Hazard Category	Situation/condition that could result in injury/illness	Risk Rating		
			Employer	Worker	All Participants
21	Equipment /MSD	Lack of access to equipment for bariatric patients to limit MSDs (power stair-chairs)	10.86	14.06	12.50
22	Equipment	Outdated equipment	5.06	7.56	6.25
23	Equipment	Uniforms (all weather conditions, chemical and biohazards)	10.03	11.08	10.56
24	Biological	Exposures to communicable diseases not considered exposures if PPE is used	7.50	9.44	8.51
25	Biological	Being exposed to a variety of infections	16.67	14.00	15.31
26	Biological	Exposure to COVID-19 and variants	12.67	9.44	11.00
27	CBRN/ Chemical	Cancer care at home – chemo exposure, Cytotoxic drugs, WHMIS, radioactive pods for cancer care at home	5.50	6.67	6.14
28	Workplace Violence	Workplace violence - inability to restrain patients	13.44	13.42	13.44
29	Workplace Violence	Violence and abuse in the workplace	18.00	16.67	17.33
30	Workplace Violence	Overall safety of paramedics, support in exigent circumstances when paramedics respond to calls for service	17.33	18.75	18.03
31	Workplace Violence	Paramedics being charged with assault on scene due to violent and unstable scene. Cell phone recording only a snapshot of the entire scene	9.50	8.89	9.24



Sequence	Hazard Category	Situation/condition that could result in injury/illness	Risk Rating		
			Employer	Worker	All Participants
32	Psychosocial	PTSD injuries	17.36	20.94	19.13
33	Psychological	Increased psychological stresses during COVID-19 pandemic	10.00	17.25	13.38
34	Psychosocial	Burnout	11.50	16.61	14.06
35	Psychosocial	Depression	13.42	16.00	14.69
36	Psychosocial	Addictions / problematic substance use	12.14	13.44	12.81
37	Psychosocial	Compassion fatigue	11.67	14.44	13.06
38	Psychosocial	Suicide / suicidal ideations of paramedics.	14.50	15.97	15.38
39	Psychosocial	Anxiety	12.22	15.28	13.71
40	Psychosocial	Call volumes	7.00	13.42	9.97
41	Psychosocial	Availability of staff, personal fatigue	12.83	14.58	13.71
42	Psychosocial	Physical wellbeing of paramedics to withstand the physical and mental demands of their work, referring to the ability to maintain physical and mental readiness for duty and the ability to have sufficient time for recovery to help maintain physical and mental readiness for duty. (Note: this is a broad category related to things like cumulative injury or burnout that relate to exposures on the body, but also the body's ability to respond and/or recover from those exposures).	12.83	11.61	12.24
43	Psychosocial	Lunches (receiving late or missed)	6.14	12.67	9.11



Seq- uence	Hazard Category	Situation/condition that could result in injury/illness	Risk Rating		
			Employer	Worker	All Participants
44	Occupational Disease	Cancers	13.72	12.83	13.33
45	Physical Agent - Temperature	Heat emergencies	9.00	12.14	10.53
46	Physical Agent - Temperature	Cold emergencies	12.25	10.50	11.38
47	Physical - Noise	Noise exposure from ambulances	8.03	11.61	9.75
48	Physical Agent - Temperature	Extreme garage temperatures	3.06	6.25	4.51
49	Physical - Noise	Noise from equipment	3.89	8.89	6.25
50	Physical - Vibration	Whole body vibration exposure	8.03	8.00	8.02
51	Safety	Confined spaces	6.94	6.86	7.03
52	Safety	Trenches/excavations	5.75	12.28	8.85
53	Safety	Injuries caused by working with different equipment (e.g., cuts, scrapes, MSD)	6.67	8.00	7.32
54	Safety	Physical fitness of partner puts worker at risk	8.97	8.97	8.97
55	Safety	Driving code 4, too many lights and siren responses leading to preventable collisions	15.97	13.44	14.69





Seq- uence	Hazard Category	Situation/condition that could result in injury/illness	Risk Rating		
			Employer	Worker	All Participants
56	Safety - Slips, Trips and Falls	Physical injury (slips, trips, falls)	14.06	15.17	14.67
57	Safety - Traffic	Vehicle collisions	17.25	16.67	16.97
58	Safety	Long transport times	11.67	12.67	12.22
59	Safety	Rural settings	9.50	12.67	11.05
60	Safety	Machine hazards	5.67	10.56	7.97
61	Safety	Paramedics on or near water	8.00	14.06	10.83
62	Safety	Driver training and new drivers	14.06	14.67	14.38
63	Safety - Working Alone	Paramedics having to work alone - no allied resources (fire, police, other EMS) nearby, sometimes hours away	14.67	15.97	15.31
64	Safety	Helmets	10.39	11.11	10.79
65	Safety - Facilities	EMS base design	6.61	12.14	9.17
66	Safety - Traffic	Roadway protections should be standardized across the province (4) Every employer shall develop in writing and implement a traffic protection plan for the employer's workers at a project if any of them may be exposed to a hazard from vehicular traffic (O. Reg. 145/00, s. 21).	17.25	15.97	16.61
67	Safety - WAH	Working at heights (i.e., awareness of WAH risk factors and WAH regulation for workers on construction projects)	6.72	13.33	9.90



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			Employer	Worker	All Participants
68	Safety	Adverse weather conditions, early warning system (e.g., thunderstorms, flooding, tornadoes, ice, driving, equipment)	9.92	15.89	12.84
69	Safety - Home Visits	No control over state of residence (e.g., hoarding, poorly maintained stairs, unshoveled walkway)	7.08	15.17	10.75
70	Safety	Active shooter/mass casualty events – stand down or attend to casualties?	12.28	16.61	14.44
71	PSO - Directives, Standards, Procedures & Regulations	Community paramedic programs not covered in Ambulance Act	3.67	11.00	6.88
72	PSO - Directives, Standards, Procedures & Regulations	New paramedic hires	8.89	11.61	10.29
73	PSO - Directives, Standards, Procedures & Regulations	Limited resources (police/fire, other ambulances)	13.44	13.42	13.44
74	PSO - Directives, Standards, Procedures & Regulations	Schedule – Part time (PT)	7.50	11.67	9.48
75	MLTSD - Directives, Standards, Procedures & Regulations	EMS needs separate Regulations under OHSA	5.42	12.14	8.44



Sequence	Hazard Category	Situation/condition that could result in injury/illness	Risk Rating		
			Employer	Worker	All Participants
76	MLTSD - Directives, Standards, Procedures & Regulations	Standard health and safety committees province-wide (multi-site vs. single site)	3.36	5.42	4.33
77	MLTSD/PSO/ MoH - Directives, Standards, Procedures & Regulations	More sector-specific health and safety training province-wide rather than individual employers	4.67	7.50	6.00
78	MoH - Directives, Standards, Procedures & Regulations	Deployment/response	3.67	9.50	6.24
79	MoH - Directives, Standards, Procedures & Regulations	Triaging by Central Ambulance Communication Centre (CACC)	15.33	15.97	15.65
80	MoH - Directives, Standards, Procedures & Regulations	Too much equipment, equipment brought to patient side should be reduced to promote rapid assessment and transport Extra can be stored in vehicle	10.50	9.44	9.97
81	Fatigue	Worker sleep-related fatigue	16.67	16.67	16.67
82	Fatigue	Physical fatigue	12.83	13.44	13.14
83	Fatigue	Driver fatigue/impaired driving	18.53	14.67	16.56
84	Fatigue	Post-shift vehicle collision following night shift due to fatigue	16.50	14.67	15.58
85	Fatigue	Schedule - Full time (FT)	13.42	11.67	12.53



Seq- uence	Hazard Category	Situation/condition that could result in injury/illness	Risk Rating		
			Employer	Worker	All Participants
86	Chemical	Clandestine lab and grow-op	7.22	9.78	8.46
87	Chemical	Toxic exposures	10.67	12.83	11.82
88	Chemical	Exposure – opioids/chemical	9.50	18.06	13.44
89	Chemical	Gas Exposure – acute and unintended exposure	9.33	15.28	12.25
90	Chemical - Training	Lack of training on low oxygen environments, air monitoring not available	11.56	13.89	12.75
91	IRS	Lack of Training (e.g., driving, equipment)	9.44	12.78	11.05
92	IRS	Lack of health and safety knowledge	9.33	14.06	11.61
93	MSD - Client Handling	Increased risk of not having hydraulic stretchers and mechanical lifts, power cot plus/minus power load system	7.39	11.67	9.44
94	MSD - Client Handling	Moving patients from stretcher to hospital bed	11.08	12.22	11.67
95	MSD – Client Handling	Patient handling (e.g., fore-aft lifting, transferring patients to conveyance devices, maneuvering patients on conveyance devices, (un)loading patients on conveyance to/from ambulance	12.83	13.42	13.14
96	MSD	Lack of ergonomic workspaces for completion of controllable work/paperwork	7.39	8.97	8.25
97	MSD	MSD due to carrying equipment (e.g., weight of bags, bag design, straps)	10.56	12.25	11.39



Seq- uence	Hazard Category	Situation/condition that could result in injury/illness	Risk Rating		
			Employer	Worker	All Participants
98	MSD	Mechanical CPR device Not having CPR device and doing CPR manually	6.22	14.00	9.76
99	MSD	Sprains and strains	10.42	14.00	12.25
100	Chemical	Chronic gas exposure	13.42	11.61	12.50
101	Safety	Working alone (1 paramedic only)	9.92	14.67	12.24
102	Ambulance Design	Lack of communication between compartment and dispatch	7.50	10.56	8.99
103	Ambulance Design	Lack of proper lunch storage, risk of exposure to biological/chemical agents	8.00	9.50	8.75
104	Physical - Noise	All crews - hearing loss from working in and around aircraft	12.83	13.42	13.13
105	Safety	Land paramedic in Ontario exposed to running aircraft at patient transfer to ORNGE	12.50	12.78	12.67



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