

BC Film Stunt Performers and Stunt Related Injuries: A Survey and Review

September 2012

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1.0 Executive Summary

Background

The purpose of this research was to a) explore the predominant health and safety issues facing stunt performers in British Columbia (BC) and b) identify areas or projects where Actsafe can help the stunt performance community to do their jobs safely.

Initial Review

- WorkSafeBC Stunt Related Injury Statistics - Falls from elevation accounted for over half of the accepted claims by stunt performers in the past 10 years.
- Academic Sources – One study highlights the prevalence of concussions/head injuries sustained during stunt performance. Stunt coordinators and physicians were found to be the individuals most influential in communicating health and safety oriented information to respondents.

Online Survey

- Wire work & ratchets, martial arts and high falls resulted in the greatest number of reported injuries respectively.
- A large percentage of respondents suffering head injuries did not report the filing of accident reports or receive compensation after injury.
- The primary rationale from respondents for not reporting an injury was a lack of recognition of the severity of injuries. Other reported factors included feelings that injury was part of the job, the belief reporting would decrease the likelihood of ascertaining future work and perceived difficulties in dealing with the regulatory agency.
- 35% of respondents felt the cumulative abuse they have sustained as a stunt performer has negatively affected their overall health and/or affected their quality of life.

Conclusions

- Head injuries were widely underreported by the responding stunt performers.
- The greatest cause of injury was reported as a lack of sufficient rehearsal time for planning and preparation of stunts. See Section 5.0 for further details.

- Solutions to a lack of sufficient rehearsal time involve members from many levels of the film/television team :
 - Producers, directors and their respective teams must budget sufficient time for rehearsal of stunts planned both well in advance and improvised on the day.
 - Stunt coordinators must demand appropriate time to review last minute changes to a planned stunt.
 - Stunt performers must refuse to perform in conditions that may lead to injury.
 - Riggers must be trained and experienced in the use of the equipment for the demands of each specific stunt.

Recommendations

1. Education and resources regarding stunt performer rights/responsibilities and injury awareness. Efforts should be targeted to members of the stunt team, in addition to direction and production groups. See Section 6.0 for further details.
2. Enhancement of lines of communication with directors/producers to emphasize the importance of allowing adequate preparation time for stunt work.
3. Encouragement of stunt performers to actively engage and inform the planning, rigging and execution of their own stunts.
4. Evaluation of the safety precautions involved in stunt work that result in falls from elevation with a focus on wire work & ratchets.
5. Establishment of improved opportunity for experienced stunt performers to transfer knowledge to inexperienced performers (i.e. a mentoring program or open forum).

2.0 Background:

The purpose of this research was to a) explore the predominant health and safety issues facing stunt performers in British Columbia (BC) and b) identify areas or projects where Actsafe can help stunt performers to do their jobs safely.

Two types of research were completed as part of the survey and review:

1. Initial assessment – review of the academic literature, the WorkSafeBC stunt related injury statistics and Union of British Columbia Performers (UBCP) stunt credits. This research was conducted to provide context and an initial look at the state of health and safety in the stunt community. The results identify gaps in the current knowledge, the most frequent claims accepted by workers compensation and health and safety communication effectiveness.
2. An on-line survey - targeted at stunt performers working in the BC motion picture industry. This research was conducted to gain insight directly from the members of the stunt performance community. The results identify work causing the greatest concern and potential safety enhancements to current stunt practices.

The findings of this research provide meaningful information and direction for Actsafe strategies and actions that can be taken to reduce stunt performers' risk of injury.

3.0 Initial Review

Stunt work encompasses a diverse field of production but can be broadly defined as any action sequence that involves an elevated risk of injury to performers or others on the set or stage. To maintain productivity and efficiency, stunt performers are required to execute diverse and sometimes dangerous stunts realistically and in the least time possible. If a stunt must be filmed multiple times, expenses to production rise considerably as all actors, stunt performers, extras and props must be returned to their “pre-stunt” look. As a result, stunt performers may face considerable pressure to perform. In British Columbia employment insurance for stunt performers is required; however, in other provincial jurisdictions coverage is optional (i.e. Alberta and Manitoba worker’s compensation boards) or not available (Ontario workplace safety and insurance board).

3.1 WorkSafeBC Stunt Related Injury Statistics

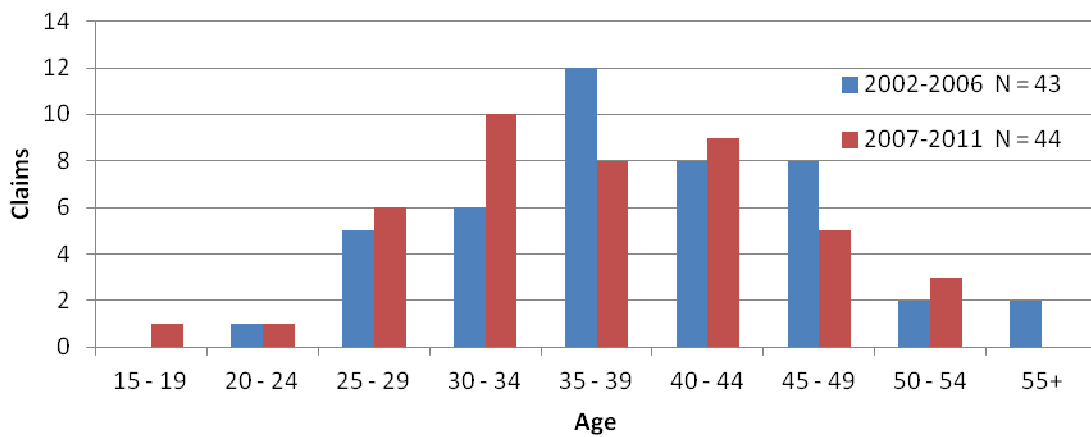
WorkSafeBC retains information on the number and type of injury and disease claims. Two WorkSafeBC reports provide detailed accepted claims statistics for individuals who identified as stuntmen/stuntwomen.

A 2002-2006 report identifies a total of 43 Time-Loss¹ claims accepted over the five year period (Figure 1). In the second, more recent 2007-2011 report, a total of 44 Time-Loss claims were accepted over the five year period.

Comparison indicates no significant differences between the two periods. Similar trends in injury claims were observed in both reports.

¹ *Time-loss Claims* refers to the total number of STD/LTD/Fatal Claims. STD/LTD/Fatal Claims are claims that received the first payment of Short Term Disability (STD), Long Term Disability (LTD) or Fatal benefit in the reporting period

Figure 1. Claims by Stunt Performer Age

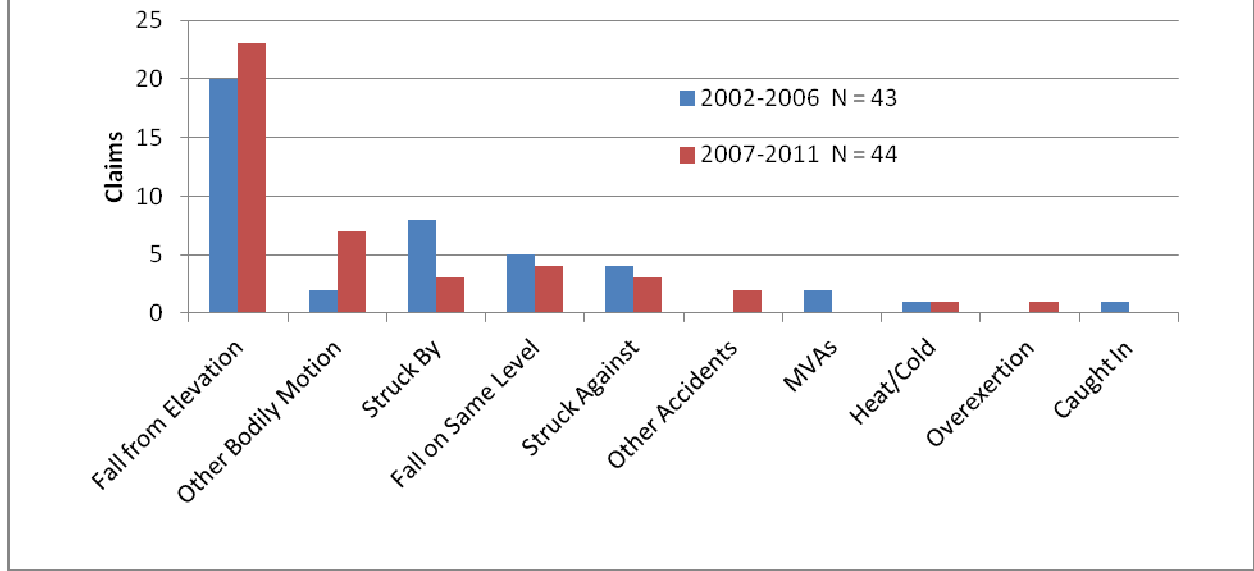


Statistics on the nature of injury indicated fractures and other strains accounted for the majority of injury types during both periods. The majority of injuries were sustained by individuals between the ages of 25-49. Of the 43 claims in 2002-2006, 39 were men while 4 were women. Similarly of the 44 claims in the second period, 40 were men while 4 were women.

This trend may reflect the age and gender distribution in the workforce. Established stunt persons under 25 years of age in the industry may be scarce due to the importance of experience and connections in ascertaining work. Whereas, individuals over 50 years of age may retire due to the intense physical demands of the occupation.

Falls, either from elevation or on the same level, caused the greatest number of injuries, accounting for approximately half of the total claims in both periods (Figure 2).

Figure 2. Claims by Accident Type



Falls from elevation are further divided into detailed accident type including fall to lower level, jump/step to lower level, and jump/step from structure. It is uncertain from these designations which falls are attributable to wire work/rigging, high falls or general stunt work. Of note: no falls from motor vehicles were reported in the 2002-2006 period, while four were reported in the most recent period. One source of these injuries may be the result of motorcycle maneuvers known as 'laydowns' in which stunt performers intentionally slide the motorcycle out from under themselves simulating an accident.

Inherent in many stunt performers work is deliberate and planned falls, in which use of a fall restraint or arrest system is not practicable in order to achieve a desired visual effect. WorkSafeBC recognizes the occupations unique requirements and provides guidelines specific to stunt work in section G11.2-6 of the Regulation. However, as evidenced by this data, fall work is a high risk activity deserving of evaluation of current safety measures.

The remaining incidents 'struck by' or 'stuck against' objects (Figure 2) accounted for the next greatest number of injuries. These typically constituted struck by falling objects/individuals or struck against objects such as ropes and pulleys.

3.2 Academic Sources

The academic literature regarding stunt-related injuries is sparse. A single study was located, addressing the effects of concussions in stunt performers (McMichael 2007). A self selected sample of stunt performers (N = 55) fully completed an online assignment consisting of psychological assessment tools. The major relevant findings included:

1. Increase in the number of reported concussions was associated with a significant decrease in performance on simple reaction time tests in stunt performers.
2. Increase in age of stunt performers was associated with a greater accrual of significant cognitive deficits (verbal and visual memory).

A further aspect of the study included a questionnaire of the stunt professionals on the acceptance of recommendations from others to stop performing after a concussion (see Appendix 1).

- Over one third (36.5%) of performers indicated they did not stop performing immediately after a concussion.
- 31.1% made an autonomous decision to stop performing.
- Stunt coordinators or physicians were found to be the individuals whose advice to stop work was most likely adhered to.

Additional studies by Hilary et al (2002) and Covassin et al (2003, 2007) found that females were more susceptible to the effects of concussions. This indicates female stunt performers may be physiologically more susceptible to repercussions from brain injuries than male stunt performers.





Revisiting the WorkSafeBC injury claims, only two stunt persons were compensated for concussions during the 2002-2006 period and a single stunt person compensated during the 2007-2011 period. 88 concussions were reported in the McMichael study (2007): far more than the 3 captured within the WorkSafeBC injury claims over 10 years. Non-reporting of such injuries is a potential explanation for this discrepancy.

3.3 Active British Columbia Stunt Community

Stunt performers may be recognized as professional stunt performers in British Columbia by achieving membership with UBCP and a listing on the CanadaWest Stuntlist. A catalog of all UBCP member stunt credits is kept by the union. For this survey, a union representative provided the number of its members with a minimum of 1 credit in the past 5 years as a stunt performer, stunt coordinator, stunt rigger or stunt safety/utility.

The stunt performers listed in the figure below (Figure 3) have 5 stunt credits or more in the last 5 years and are presumed to be active members. Results indicate there are approximately **342** recognized stunt performers currently active in BC.

Figure 3. BC Stunt Community Numbers

Primary Role	Chart	Percentage	Count
Stunt Performer		57%	342
Stunt Coordinator		17%	101
Stunt Rigger		16%	93
Stunt Safety/Utility		10%	59

Many individuals who are not recognized as professional stunt performers also perform stunts. 492 individuals were reported as having 1 stunt credit or more in the last 5 years. Performers with between 1 and 5 stunt credits include actors who have been occasionally asked to undertake stunts.

4.0 Online Survey

Currently, there is limited available health and safety information focusing on the risks and health impacts of stunt performance. This gap was identified by stunt community leaders, in addition to the preliminary research discussed. Rationale for the survey arose from the need to address this resource and knowledge gap with input from the individuals actually performing the work.

The survey assessed stunt performers' primary areas of stunt work, types of injuries sustained, reporting of WorkSafeBC claims, specific incident details and wire and ratchet work involvement.





Survey Methodology

The online survey was available for three weeks from June 6th to June 27th. The survey was promoted in collaboration with the Union of BC Performers (UBCP) and BC's Stunt Committee who sent initial and reminder emails to all individuals on the BC Stunt List. Actsafe also delivered initial invitations to a stunt safety contact list.

Respondents to the Survey

267 responses were received to the survey. Of these responses, 155 were fully completed. The following is a breakdown of individuals' self-identified primary role in stunt work. Results indicate (Fig 4) **188** stunt performers responded to the survey.

Figure 4. Survey Respondents by Primary Role

Primary Role	Chart	Percentage	Count
Stunt Performer		81%	188
Stunt Coordinator		6%	13
Stunt Rigger		6%	13
Other		8%	19

Those that replied 'other' predominantly consisted of actors or stunt safety. A small portion of individuals identified primary roles as all three listed positions.

Responses of 'Stunt Performer' were asked to complete the full survey, while Stunt Coordinator, Stunt Rigger or Other roles were asked an abbreviated set of questions. The primary rationale is that the scope of this survey was limited to stunt performers.

The strong number of responses to the survey was directly attributable to the work done by UBCP and the BC Stunt Committee in promoting it.







Respondents Overview

- The majority of respondents identified stunt performance as a secondary source of income or one of several sources of income (56%).

- Respondents had a very large range of experience from 0 stunt credits to in excess of 1200.

The following is a breakdown of individuals self-identified years of experience as a stunt performer. Results indicate (Figure 5) a relatively even distribution of experience from experienced to inexperienced amongst BC stunt performers.

Figure 5. Respondents by Years of Experience

Years of Experience	Chart	Percentage	Count
Under 3 years		19%	35
3 - 6 years		15%	28
7 - 10 years		17%	31
11 - 14 years		17%	32
15 - 18 years		12%	22
19+ years		19%	35

Respondents consisted of 73% males (169) and 27% females (62). According to the 2007-2011 WorkSafeBC Report females accounted for 10% of accepted claims.

4.1 Types of Stunt work performed and related injuries

Respondents were asked to identify the primary types of stunt work they performed in a professional capacity. The results (Figure 6) show that the excluding general stunts, types of work performed always or frequently by the greatest number of individuals were respectively a) martial arts, b) wire work & ratchets, and c) sports specialist.

Respondents were also asked to list and comment on the number of serious injuries² experienced during each type of work. The results (Figure 6) show that, excluding general stunts, the type of work performed resulting in the greatest number of injuries was respectively a) wire work & ratchets b) martial arts and c) high falls.

² Serious injuries were defined as including but not be limited to hospitalization for more than 48 hours; a week off work; a fracture; lacerations which caused nerve, muscle or tendon damage; a concussion; injury to any internal organ; second or third degree or extensive burns.

The two lists have been brought together to show the combined sources of information.

Figure 6. Respondent's Work and Injury

Work Most Frequently Performed				Work Most Frequently Injured During		
Rank	Type of Work	Responses*		Rank	Type of Work	# of Injuries
1	General Stunt Performance	101		1	General Stunt Performance	69
2	Martial Arts	55		2	Wire Work & Ratchets	45
3	Wire Work & Ratchets	47		3	Martial Arts	23
4	Sport Specialist	25		4	High Fall	16
5	Acrobatics	23		5	Acrobatics	14
6	Driving	20		6	Driving	12
7	Aerial Work	19		7	Work with Horses	8
8	Work in & around Water	15		8	Fire	8
9	Work with Horses	14		9	Aerial Work	6
10	High Fall	11		10	Motorcycle	6
11	Fire	7		11	Sport Specialist	5
12	Work with animals other than horses	6		12	Dirt Bike	5
13	Motorcycle	5		13	Work in/around Water	4
14	Dirt Bike	2		14	Work with animals other than horses	4

*Always/Frequent responses

By comparing the most frequently performed work to the work that results in the most reported injuries an assessment of the likelihood of injury can be made.

The results suggest that most frequently performed work did not always result in the most injuries. For example high falls appears to be a high risk type of work. High falls were not performed often ranking #10 in work performed; however, it results in a high number of injuries, ranking #4 in serious injuries. Alternatively, sport specialist work indicates low risk as it was performed frequently ranking #4 in the left column but resulted in few injuries ranking #11 in the right column. High fall, wire work and ratchets and general stunt performance were noted for resulting in the relatively highest amount of injuries for how frequently they were performed respectively. Fire, motorcycle and dirt bike work were similarly noted, but received too few always/frequent responses for conclusions.

4.2 WorkSafeBC Claims

To help understand claims reporting practices, questions concerning number of claims submitted/accepted and rationale for non-reporting were considered.

Respondents were asked if they had ever filed a WorkSafeBC claim for a stunt performance related injury. The number of claims and accepted status of the claims was requested if the answer was 'Yes'.

Results indicate that 25% of respondents had filed a claim for a total of 53 claims. This compares to a total of 225 injuries sustained from Figure 6. Of the 53 claims, 42 were reportedly accepted. However 6 individuals did not continue to answer the acceptance question; It is likely the number of accepted claims is greater than the 42 respondent answers. For comparison, approximately 7% of all claims received by WorkSafeBC were disallowed in 2011.

Next respondents were asked if they had sustained a stunt performance related injury that went unreported, why was it not filed with WorkSafeBC? Results indicate (Figure 7) the prevailing reason for non-reporting was not realizing the severity of the injury at the time.

Figure 7. Rationale for Non-Reporting of Injury

Rationale	Chart	Percentage	Count
Reporting may lose future work opportunities		16%	12
Feel that it's part of the job		16%	12
Not sure how the reporting process works		3%	2
Did not realize severity of injury at the time		30%	22
Preserve stuntperson image with cast and crew		5%	4
Other, please specify...		30%	22

Those that replied 'other' indicated:

- Perceived difficulties in dealing with WorkSafeBC (5 responses)
- All or a combination of the above elements (3 responses)
- Working outside of Canada (3 responses)

Pressure by coordinator not to report, misdiagnosis by physician, and unaware of right to compensation all received 1 response.

4.3 General Inquiry Questions







1. 27% of respondents had gone to work with a serious injury against the advice of a medical professional
2. 35% of respondents feel that cumulative abuse they have sustained as a stunt performer has negatively affected their overall health and/or affected their quality of life
 - 18% report possessing a permanent medical condition, undertaking corrective surgery or having ongoing rehabilitation.
3. 44% of respondents to the question reported suffering 1 or more concussion or head injury during their career.
 - 14% report suffering 3 or more concussions or head injuries

Respondents that had experienced head trauma were asked if they had made any changes to prevent further concussions/injuries. The majority of these individuals (60%) reported they had taken steps to reduce the risk of an additional incident.

4.4 Wire Work and Ratchets

Stunt community leaders perceived wire work & ratchets to be an area of potential concern regarding stunt performer safety. As a result, respondents were asked how many times they had been seriously injured or experienced a near miss during wire work or ratchets over the past 5 years. Results indicate (Figure 8) that 24% of respondents experienced a serious injury or near miss while performing the work. A total of 49 incidents were reported by 31 different stunt performers.

Figure 8. Serious Incidents from Wire/Ratchet Work

Serious Injuries/Near Misses	Chart	Percentage	Count
0		76%	99
1		15%	19
2		5%	7
3		3%	4
4		1%	1
5+		0%	0

4.5 Stunt Community Opinions

When asked in an open-ended question what creates the greatest health and safety risk for stunt performers the following responses were most frequently provided:

- Lack of sufficient rehearsal time, planning and preparation. Often caused by a) on the day or last minute changes to stunts by directors or b) pressure from production to get the shot in the shortest time possible (50 responses)
- Use of inexperienced riggers who may not have appropriate knowledge and experience (23 responses)
- Stunt performers ego's resulting in an invulnerable or 'I can take anything' mentality (22 responses)
- Stunt performers unaware or uncomfortable asking questions about the stunt to be performed and uncertain how to approach potential issues (14 responses)
- Stunt coordinators not taking responsibilities for the safety of their stunt performers (12 responses)
- Inability of stunt performers to maintain the necessary top physical shape (9 responses)

When asked in an open ended question what recommendations would make stunt performance safer the following response were most frequently provided:

- Adequate time for review and rehearsal by the stunt team of last minute or on the day changes must be allocated (23 responses)
- Stunt performers should engage in the stunt planning, get informed, and voice their opinion to the stunt team. Saying 'no' and refusing to undertake stunts that are outside of the performer's comfort zone are paramount (18 responses)
- Only utilize experienced and knowledgeable riggers for stunt performance (16 responses)
- Improve knowledge transfer between experienced and inexperienced stunt performers (13 responses)
- Shoot stunts earlier in the day instead of the end when fatigue and rushing to get the shot play larger factors (12 responses)
- Utilize personal protective equipment to the greatest extent possible – mouth guards, helmets (including custom Kevlar that fits under wigs), padding etc (8 responses)
- Increase accountability of stunt coordinators whose stunt performers suffer injury (7 responses)
- Wear costume during rehearsal that will be used during filming or else clothing most similar to the attire required during the actual stunt to reduce uncertainties (6 responses)
- Develop awareness course for stunt coordinators including responsibilities and stunt physics
- Ensure union representation on all sets (3 responses)

A sincere thanks is extended to all participants in the survey for their thoughtful feedback and to the individuals and organization that facilitated the surveys distribution. The results are essential in supporting Actsafe to better provide health and safety resources to stunt performers in BC.

5.0 Conclusions

Initial Review

- Falls from elevation account for over half of the accepted claims by stunt performers in the past 10 years. While planned falls are inherently very dangerous work, there is opportunity for additional safety precautions and health and safety resource development.
- A selection of stunt performers reported suffering numerous unreported head injuries.
 - Female stunt performers may be more physiologically susceptible to the health affects arising from such injuries
 - Stunt coordinators and physicians were found to be the individuals most influential in communicating health and safety oriented information. Evidence includes stunt performer's adherence to 'stop work' advice from such individuals after head injury from the academic research.

Online Survey

- Head injuries are widely underreported for compensation by BC stunt performers; this is evidenced by the 56 performers indicating they had experienced at least one concussion or head injury while only 3 claims were recorded in the WorkSafeBC injury data over the past 10 years. Findings from the concussion study support this result.
 - a. Other injuries also exhibit broad non-reporting.
- Rationale for not reporting an injury largely involved lack of recognition of the severity of injuries.
 - a. Other reported factors included feelings that injury was part of the job, the belief reporting would decrease the likelihood of ascertaining future work and perceived difficulties in dealing with WorkSafeBC.
- Respondents felt the greatest cause of injury results from a lack of sufficient rehearsal time for planning and preparation of stunts.
- Solutions to a lack of sufficient rehearsal time involve members from many levels of the film/television team :
 - Producers, directors and their respective teams must budget sufficient time for rehearsal of stunts planned both well in advance and improvised on the day.
 - Stunt coordinators must demand appropriate time to review last minute changes to a planned stunt

- Stunt performers must refuse to perform in conditions that may lead to injury. Riggers must be trained and experienced in the use of the equipment for the demands of each specific stunt.

6.0 Recommendations

- 1) Delivery of education and resources regarding stunt performer rights/responsibilities and injury awareness. Efforts should be targeted to members of the stunt team, in addition to direction and production groups
 - An opportunity exists to reinforce stunt performers obligation under the OH&S Regulation to refuse work believed to be unsafe. In addition, opportunity exists to clarify the WorkSafeBC claims process towards encouraging performers to seek appropriate compensation.
 - Broadly, information should detail the importance of reporting injury, injury symptoms and near misses as soon as they are experienced.
 - Specifically, head injuries, including concussions, should be directly addressed. Such injuries were clearly identified as both prevalent and underreported. Information communicated should include recognition, health repercussions and appropriate recovery.
 - Stunt coordinators, production managers, production assistants, and assistant directors must be aware and adhere to the responsibilities of their role as supervisors.
 - Included should be information detailing the importance of adequate rehearsal, and the need for additional rehearsal when stunts are changed with short notice
- 2) Enhancement of lines of communication with Directors/Producers to emphasize the importance of allowing adequate preparation time for stunt work. Commitment from high level individuals will contribute strongly to the improvement of health and safety culture for stunt performers.
 - Included should be the recommendation that scheduling of stunt work should be done early in the shooting day, when possible, to decrease risk of injury resulting from fatigue and pressure to rush.
- 3) Encouragement of stunt performers to actively engage in the planning, rigging and execution of their own stunts.

- 4) Evaluation of the safety precautions involved in stunt work that result in falls from elevation with a focus on wire work & ratchets.
- 5) Enhancement of the reputation of the regulatory agency, WorkSafeBC with the BC stunt community.
 - Support the proactive interaction of safety and hygiene officers with all members of the stunt community towards improving informed discussions of stunt safety measures and accurate and specific accident reporting.
- 6) Establishment of improved opportunity for experienced stunt performers to transfer knowledge to inexperienced performers (i.e. a mentoring program or open forum)

6.0 References

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Appendix 1

Self reported response after incurring concussions (N=82). Accepted advice indicates whose recommendation to stop work was adhered to (adapted from McMichael 2007)

Parties Involved	Accepted Advice (%)
Stunt Coordinator	12.2
Paramedic	4.1
Craft Service	1.4
Other Stunt Performers	1.4
1 st Assistant Director	1.4
Doctor	12.2
Self-decisions	31.1
Did not stop after injury	36.5

Over one third (36.5%) of performers indicated they did not stop performing immediately after a concussion, while 31.1% made an autonomous decision to stop performing. Stunt coordinators or physicians were found to be the individuals whose advice was most likely to be adhered to. While this data is specific to concussions, the influence of these individuals on stunt performers may be generalizable to communicating other work related injury and illness risk.