Trauma as a Cause of Death in Western Canadian Avalanches: A 21 Year Review

Jeff Boyd ¹,² Pascal Haegeli ³ Riyad B. Abu-laban ⁴ Michael Shuster ² John Butt ⁵

¹ Emergency Department, Mineral Springs Hospital, Banff, AB, Canada; ² International Commission for Mountain Emergency Medicine (ICAR MedCom), Banff, AB, Canada; ³ SSHRC Postdoctoral Fellow, School for Resource and Environmental Management, Simon Fraser University, Burnaby; ⁴ Avisualanche Consulting, Vancouver, BC, Canada; ⁵ Division of Emergency Medicine, Department of Surgery, University of British Columbia, Vancouver, BC, Canada; ⁶ Pathfinder Forum Consulting Inc., Vancouver, BC, Canada

Purpose: To determine if trauma is a significant cause and contributor to death in Western Canadian avalanches and whether this varies between different activity groups or differs from European data.

Methods: A systematic review using explicit criteria was performed of all avalanche fatalities from 1984 to 2005 investigated by Chief Coroner of British Columbia and the Chief Medical Examiner of Alberta. Additionally, the database of the Canadian Avalanche Centre was reviewed for accident details for the same fatalities. Injury Severity Scores were calculated for all autopsied victims, and all research questions were determined prior to statistical analysis.

Results: There were 204 snow avalanche fatalities in open terrain in the 21 years of the study. Of these, 117 underwent a full forensic autopsy while the remaining 87 underwent forensic external examination without dissection. Overall, trauma caused 24% of fatalities but this varied from 9% for snowmobilers to 38% for ice climbers and 77% for the largest mechanized ski operation. Only 48% of trauma victims were completely buried. Asphyxia and hypothermia caused the remaining deaths, 75% and 1% overall.

Conclusions: Fatality patterns in Western Canadian avalanches differ significantly between activity groups from those of European studies, which report a traumatic death rate of approximately 5%. These findings may help guide future preventative and safety interventions.