# Optimization of the Medical and Surgical Management of Traumatic Spinal Cord Injury: A Retrospective Review of Management Parameters and Related Complications

Ayoub Dakson MBChB; David M. Brandman MD; Ginette Thibault-Halman; Sean D. Christie MD, FRCS(C)
Division of Neurosurgery, Dalhouie University, Halifax, Nova Scotia. CANADA

CNS 2016 ANNUAL MEETING San Diego CALIFORNIA SEPTEMBER 24-28, 2016

## Introduction

Our understanding of the optimal surgical and medical management of traumatic spinal cord injury (SCI) continues to evolve. Case series have suggested improved neurologic outcome with augmentation of the mean arterial pressure (MAP) = 85 mm Hg for 5–7 days post-SCI. Other studies have suggested improved outcomes for patients undergoing early surgical intervention (defined as <24 hours postinjury)

## Methods

This retrospective study sought to investigate the extent to which these interventions affected neurological recovery utilizing internal control groups for comparison of outcomes. We further evaluated the incidence of complications related to SCI that could impede recovery including venous thromboembolism and pressure ulcers, and probed different risk factors that underlie their occurrence. We identified 94 patients with SCI. Follow-up data available at 3 different time

## Study design

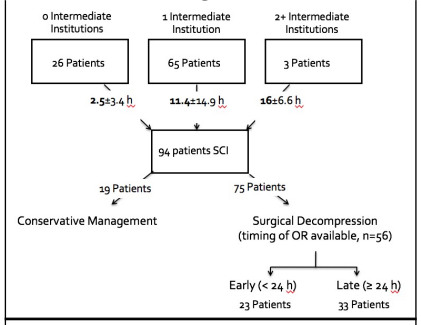
**Study design: Retrospective chart review**

| Study Population | Selection of Cases | Prognostic factors | Outcomes |
|---|---|---|---|
| Data source: Trauma data base<br><br>All cases > 16 yr-old<br><br>Time period: 2006 - 2010 | Consecutively identified cases of SCI | 1 Timing of surgical decompression<br><br>2 Post-op MAP > 85 mmHg<br><br>3 Timing and type of chemical prophylaxis<br><br>4 Time of transportation to a specialized care cenre | Improvement in the American Spinal Injury Association (ASIA) Impairment Scale (AIS)<br><br>Documented evidence of DVT/PE as per diagnostic studies<br><br>Documented evidence of pressure ulcers |

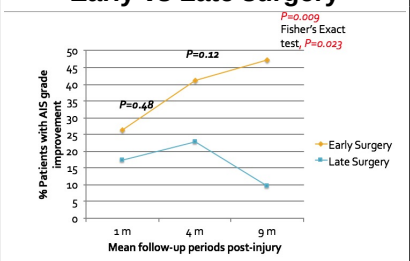
## Results

Patients with MAP <85 mm Hg for at least 2 consecutive hours during the 5-day period postinjury were 11.7 times less likely to have an improvement in the American Spine Injury Association (ASIA) Impairment Scale (AIS) when compared to patients with MAP =85 mm Hg (P = 0.006). This association was independent of early surgery or the severity of SCI. At a mean of 252.0 days postinjury, a significantly greater proportion of SCI patients treated with early surgical decompression improved neurologically, compared to patients in the late surgery group (P = 0.031). VTE and pressure ulcers occurred at a rate of 11.7% and 16%, respectively.

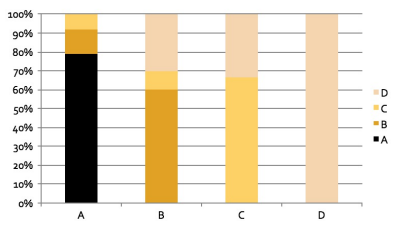
## Transportation and Management



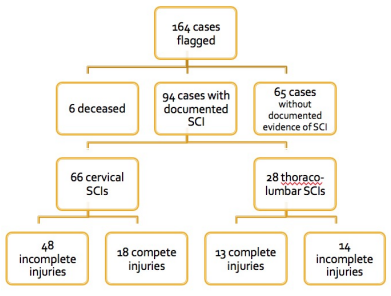

## Early vs Late surgery



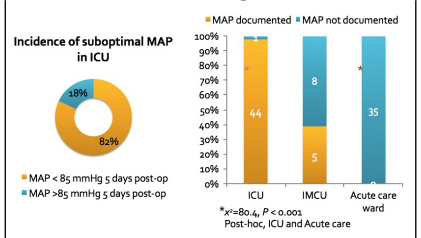

## Improvement at average 1 month



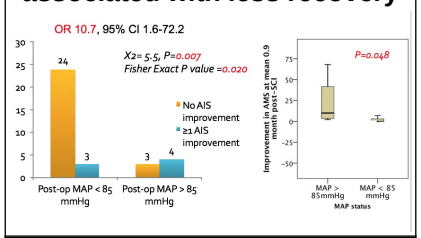

## Study population



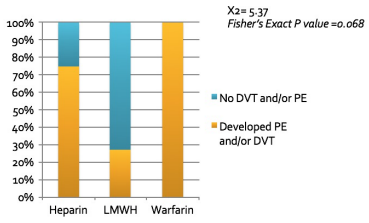

## Majority of cases had MAP < 85 mmHg



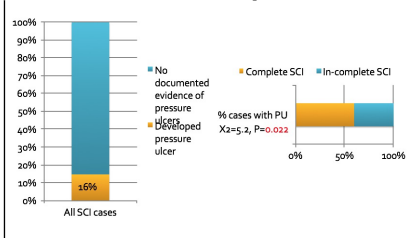

## Postop MAP<85 mmHg is associated with less recovery



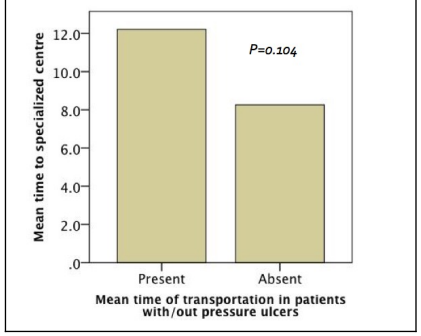

## LMWH is associated with lower rate of VTE




## High rate of pressure ulcers occured in complete SCI




## Timing of tansportation versus incidence of pressure ulcers




## Conclusions

This study suggests that there may be improved neurologic outcomes in SCI patients who undergo early surgical decompression and maintenance of MAP =85 mm Hg for at least 5 consecutive days post-SCI, and emphasizes the role of clinical vigilance for potential post-operative SCI sequelae including VTE and pressure ulcers.