

# Operative Treatment of Flail Chest Injuries Does Not Reduce Pain or In-Hospital Opioid Requirements & Results from A Multi Centred Randomized Controlled Trial

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## INTRODUCTION:

A previous randomized clinical trial (RCT) evaluating operative versus nonoperative treatment of acute flail chest injuries revealed more ventilator free days in operatively treated patients who were ventilated at the time of randomization. It has been suggested that surgery for these injuries may also improve patients' pain and function, and many surgeons perform these procedures for these reasons. Our goal was to perform a secondary analysis of this previous RCT to evaluate pain, and post-injury opioid requirements of operatively and non-operatively treated unstable chest wall injuries.

## METHODS:

Data from a previous multicenter RCT conducted from 2011-2019 were analyzed. Patients sustaining acute, unstable chest wall injuries were randomized to operative or non-operative treatment. In hospital pain medication logs were evaluated and daily morphine milligram equivalents (MME) were calculated. Patients were followed up in clinic at 2 weeks, 6 weeks, 3 months, 6 months, and 12 months post injury. Patients' symptoms were assessed at each visit, including generalized pain, chest wall pain, chest tightness, and shortness of breath. Patients also completed SF-36 Health Outcome Scores at each visit. Patients were followed up for one year post injury.

## RESULTS:

Two-hundred and seven patients were randomized in the original trial - 99 patients to non-operative treatment and 108 to operative treatment. The median MME utilization for operative versus non-operative groups were: 26 vs. 22 on day-1, 82 vs. 75 on day-3, 81 vs. 68 on day-5, and 84 vs. 83 on day-7. There were no significant differences in pain medication usage between the two groups at any of the time points examined ( $p=0.477$ ). There were no significant differences in generalized pain, chest wall pain, chest wall tightness or shortness of breath at any time post-injury in patients treated operatively versus non-operatively. There was no significant differences in SF-36 Health Outcome Scores at any timepoint. At 12 months, the mean SF-36 Physical component score was 42.1 in the operative and 41.3 in the non-operative group, and the mean mental component score was 46.3 in the operative and 46.8 in the non-operative group.

## DISCUSSION AND CONCLUSION:

This secondary analysis of a previous RCT suggests that operative treatment of patients with flail chest injuries does not reduce in-hospital daily opioid requirements. There were also no reductions in generalized pain, chest wall pain, chest wall tightness or shortness of breath symptoms with operative treatment. Health outcome scores were similar for both groups. Further work is needed to identify those patients most likely to benefit from operative treatment of flail chest injuries.

