Weil Institute of Critical Care Medicine

# Clinical Use of Miniaturized Chest Compressor for Cardiopulmonary Resuscitation

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## Introduction

During cardiopulmonary resuscitation (CPR), high quality chest compression is the most important factor for successful resuscitation. In the present study, we investigated the effectiveness of a mechanical miniaturized chest compressor (MCC) on successful resuscitation in human patients.

## Hypothesis

We hypothesized that MCC is safe and equally as effective for CPR when compared with conventional manual chest compression.

## Methods

This is a retrospective study comparing the effectiveness of MCC between 2 separate cohorts of patients. From May 2011 - April 2012, the MCC was used in all out-of-hospital cardiac arrest (CA) patients brought to our emergency room; except those who were 18 yrs old or under and patients of trauma and terminal stage diseases. A total of 25 patients were included in the MCC group. Another 22 patients with similar conditions received conventional manual chest compressions from May 2010 - April 2011 that were included as the control group. The MCC device was used with a fixed compression rate of 100/min and compression depth between 3.8 and 5 cm. Manual chest compression was performed based on the current CPR guidelines. ACLS guideline procedures were followed in all patients. The protocol was continued until successful resuscitation or for a total of 30 mins. Successful resuscitation was defined as return of spontaneous circulation with blood pressure > 90/60 mmHg for more than 30 mins.

Table. 1 Table: Baseline and Outcome of CPR

| Group | N | Age (years) | Gender (male/ female) | Time from CA to CPR (min) | Success of CPR |
|---|---|---|---|---|---|
| MCC | 25 | 55±22 | 18/7 | 7.5±4.9 | 7(28%) |
| Manual | 22 | 54±21 | 15/7 | 8.1±4.4 | 3(13%) |

## Results

Mean age, gender and duration from CA to CPR did not differ significantly between the MCC and manual groups. The success of resuscitation was numerically greater in the MCC group when compared with the manual group (Table). There was no single incidence of rib fractures in patients treated with the MCC.

## Conclusion

The MCC is safe and as effective as manual chest compression. Therefore, it may provide a new option for CPR.

## Disclosure

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## References

1. Ristagno G, Castillo C, Tang W, et al. Miniaturized mechanical chest compressor: a new option for cardiopulmonary resuscitation. Resuscitation. 2008; 76(2):191-197.

2.Chen W, Weng Y, Wu X, et al. The effects of a newly developed miniaturized mechanical chest compressor on outcomes of cardiopulmonary resuscitation in a porcine model. Crit Care Med. 2012; 40(11):3007-3012.


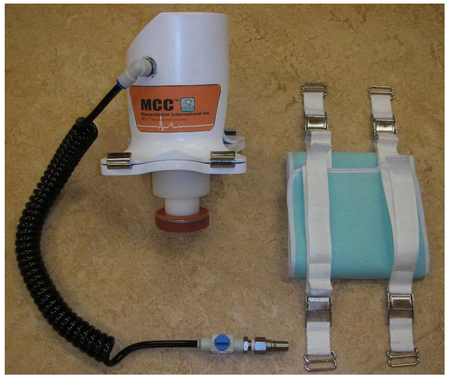


Fig. 1 Miniaturized mechanical chest compressor

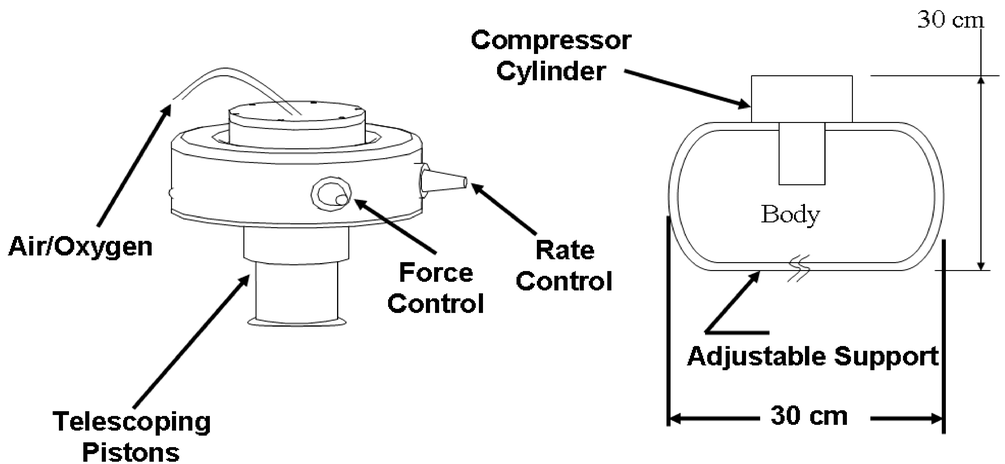


Fig. 2 Compact Chest Compressor