**INPLASY PROTOCOL**


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**INTRODUCTION**

**Review question / Objective:** The authors conducted a systematic review and meta-analysis of published studies to determine the safety of mechanical and manual chest compressions for cardiac arrest patients.

**Condition being studied:** Recent studies have reported that mechanical chest compressions were associated with more injuries to cardiac arrest patients than manual chest compressions, although these results remain controversial.

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**Safety of mechanical and manual chest compressions in cardiac arrest patients: A systematic review and meta-analysis**

Gao, Y1; Sun, T2; Yuan, D3; Liang, H4; Wan, Y5; Yuan, B6; Yu, Y7; Li, Y8.

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**Review question / Objective:** The authors conducted a systematic review and meta-analysis of published studies to determine the safety of mechanical and manual chest compressions for cardiac arrest patients.

**Condition being studied:** Recent studies have reported that mechanical chest compressions were associated with more injuries to cardiac arrest patients than manual chest compressions, although these results remain controversial.

**Information sources:** PubMed, EMBASE, and Cochrane Library

**INPLASY registration number:** This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 26 November 2020 and was last updated on 26 November 2020 (registration number INPLASY2020110111).
METHODS

Participant or population: Cardiac arrest patients.

Intervention: Mechanical chest compression.

Comparator: Manual chest compression.

Study designs to be included: Cohort studies or randomized clinical trials.

Eligibility criteria: (1) the study participants included were cardiac arrest patients; (2) the study comparative arms were mechanical chest compression (AutoPulse or LUCAS) and manual chest compression; (3) the studies were observational cohort studies or randomized clinical trials; (4) all patients were adults; (5) the study papers were written in English; (5) the studies measured CPR-related injuries and the investigation method of injuries used was either by autopsy, post-mortem computed tomography (PMCT), or dedicated imaging.

Information sources: PubMed, EMBASE, and Cochrane Library.

Main outcome(s): The primary outcome were the overall rate of CPR-associated injuries and the incidence of severe or life-threatening injuries.

Additional outcome(s): The secondary outcome were skeletal fractures and visceral injuries.

Quality assessment / Risk of bias analysis: The randomized controlled studies were evaluated by the Jadad scale. In addition, the Newcastle-Ottawa Scale (NOS) was used to assess the risk of bias in the observational cohort studies.

Strategy of data synthesis: A meta-analysis of the random effects model was performed to calculate the pooled odds ratios (ORs) and 95% confidence intervals (CIs) for each patient outcome.

Subgroup analysis: Mechanical chest compression devices were subgroup in LUCAS and Autopulse when compared with manual chest compression.

Sensibility analysis: A sensitivity analysis was performed to assess the influence of any one study on the pooled OR and 95% CI, by omitting one individual study at a time.

Country(ies) involved: China.

Keywords: CPR, mechanical chest compression, manual chest compression, injuries

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