# QUESTION

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| **Harm from CPR to Victims Not in Cardiac Arrest** | |
| **POPULATION:** | Among adults and children who are not in cardiac arrest out-side of a hospital |
| **INTERVENTION:** | Does provision of chest compressions from lay rescuers |
| **COMPARISON:** | Compared with no use of chest compressions |
| **MAIN OUTCOMES:** | Change survival with favorable neurological / functional outcome at discharge, 30 days, 60 days, 180 days, and/or 1 year; harm (e.g. rib fracture); complications; major bleeding; risk of complications (e.g. aspiration); survival only at discharge, 30 days, 60 days, 180 days and/or 1 year; survival to admission |
| **SETTING:** | OHCA |
| **PERSPECTIVE:** | Patient perspective |
| **BACKGROUND:** | Many lay rescuers are concerned that delivering chest compressions to a person who is not in cardiac arrest could lead to serious complications and, thus, are reluctant to initiate CPR even when a person is actually in cardiac arrest.  The 2015 International Liaison Committee on Resuscitation (ILCOR) review, for the important outcome of “harm,” identified very-low-quality evidence and concluded with a strong recommendation (“We recommend that laypersons initiate CPR for presumed cardiac arrest without concerns of harm to patients not in cardiac arrest). |
| **CONFLICT OF INTERESTS:** | None |

**ASSESSMENT**

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| **Problem**  Is the problem a priority? | | |
| **JUDGEMENT** | **RESEARCH EVIDENCE** | **ADDITIONAL CONSIDERATIONS** |
| * No * Probably no * Probably yes * Yes * Varies * Don't know | Cardiopulmonary resuscitation has been established as a critical step in the “chain of survival” for victims of sudden cardiac arrest (Cummins et al 1991). Low occurrence of complications by doing CPR on patients not in cardiac arrest is so that it is reasonable to perform immediate CPR initiated by lay persons for patients in cardiac arrest against the low risk of injury in patients not in cardiac arrest.  The ILCOR Basic Life Support Task Force prioritized this PICOST as a systematic review as it had not been reviewed since the 2015 Guidelines. |  |
| **Desirable Effects**  How substantial are the desirable effects? | | |
| **JUDGEMENT** | **RESEARCH EVIDENCE** | **ADDITIONAL CONSIDERATIONS** |
| * Trivial * Small * Moderate * Large * Varies * Don't know | The BLS Task Force considered the likely survival benefit of CPR initiated by lay persons for patients in cardiac arrest to outweigh the low risk of injury in patients not in cardiac arrest. |  |

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| **Undesirable Effects**  How substantial are the undesirable anticipated effects? | | |
| **JUDGEMENT** | **RESEARCH EVIDENCE** | **ADDITIONAL CONSIDERATIONS** |
| * Large * Moderate * Small * Trivial * Varies * Don't know | Case reports and case series of serious harm to persons receiving CPR who are not in cardiac arrest are considered likely to be published as they are of general interest to a broad group of health care providers. There is lack of reported cases demonstrating serious harm strengthens the belief that desirable effects will far outweigh undesirable effects. |  |
| **Certainty of evidence**  What is the overall certainty of the evidence of effects? | | |
| **JUDGEMENT** | **RESEARCH EVIDENCE** | **ADDITIONAL CONSIDERATIONS** |
| * Very low * Low * Moderate * High * No included studies | The evidence is of observational studies and case series only. |  |
| **Values**  Is there important uncertainty about or variability in how much people value the main outcomes? | | |
| **JUDGEMENT** | **RESEARCH EVIDENCE** | **ADDITIONAL CONSIDERATIONS** |
| * Important uncertainty or variability * Possibly important uncertainty or   variability   * Probably no important | There is little uncertainty about people valuing survival from cardiac arrest.  The BLS Task Force believes risk from CPR to patients not in cardiac arrest (but with a condition serious enough to be mistaken for a cardiac arrest) is acceptable to the general population given the potential benefits of early CPR in cardiac arrest. |  |

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| uncertainty or variability   * No important uncertainty or variability |  |  |
| **Balance of effects**  Does the balance between desirable and undesirable effects favor the intervention or the comparison? | | |
| **JUDGEMENT** | **RESEARCH EVIDENCE** | **ADDITIONAL CONSIDERATIONS** |
| * Favors the comparison * Probably favors the comparison * Does not favor either the intervention or the comparison * Probably favors the intervention * Favors the intervention * Varies * Don't know | In making this recommendation, we place a higher value on the survival benefit of CPR initiated by laypersons for patients in cardiac arrest, and lower value to what is believed to be minimal risk of injury to patients not in cardiac arrest. |  |
| **Resources required**  How large are the resource requirements (costs)? | | |
| **JUDGEMENT** | **RESEARCH EVIDENCE** | **ADDITIONAL CONSIDERATIONS** |
| * Large costs * Moderate costs * Negligible costs and savings * Moderate savings * Large savings * Varies * Don't know | No studies examined costs for OHCA  In healthcare systems where emergency services and dispatch centres are already well established additional cost may be minimal. |  |
| **Certainty of evidence of required resources**  What is the certainty of the evidence of resource requirements (costs)? | | |
| **JUDGEMENT** | **RESEARCH EVIDENCE** | **ADDITIONAL CONSIDERATIONS** |
| * Very low * Low * Moderate * High * No included studies |  |  |
| **Cost effectiveness**  Does the cost-effectiveness of the intervention favor the intervention or the comparison? | | |

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| **JUDGEMENT** | **RESEARCH EVIDENCE** | **ADDITIONAL CONSIDERATIONS** |
| * Favors the comparison * Probably favors the comparison * Does not favor either the intervention or the comparison * Probably favors the intervention * Favors the intervention * Varies * No included studies | No studies examined the cost-effectiveness |  |
| **Equity**  What would be the impact on health equity? | | |
| **JUDGEMENT** | **RESEARCH EVIDENCE** | **ADDITIONAL CONSIDERATIONS** |
| * Reduced * Probably reduced   X Probably no impact  Probably increased   * Increased * Varies * Don't know | No studies examined health equity for OHCA |  |
| **Acceptability**  Is the intervention acceptable to key stakeholders? | | |
| **JUDGEMENT** | **RESEARCH EVIDENCE** | **ADDITIONAL CONSIDERATIONS** |
| * No * Probably no * Probably yes * Yes * Varies * Don't know | No studies examined acceptability for OHCA |  |
| **Feasibility** | | |
| **JUDGEMENT** | **RESEARCH EVIDENCE** | **ADDITIONAL CONSIDERATIONS** |
| * No * Probably no * Probably yes * Yes * Varies * Don't know | No studies examined feasibility for OHCA |  |

# SUMMARY OF JUDGEMENTS

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|  | **JUDGEMENT** | | | | | | |
| **PROBLEM** | No | Probably no | Probably yes | **Yes** |  | Varies | Don't know |
| **DESIRABLE EFFECTS** | Trivial | Small | Moderate | **Large** |  | Varies | Don't know |
| **UNDESIRABLE EFFECTS** | Large | Moderate | Small | Trivial |  | Varies | **Don't know** |
| **CERTAINTY OF EVIDENCE** | **Very low** | Low | Moderate | High |  |  | No included studies |
| **VALUES** | Important uncertainty or variability | Possibly important uncertainty or variability | Probably no important uncertainty or variability | **No important uncertainty or variability** |  |  |  |
| **BALANCE OF EFFECTS** | Favors the comparison | Probably favors the comparison | Does not favor either the intervention or the comparison | **Probably favors the intervention** | Favors the intervention | Varies | Don't know |
| **RESOURCES REQUIRED** | Large costs | Moderate costs | Negligible costs and savings | Moderate savings | Large savings | **Varies** | Don't know |
| **CERTAINTY OF EVIDENCE OF REQUIRED RESOURCES** | Very low | Low | Moderate | High |  |  | **No included studies** |
| **COST EFFECTIVENESS** | Favors the comparison | Probably favors the comparison | Does not favor either the intervention or the comparison | Probably favors the intervention | Favors the intervention | Varies | **No included studies** |
| **EQUITY** | Reduced | Probably reduced | Probably no impact | **Probably increased** | Increased | Varies | Don't know |
| **ACCEPTABILITY** | No | Probably no | **Probably yes** | Yes |  | Varies | Don't know |
| **FEASIBILITY** | No | Probably no | Probably yes | Yes |  | **Varies** | Don't know |

**TYPE OF RECOMMENDATION**

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| Strong recommendation against the intervention  ○ | Conditional recommendation against the intervention  ○ | Conditional recommendation for either the intervention or the comparison  ○ | Conditional recommendation for the intervention  ○ | Strong recommendation for the intervention  **●** |

**CONCLUSIONS**

## Recommendation

We recommend that lay persons initiate CPR for presumed cardiac arrest without concerns of harm to patients not in cardiac arrest (strong recommendation, very low certainty evidence).

## Justification

In making this discordant recommendation, the BLS Task Force placed a much higher value on the potential survival benefits of CPR initiated by lay persons for patients in cardiac arrest, and a lower value on the low risk of injury in patients not in cardiac arrest. The intention of this recommendation is to strongly encourage and support lay rescuers who are willing to initiate CPR in any setting when they believe someone to have suffered from a cardiac arrest. The intention is also to support emergency medical dispatchers or telecommunicators in their efforts to provide telephone assisted CPR instructions in suspected cardiac arrest calls.

## Implementation considerations

## Monitoring and evaluation

Registries of OHCA are an effective method for monitoring the participation and results of CPR by lay persons and

## Research priorities

Current knowledge gaps include but are not limited to:

* There is only observational data available. More studies are needed with robust methodology to identify harm and provide follow-up after hospital discharge.
* There is possibility of under reporting due to nonsystematic diagnostic studies and further research is warranted.
* Could the accuracy of dispatcher-assisted protocol be enhanced to reduce the frequency of CPR performed on patients not in cardiac arrest without compromising the initiation of CPR on patients in cardiac arrest?