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| QUESTION |
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| **POPULATION:** | Adults and children with cardiac arrest |
| **INTERVENTION:** | Administration of calcium (intravenous or intraosseous) during cardiac arrest |
| **COMPARISON:** | No administration of calcium during cardiac arrest |
| **MAIN OUTCOMES:** | Any clinical outcome, including return of spontaneous circulation, short-term survival and neurological outcomes (e.g., hospital discharge, 28-days, 30-days, and 1-month) and long-term survival and neurological outcomes (e.g., 3-months, 6-months, 1-year) |
| **SETTING:** | Any setting (in-hospital or out-of-hospital) |

# ASSESSMENT

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| ProblemIs the problem a priority? |
| JUDGEMENT | RESEARCH EVIDENCE | ADDITIONAL CONSIDERATIONS |
| ○ No○ Probably no○ Probably yes●  Yes○ Varies○ Don't know | Survival for refractory cardiac arrest remains low with limited pharmacological intervention. Calcium has a theoretically important role through its inotropic effect and smooth muscle contraction that could potentially benefit cardiac arrest patients. | Despite previous recommendations against administering calcium during cardiac arrest management, it continues to be routinely used during resuscitation.  |
| Desirable EffectsHow substantial are the desirable anticipated effects? |
| JUDGEMENT | RESEARCH EVIDENCE | ADDITIONAL CONSIDERATIONS |
| ● Trivial○ Small○  Moderate○ Large○ Varies○   Don't know | Evidence from a recent randomized trial demonstrated no benefit to routine calcium administration during cardiac arrest. | The Task Force discussed the potential effect that calcium administration could have in subpopulations during cardiac arrest, but that there is no evidence to support this (e.g hyperkalemia).  |
| Undesirable EffectsHow substantial are the undesirable anticipated effects? |
| JUDGEMENT | RESEARCH EVIDENCE | ADDITIONAL CONSIDERATIONS |
| ○ Large○ Moderate● Small○ Trivial○  Varies○  Don't know | The single high-quality trial available showed a possible decrease in ROSC with calcium administration, although this did not achieve statistical significance. | Longer-term outcomes also had point estimates suggesting worse outcomes with calcium, although numbers were small and confidence intervals included both possible harm and possible benefit.  |
| Certainty of evidenceWhat is the overall certainty of the evidence of effects? |
| JUDGEMENT | RESEARCH EVIDENCE | ADDITIONAL CONSIDERATIONS |
| ○  Very low○ Low● Moderate○ High○ No included studies | Moderate for out-of-hospital cardiac arrest.Low for in-hospital cardiac arrest | All trials to date have included OHCA patients only.  |
| ValuesIs 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 uncertainty or variability○ No important uncertainty or variability | The importance of neurologically intact survival is generally agreed upon with recognition that survival without neurological recovery is an undesirable outcome for most patients. |  |
| Balance of effectsDoes 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 | The available evidence does not show any benefit from the intervention, and suggests possible harm.  |  |
| Resources requiredHow 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 |  | Cost of calcium is low in most settings.  |
| Certainty of evidence of required resourcesWhat is the certainty of the evidence of resource requirements (costs)? |
| JUDGEMENT | RESEARCH EVIDENCE | ADDITIONAL CONSIDERATIONS |
| ○ Very low○ Low○ Moderate○ High●  No included studies |  | Cost of calcium is low in most settings.  |
| Cost effectivenessDoes the cost-effectiveness of the intervention 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●  No included studies | There has been no comprehensive cost-effectiveness analysis based on effectiveness data from the randomized trials.. |  |
| EquityWhat would be the impact on health equity? |
| JUDGEMENT | RESEARCH EVIDENCE | ADDITIONAL CONSIDERATIONS |
| ○ Reduced○ Probably reduced● Probably no impact○ Probably increased○ Increased○ Varies○  Don't know |  | No relevant studies have been identified. However, calcium is low cost and widely available in most prehospital and hospital settings. |
| AcceptabilityIs the intervention acceptable to key stakeholders? |
| JUDGEMENT | RESEARCH EVIDENCE | ADDITIONAL CONSIDERATIONS |
| ○ No○ Probably no○  Probably yes● Yes○ Varies○ Don't know |  | The acceptability of calcium administration to key stakeholders would likely depend on the patient subpopulation. |
| FeasibilityIs the intervention feasible to implement? |
| JUDGEMENT | RESEARCH EVIDENCE | ADDITIONAL CONSIDERATIONS |
| ○ No○ Probably no○  Probably yes● Yes○ Varies○ Don't know |  | Calcium is widely available in most settings and can be administered intravenously or intraosseously during cardiac arrest. |

# SUMMARY OF JUDGEMENTS

|  | **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

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **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 |
| ●  | ○ | ○  | ○ | ○  |