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| Question |
| **Should Insulin vs. no treatment be used for the treatment of acute hyperkalemia?** |
| **Population:** | Pharmacological Interventions for the Acute Treatment of Hyperkalaemia |
| **Intervention:** | Bicarbonate as an acute pharmacological intervention with the aim of mitigating the harmful effect of hyperkalaemia or with the aim of lowering potassium levels |
| **Comparison:** | compared to either no intervention, a different intervention (including a different dose), or placebo |
| **Main outcomes:** | Clinical outcomes (see below), potassium levels, or ECG findings |
| **Setting:** | Adults |
| **Perspective:** |  |
| **Background:** |  |
| **Conflict of interests:** | None |

# 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 | Hyperkalaemia is a common electrolyte disturbance that is potentially life-threatening. The topic of acute treatment of hyperkalaemia was formally reviewed almost a decade ago |  |
| Desirable EffectsHow substantial are the desirable anticipated effects? |
| Judgement | Research evidence | Additional considerations |
| ○ Trivial○ Small○ **Moderate**○ Large○ Varies○ Don't know | Guidelines for the treatment of hyperkalemia both in non-arrested and arrested patients is very limited. Hyperkalemia is life-threatening, why any pharmacological intervention with the potential to mitigate the effects of hyperkalemia will have a moderate effect.  |  |
| Undesirable EffectsHow substantial are the undesirable anticipated effects? |
| Judgement | Research evidence | Additional considerations |
| ○ Trivial○**Small**○ Moderate○ Large○ Varies○ Don't know | None |  |
| 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 |

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| **Table 2. GRADE Overview** |  |  |
| **Question** | **Effect** | **Certainty of evidence** |
| **Adults** |
| Intravenous bicarbonate 50-390 mmol compared to no treatment for the treatment of acute hyperkalemia | mean.0.1 mmol/l lower(0.3 lower to 0.1 higher) | Very low |

 | In general there was a lack of studies including clinical relevant outcomes and a lack of studies conducted. Only a limited number of studies has compared different treatment strategies, providing little guidance to clinicians in prioritizing interventions |
| 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 primary outcomes reported was change in potassium levels. Only a limited number of studies reported clinical relevant outcomes.  |  |
| 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 rationale for recommending against the routine use of sodium bicarbonate in non-arrest patients is based on a meta-analysis of five studies, which showed no reduction in potassium levels with sodium bicarbonate.The decision that there is insufficient evidence to make a recommendation for or against the routine use of bicarbonate in cardiac arrest suspected to be caused by acute hyperkalemia was based on the lack of studies addressing this question and the general lack of effect of bicarbonate in cardiac arrest [3](CoSTR Buffering agents ALS TF 483). The decision not to recommend against bicarbonate was based on the lack of evidence for harm in the general cardiac arrest population. |  |
| Resources required |
| Judgement | Research evidence | Additional considerations |
| ○ Large costs○ Moderate costs○ **Negligible costs and savings****○**Moderate savings○ Large savings○ Varies○ Don't know | Bicarbonate is frequently used in clinical practice with a low cost  |  |
| 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 | There are no cost-effectiveness studies |  |
| 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 is no evidence.  |   |
| 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 studies identified | The drugs are widely available at a low costs.  |
| AcceptabilityIs the intervention acceptable to key stakeholders? |
| Judgement | Research evidence | Additional considerations |
| ○ No○ Probably no**○ Probably yes**○ Yes○ Varies○ Don't know | Yes. The recommendation is in line clinical practice.  |  |
| FeasibilityIs the intervention feasible to implement? |
| Judgement | Research evidence | Additional considerations |
| ○ No○ Probably no○ Probably yes**○ Yes**○ Varies○ Don't know | No evidence but the drugs are already used clinically.  |  |

# 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** | Trivial | **Small** | Moderate | Large |  | 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

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| Recommendation |
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| Justification |
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| Subgroup considerations |
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| Implementation considerations |
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| Monitoring and evaluation |
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| Research priorities |
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# References Summary