



## INTRODUCTION

Electrical stimulation (ES) is widely used for the treatment of pressure ulcers (PU). There are many theories about how ES may help heal PU. Most of these theories were proposed in the 1980's with very little recent work directed at furthering our understanding, so the veracity of these theories is unclear and there is no strong evidence to support these theories. Based on these theories, a small number of non-Cochrane reviews claim that ES is effective for the treatment of PU and have prompted clinical guidelines to start recommending ES.

## RATIONALE

It is not clear whether recommendations from clinical guidelines are justified because the reviews and studies that they are based upon have methodological limitations.

## OBJECTIVE

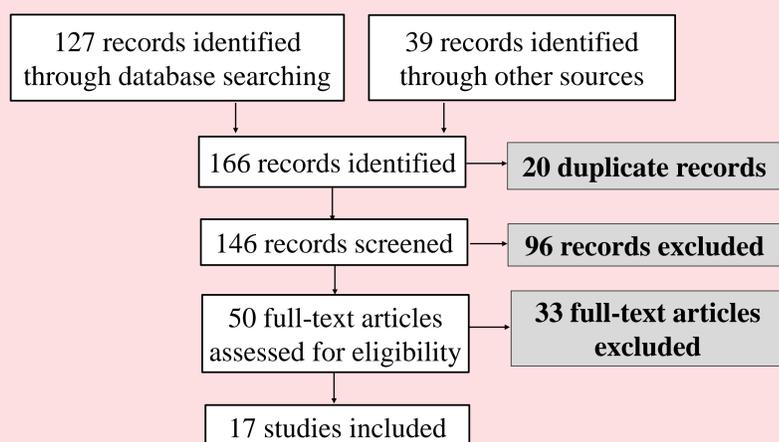
It is important to establish whether:

- ES is effective
- the potential for therapeutic effect outweighs any potential for harm
- the associated cost, time and inconvenience of ES are justified.

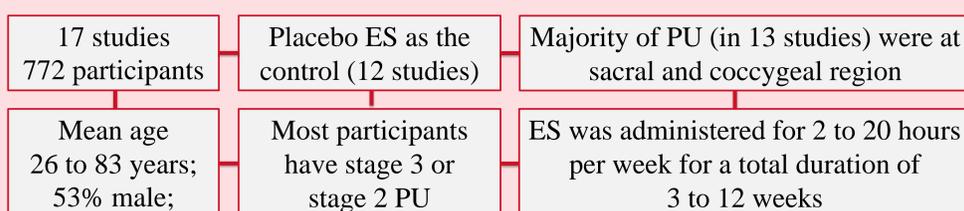
## STUDY METHODS

1. Systematic electronic search strategies (May 2017)
2. Prospectively registered<sup>1</sup> and published protocol<sup>2</sup>
3. Eligibility criteria - studies included published and unpublished randomised controlled trials and randomised cross-over studies, irrespective of language of publication. Participants with all ages and both genders with at least one PU (no restrictions on type or stage).
4. Comparison: [ES plus standard care] to [sham ES or no ES plus standard care]
5. Outcomes - *five primary outcomes* (proportion of PU healed; surface area of PU; composite measures of PU; time to complete healing; adverse effects of ES) and *four secondary outcomes* (rate of PU healing; quality of life, depression; consumers' perception)
6. Assessment of risk of bias
7. Grading the level of evidence: GRADE approach
8. For continuous data, we expressed mean differences (MD) with 95% CI; for dichotomous data, we expressed summary estimates as risk ratios (RR) with 95% CI; for time-to-event data, we expressed summary estimates as hazard ratios (HR) with 95% CI. Where possible, results were pooled in meta-analyses.

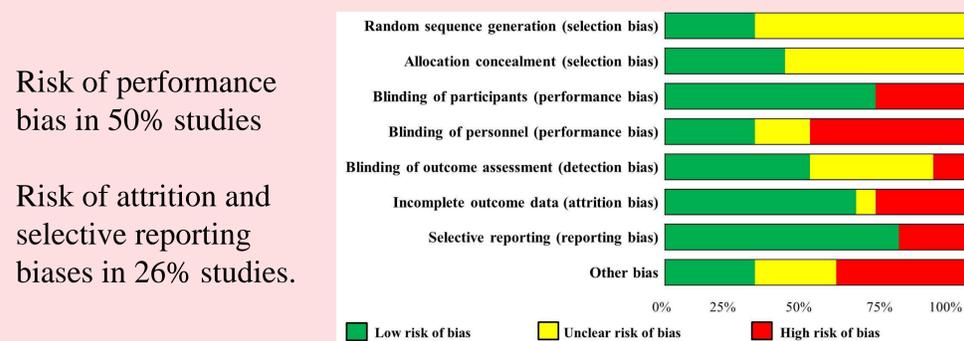
## STUDY FLOW DIAGRAM



## RESULTS



## RISK OF BIAS



Risk of performance bias in 50% studies

Risk of attrition and selective reporting biases in 26% studies.

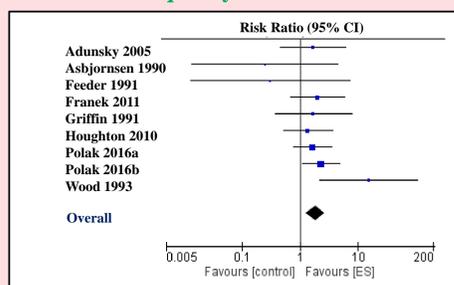
## POOLED RESULTS

### Primary outcomes

#### Proportion of PU healed (9 studies)

RR 1.8 (95% CI, 1.3 to 2.7, P = 0.002); I<sup>2</sup> = 6%

GRADE quality of evidence: Low

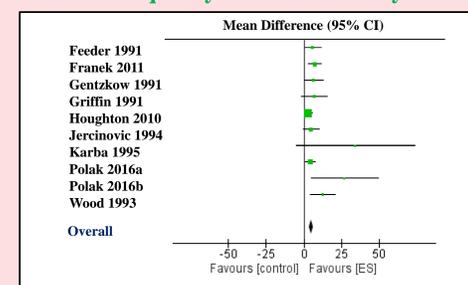


### Secondary outcomes

#### Rate of PU healing (10 studies)

MD 5 (95% CI, 3.5 to 6.6, P < 0.0001); I<sup>2</sup> = 36%

GRADE quality of evidence: Very-low



#### Time to complete healing (2 studies)

HR 1.1 (95% CI, 0.5 to 2.4, P = 0.89); I<sup>2</sup> = 0%

GRADE quality of evidence: Very-low

#### Quality of life, Depression and Consumers' perception of treatment effectiveness

No studies included these outcomes

## DISCUSSION

- ✓ The results of 4 outcomes provide very-low to low quality evidence that ES has very small effects on the healing of PU (*proportion of PU healed, surface area of PU, time to complete healing and rate of PU healing*). No results from the other 5 outcomes indicate that ES has a treatment effect because of lack of or insufficient data to analyse.
- ✓ It is somewhat surprising that all national guidelines recommend the use of ES, and most grade the quality of evidence as high. The results of our systematic review do not support this interpretation of the evidence.
- ✓ The widespread use of ES for the treatment of PU does not seem justifiable due to:
  - low or very-low quality of evidence
  - small treatment effects size
  - inadequate analysis of potential adverse effects of ES
  - ES being time consuming and potentially costly to apply.

## CONCLUSION

There is currently no strong evidence to suggest that ES promotes healing of PU. Authors of clinical practice guidelines need to reconsider their recommendation about widespread use of ES for this purpose.

## REFERENCE

1. Arora M et al. Electrical stimulation for treating pressure ulcers [Cochrane Protocol]. PROSPERO 2016 CRD42016045932 Available from: [http://www.crd.york.ac.uk/PROSPERO/display\\_record.php?ID=CRD42016045932](http://www.crd.york.ac.uk/PROSPERO/display_record.php?ID=CRD42016045932)
2. Arora M et al. Electrical stimulation for treating pressure ulcers. Cochrane Database of Systematic Reviews 2016, Issue 5. Art. No.: CD012196. DOI: 10.1002/14651858.CD012196

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