

## Appendix 1. Search results

Keywords “acupuncture”, “emergency”

1. MEDLINE via Pubmed on 8 Nov 2016

#1 acupuncture	25437
#2 Emergency	302138
#1 and #2	169
  
2. EMBASE via OVID (from 1947 to November 7 2016) on 8 Nov 2016

#1 acupuncture	39184
#2 emergency	400056
#1 and #2	295
  
3. CENTRAL on 8 Nov 2016

#1 acupuncture	8410
#2 emergency	17939
#1 and #2	42
  
4. AMED on 8 Nov 2016

#1 acupuncture	9510
#2 emergency	1129
#1 and #2	44
  
5. CNKI on 8 Nov 2016

(‘針灸’ OR ‘針刺’)	155702
AND (‘急症室’ OR ‘急診科’)	681
  
6. Wanfang on 8 Nov 2016

(‘針灸’ OR ‘針刺’)	175825
AND (‘急症室’ OR ‘急診科’)	542

Bibliographic search of previous review articles 18

**Appendix 2. Characteristics of the excluded studies and reasons for their exclusion (order by the year of publication)**

Author, year of publication	Country	Language of publication	Reasons for exclusion
Ma 1996 <sup>36</sup>	China	Chinese	Inappropriate standard medical therapy (diazepam was used as the standard therapy for tachyarrhythmia)
He 1997 <sup>37</sup>	China	Chinese	Inappropriate standard medical therapy (phenobarbitone was used as the first-line therapy for febrile convulsion); inappropriate randomization methodology (based on visit sequence)
Guo 2001 <sup>38</sup>	China	Chinese	Inappropriate standard medical therapy (diazepam was used as the standard medical therapy for shock); inappropriate randomization methodology (based on time of admission)
Wong 2003 <sup>39</sup>	Taiwan	English	Non-ED setting (recruited in-patients and post-operative patients)
Zhu 2004a <sup>40</sup>	China	Chinese	Non-RCT
Zhu 2004b <sup>41</sup>	China	Chinese	Non-RCT
Guan 2007 <sup>42</sup>	China	Chinese	Non-RCT; non-ED setting
Chen 2008 <sup>43</sup>	China	Chinese	Mixed clinical settings (acupuncture clinic and ED)
Qin 2008 <sup>44</sup>	China	Chinese	Questionable acupuncture treatment (a device called “Acupuncture Resuscitation Device” was used); mixed clinical settings; acupuncture treatment not completed during ED stay
Li 2009 <sup>45</sup>	China	Chinese	Non-RCT; mixed clinical settings
Liang 2011 <sup>46</sup>	China	Chinese	Non-RCT
Qin 2011 <sup>47</sup>	China	Chinese	Questionable acupuncture treatment (a device called “Acupuncture Resuscitation Device” was used); mixed clinical settings
Yang 2011 <sup>48</sup>	China	Chinese	Inappropriate standard medical therapy (bucinnazine hydrochloride was used as the standard therapy for renal colic)
Amos 2012 <sup>49</sup>	Israel	English	Abstract only
Wen 2012 <sup>50</sup>	China	Chinese	Mixed clinical settings (bowel obstruction clinic and ED); concurrent use of herbal medicine
Yao 2012 <sup>51</sup>	China	Chinese	Inappropriate standard medical therapy (per rectal indomethacin was used as the standard therapy for dysmenorrhea)
Hasegawa 2014 <sup>52</sup>	Brazil	English	Treatment not completed in the ED
Li 2014 <sup>53</sup>	China	Chinese	Questionable results (unclear doses of glyceryl trinitrate in both control and treatment group)
Sun 2014 <sup>54</sup>	China	Chinese	Non-ED setting
Chiu 2015 <sup>55</sup>	Taiwan	English	Non-RCT

Fong 2015 <sup>56</sup>	China	Chinese	Questionable results (exactly the same article published by Lai in 2016 despite different study center)
Liu 2015 <sup>57</sup>	Taiwan	English	Non-RCT
Nager 2015 <sup>58</sup>	USA	English	Non-RCT
Lai 2016 <sup>59</sup>	China	Chinese	Questionable results (exactly the same article published by Fong in 2016 despite different study center)

### Appendix 3. Full description of the included studies (ordered by the year of publication)

#### Goertz et al. 2006

Study design	<p>Study design: randomized controlled trial Randomization: computer-generated simple block randomization Allocation concealment: The randomization sheets were put in sealed, numbered opaque envelopes. Treatment group was assigned by selecting the next envelope in sequence. Blinding: patients and the treating acupuncturist were not blinded during treatment. Research coordinator, outcome assessors, and other ER staff were blinded by placing an adhesive patch over the ear lobe Follow-up: 24 hours Intention-to-treat: yes Ethics approval: not reported Informed consent: yes Trial register: not reported</p>
Participants and settings	<p>Setting: an emergency room (ER) at Malcolm Grow Medical Center, Andrew Air Force Base, Maryland, USA Total number of subjects: 100 patients, aged 18-50 with acute pain syndromes not requiring intervention other than pain management, were allocated to the acupuncture group (n = 50) or to the standard medical care group (n = 50).</p> <p>Mean age: acupuncture group <math>30.4 \pm 9.67</math> year; standard care group <math>32.76 \pm 7.45</math> year</p> <p>Gender (female %): acupuncture group 42%; standard care group 64%</p> <p>Mean baseline pain level: acupuncture group <math>6.98 \pm 1.68</math>; standard medical care group <math>7.78 \pm 1.84</math></p> <p>Diagnosis: clinical diagnosis by ER physicians Acute pain complaints: low back pain (27%), lower extremities (13%), head (9%), and neck (8%) Excluded: patients who were not willing or unable to participate; admitted to hospital; pregnant or nursing; unable to give consent; allergic to adhesive tape, gold, or other needle components; or if they required other medical intervention.</p>
Interventions	<p>Comparison: auricular acupuncture with standard medical care vs standard medical care (1) Acupuncture group Style: auricular acupuncture Reasoning for treatment, including rationing for diagnosis, point selection and treatment: selection of acupoints based on functional magnetic resonance imaging studies and clinical observation Extent to which treatment was varied: no variation reported Number of needle insertions per subject per session: 4</p>

	<p>Names or location of points used: bilateral cingulate gyrus (143 F) and thalamic nucleus (138 F)  Depth of insertion: not reported  Response sought: not reported  Needle stimulation: No  Needle retention time: 4 to 6 days before the needles fell out on their own  Needle type: sterile Aiguille SemiPermanent (ASP needle) (SEDATELEC; Lyon, France)  Total number of sessions: one-time treatment  Frequency/duration of sessions: one-time treatment  Concomitant treatment: standard medical care  Practitioner background: not reported</p> <p>(2) Standard medical care group  Asked the patient to walk around as a distraction from the pain</p>						
<p>Outcomes</p>	<p>Primary outcomes:  1) Pain; verbal 0- to 10-point verbal Numerical Rating Scale (NRS) in the ER and upon 24-hour telephone follow-up  Secondary outcomes:  2) ED medication prescription; participant's medication diary  Outcome measure results:  1) Significantly higher pain reduction in acupuncture group immediately after acupuncture (2.18 mean difference in pain reduction between groups, <math>p &lt; 0.001</math>) but no significant difference at 24 hr follow-up (0.37 mean difference between groups, <math>p = 0.503</math>)  2) No significant difference in the frequency of medication use (<math>p = 0.783</math>) or whether medication was prescribed (<math>p = 0.712</math>) between the groups  Withdrawal/drop-outs: 9 in the acupuncture group; 7 in the standard medical care group  Adverse effects: not reported</p>						
<p>Notes</p>	<p>The nature of standard medical treatment in both groups were not reported or compared  Other information: acupuncture cost \$ 1.52 per patient  Language: English  Funding: Samueli Institute for Information Biology under a contract with the Department of Defense</p>						
<p><b>Risk of bias</b></p> <p><b>Bias</b></p> <p>Random sequence generation (selection bias)</p> <p>Allocation concealment (selection bias)</p>	<table border="0"> <thead> <tr> <th data-bbox="451 1697 606 1776"><b>Author's judgement</b></th> <th data-bbox="630 1697 949 1731"><b>Support for judgement</b></th> </tr> </thead> <tbody> <tr> <td data-bbox="451 1776 606 1910">Low risk</td> <td data-bbox="630 1776 1284 1809">A computer was used to generate random number.</td> </tr> <tr> <td data-bbox="451 1921 606 1955">Low risk</td> <td data-bbox="630 1921 1252 1955">Numbered, opaque, sealed envelopes were used.</td> </tr> </tbody> </table>	<b>Author's judgement</b>	<b>Support for judgement</b>	Low risk	A computer was used to generate random number.	Low risk	Numbered, opaque, sealed envelopes were used.
<b>Author's judgement</b>	<b>Support for judgement</b>						
Low risk	A computer was used to generate random number.						
Low risk	Numbered, opaque, sealed envelopes were used.						

Blinding of participants and personnel (performance bias) outcome	High risk	Participants were not blinded and the reported pain level might be affected.
Blinding of outcome assessment (detection bias) All outcomes	Low risk	Outcome assessors were blinded by using patch covering the needling sites.
Incomplete outcome data (attrition bias) All outcomes	High risk	13% dropouts at 24-hr follow-up.
Selective reporting (reporting bias)	Unclear risk	Study protocol not published before trial.
Other bias	High risk	The baseline characteristics were not balanced between the 2 groups with significantly more female and higher baseline pain level in the standard medical care group.

### Harkin et al. 2007

Study design	Study design: randomized controlled trial Randomization: not reported Allocation concealment: not reported Blinding: no Follow-up: no Intention-to-treat: not reported Ethics approval: yes Informed consent: written Trial register: no
Participants and settings	Setting: ED of the Northern Hospital, Melbourne, Australia  Total number of subjects: 45 triage categories 3, 4, 5 patients with migraine, tension headache, torticollis, muscular back pain, acute musculoskeletal pain (excluding fracture), hyperemesis gravidarum, chemotherapy-induced nausea and vomiting, anxiety/panic attack, viral upper respiratory tract infection, and dysmenorrhea were allocated to the acupuncture group (n = 32) or to the conventional group (n = 13).  Mean age: acupuncture group 40.25 ± 14.68 year; conventional group 45.46 ± 16.18 year  Gender (female %): acupuncture group 60.6%; conventional group 46.7%

Mean baseline pain score: acupuncture group  $64.39 \pm 24.07$ ; conventional group  $54.71 \pm 17.98$

Diagnosis: clinical diagnosis by ER physicians

Excluded: triage categories 1 and 2; haemodynamically unstable or critically ill; acute severe pain requiring parental narcotics; undifferentiated conditions requiring further investigations

Interventions

Comparison: acupuncture vs conventional medical treatment

(1) Acupuncture group

Style: TCM acupuncture

Reasoning for treatment, including rationing for diagnosis, point selection and treatment: based on clinical experience of the acupuncturist

Extent to which treatment was varied: individualized

Number of needle insertions per subject per session: variable

Names or location of points used: Hegu (LI-4) and Taichong (LIV-3) in all cases and supplementary points as determined by the acupuncturist

Depth of insertion: till 'de qi' was reached but not specified

Response sought: 'de qi'

Needle stimulation: electroacupuncture (Hwato SDZ 2)

Needle retention time: 20 min

Needle type: 0.25 x 30 mm, 0.25 x 40 mm, 0.32 x 75 mm, 0.30 x 30 mm, 0.30 x 40 mm, 0.30 x 75 mm, 0.18 x 13 mm, 0.18 x 25 mm

Total number of sessions: one-time treatment

Frequency/duration of sessions: one-time treatment

Concomitant treatment: no

Practitioner background: TCM practitioner

(2) Conventional care group

Conventional ED treatment determined by the treating ED doctor

Outcomes

Primary outcomes:

1) Pain score; Visual Analogue Scale (VAS)

2) Physiological parameters: heart rate (HR), blood pressure (BP) and respiratory rate (RR)

3) ED length of stay

4) Perceived effectiveness of treatment

5) Willingness to undergo the same treatment

Outcome measure results:

1) Significant reduction in the mean VAS was seen in both groups after treatment (acupuncture group  $25.90 \pm 17.64$ ,  $p < 0.001$ ; control group  $22.18 \pm 24.08$ ,  $p = 0.002$ ), but the difference between the two groups was not significant ( $p = 0.422$ )

2) Significant reduction in SBP and DBP was seen in both groups. Significant reduction in HR was seen in the conventional group.

3) No significant difference in ED length of stay (acupuncture group  $238.93 \pm 82.48$  min vs conventional group  $255.94 \pm 132.03$  min)

4) Perceived effectiveness of treatment: acupuncture group 84.4% positive; conventional group 75.0% positive ( $p = 0.433$ )

	5) Willingness to undergo the same treatment: acupuncture group 81.8%; conventional group 58.8% (p = 0.079) Adverse effects: 6 in the acupuncture; 1 in the conventional group (p = 0.235)
Notes	Language: English Funding: no
<b>Risk of bias</b>	
<b>Bias</b>	<b>Author's judgement</b> <b>Support for judgement</b>
Random sequence generation (selection bias)	Unclear risk      The randomisation process was not reported.
Allocation concealment (selection bias)	Unclear risk      Allocation concealment was not reported.
Blinding of participants and personnel (performance bias) outcome	High risk      No blinding
Blinding of outcome assessment (detection bias) All outcomes	High risk      No blinding
Incomplete outcome data (attrition bias) All outcomes	Low risk      No dropout
Selective reporting (reporting bias)	Unclear risk      Study protocol not published before trial
Other bias	High risk      The number of patient was not balanced between the two groups

### Yang et al 2012

Methods	Study design: randomized controlled trial Randomization: random number table generated with Excel software Allocation concealment: the random number cards were put in sequenced opaque envelopes Blinding: patients and the treating acupuncturist were not blinded during treatment. Outcome assessors were blinded. Follow-up: 1 min after treatment Intention-to-treat: yes Ethics approval: yes
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	<p>Informed consent: yes  Trial register: not reported</p>
Participants	<p>Setting: ED at the Second Clinical Hospital of Guangzhou University of Chinese Medicine, Guangzhou, China  Total number of subjects: 74 patients, aged 8-65 with acute pharyngitis were randomly assigned to the acupuncture group (n = 36) or to the sham acupoint group (n = 38)</p> <p>Mean age: acupuncture group <math>28.56 \pm 15.43</math> years; sham acupoint group <math>29.16 \pm 12.21</math> years</p> <p>Gender (female %): acupuncture group 50%; sham acupoint 50%</p> <p>Baseline VAS of sore throat: acupuncture group <math>5.25 \pm 1.51</math>; sham acupoint group <math>4.83 \pm 1.59</math></p> <p>Diagnosis: clinical diagnosis by the treating clinicians  Excluded: history of acupuncture-induced syncope; having receiving other treatment within 6 hrs; skin damage or infection at the acupuncture location; coagulopathy; pregnant or lactating women; refusal of consent</p>
Interventions	<p>Comparison:</p> <p>(1) Acupuncture group  Style: Balance acupuncture  Reasoning for treatment, including rationing for diagnosis, point selection and treatment: clinical experience  Extent to which treatment was varied: fixed  Number of needle insertions per subject per session: 1  Names or location of points used: ‘Yantong’ point on the contralateral side  Depth of insertion: 2 – 4 cm  Response sought: ‘de qi’  Needle stimulation: manual  Needle retention time: No needle retention  Needle type: 0.35 mm x 40.75 mm ‘Tian Hip’ single-use needle  Total number of sessions: one-time treatment  Frequency/duration of sessions: one-time treatment  Concomitant treatment: nil  Practitioner background: not reported</p> <p>(2) Control group: sham acupuncture at the site 1 cm lateral to the mid-point between the ulnar endpoint of the cubic transverse striation and that of the wrist-palm transverse striation</p> <p>Rationale: not reported</p>
Outcomes	<p>Primary outcomes:</p> <p>1) Pain (VAS, 0-10) at 1 min after treatment  2) ‘Cure rate’: ‘Recovered’ if symptom score reduced <math>\geq 95\%</math>; ‘markedly effective’ if symptom score reduced <math>\geq 70\%</math> but <math>&lt; 95\%</math>; ‘effective’ if</p>

symptom score reduced  $\geq 30\%$  but  $< 70\%$ ; 'not effective' if symptom score reduced  $< 30\%$

Outcome measure results:

The VAS of the acupuncture group and the sham acupoint group decreased significantly to  $2.11 \pm 1.88$  and  $3.39 \pm 1.94$ , respectively. The 'cure plus markedly effective' rate was significantly higher in the acupuncture group than in the sham acupoint group (44.4% vs 10.5%,  $p < 0.01$ )

Adverse effects: no

Notes

Language: Chinese  
Funding: not reported

***Risk of bias***

<b>Bias</b>	<b>Author's judgement</b>	<b>Support for judgement</b>
Random sequence generation (selection bias)	Low risk	Random number table generated with excel was used
Allocation concealment (selection bias)	Low risk	Sequential numbered, opaque envelope
Blinding of participants and personnel (performance bias)	High risk	No blinding
Outcome Blinding of outcome assessment (detection bias)	Low risk	Outcome were assessed by independent assessors. Needle was not retained and the risk of knowing the group assignment by the assessor was low
All outcomes Incomplete outcome data (attrition bias)	Low risk	No dropout reported
All outcomes Selective reporting (reporting bias)	Unclear risk	Study protocol not published before trial
Other bias	Unclear risk	No flow diagram was shown. The risk of selection bias is uncertain.

**Liang et al. 2014**

Methods	Study design: randomized controlled trial Randomization: random number table generated with Excel software Allocation concealment: the random number cards were put in sequenced opaque envelopes Blinding: no Follow-up: 120 min Intention-to-treat: yes Ethics approval: yes Informed consent: yes Trial register: not reported
Participants	Setting: ED at the Fangcun Hospital, Guangdong Provincial Hospital of Traditional Chinese Medicine, Guangzhou, China Total number of subjects: 68 patients with hypertension were randomly assigned to the acupuncture group (n = 34) and the medical therapy group (n = 34). Subjects were not allowed to take other antihypertensive medication within 120 min of study enrolment.  Mean age: acupuncture group $60.59 \pm 8.97$ years; medical therapy group $62.03 \pm 9.13$ years.  Gender (Female %): acupuncture group 52.9%; medical therapy group 44.1%.  Baseline SBP: acupuncture group $197.91 \pm 16.92$ mmHg; medical therapy group $196.97 \pm 15.59$ mmHg.  Baseline DBP: acupuncture group $101.76 \pm 14.58$ mmHg; medical therapy group $105.50 \pm 18.76$ mmHg.  Diagnosis: clinical diagnosis by the treating clinicians Excluded: patients with severe cardiovascular, cerebrovascular, liver, renal, oncological, haematological and psychiatric diseases; refusal of acupuncture or consent; skin damage or infection at the site of acupuncture; pregnant or lactating women; record of adverse drug reaction to captopril; drug allergy.
Interventions	Comparison: (3) Acupuncture group Style: Balance acupuncture Reasoning for treatment, including rationing for diagnosis, point selection and treatment: not reported Extent to which treatment was varied: fixed Number of needle insertions per subject per session: 2 Names or location of points used: 'Jiangya' and 'Toutong' point Depth of insertion: 2.5 to 5 cm

Response sought: 'de qi'  
 Needle stimulation: manual  
 Needle retention time: no  
 Needle type (e.g. manufacturer or material): 0.35 mm x 75 mm single-use needle (Tian Xie, Suzhou Tianyi Acupuncture Company)  
 Total number of sessions: one-time treatment  
 Frequency/duration of sessions: one-time treatment  
 Concomitant treatment: nil  
 Practitioner background: not reported

(4) Control group: Sublingual Captopril 25 mg

Outcomes

Primary outcomes:

- 1) SBP (mmHg) at 10, 30, 60, 120 min after treatment
- 2) DBP (mmHg) at 10, 30, 60, 120 min after treatment
- 3) 'Effectiveness' defined as 'markedly effective' if DBP reduced  $\geq 10$  mmHg and returned to the normal range or DBP not yet returned to the normal range but had reduced  $\geq 20$  mmHg; 'effective' if DBP reduced  $\leq 10$  mmHg but had returned to the normal range or 10-19 mmHg but not yet to the normal range or SBP reduced  $\geq 30$  mmHg; 'ineffective' if neither of the above criteria were met.

Outcome measure results:

Both the acupuncture and medical therapy groups showed significant reduction of SBP and DBP at the pre-determined time points after treatment. No significant difference was noted between two groups at each time point after treatment in terms of treatment effectiveness

Adverse effects: no

Notes

Language: Chinese  
 Funding: not reported

**Risk of bias**

<b>Bias</b>	<b>Author's judgement</b>	<b>Support for judgement</b>
Random sequence generation (selection bias)	Low risk	Random number table generated with excel was used
Allocation concealment (selection bias)	Low risk	Sequential numbered, opaque envelope
Blinding of participants and personnel (performance bias) outcome	High risk	No blinding

Blinding of outcome assessment (detection bias) All outcomes	High risk	No blinding
Incomplete outcome data (attrition bias) All outcomes	Low risk	No dropout reported
Selective reporting (reporting bias)	Unclear risk	Study protocol had not been published
Other bias	Unclear risk	No flow diagram was shown. The risk of selection bias is uncertain.

### Zhang et al. 2015

Methods	<p>Study design: randomized controlled trial  Randomization: random number table for sequence generation  Allocation concealment: opaque envelopes  Blinding: No  Follow-up: not reported  Intention-to-treat: not reported  Ethics approval: not reported  Informed consent: yes (next-of-kin)  Trial register: not reported</p>
Participants	<p>Setting: ED of the Guangdong Hospital of Traditional Chinese Medicine, China  Total number of subjects: 64 patients with pre-hospital cardiac arrest or cardiac arrest during ED observation (ventricular fibrillation/asystole) were enrolled; 5 were excluded; 28 were allocated to the acupuncture group and 31 to the standard care group</p> <p>Mean age: acupuncture group <math>69.18 \pm 10.04</math> years; control group <math>74.71 \pm 14.02</math>  Gender (female %): acupuncture group 35.7%; control group 51.6%  Diagnostic criteria: clinical and electrocardiogram  Excluded: cardiac arrest due to aortic aneurysm, terminal malignancies, metabolic and endocrine disease, trauma, and poisoning; pregnant women; uncooperative patients due to psychiatric disease; patients with blood-borne infectious disease; skin damage around the acupoints.</p>
Interventions	<p>Comparison: Balanced acupuncture with standard resuscitation vs standard resuscitation  (1) Acupuncture group  Style: TCM (Balanced Method)  Reasoning for treatment, including rationing for diagnosis, point selection and treatment: Based on clinical experience and animal studies  Extent to which treatment was varied: fixed  Number of needle insertions per subject per session: 1</p>

Names or location of points used: Renzhong (GV26)  
 Depth of insertion: around 12 mm  
 Response sought: not reported  
 Needle stimulation: manual  
 Needle retention time: 2 min  
 Needle type: not reported  
 Total number of sessions: one-time treatment  
 Frequency/duration of sessions: one-time treatment  
 Concomitant treatment: resuscitation based on 2010 Advanced Cardiac Life Support (ACLS) Guideline  
 Practitioner background: trained acupuncture post-graduate(s)

(2) Standard care group: resuscitation based on 2010 ACLS Guideline

Outcomes

Outcome (primary outcome not specified)  
 1) Return of spontaneous circulation rate (ROSC)  
 2) Survival rate  
 3) Time to ROSC (min)  
 4) Adverse effects  
 Outcome measure results:  
 1) ROSC rate: acupuncture group: 67.9%; standard care group: 29.0%;  
 p = 0.003  
 2) Survival rate: acupuncture group: 28.6%; standard care group 12.9%;  
 p = 0.135  
 3) Time to ROSC: acupuncture group: 10.47 ± 4.23 min; standard care  
 group: 16.00 ± 4.12 min; p=0.004  
 4) Adverse effects: no

Notes

Language: Chinese  
 Funding: not reported

***Risk of bias***

<b>Bias</b>	<b>Author's judgement</b>	<b>Support for judgement</b>
Random sequence generation (selection bias)	Low risk	Random number table was used
Allocation concealment (selection bias)	High risk	Envelope
Blinding of participants and personnel (performance bias) outcome	High risk	Patients were in cardiac arrest, no participant blinding was needed. However personnel were not blinded
Blinding of outcome	Low risk	ROSC and survival rates were unlikely to be affected by a lack of blinding of the assessor

assessment (detection bias) All outcomes	Low risk	No dropout
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	Study protocol not published prior to the trial
Selective reporting (reporting bias) Other bias	High risk	Pooling patients with very different prognoses without subgroup analysis (significantly higher ROSC and survival rates for ventricular fibrillation than asystole), unclear outcome definition (it is not clear whether the survival rate in the paper referred to survival to admission or survival to discharge), and failure of following the Utstein-style template (which is commonly used in cardiac arrest research) in reporting study details and findings.

### Grissa et al. 2016

Methods	<p>Study design: randomized controlled trial  Randomization: computer-generated random number  Allocation concealment: sealed envelopes  Blinding: no  Follow-up: 60 min  Intention-to-treat: not specified  Ethics approval: yes  Informed consent: yes  Trial register: NCT02460913</p>
Participants	<p>Setting: ED at the Fattouma Bourguiba University Hospital in Tunisia  Total number of subjects: 300 adult ED patients with acute (&lt;72 hrs of ED presentation) moderate to severe acute pain (VAS or NRS <math>\geq</math> 40) with stable clinical conditions.</p> <p>Mean age: acupuncture group <math>42 \pm 15</math> years; morphine group <math>42 \pm 16</math> years.</p> <p>Gender (female %): acupuncture group 53.3%; morphine group 42.7%.</p> <p>There were significantly more patients with abdominal pain in the morphine group and more low back pain cases in the acupuncture group.</p> <p>Diagnosis  Excluded: temperature <math>&gt;37.5^{\circ}\text{C}</math>; patient on anticoagulant drugs or with coagulopathy; skin affections that would impair the use of certain acupuncture points; physician judgement of not able to participate; refusal of inability to consent; inability to assess pain using VAS or NRS; use of</p>

analgesics within 6 hrs of enrolment; initial pain  $\leq 40$  on VAS or NRS; patients who had presented to the ED with the same complaint; pregnancy

Interventions

Comparison:

(5) Acupuncture group

Style: TCM acupuncture

Reasoning for treatment, including rationing for diagnosis, point selection and treatment: Through literature review and a panel of specialist acupuncturists from TCM background

Extent to which treatment was varied: varied and individualized treatment based on a pool of pre-determined points for each condition

Number of needle insertions per subject per session: variable

Names or location of points used: variable

Depth of insertion: variable

Response sought: not reported

Needle stimulation: manual

Needle retention time: 5 min

Needle type (e.g. manufacturer or material): not reported

Total number of sessions: one-time treatment

Frequency/duration of sessions: 20 to 30 min

Concomitant treatment: nil

Practitioner background: an ED with medical acupuncture qualification accredited by the National Tunisian Council of Doctors with 10-years of experience in the field

(6) Control group: IV titrated morphine

Description of the control: initial dose of 0.1 mg/Kg and repeated regularly at the dose of 0.05 mg/Kg every 5 min until reaching objective. The maximum allowed dose was 15 mg.

Outcomes

Primary outcomes:

- 1) Pain (VAS or NRS 0-100 for those with difficulties in understand VAS) at the start of the protocol (T0) and at 5, 10, 20, 30, 45 and 60 minutes. The success rate of treatment at 60 min was defined as a reduction in pain score  $\geq 50\%$  of its baseline value
- 2) Resolution time defined as the time elapse between T0 and decrease in pain score of  $\geq 50\%$  of its baseline value
- 3) SBP/DBP, HR, RR, pulse oximetry, consciousness

Outcome measure results:

- 1) Success rate was significantly higher in the acupuncture group (92% vs 78%,  $p < 0.001$ ).
- 2) The resolution time was also significantly shorter in the acupuncture group ( $16 \pm 8$  min vs  $28 \pm 14$  min,  $p < 0.005$ ). The mean absolute difference in pain score between the 2 groups was not clinically significant.
- 3) The change in SBP/DBP, HR, RR, and oxygen saturation was not significant in both groups.

Adverse effects: 2.65% in the acupuncture group; 56.6% in the morphine group ( $p < 0.001$ )

Notes

Language: English



Funding: No

***Risk of bias***  
**Bias**

**Author's judgement**

**Support for judgement**

Random sequence generation (selection bias)

Low risk

Computer generation of random numbers

Allocation concealment (selection bias)

Low risk

Use of opaque envelopes

Blinding of participants and personnel (performance bias)

High risk

No blinding

outcome  
Blinding of outcome assessment (detection bias)

High risk

No blinding

All outcomes  
Incomplete outcome data (attrition bias)

Low risk

No dropout reported

All outcomes  
Selective reporting (reporting bias)

Low risk

No significant difference from the registered study protocol but minor change in the definition of the primary outcome was noted.

Other bias

High risk

Significantly more low back pain cases in the acupuncture group and more abdominal pain cases in the morphine group.