Physical therapy for Bell’s palsy (idiopathic facial paralysis) (Review)

Teixeira LJ, Valbuza JS, Prado GF

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# Table of Contents

- **HEADER** .................................................. 1
- **ABSTRACT** ............................................ 1
- **PLAIN LANGUAGE SUMMARY** ........................ 2
- **BACKGROUND** ......................................... 3
- **OBJECTIVES** .......................................... 4
- **METHODS** ............................................ 4
- **RESULTS** ................................................
  - Figure 1 .................................................. 7
  - Figure 2 .................................................. 10
- **DISCUSSION** ........................................... 14
- **AUTHORS’ CONCLUSIONS** ............................. 17
- **ACKNOWLEDGEMENTS** .................................. 17
- **REFERENCES** ........................................... 18
- **CHARACTERISTICS OF STUDIES** ..................... 22
- **DATA AND ANALYSES** .................................. 45
  - Analysis 1.1. Comparison 1 Electrostimulation versus control, Outcome 1 Incomplete recovery after 6 and 12 months. 48
  - Analysis 1.2. Comparison 1 Electrostimulation versus control, Outcome 2 Mean Facial Grading Scale after 3 months. 49
  - Analysis 1.3. Comparison 1 Electrostimulation versus control, Outcome 3 Incomplete recovery after 3 months. 49
  - Analysis 1.4. Comparison 1 Electrostimulation versus control, Outcome 4 Mean House-Brackmann Facial Grading Systems. 50
  - Analysis 1.5. Comparison 1 Electrostimulation versus control, Outcome 5 Motor synkinesia after treatment. 50
  - Analysis 2.1. Comparison 2 Electrostimulation versus prednisone, Outcome 1 Incomplete recovery after six months (all participants). 51
  - Analysis 2.2. Comparison 2 Electrostimulation versus prednisone, Outcome 2 Incomplete recovery six months according severity. 51
  - Analysis 2.3. Comparison 2 Electrostimulation versus prednisone, Outcome 3 Mean time to complete recovery (in days). 52
  - Analysis 3.1. Comparison 3 Exercise versus waiting list, Outcome 1 Recovery on Facial Grading Scale (Sunnybrook scale). 52
  - Analysis 3.2. Comparison 3 Exercise versus waiting list, Outcome 2 Recovery on Facial Disability Index-physical. 53
  - Analysis 3.3. Comparison 3 Exercise versus waiting list, Outcome 3 Recovery on House Brackmann grading system. 53
  - Analysis 4.1. Comparison 4 Exercise versus conventional treatment, Outcome 1 Incomplete recovery three months after randomisation. 54
  - Analysis 4.2. Comparison 4 Exercise versus conventional treatment, Outcome 2 Mean time from the beginning of the recovery (in weeks). 54
  - Analysis 4.3. Comparison 4 Exercise versus conventional treatment, Outcome 3 Mean time from completion of recovery (in weeks). 55
  - Analysis 4.4. Comparison 4 Exercise versus conventional treatment, Outcome 4 Motor synkinesia after treatment. 56
  - Analysis 5.1. Comparison 5 Exercise plus acupuncture versus acupuncture, Outcome 1 Number of participants without recovery. 56
  - Analysis 5.2. Comparison 5 Exercise plus acupuncture versus acupuncture, Outcome 2 Portmann Score. 57
  - Analysis 5.3. Comparison 5 Exercise plus acupuncture versus acupuncture, Outcome 3 Mean House Brackmann score. 58
  - Analysis 6.1. Comparison 6 Electrotherapy plus acupuncture versus acupuncture, Outcome 1 Number of participants without recovery. 58
  - Analysis 7.1. Comparison 7 Physical therapy versus acupuncture, Outcome 1 Number of participants without recovery. 59
- **ADDITIONAL TABLES** .................................... 59
- **APPENDICES** ........................................... 62
- **WHAT’S NEW** ......................................... 67
- **HISTORY** ............................................... 67
- **CONTRIBUTIONS OF AUTHORS** ....................... 67
- **DECLARATIONS OF INTEREST** ......................... 68
- **SOURCES OF SUPPORT** .................................. 68
- **DIFFERENCES BETWEEN PROTOCOL AND REVIEW** .... 68
Physical therapy for Bell’s palsy (idiopathic facial paralysis)

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ABSTRACT

Background
Bell’s palsy (idiopathic facial paralysis) is commonly treated by various physical therapy strategies and devices, but there are many questions about their efficacy.

Objectives
To evaluate physical therapies for Bell’s palsy (idiopathic facial palsy).

Search methods
We searched the Cochrane Database of Systematic Reviews and the Cochrane Central Register of Controlled Trials (The Cochrane Library, Issue 1, 2011), MEDLINE (January 1966 to February 2011), EMBASE (January 1946 to February 2011), LILACS (January 1982 to February 2011), PEDro (from 1992 to February 2011), and CINAHL (January 1982 to February 2011). We included searches in clinical trials register databases until February 2011.

Selection criteria
We selected randomised or quasi-randomised controlled trials involving any physical therapy. We included participants of any age with a diagnosis of Bell’s palsy and all degrees of severity. The outcome measures were: incomplete recovery six months after randomisation, motor synkinesis, crocodile tears or facial spasm six months after onset, incomplete recovery after one year and adverse effects attributable to the intervention.

Data collection and analysis
Two authors independently scrutinised titles and abstracts identified from the search results. Two authors independently carried out risk of bias assessments, which took into account secure methods of randomisation, allocation concealment, observer blinding, patient blinding, incomplete outcome data, selective outcome reporting and other bias. Two authors independently extracted data using a specially constructed data extraction form. We undertook separate subgroup analyses of participants with more and less severe disability.
Main results

For this update to the original review, the search identified 65 potentially relevant articles. Twelve studies met the inclusion criteria (872 participants). Four trials studied the efficacy of electrical stimulation (313 participants), three trials studied exercises (199 participants), and five studies compared or combined some form of physical therapy with acupuncture (360 participants). For most outcomes we were unable to perform meta-analysis because the interventions and outcomes were not comparable.

For the primary outcome of incomplete recovery after six months, electrostimulation produced no benefit over placebo (moderate quality evidence from one study with 86 participants). Low quality comparisons of electrostimulation with prednisolone (an active treatment) (149 participants), or the addition of electrostimulation to hot packs, massage and facial exercises (22 participants), reported no significant differences. Similarly a meta-analysis from two studies, one of three months and the other of six months duration (142 participants) found no statistically significant difference in synkinesis, a complication of Bell's palsy, between participants receiving electrostimulation and controls. A single low quality study (56 participants), which reported at three months, found worse functional recovery with electrostimulation (mean difference (MD) 12.00 points (scale of 0 to 100) 95% confidence interval (CI) 1.26 to 22.74).

Two trials of facial exercises, both at high risk of bias, found no difference in incomplete recovery at six months when exercises were compared to waiting list controls or conventional therapy. There is evidence from a single small study (34 participants) of moderate quality that exercises are beneficial on measures of facial disability to people with chronic facial palsy when compared with controls (MD 20.40 points (scale of 0 to 100), 95% CI 8.76 to 32.04) and from another single low quality study with 145 people with acute cases treated for three months, in which significantly fewer participants developed facial motor synkinesis after exercise (risk ratio 0.24, 95% CI 0.08 to 0.69). The same study showed statistically significant reduction in time for complete recovery, mainly in more severe cases (47 participants, MD -2.10 weeks, 95% CI -3.15 to -1.05) but this was not a prespecified outcome in this meta analysis.

Acupuncture studies did not provide useful data as all were short and at high risk of bias. None of the studies included adverse events as an outcome.

Authors' conclusions

There is no high quality evidence to support significant benefit or harm from any physical therapy for idiopathic facial paralysis. There is low quality evidence that tailored facial exercises can help to improve facial function, mainly for people with moderate paralysis and chronic cases. There is low quality evidence that facial exercise reduces sequelae in acute cases. The suggested effects of tailored facial exercises need to be confirmed with good quality randomised controlled trials.

Plain Language Summary

Physical therapies for idiopathic facial paralysis

Bell's palsy is an acute disorder of the facial nerve, which produces full or partial loss of movement on one side of the face. The facial palsy gets completely better without treatment in most, but not all, people. Physical therapies, such as exercise, biofeedback, laser treatment, electrotherapy, massage and thermotherapy, are used to hasten recovery, improve facial function and minimise sequelae. For this updated review we found a total of 12 studies with 872 participants, most with high risk of bias. Four trials studied the efficacy of electrical stimulation (313 participants), three trials studied exercises (199 participants), and five studies combined some form of physical therapy and compared with acupuncture (360 participants). There is evidence from a single study of moderate quality that exercises are beneficial to people with chronic facial palsy when compared with controls and from another low quality study that it is possible that facial exercises could help to reduce synkinesis (a complication of Bell's palsy), and the time to recover. There is insufficient evidence to decide whether electrical stimulation works, to identify risks of these treatments or to assess whether the addition of acupuncture to facial exercises or other physical therapy could produce improvement. In conclusion, tailored facial exercises can help to improve facial function, mainly for people with moderate paralysis and chronic cases, and early facial exercise may reduce recovery time and long term paralysis in acute cases, but the evidence for this is of poor quality. More trials are needed to assess the effects of facial exercises and any risks.
BACKGROUND

Description of the condition

Idiopathic facial palsy, also called Bell’s palsy, is an acute disorder of the facial nerve, which may begin with symptoms of pain in the mastoid region and produce full or partial paralysis of movement of one side of the face (Adour 1982; Valença 2001). Its cause is not known (Peitersen 2002). Increasing evidence suggests that the main cause of Bell’s palsy is reactivation of latent herpes simplex virus type 1 in the cranial nerve ganglia (De Diego 1999; Holland 2004; Valença 2001). How the virus damages the facial nerve is uncertain (Gilden 2004). The annual incidence of Bell’s palsy varies widely, ranging between 11.5 and 40.2 cases per 100,000 population (De Diego 1999; Peitersen 2002). There are peaks of incidence in the 30 to 50 and 60 to 70 year old age groups (Gilden 2004; Gonçalvez 1997). Bell’s palsy has a fair prognosis without treatment (Holland 2004). According to Peitersen (Peitersen 2002), complete recovery was observed in 71% of all patients. Ninety-four per cent of patients with incomplete and 61% with complete paralysis made a complete recovery, but it is unknown if intervention with physical therapies improves outcome. About 23% of people with Bell’s palsy are left with either moderate to severe symptoms, such as hemifacial spasm, partial motor recovery, crocodile tears (tears upon salivation), contracture or synkinesis (involuntary twitching of the face or blinking). Recurrence occurs in about 8.3% (Valença 2001). The prognosis depends to a great extent on the time at which recovery begins. Early commencement of recovery is associated with a good prognosis and late recovery a bad prognosis. If recovery begins within one week, 88% obtain full recovery, within one to two weeks 83% and within two to three weeks 61%. Normal taste, stapedius reflex and tearing are also associated with a significantly better prognosis than if these functions are impaired. Recovery is less likely to be satisfactory with complete rather than incomplete paralysis, with pain behind the ear and in older people (Danielidis 1999). Other poor prognostic factors include hypertension and diabetes mellitus (Gilden 2004; Peitersen 2002). Evaluation of therapies is made difficult by the high rates of spontaneous and complete recovery (Peitersen 2002) which need to be controlled for in studies.

Description of the intervention

Treatments for Bell’s palsy are aimed at returning facial power to normal for cosmesis, competence of lip seal and protection of the cornea from drying and abrasion due to impaired lid closure and tear production. For the latter, lubricating drops are recommended during the day and a simple eye ointment at night (Adour 1982; Holland 2004; Valença 2001). Recent Cochrane systematic intervention reviews did not show significant benefit from aciclovir or similar agents (Lockhart 2010a), or acupuncture (Chen 2010). There is significant benefit from treating Bell’s palsy with corticosteroids (Salinas 2010). Some authors suggest that facial nerve decompression might be considered, although there are no data from clinical trials to support its use (Adour 2002; Gilden 2004; Grogan 2001) and a Cochrane systematic review about surgical interventions confirmed this finding (McAllister 2011). A systematic review about the efficacy of hyperbaric oxygen therapy (Holland 2008) and a overview of reviews about the Bell’s palsy treatment (Lockhart 2010b) are in development.

Peitersen 2002 highlighted the lack of evidence for current physical treatments, including thermal methods (conductive, radiative and convective heat transfer in order to achieve vasodilatation, or ice over the mastoid region with the aim of relieving oedema), electrotherapy (which uses an electrical current to cause a single muscle or group of muscles to contract), massage and facial exercise.

How the intervention might work

Thermal methods, electrotherapy, massage, facial exercises and biofeedback are forms of physical therapy that have been used for Bell’s palsy (Mosforth 1958; Peitersen 2002). Exercise therapy has been used more than other interventions (Beurskens 2003; Brach 1999; Ross 1991; Segal 1995a). Physical therapy, in the context of Bell’s palsy, mainly uses methods which increase muscle and nerve function either through exercise or electrotherapy. Thermal methods and massage work by decreasing swelling and increasing blood flow to affected tissues, increasing the amount of oxygen available to damaged, hypoxic tissues with the aim of promoting recovery (Lockhart 2010b).

Why it is important to do this review

In the last few years other systematic reviews of physical therapies have been undertaken. Beurskens 2004a searched electronic databases and included two studies (Ross 1991; Segal 1995a) which did not show a significant effect of intervention. Quinn 2003 searched for electrotherapy interventions in electronic databases, reference lists in the studies and contacted experts from 1975 to 2002. They provide a very good discussion about the current knowledge of the anatomy, physiology and pathomechanics during the course of the palsy to support the use of physiotherapy resources; however, the benefit of electrotherapy was unclear due to inadequate research methods, sample sizes and dose information. This is an update to our original Cochrane review (Teixeira 2008).
OBJECTIVES

To evaluate the efficacy of physical therapies for Bell's palsy (idiopathic facial palsy).

METHODS

Criteria for considering studies for this review

Types of studies

We included all randomised or quasi-randomised (alternate or other systematic allocation) controlled trials involving any physical therapy compared with no treatment, placebo treatment, drug treatment, acupuncture or other physical therapy interventions.

Types of participants

We included participants with a diagnosis of Bell's palsy, defined as idiopathic lower motor neuron facial palsy of sudden onset. We included participants of any age, and all degrees of severity. We did not include people with facial palsy due to Ramsay-Hunt syndrome or other recognised causes.

Types of interventions

We included trials of any form of physical therapy treatment compared with either no treatment, drugs or an alternative form of non-drug treatment. We considered physical therapy to be the use of any physical agents, such as heat, light, cold, sound, water, electricity, manual therapy and other gadgets working on physical principles in treatment. Types of physical therapy interventions for facial palsy included facial exercises, such as strengthening and stretching; endurance; therapeutic and facial mimic exercises (“mime therapy”) (Beurskens 2003); electrotherapy; biofeedback; transcutaneous electrical nerve stimulation (TENS) or electrical neural muscular stimulation (ENMS); thermal methods; and massage, alone or in combination with any other therapy.

Types of outcome measures

Primary outcomes

The primary outcome measure was incomplete recovery preferably six months after randomisation. We defined incomplete recovery in two ways. We considered participants who had House-Brackmann Facial Grading System (House 1985) grade III (moderate dysfunction) or worse at entry to have incomplete recovery if they still had House-Brackmann Grade III or worse after treatment. For participants who had House-Brackmann grade II at entry, we defined incomplete recovery as a persistent House-Brackmann grade II or worse after six months. If the House-Brackmann Facial Grading System was not available, we used another similar facial nerve disability score instead (House 1985; VanSwearingen 1996). Within the search, the authors found very few trials of six months duration or more and therefore chose to include shorter trials in the analysis, while recognising the increased risk of bias.

Secondary outcomes

1. The presence of motor synkinesis, contracture, hyperkinesia, facial spasm or crocodile tears preferably six months after onset.
2. Incomplete recovery after one year.
3. Adverse effects attributable to the intervention such as pain or worsening of condition.

In a future update we will consider a change in the protocol to include 'time to recovery' as a secondary outcome measure.

Search methods for identification of studies

We searched the Cochrane Library - Cochrane Database of Systematic Reviews (Cochrane Reviews) and the Cochrane Central Register of Controlled Trials (The Cochrane Library, Issue 1, 2011), and PEDro (from 1929 to February 2011) using the terms 'Bell's palsy' or 'idiopathic facial paralysis' or 'facial palsy'. We also searched MEDLINE (January 1966 to February 2011), EMBASE (January 1947 to February 2011), LILACS (January 1982 to February 2011) and CINAHL (January 1982 to February 2011) according to a specific search strategy (see Appendices). We also searched clinical trial databases in February 2011 (see searching other resources above).

Electronic searches

We constructed specific search strategies for the different databases. For a complete description, see Appendix 1 (MEDLINE), Appendix 2 (EMBASE), Appendix 3 (CINAHL), Appendix 4 (LILACS), Appendix 5 (PEDro).

Searching other resources

1. We checked references of all identified trials.
2. We contacted physical therapy companies in order to obtain data on unpublished trials.
3. We contacted first authors of all included trials for further information or information regarding unpublished trials.
4. We consulted databases of ongoing trials. We searched the World Health Organization (WHO) International Clinical Trials Registry Platform (http://apps.who.int/trialsearch), Current Controlled Trials (http://www.controlled-trials.com), the National Institute for Health Research Register (NRR) Archive (http://www.nihr.ac.uk/Pages/NRR_ARCHIVE/search.aspx), the US

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Selection of studies
Two authors scrutinised titles and abstracts that we identified from the search results. We obtained the full texts of all potentially relevant studies for independent assessment and two authors decided which trials fitted the inclusion criteria. We resolved disagreements about study inclusion by consensus.

Data extraction and management
Two authors independently extracted data on participants, methods, interventions, outcomes and results using a specially constructed data extraction form. We obtained missing data from the trial authors whenever possible. We resolved disagreements about data extraction by consensus.

Assessment of risk of bias in included studies
Two authors assessed quality independently. The authors resolved disagreement by discussion. In the updated version we incorporated the new 'Risk of bias' assessments and the 'Risk of bias' tables, described in the Cochrane Handbook for Systematic Reviews of Interventions (Higgins 2008). We considered the following criteria: adequate sequence generation, allocation concealment, blinding of participants and personnel and blinding of outcome assessment, incomplete outcome data, selective outcome reporting and other bias.

We assigned each criterion a judgement of 'Low risk', 'High risk' or 'Unclear risk'. 'Unclear risk' indicated that there was insufficient information to permit a clear judgement. We used the GRADE approach (GRADE 2004) to assess quality of the evidence across outcomes and presented the results in 'Summary of findings' tables. Where no data were available for a comparison we did not include the 'Summary of findings' table in the review. The GRADE approach specifies four grades of quality of evidence: high, moderate, low and very low. We downgraded the included primary studies from the highest level for the following reasons: limitations in design or implementation (risk of bias), unexplained heterogeneity or inconsistency, indirectness of evidence, imprecision and publication bias. We downgraded a study's quality assessment by one point if there were serious problems with each risk of bias criterion, or two points if there were very serious problems. We would have upgraded the quality of evidence by one point if the study presented a large effect (for example risk ratio (RR) >2.0 or <0.5) and two points if there was a very large effect of the intervention (for example RR either >5.0 or <0.2) in the absence of any major threats to validity. For the 'Summary of findings table', we chose the same outcomes as those in the review. We will consider inclusion of a time to recovery outcome for the next update.

Measures of treatment effect
We entered and analysed data using the Cochrane statistical software Review Manager 5.1 (RevMan) We constructed the 'Summary of findings' tables using the software GRADEprofiler 3.2.2 (GRADEPro 2008). For dichotomous data, we calculated RRs with 95% confidence intervals (CI) based on the fixed-effect model or on the random-effects model if statistically significant (P < 0.1) heterogeneity was present. We calculated the number needed to treat for an additional beneficial outcome (NNTB) and number needed to treat for an additional harmful outcome (NNTH) if possible. For continuous outcomes, we estimated mean differences (MD) between groups with 95% CI.

Assessment of heterogeneity
We assessed heterogeneity by the Chi² test and we assumed it to be present when the significance level was lower than 0.10 (P < 0.10). When significant heterogeneity was present, we attempted to explain the differences based on clinical characteristics of the included studies.

Data synthesis
If there had been sufficient trials of the same intervention, we would have constructed a funnel plot (of trial effect versus trial size) to assess potential publication bias.

Subgroup analysis and investigation of heterogeneity
We undertook separate subgroup analyses of participants with more severe disability (House-Brackmann Grading System grade III or worse) and less severe disability (House-Brackmann grade II or better). We also considered patients as acute cases if they were treated before two weeks from onset. We defined chronic cases as those who were being treated more than three months after onset of the condition.

Sensitivity analysis
We performed a sensitivity analysis omitting trials which included participants with different clinical characteristics or trials with lower methodological quality.
Description of studies
See: Characteristics of included studies; Characteristics of excluded studies; Characteristics of studies awaiting classification.

Results of the search
The database searches and handsearches identified a total of 1304 potentially relevant articles (CENTRAL 88 records, Cochrane Neuromuscular Disease Group Specialized Register 35, MEDLINE 414, EMBASE 199, CINAHL 336, LILACS 146, PEDro 23 and handsearching 3). Clinical trials register databases searches identified 60 studies (The WHO International Clinical Trials Registry Platform 6, Current Controlled Trials 2, US National Institutes of Health 14, National Institute for Health Research Register (NRR) Archive 20, Australian New Zealand Clinical Trial Registry 18) but none of these studies was of physical therapy for Bell's palsy.

After scrutiny of titles, abstracts and removal of duplicates, we identified 65 potentially relevant articles (see PRISMA flow diagram Figure 1). Of these trials, we excluded 43 and 10 are awaiting assessment. Seven studies were found in the Chinese Journal of Physical Therapy in the last search in CENTRAL; together with another two Chinese language studies; these have been classified as awaiting classification while in translation. Because the full text of one study (Wang 2004) was not available in national and international medical libraries, we tried to contact the authors by e-mail, but since we were unable to obtain the full text article, this study also awaits classification. We assessed all the studies awaiting assessment in the first version of the review in the update.
Figure 1. Study flow diagram.

1301 records identified through database searching

3 additional records identified through handsearching

1304 records before duplicates removed

65 records screened

43 full-text articles excluded, with reasons

22 full-text articles assessed for eligibility

10 full-text articles awaiting classification

12 studies included in qualitative synthesis

12 studies included in quantitative synthesis (meta-analysis)
Included studies

We identified twelve published trials that fulfilled the inclusion criteria (Alakram 2010; Barbara 2010; Beurskens 2003; Flores 1998; Manikandan 2007; Mosforth 1958; Pan 2004; Qu 2005; Wong 2004; Wen 2004; Yang 2001; Zhang 2005); see Characteristics of included studies. A total of 872 participants were randomised in parallel design studies. Four trials studied manual therapy and electrostimulation (Alakram 2010; Flores 1998; Manikandan 2007; Mosforth 1958) (n = 313), three involved exercise (Barbara 2010; Beurskens 2003; Wen 2004) (n = 199); and the other five studies either added exercises to acupuncture treatment (Qu 2005; Wong 2004; Zhang 2005) or compared physical therapy with acupuncture (Pan 2004; Yang 2001), with 360 participants in total.

The first study evaluating physical therapy for facial palsy was one of the first physical therapy randomised controlled trials (RCTs) described for any condition. Mosforth 1958 studied 86 people with acute Bell’s palsy of less than 14 days duration. Three participants were lost to follow-up. Auto-massage of the face and infrared and interrupted galvanic stimulation (pulse 100 msec) in 44 participants, was compared to massage alone in 42 participants. Treatment was continued until recovery, or until the condition seemed stable (two to six months). The outcomes were electrical examination and grade of paralysis estimated visually as a percentage of the function of the normal side, the time to begin improvement and the time to complete recovery.

Alakram 2010 studied 22 participants with peripheral facial nerve paresis less than 30 days post onset of Bell’s palsy (11 in the control group and 11 in the electrical stimulation group). Six participants were lost to follow-up (three dropped out in each group). The author compared two groups: both submitted to hot packs, facial massage and facial exercises, but one of the groups also received electrical stimulation for three months after onset of Bell’s palsy or until the participant recovered a minimum of 80% on the House-Brackmann Facial Nerve Grading System (House 1985). The authors kindly sent us the mean scale results with standard deviations, and the number of participants with a House-Brackmann grade above two after the treatment.

Manikandan 2007 assessed the results of 59 participants with acute facial palsy of a mean two weeks duration. There were 29 participants in a specific exercises group and 30 in an electrical stimulation group. One participant from the exercise group and two from the electrical stimulation group dropped out before the completion of the study; the reasons were stated. Although the objective of the study was to test a specific exercise strategy and both groups undertook different exercises for three months, the regimen adopted was similar (home based exercises) and electrotherapy was the main difference between the groups. Thirty people underwent a fixed protocol with electrostimulation (galvanic and faradic currents) for the two first weeks, with massage and gross facial exercises. The other 29 people learnt an individualised exercise program focusing on the quality of the exercises and not on the quantity. The movements were to be symmetrical without voluntary movement of the uninvolved side. All individuals were assessed by the Facial Grading Scale (Roos 1996) at the outset and after three months.

In Flores 1998, there were 149 participants with acute Bell’s palsy of one to three days onset. Twenty-nine people (19.46%) dropped out without a description of the reason for drop out. Seventy-seven people were treated with infrared treatment and electrostimulation and these were compared to 72 people who were treated with prednisone for up to 14 days. Outcomes presented were different to those specified by our protocol, including time to recover, clinical history and a functional scale (May Scale). The authors analysed different groups according to whether the lesion was thought to be proximal or distal to the origin of the chorda tympani nerve. We analysed this study with caution because corticosteroids have now been shown to be efficacious in Bell’s palsy (Sullivan 2007; Salinas 2010), and comparing physical therapies with this active treatment could be considered inappropriate. Nevertheless, we included this study and discussed some of its outcomes.

Beurskens 2003 studied 50 people with chronic (defined in this study as of more than nine months duration) facial paralysis during three months of therapy but only 34 people had idiopathic facial palsy (16 in the exercises group (mime therapy, mainly of facial exercises) and 18 in a waiting list control group). Four participants were lost to follow-up (two dropped out in each group). Outcomes were facial stiffness, lip mobility, the Facial Disability Index (VanSwearingen 1996), the Sunnybrook Facial Grading Scale (Roos 1996), and the House-Brackmann Facial Grading System (House 1985). The author kindly sent us all the outcomes for the idiopathic facial palsy participants.

Barbara 2010 studied 20 people with acute facial palsy who presented within three days of onset (nine received exercises and eleven were controls). No drop outs were mentioned. Participants in the treatment group undertook exercises based on the Kabat concept. Kabat is a ‘proprioceptive neuromuscular facilitation procedure’ based on a theory that harmony, coordination and optimal strength of body movements mainly depend upon the fact that the movements are performed following diagonal lines with respect to the sagittal axis of the body, thus implying a ‘rotational’ effect. The procedure consists of facilitating the voluntary response of an impaired muscle which undergoes resistance (Barbara 2010). The participants were followed for only 15 days, and compared according to change in the House-Brackmann grade at 4, 7 and 14 days after the onset of the treatment.

Wen 2004 studied 145 people with acute idiopathic facial palsy for 12 weeks. Eighty-five participants were submitted to a combina-
tion of “conventional therapy” plus facial rehabilitation exercises (movements using facial muscles) while 60 participants received only “conventional therapy”, which was not detailed in the translation process. “Conventional therapy” was an unspecified pharmacological treatment. No drop outs were mentioned. This Chinese study presented outcomes not prelisted in the protocol but which were listed in the results and discussion: (1) time when the patient started to recover and (2) time that the recovery was complete. The study analysed groups of patients with ‘mild’, ‘moderate’ and ‘severe’ dysfunction.

Wong 2004 treated 74 people with acute Bell’s palsy with two different strategies for one month. Both groups received a combined treatment of medicine (cortisone, and mecobalamin and vitamin B12), physical treatment (not described in the translation), massage, and acupuncture. For the exercise therapy group (n = 43), functional exercises were added. The outcome was facial muscle function with the Portmann Score after one month.

Zhang 2005 compared the treatment results of 61 people divided into two groups. No drop outs were mentioned. Both groups received acupuncture. Facial exercises were added to acupuncture treatment in the experimental group (n = 31). The effectiveness was judged according to facial muscle strength using the following categories: full recovery, highly effective, effective, and not effective, after 14 days of treatment. No follow-up was done.

Qu 2005 studied 90 people in three groups: in the experimental group (n = 30), participants received acupuncture combined with facial exercises; in control group I (n = 30) the intervention was exercise alone; and in control group II (n = 30) acupuncture alone was used. No drop outs were mentioned in either group. The effect was measured after two months using the House-Brackmann grading system.

Pan 2004 studied 75 participants with Bell’s palsy and treated all individuals with acupuncture. The experimental group was treated with shortwave diathermy (n = 38). Details about the equipment, parameters and dose were not provided in the translation process. The authors measured the results according to clinical characteristics (full recovery, effective, and no effect) after one month, without follow-up.

Similarly, Yang 2001 used what was called in translation a “commercial rapid therapeutic device” to treat half of their 60 participants, and compared this with acupuncture. Both groups also received “standard treatment”, which was not further defined by the authors. The assessment was done after 21 days, and the participants were classified as cured, improved or no effect.

Excluded studies
Forty-three studies were excluded for the following reasons.
1. Series of cases or case reports (Aleev 1973; Brach 1999; Brown 1978; Coulson 2006b; Danile 1982; Gómez-Benítez 1995; Lobzin 1989; Manca 1997; Romero 1982).
2. Retrospective studies (Bernardes 2004; Cronin 2003; Dalla-Toffola 2005).
3. Non-systematic reviews (Beurskens 2004a; Goulart 2002).
4. There were no physical therapy interventions (Adour 1971; Casler 1990; Cui 2009; Guo 2006; Klingler 1982; Li 2005; Taverner 1966; Zhao 2005; Yang 2009a; Yang 2009b).
6. Composed of few participants with idiopathic facial palsy (Balliet 1982; Cai 2010; Coulson 2006a; Fombeur 1988; Nakamura 2003; Ross 1991; Segal 1995b).
7. It was not possible to access the study (Wang 2004).

Risk of bias in included studies
The ‘Risk of bias’ assessments for each trial can be found in Figure 2.
Figure 2. Methodological quality summary: review authors’ judgements about each methodological quality item for each included study.

<table>
<thead>
<tr>
<th>Study</th>
<th>Random sequence generation (selection bias)</th>
<th>Allocation concealment (selection bias)</th>
<th>Incomplete outcome data (attrition bias)</th>
<th>Selective reporting (reporting bias)</th>
<th>Other bias</th>
<th>Binding of participants and personnel (performance bias)</th>
<th>Binding of outcome assessment (detection bias)</th>
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<td>Akiyan 2010</td>
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Allocation

Only three studies had adequate allocation concealment. Mosforth 1958 randomised the groups using a prepared list, Manikandan 2007 used a method of six blocks with 10 in each block and Wong 2004 randomised their samples by computer. Three trials were only quasi-randomised, using inadequate allocation methods. Beurskens 2003 used a coin flip to assign the first participant. Participants in the other two trials (Qu 2005 and Alakram 2010) were allocated by alternation on arrival. Six studies (Barbara 2010; Flores 1998; Pan 2004; Wen 2004; Yang 2001; Yang 2001) classified their trial as randomised, but they did not describe the randomisation method.

Blinding

Blinding was a major methodological problem in the studies. Owing to the nature of the interventions evaluated in this review, effective blinding of participants is problematic. Placebo electrostimulation could have been used but blinding to exercise interventions is impractical or impossible. Blinding of outcome assessors can be achieved, but only Beurskens 2003 blinded the assessor. Barbara 2010 appeared to have blinded the assessor but it was not possible to confirm this.

Incomplete outcome data

Flores 1998 stated that 29 people (19.26%) dropped out without describing the participant allocation. The reasons given were that the participants requested another medication or they did not adhere to the treatment. Alakram 2010 cited the highest drop out: three people in each group of 11, corresponding to 27%. No reasons were given but the number was equivalent in the control and experimental group. We considered these people, three in each group, as having incomplete recovery in an intention-to-treat analysis. These drop outs did not influence the results. In Manikandan 2007 one patient from the control group (3.4%) and two from the experimental group (6.7%) dropped out. Mosforth 1958 had 2.3% drop outs in the experimental group versus 4.8% in the control group. Both Manikandan 2007 and Mosforth 1958 stated reasons for the drop outs. The other trials did not describe drop outs. Wen 2004 reported 12 cases of complications in the control group and four cases in the training group among the participants with severe disease. There was one case of facial muscle synkineses in the mild group and one in the moderate group, but there were no drop outs.

Selective reporting

Studies with problems in selective reporting were not identified. Because of this, all included studies were classified as low risk for this criterion.

Other potential sources of bias

Differences in baseline between groups

Barbara 2010, Flores 1998, Manikandan 2007, Mosforth 1958, Qu 2005; Wong 2004; Yang 2001 and Zhang 2005 reported number, sex, and age and some included palsy duration, with no significant differences between groups. Alakram 2010 and Beurskens 2003 reported no significant differences between groups at baseline for demographic data and severity and duration of facial palsy. It was unclear if there were baseline differences between groups in Pan 2004. In Wen 2004 different degrees of disease severity were recorded for individual patients before starting the trial.

Follow-up

Beurskens 2003 and Mosforth 1958 assessed outcomes at one year follow-up. Beurskens analysed all the 50 participants (of whom 34 had Bell's palsy) at this time. Mosforth did not analyse all the participants after one year because participants were discharged when recovered. The data of interest (incomplete recovery) were reported by the study, and drop outs were considered to have incomplete recovery in our intention-to-treat analysis. Flores 1998 did not describe follow-up and 29 people (19.26%) dropped out without description of their allocation groups. The reasons described were that the participants requested another medication or they had not adhered to the treatment. Despite our primary outcome specifying follow-up at six months, several studies did not measure their results at this time. Alakram 2010, Manikandan 2007 and Wen 2004, for example, followed subjects for 12 weeks. The others proposed very short treatment plans without follow-up. Qu 2005 treated their patients for 58 days. Wong 2004 and Pan 2004 followed their patients for 30 days, Yang 2001 for 21 days, Barbara 2010 and Zhang 2005 for 15 days. The short follow-up in nine studies was the reason for the high number of studies with high risk of bias.

Effects of interventions

The results have been divided by intervention and described for each outcome measure in the protocol. Some other outcomes that were not suggested previously have also been added to the results. Studies with a shorter follow-up time than that specified for the primary outcome measure in the protocol (six months) were included in the review analysis.
Electrical stimulation

Primary outcome measure

Only Mosforth 1958 studied the efficacy of electrotherapy after six months, in a total of 86 participants (n = 44 electrical stimulation and n = 42 control). Forest plots were constructed using an intention-to-treat analysis and less than 75% recovery was considered a bad outcome. The relative rate of improvement was not significantly different, RR 1.30, 95% CI 0.68 to 2.50 (see Analysis 1.1).

Some authors measured their results before six months had elapsed. Manikandan 2007 described results after three months on a continuous scale. The Facial Grade Score measured rest score, synkinesis scores and movement score of the 28 participants in each group. The first two scores did not show statistical significance. The movement score improved significantly in the group without electrical stimulation, MD 68.00 points on a scale of 0 to 100, 95% CI 59.93 to 76.07 (see Analysis 1.2). Consequently, the total score improved, MD 12.00 points, 95% CI 1.26 to 22.74 (see Analysis 1.2).

Alakram 2010 compared two groups of 11 participants, one treated with hot packs, massage and facial exercises, once a week, and the other receiving the same regime plus electrical stimulation. After three months, three participants dropped out in each group, and all recovered in both groups (see Analysis 1.3). The mean improvement on the House-Brackmann rating scale was similar in both groups (Analysis 1.4) with the addition of electrical stimulation not helping to improve outcomes (MD -0.50 points on a scale of 1 to 6 grades, 95% CI -1.63 to 0.63), but the sample was too small to reach sufficient statistical power.

Flores 1998 demonstrated no significant benefit from electrical stimulation when compared to prednisolone. Ten (12.98%) of the 77 participants that were treated with electrical stimulation, and 11 (15.27%) of the 72 treated with prednisone had incomplete recovery after six months, RR 0.85, 95% CI 0.38 to 1.88 (see Analysis 2.1).

Secondary outcome measures

(1) Presence of motor synkinesis, contracture, hyperkinesia, facial spasm or crocodile tears six months after onset

Mosforth 1958 showed no significant differences between the group receiving electrical stimulation and the control group in respect of facial muscle contracture at six months follow-up. Eleven participants (25%) in the treated group and eight (20%) in the control group had contracture, RR 1.31, 95% CI 0.59 to 2.94 (see Analysis 1.5).

Manikandan 2007 reported that two participants (seven per cent of the group participants) in the group receiving exercise and electrical stimulation presented with mild synkinesis after three months, and none in the group with exercise alone. This difference was nonsignificant, RR 5.00, 95% CI 0.25 to 99.67 (Analysis 1.5). Inferring from this limited data that no additional benefit was likely between three and six months, we pooled the data from Mosforth and Manikandan and found no statistically significant difference in synkinesis between electrical stimulation and control groups, although there is a tendency for fewer complications if electrical stimulation is not used (RR 1.52, 95% CI 0.71 to 3.30). Alakram 2010 and Flores 1998 did not report on this outcome.

(2) Incomplete recovery after one year

Mosforth 1958 reported no statistically significant differences in this assessment, RR 1.15, 95% CI 0.55 to 2.36 (see Analysis 1.1). The other studies did not report on recovery at this time point.

(3) Adverse effects attributable to the intervention such as pain or worsening of condition

None of the studies provided information on adverse events.

Subgroup analyses

Flores 1998 undertook a subgroup analysis by severity of the axonal damage. In the group with mild disease or with lesions distal to the chorda tympani (n = 102) all individuals in both groups improved at six months. In the most severe group or in those with lesions proximal to the chorda tympani (n = 47) there was no significant difference in recovery, RR = 0.62, 95% CI 0.34 to 1.15 (see Analysis 2.2). Analysing mean time to recovery in days of the 149 participants in the study, we found significantly faster recovery with electrical stimulation (MD -7.42 days, 95% CI -13.99 to -2.77 Analysis 2.3). The effect estimate was only just statistically significant for infrachordal lesions, but larger for suprachordal lesions (MD -33.94 days, 95% CI -63.40 to -4.48). These data suggest a possible therapeutic benefit especially in suprachordal lesions, but these results are generated from data from a trial with a very high risk of bias. Manikandan 2007, also a trial with a high risk of bias, had opposite results, with more participants who received electrical stimulation not improving after three months (Analysis 1.2).

Facial exercises

Primary outcome measure

Barbara 2010 included 20 participants with acute facial palsy, and compared facial exercises based on the Kabat concept (n = 9) with controls (n = 11). The results were assessed after 4, 7 and 14 days according to House-Brackmann grade variation. None of the measures achieved statistical significance but the number of
patients with recovery was faster in the participants treated with exercises during the two weeks of treatment (see Analysis 3.3).

Wen 2004 compared facial exercises (n = 85) with “conventional therapy” (n = 60) in acute cases. There was no significant difference in improvement between the groups. Ninety-three per cent of participants in the exercise group and 88% of participants in the control group recovered after three months, RR 0.61 95% CI 0.21 to 1.71 (see Analysis 4.1).

Beurskens 2003 did not report on this outcome.

**Secondary outcome measures**

(1) Presence of motor synkinesis, contracture, hyperkinesia, facial spasm or crocodile tears six months after onset

After 12 weeks, Wen 2004 reported significantly fewer participants with facial motor synkinesis after exercise, with 12 cases in the control group (20%) and four cases in the exercise group (4.7%), RR 0.24, 95% CI 0.08 to 0.69 (see Analysis 4.4). There was no information from the other exercise studies on this outcome.

(2) Incomplete recovery after one year

Beurskens 2003 was the only study that treated participants (n = 34) with chronic Bell's palsy. In all participants the palsy had lasted more than nine months. The mean baseline House-Brackmann grade was four and after one year it was three for all the participants in the treatment group. Although all participants apparently improved, in the protocol for this review we made the assumption that a grade over three could mean improvement but does not necessarily mean recovery. This was based on a previous study (Peitersen 2002) and the clinical meaning of House-Brackmann grades (House 1985). These scales all showed improvements in favour of the exercise group: the Facial Grading Scale improved by a MD of 20.40 points (scale 0 to 100), 95% CI 8.74 to 32.04; the Facial Disability Index Physical MD 10.30 points (scale 0 to 100, 95% CI -1.37 to 21.97 (not significant), and the Facial Disability Index Social MD 14.50 points, 95% CI 4.85 to 24.15 (see Analysis 3.1, Analysis 3.2). The samples were composed of 16 and 18 individuals with Bell's palsy in the exercise and control groups respectively. This small sample is a significant limitation. More observations on this study are made in the Discussion. None of the other studies reported on outcomes after one year.

(3) Adverse effects attributable to the intervention such as pain or worsening of condition

None of the studies provided information on adverse events.

**Subgroup analyses**

Wen 2004 presented data on participants with mild and more severe disease after 12 weeks treatment. There was no difference in the proportion of participants that improved in the exercise group and conventional therapy group in the individuals with mild paralysis (Analysis 4.2). However, when we analysed the subgroup with moderate severity, we observed that the exercise group began (Analysis 4.2) and finished (Analysis 4.3) improving sooner.

**Acupuncture and physical therapy**

**Primary outcome measure**

Follow-up periods of the studies in this category ranged from 14 to 60 days (Pan 2004; Qu 2005; Yang 2001; Wong 2004; Zhang 2005). There were no studies of sufficient duration to report on this outcome.

**Secondary outcome measures**

(1) Presence of motor synkinesis, contracture, hyperkinesia, facial spasm or crocodile tears six months after onset

There were no complications cited by the study authors. The treatment duration was very short and does not permit satisfactory assessment of these complications.

(2) Incomplete recovery after one year

There were no studies with one year follow-up.

(3) Adverse effects attributable to the intervention such as pain or worsening of condition

None of the studies provided information on adverse events.

**Subgroup analyses**

**Exercise plus acupuncture versus acupuncture alone**

Zhang 2005 treated 30 individuals with acupuncture and compared the results of the other 31 treated with acupuncture plus facial exercises after 14 days. In this brief trial, there was no statistically significant improvement, at least in the short term, with the addition of exercises to acupuncture in a treatment program (RR 0.16, 95% CI 0.02 to 1.26, see Analysis 5.1).

Qu 2005, in a similar study design, compared 30 people combining facial exercises and acupuncture with another 30 who received only acupuncture. After 60 days, there was no statistical difference in the number of individuals without recovery (RR 0.67, 95% CI
Overall completeness and applicability of evidence

Almost all the outcomes reported failed to show any statistically significant difference between either electrotherapy or exercises, and conventional or no treatment. Physical therapy in addition to acupuncture shows no additional benefit over any effect of acupuncture alone.

The studies of electrical stimulation, mainly of moderate quality, have shown that electrical currents did not help to improve facial movements and perhaps caused more complications (see Summary of findings Table 1). The studies of Flores 1998 and Alakram 2010 were at very high risk of bias. The improvement demonstrated by the Flores study (Analysis 2.1; Analysis 2.2; Analysis 2.3) is contradicted by the negative result of the Alakram study (Analysis 1.3). Further high quality studies are needed to resolve this inconsistency (see Summary of findings Table 2).

There is moderate quality evidence from a single trial (Beurskens 2003) that facial exercises have some benefit in chronic cases of idiopathic facial palsy. Exercises improved the Sunnybrook Facial Grading System by a mean of 20.4 points (8.76 to 32.04 higher, scale 0 to 100 with 0 being worst, Analysis 3.1). Facial exercises also improved the social subscale of the Physical Disability Index, by a mean of 14.5 points (4.85 to 24.15 higher, range 0 to 100, with 0 being worst, Analysis 3.2). In acute cases, facial exercises significantly shortened the treatment duration by a mean of 2.1 weeks (3.15 to 1.05 weeks, Analysis 4.3) compared to a mean of 9.3 weeks in subgroups of patients with moderate paralysis, but the proportion of patients recovering at three months was unchanged. For both acute and chronic cases there is an urgent need for high quality evidence.

Two low quality studies showed that the combination of acupuncture and facial exercises seemed to be useful and could reduce incomplete recovery from 15% to 5% for up to 60 days, but the quality of the evidence does not permit firm conclusions to be drawn. The combined treatment showed improvement in facial function with the mean of two continuous facial grading systems, but the studies had a high risk of bias.

Two other studies tried to demonstrate the effect of other electrotherapeutic resources combined with acupuncture but they had a high risk of bias and did not show significant effects. More detailed comments about the findings are given below.

Electrical stimulation

Mosforth 1958 concluded that it is not possible to recommend electrostimulation and questioned its cost-effectiveness (n = 86, moderate quality). The results of Manikandan 2007 are in agreement as the group with electrical stimulation had worse quality of movement and functional recovery after three months (n = 56, low quality), as did those in Alakram 2010. Alakram 2010 used a current intensity able to cause a twitch contraction, which is an indication that the nerve had either neuropraxic injury or had

Physical therapy versus acupuncture

Yang 2001 treated two groups with 30 people in each with either acupuncture or another physical therapy (a "commercial rapid therapeutic device") and compared results after 21 days. The results were similar, without statistical significance, because all the 60 participants improved (Analysis 7.1).

DISCUSSION

Summary of main results

Despite the numerous physiotherapy resources used for treating Bell’s palsy in daily practice, this review highlights the lack of high quality evidence to support the use of these strategies. The trials were heterogeneous and assessed different outcomes and for this reason no consistent meta-analysis was produced. Electrotherapy, exercises, biofeedback, manual therapy, shortwave and laser were evaluated in some studies, but only trials involving electrostimulation and exercise had the minimum methodological quality to be considered for this systematic review. Other small studies adding physical therapy (exercises and electrotherapy) to acupuncture therapy gave no high quality evidence of additional benefit.

Electrotherapy plus acupuncture versus acupuncture

Pan 2004 added shortwave diathermy to acupuncture in 38 individuals and compared them with another 37 participants that received only acupuncture. There was no statistically significant difference between groups in the number of participants that had not improved after 30 days (RR 0.49, 95% CI 0.05 to 5.14, see Analysis 6.1).

Physical therapy versus acupuncture

Analysis 5.1). However, when the trial compared the mean House-Brackmann results after treatment, it was possible to see statistical differences in the group where facial exercises were added to acupuncture (MD -5.30 points, 95% CI -6.33 to -4.27, see Analysis 5.3). Wong 2004 compared a combination of medicines, acupuncture and physiotherapy (n = 31) with the same interventions plus functional exercises (n = 43). The single outcome was facial muscle function (Portmann Score, scale 0 to 20) after 30 days. It showed a statistically significant difference in favour of the functional exercise group (MD 8.47 points, 95% CI 7.05 to 9.89; see Analysis 5.2).

Electrical stimulation

Mosforth 1958 concluded that it is not possible to recommend electrostimulation and questioned its cost-effectiveness (n = 86, moderate quality). The results of Manikandan 2007 are in agreement as the group with electrical stimulation had worse quality of movement and functional recovery after three months (n = 56, low quality), as did those in Alakram 2010. Alakram 2010 used a current intensity able to cause a twitch contraction, which is an indication that the nerve had either neuropraxic injury or had

Overall completeness and applicability of evidence

Almost all the outcomes reported failed to show any statistically significant difference between either electrotherapy or exercises, and conventional or no treatment. Physical therapy in addition to acupuncture shows no additional benefit over any effect of acupuncture alone.

The studies of electrical stimulation, mainly of moderate quality, have shown that electrical currents did not help to improve facial movements and perhaps caused more complications (see Summary of findings Table 1). The studies of Flores 1998 and Alakram 2010 were at very high risk of bias. The improvement demonstrated by the Flores study (Analysis 2.1; Analysis 2.2; Analysis 2.3) is contradicted by the negative result of the Alakram study (Analysis 1.3). Further high quality studies are needed to resolve this inconsistency (see Summary of findings Table 2).

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Two low quality studies showed that the combination of acupuncture and facial exercises seemed to be useful and could reduce incomplete recovery from 15% to 5% for up to 60 days, but the quality of the evidence does not permit firm conclusions to be drawn. The combined treatment showed improvement in facial function with the mean of two continuous facial grading systems, but the studies had a high risk of bias.

Two other studies tried to demonstrate the effect of other electrotherapeutic resources combined with acupuncture but they had a high risk of bias and did not show significant effects. More detailed comments about the findings are given below.

Electrical stimulation

Mosforth 1958 concluded that it is not possible to recommend electrostimulation and questioned its cost-effectiveness (n = 86, moderate quality). The results of Manikandan 2007 are in agree-
not fully degenerated. It is important to comment that this author probably selected only mild and moderate cases, because neurtoritis cases could not be stimulated with this kind of current. This study was classified as having a very high risk of bias. 

_Flores 1998 (n = 149, low quality) found no differences in the proportion of participants with recovery after six months but found a shorter time to recovery in the electrostimulation group (MD - 8.38 days, 95% CI -13.99 to -2.77 Analysis 2.3). Moreover, the study had methodological limitations, as it compared physiotherapy with prednisone, an active treatment, and had a drop out rate for participants of almost 20%. Manikandan 2007 in contrast showed no benefit from electrical stimulation (Analysis 1.3; n = 56, low quality study; see Summary of findings Table 1 and Summary of findings Table 2). More complications, such as motor synkinesis, were found in groups treated with electrical stimulation but no statistical differences were found after either three months (RR 5.00, 95% CI 0.25 to 99.67, n = 56, low quality) or six months (RR 1.31, 95% CI 0.59 to 2.94; n = 86, moderate quality) (see Analysis 1.5; and Summary of findings Table 1).

More complications, such as motor synkinesis, were found in groups treated with electrical stimulation but no statistical differences were found after either three months (RR 5.00, 95% CI 0.25 to 99.67, n = 56, low quality) or six months (RR 1.31, 95% CI 0.59 to 2.94; n = 86, moderate quality) (see Analysis 1.5; and Summary of findings Table 1).

Exercise

Neither Wen 2004, who studied acute cases, nor Beurskens 2003, who studied chronic cases, found differences in the proportion of participants recovering after three and six months. Significantly less synkinesis was observed by Wen 2004 in acute cases after three months, but the evidence was limited by the restriction of reported outcomes to continuous data (Analysis 4.2; Analysis 4.3). A shortening of both treatment duration and recovery was seen, mainly for more severe paralysis (one low quality study, n = 47, follow-up of three months, but further studies are needed to confirm or refute these results. Barbara 2010 included only 20 people with acute facial palsy, and compared facial exercises based on the Kabat concept (n = 9) with controls (n = 11). None of the measures achieved statistical significance (Analysis 3.3), perhaps owing to the very short treatment and small sample size. The statistical tendency is to show a significant effect but the study was classified as at high risk of bias. Facial exercises showed good results in chronic cases (evidence from one study, n = 34, follow-up of one year, moderate quality), particularly in functional measures, social activities and participation, across continuous data (Beurskens 2003) (Analysis 3.1; Analysis 3.2). The Beurskens 2003 study was limited by an insufficient duration and small sample size.

Acupuncture and physical therapy

The studies were limited by their very short treatment duration. Almost all the studies that examined physical therapy and acupuncture (except Qu 2005) were of less than a month's duration. The short duration, absence of blinding and problems with allocation concealment were the main reasons for studies being classified as of low quality, with a high risk of bias. The analysis illustrates a possible clinical advantage of a combination of facial exercises with acupuncture for some outcomes. It seems that this combination could diminish the number of participants without recovery, mainly in the first two weeks (RR 0.16, 95% CI 0.02 to 1.26, one study, n = 61, low quality, Analysis 5.1), but this was not found after two months (RR 0.67, 95% CI 0.12 to 3.71, one study, n = 61, low quality). Meta-analysis of these studies shows no statistically significant benefit from the addition of facial exercises (RR 0.33, 95% CI 0.09 to 1.16, two studies, n = 121, low quality, Analysis 5.1). There were some studies with more methodological shortcomings that compared acupuncture with physical therapy and found no differences, but the risk of bias was very high.

Quality of the evidence

Almost all the included studies had significant limitations which should be considered in the design of future research. Blinding is the major methodological problem in the studies. Due to the nature of the intervention evaluated in this review, effective blinding of the participants is problematic. Placebo electrostimulation could have been used but blinding to exercise interventions is impractical or impossible. Blinding of outcome assessors can be achieved but only Beurskens 2003 described the assessor as blinded. Barbara 2010 seemed to have blinded the assessor but it is not possible to be sure.

The second major risk of bias was “other bias”, represented mainly by the short period of follow-up. Only four studies followed up the participants for more than six months. The others treated their patients for a very brief time. Twelve weeks (Alakram 2010; Manikandan 2007; Wen 2004) could be considered a tolerable time for treating slight and moderate cases, but two months (Qu 2005), or less than 30 days (Wong 2004; Pan 2004; Yang 2001; Barbara 2010; Zhang 2005) do not seem to be long enough to observe possible complications or better outcomes. Curiously, the dichotomous results of these short duration trials did not have sufficient statistical power to demonstrate adequate efficacy. Only three studies had an inadequate allocation concealment, but in six studies it was not possible to identify the method used. This criterion raised the risk of bias and limited the findings of this review.

In the electrical stimulation trials, Flores 1998 compared electrostimulation and prednisolone, an active treatment, which could have biased the study results. Manikandan 2007 used different exercise regimens in both groups but the main difference was the use of electrical stimulation in one of the groups. This modified the way data have been analysed and we considered that the study tested electrical stimulation rather than different exercise regimens. Alakram 2010 and Manikandan 2007 followed up their participants for only three months.
In the exercise trials, Beurskens 2003 studied chronic facial palsy and included participants with dysfunctions other than idiopathic facial palsy, which reduced the size of the sample of interest for this review and limited conclusions. Wen 2004 compared combinations of physiotherapy and medicine with functional exercises which complicated interpretation. Barbara 2010 studied a very small sample (20 people) and followed them for only the 15 days of treatment, which is a very short time.

All the studies that measured acupuncture combined or compared with physical therapy resources did not describe the physical therapy adequately. Yang 2001 compared use of a “commercial rapid therapeutic device” with acupuncture, but did not describe what physical therapy resource was used. Pan 2004 used diathermy in one group and acupuncture in the other but there were no details about the method of application of diathermy. Zhang 2005 compared facial exercises and acupuncture with acupuncture alone, but we were not able to obtain details about the exercises used. Qu 2005 compared the outcome of treatment in three groups, one using facial exercises alone, a second using exercises and acupuncture and a third using only acupuncture. We were unable to obtain details about the exercises. Wong 2004 compared combinations of physiotherapy and medicine with functional exercises which complicated interpretation.

In another publication, Beurskens 2004b discussed outcomes after applying exercise to treat facial paresis. He observed a significant recovery in outcomes in participants receiving exercise for palsies lasting more than nine months: asymmetry in the face at rest, asymmetry during voluntary facial movements, synkineses, complaints concerning pain, stiffness, involuntary movements, reports concerning difficulties in eating, drinking, speaking, and patient perception about their quality of life. Although the House-Brackmann grading system was used as an overall measure of facial impairment, the authors stated that it was not sensitive enough to measure improvement during therapy with exercise in chronic cases. The Facial Grading Scale (Roos 1996) and the Facial Disability Index (VanSwearingen 1996) were considered good assessment options.

The main outcomes used in the included studies were continuous scales of motor function. We would have preferred to convert continuous data into dichotomous data. For example, for recent Bell's palsy we expect a minimum of 71% recovery (House-Brackmann grade of I or II) before three months. In chronic stationary cases with House-Brackman grade of III or IV, patients might find lesser degrees of improvement valuable.

In subgroups with severe dysfunction, “complications” or “sequela” were the clinical outcomes considered. Peitersen 2002 reported that out of more than 2500 people with facial paralysis, 29% had persistent weakness, 17% contracture and 16% synkinesis. We could expect a similar number in the control groups of clinical trials. Mosforth 1958 (moderate quality study) found 34% of negative results in the group that used electrical stimulation versus 26% in the control after six months. After one year, the results were 27% and 23%, respectively. Despite this, shorter studies like Manikandan 2007 and Wen 2004 (both low quality studies), found 7% and 11% of recovery in their comparative groups, respectively, after three months. However, they did not design true control groups and participants were treated with co-interventions (specific facial exercises (Manikandan 2007) and “conventional therapy” (Wen 2004)). This shows how studies of low quality could raise the risk of bias. More studies are needed to confirm this.

However, the trials in which improvements were reported as continuous outcomes are less reliable, particularly if they were not blinded. It is not impossible to blind such studies, since the authors can either introduce an observer who has not seen the patient before or take photographs or even videos, as in the Beurskens 2003 study.

Other clinical references used in the studies were the “times to onset of recovery” and “times to complete recovery”. Some differences emerged between the groups treated with physical therapy and other treatment (prednisone or other medication). The time to improvement seemed to be shorter in participants receiving physical therapies, even in slight grades of paralysis as well as moderate ones, but these results are not really reliable.

**Potential biases in the review process**

The conclusions of this systematic review were limited. We found 12 RCTs but these still did not provide definitive evidence of benefit or harm for physical therapy that aimed to treat dysfunctions from Bell's palsy, because the trials were of poor quality and used different interventions with controversial results.

**Agreements and disagreements with other studies or reviews**

Ohtake 2006 searched electronic databases in order to find evidence of clinical trials in English. This evidence was used as a basis for a review of the application of electrical stimulation in clinical practice. They found three controlled clinical trials of good quality (Mosforth 1958; Farragher 1987; Targan 2000). The latter two were not included in our review because they were not randomised clinical trials with comparison groups. Based on these studies, the review authors did not recommend electrical stimulation before palsy had been present for three months and they suggested that a more conservative approach could be more cost-effective and safe. Amid the controversy about electrical stimulation, two systematic reviews have been carried out in recent years that assess the results from electrical stimulation applied to facial paralysis. Searches in electronic databases, conducted by Beurskens 2004a, found only two studies on this theme (Ross 1991; Segal 1995a). Neither study showed a significant effect of the intervention. Quinn 2003 found six studies of electrotherapy (two controlled trials and four case
In the Quinn 2003 review, the authors searched for all electrotherapy studies, and not only for those on electrical stimulation. They found one study of shortwave diathermy, without a control group; five studies of biofeedback (two clinical trials and three case studies); one case study of ultrasound; and two others using laser techniques (one retrospective study and one case study). They suggest that electrotherapy may be beneficial in chronic cases, and biofeedback could help when muscular activity is present. According to the authors, neuropraxia cases could recover quickly with ultrasound and laser techniques. Biofeedback could be used once active movement has been recovered. In more severe cases, like axonotmesis, electrostimulation could be applied for three hours a day, for 10 days. Laser and biofeedback techniques are still proposed by the author as soon as some movement returns. In neurotmesis cases, electrostimulation was recommended by the author to recover muscle tone, improve blood flow and recover the neuronal function.

Caution is needed in interpreting some of the conclusions of the Quinn 2003 review, in that the recommendation for electrical stimulation was not based on reliable high quality evidence. At the time of the publication of the Quinn review, two randomised clinical trials that measured the efficacy of electrical stimulation had been published (Mosforth 1958; Flores 1998) and were not included in their analysis. These clinical trials could have modified their conclusion. One further study was published later (Manikandan 2007), and provided less evidence of the benefit of using electrical stimulation to treat Bell’s palsy patients, if we analyse the number of participants experiencing improvement or number of sequelae such as synkinesia (Analysis 1.5).

Six studies with acceptable methodology were found in the systematic review regarding facial exercise by Touche 2008. Based on his criteria, the conclusion is that five of those studies presented positive results on symmetry improvement, facial mobility and decreasing synkinesia. All five studies were carried out using kinesitherapy methods.

New directions were pointed out in the White 2008 Cochrane systematic review. This review assessed exercises for peripheral neuropathies and found three studies with 82 patients who presented with different kinds of peripheral neuropathy. The study also suggested that progressive resistance exercises are effective in increasing the strength of tested muscle.

The most recent systematic review on this topic was conducted by Cardoso 2008 and updated by Pereira 2011. They found six studies on the treatment of peripheral facial paralysis but permitted other aetiologies in the inclusion criteria. They concluded that facial exercises may improve facial functionality and may be included in treatment regimens to assist with the recovery of facial palsy.

**Implications for practice**

There is no high quality evidence to support significant benefit or harm from any physical therapy for idiopathic facial paralysis. There is low quality evidence that tailored facial exercises can help to improve facial function, mainly for people with moderate paralysis and chronic cases. There is low quality evidence that facial exercise reduces recovery time and sequelae in acute cases. The suggested effects of tailored facial exercises need confirming with good quality RCTs.

**Implications for research**

Trials of electrical stimulation, exercise and other physical therapies for Bell’s palsy need to have adequate sample sizes, double-blind placebo-controlled randomised parallel designs and clinically relevant outcome measurements. Subjective measurements need to be made using internationally validated scales that have been defined by means of a consensus. Future trials should follow specific guidelines concerning the inclusion criteria and control over adverse events and should follow internationally published guidelines for reporting on trials. Reports of such trials should give details of the treatments given including dose and duration.

Outcome measures should be selected which are likely to be responsive for detecting change with physical therapies. Measures should include facial appearance, function (eating and drinking and speaking), facial appearance (including asymmetry and involuntary movements) and quality of life. Recovery at defined times, such as three, six and twelve months of treatment, is easier to measure accurately than the time to recovery. Use of photography or video to blind the outcome assessor is encouraged.

Of concern is that no record of new or ongoing research about the effectiveness of physical therapy for idiopathic facial palsy was found in the worldwide trials databases at the date of the last search.

**Acknowledgements**

The staff of the Brazilian Cochrane Centre, Cochrane Neuro-muscular Disease Group, Dr David Allen for his important contribution reviewing the protocol and a special thanks to Professor Richard Hughes for all the comments during all the editorial process. Rachel Barton for the search strategy and the database searches. To Zhanmat Idrissova, Hiroshi Nukada, Yuqian Ma, and Jolanta Sabbat for the translations. Kate Jewitt, Janice Fernandes, Jane Batchelor, Ruth Brassington, Chris Frost, Claire White and Mike Lunn for all the support, improvements and patience in the update process. Specially thanks to Dr Bernardo Garcia de Oliveira Soares and Vanessa Pedrosa Vieira for the contributions to the first version of the review. To my dears Cinira, Rafaela and Tiago, with love.

**Authors’ Conclusions**

Physical therapy for Bell’s palsy (idiopathic facial paralysis) (Review)

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The Cochrane Neuromuscular Disease Group editorial base is supported by the MRC Centre for Neuromuscular Diseases.

REFERENCES

References to studies included in this review
Alakram 2010 [published and unpublished data]

Barbara 2010 [published data only]

Beurskens 2003 [published and unpublished data]


Flores 1998 [published data only]

Manikandan 2007 [published and unpublished data]

Mosforth 1958 [published data only]

Pan 2004 [published data only]

Qu 2005 [unpublished data only]

Wen 2004 [unpublished data only]

Wong 2004 [published data only]

Yang 2001 [published data only]

Zhang 2005 [published data only]

References to studies excluded from this review
Adour 1971 [published data only]

Alee 1973 [unpublished data only]

Balliet 1982 [published data only]

Bernardes 2004 [published data only]

Beurskens 2004c [published data only]

Brach 1999 [published data only]
Brown 1978 (published data only)

Cai 2010 (published data only)

Casler 1990 (published data only)

Coulson 2006a (published data only)

Coulson 2006b (published data only)

Cronin 2003 (published data only)

Cui 2009 (published data only)

Dalla-Toffola 2005 (published and unpublished data)

Danile 1982 (published data only)

Diao 2002 (published data only)

Dubravica 1996 (published data only)

Fonbeur 1988 (published data only)

Gómez-Benítez 1995 (published data only)

Goulart 2002 (published data only)

Guo 2006 (published data only)

Hou 2008 (published data only)

Klinger 1982 (published data only)

Koyama 2005 (unpublished data)

Krukowska 2004 (published data only)

Li 2005 (published data only)

Lobzin 1989 (unpublished data)
Lu 2006  *{unpublished data only}*  

Manca 1997  *{published data only}*  

Murakami 1993  *{published data only}*  

Nakamura 2003  *{published data only}*  

Ortega-Torres 2009  *{published data only}*  

Penteado 2009  *{published and unpublished data}*  

Romero 1982  *{published data only}*  

Ross 1991  *{published data only}*  

Segal 1995a  *{published data only}*  

Segal 1995b  *{published data only}*  

Shiao 1995  *{published data only}*  

Taverner 1966  *{published data only}*  

Tessitore 2009  *{published data only}*  

Yang 2009a  *{published data only}*  

Yang 2009b  *{published data only}*  

Zhao 2005  *{published data only}*  

References to studies awaiting assessment

Chen 1995  *{published data only}*  

Shen 1998  *{published data only}*  

Tang 2002  *{published data only}*  

Wang 1995a  *{published data only}*  

Wang 1995b  *{published data only}*  

Wang 1999  *{published data only}*  

Wang 2004  *{published data only}*  
Additional references

Adour 1982

Adour 2002

Beurskens 2004a

Beurskens 2004b

Cardoso 2008

Chen 2010

Danielidis 1999

De Diego 1999

Farragher 1987
References

Peitersen 2002

Pereira 2011

Quinn 2003

Roos 1996

Salinas 2010

Sullivan 2007

Targan 2000

Touche 2008

Valença 2001

VanSwearingen 1996

White 2008

References to other published versions of this review

Teixeira 2008

* Indicates the major publication for the study
### Characteristics of included studies  [ordered by study ID]

**Alakram 2010**

| Methods | Analysis: differences between the experimental and control group and between pre- and post-tests  
Treatment duration: 3 months after onset of Bell’s palsy or until the patient recovered a minimum of 80% on the House-Brackmann Facial Nerve Grading System  
Follow-up: no  
Center: University of KwaZulu Natal, South Africa  
Design: randomised clinical trial |
|---|---|
| Participants | N = 22 peripheral facial nerve paresis. 3 dropped out in each group  
Diagnosis: Patients diagnosed with Bell’s palsy by a neurologist or otolaryngologist and referred for physiotherapy  
Exclusions were: pregnant women; pacemaker users or participants with any sensory impairment over the electrode placement area  
Duration of the palsy: less than 30 days post onset of Bell’s palsy  
Gender: both sexes (8 males and 8 females, drop outs not described)  
Race: black = 4 experimental, 7 control; white = 2 experimental, 1 control; Asian = 2 experimental, 0 control  
Age: median 40 years (11 to 68, SD 16.6)  
Setting: physiotherapy department at a community-based hospital complex that consists of three hospitals in South Africa |
| Interventions | 1. Control group (heat, massage, and exercises), N = 11  
2. Electrical stimulation (heat, massage, exercises and electrical stimulation (TENS)), N = 11.  
Exercises: each exercise was thoroughly taught to the patient with instructions to do 10 repetitions of each exercise, using a mirror, 3 x /day  
Hot packs: 70°C thermal pack with towel prior to massage on both sides of the face, for 5 min  
Massage: in supine, massage in both sides of the face and neck and intra-oral, for 10 min  
Electrical stimulation: frequency = 10 Hz, pulse duration 10 microseconds. The intensity used was minimally visible contraction. The muscles orbicularis oculi, orbicularis oris and zygomaticus major were stimulated, 10 min each, totaling 30 min  
All subjects had prednisolone (2 mg per kg daily and weaned off within 2 weeks); those with eye problems were given eye drops and those with pain were given paracetamol |
| Outcomes | House-Brackmann Facial Grading System |
| Notes | Both groups were treated once a week due to the inability of patients to attend the outpatient clinic more frequently |

**Risk of bias**

<table>
<thead>
<tr>
<th>Bias</th>
<th>Authors’ judgement</th>
<th>Support for judgement</th>
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### Alakram 2010

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<th>Random sequence generation (selection bias)</th>
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<th>Alternation</th>
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<td>Allocation concealment (selection bias)</td>
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<td>Allocation by alternation so there was no allocation concealment</td>
</tr>
<tr>
<td>Incomplete outcome data (attrition bias)</td>
<td>High risk</td>
<td>There were 6 drop outs: 3 people in each group of 11, corresponding to 27%. No reasons were given but the number was equivalent in the control and experimental group. There were no major adverse events</td>
</tr>
<tr>
<td>Selective reporting (reporting bias)</td>
<td>Low risk</td>
<td>The published reports include all expected outcomes</td>
</tr>
<tr>
<td>Other bias</td>
<td>High risk</td>
<td>The study length was very short (12 weeks). There was no follow-up</td>
</tr>
<tr>
<td>Blinding of participants and personnel (performance bias)</td>
<td>High risk</td>
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<tr>
<td>Blinding of outcome assessment (detection bias)</td>
<td>High risk</td>
<td>There was no blinding</td>
</tr>
</tbody>
</table>

### Barbara 2010

**Methods**

- Analysis: The difference between electrophysiological and clinical (House-Brackmann grade) data, within each group and between the groups, was evaluated statistically
- Duration: 15 days
- Follow-up: no
- Center: Azienda Ospedaliera Sant’Andrea, Rome, Italy
- Design: randomised clinical trial

**Participants**

- N = 20 participants.
- Diagnosis: people affected by idiopathic facial palsy with House-Brackmann ≥ 3/6, within 3 days after onset. The viral origin was supported by positive serology for antibodies against herpes virus 1, negative otoneurological examination, and normal gadolinium-enhanced MRI
- Duration of the palsy: no more than 3 days (acute cases)
- Gender: both sexes (10 males and 10 females)
- Race: not mentioned
- Age: therapy group mean 35 (25 to 58) years old, and control group 42 (28 to 56) years old
- Setting: unclear
### Interventions

1. Exercises (proprioceptive neuromuscular facilitation procedure - Kabat), 1x /day, for 15 days. N = 9
2. Control group. N = 11

Participants in both the groups received an antiviral (aciclovir 400 mg, 3x /day for 15 days) and steroids (prednisolone 40 mg/day for 10 days, tapered within the next 5 days)

### Outcomes

House-Brackmann Facial Grading System.
Electroneurography

### Notes

**Bias**

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<th>Bias</th>
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<tr>
<td>Allocation concealment (selection bias)</td>
<td>Unclear risk</td>
<td>Randomisation is not clear</td>
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<tr>
<td>Incomplete outcome data (attrition bias)</td>
<td>Low risk</td>
<td>All patients completed the study and there were no losses to follow-up, no treatment withdrawals, no trial group changes and no major adverse events but there was no follow-up</td>
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<tr>
<td>Selective reporting (reporting bias)</td>
<td>Low risk</td>
<td>The published reports include all expected outcomes</td>
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<tr>
<td>Other bias</td>
<td>High risk</td>
<td>The study duration was very short (15 days)</td>
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<tr>
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<td>High risk</td>
<td>Participant blinding not done</td>
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<tr>
<td>Blinding of outcome assessment (detection bias)</td>
<td>Unclear risk</td>
<td>Assessor blinding not clear</td>
</tr>
</tbody>
</table>
### Methods
Analysis: differences (between the experimental and control group and between pre- and post-tests). Data were collected concerning the level of impairment, disability, and handicap of the patient in pre-test and post-test measures in both the treatment and the control groups.

Duration: 3 months of therapy

Follow-up: 3 measurement occasions within 1 year: immediately, 3 and 12 months after therapy

Center: Radboud University Nijmegen Medical Center, Nijmegen, The Netherlands and Vrije Universiteit Medical Center, Amsterdam

Design: randomised clinical trial

### Participants
N = 50 peripheral facial nerve paresis (34 idiopathic facial palsy considered in the analysis)

Diagnosis: people with sequelae of facial paralysis, House-Brackmann IV, for at least 9 months; no nerve or muscle reconstruction; absence of complete, partial, or central facial paralysis; absence of congenital facial paralysis; and sufficient knowledge of the Dutch language

Duration of the palsy: more than 9 months (chronic cases)

Gender: both sexes (21 males and 29 females), including the participants with other causes of facial palsy

Race: not mentioned

Age: median 44 years (20 to 73, SD 14) including the participants with other causes of facial palsy

Setting: physiotherapy outpatient department

### Interventions
1. Exercises (mime therapy) on an individual basis in sessions of 45 minutes, once weekly, over 3 months (10 sessions) and home program of exercises. N = 16
2. Control group (waiting list). N = 18

### Outcomes
Stiffness of the face. Lip mobility (both lip and pout length)
Physical and social index of the Facial Disability Index (*VanSwearingen 1996*)
Sunnybrook Facial Grading System
House-Brackmann Facial Grading System

### Notes
This study description is the pool of three publications by the author about the same population and groups

### Risk of bias

<table>
<thead>
<tr>
<th>Bias</th>
<th>Authors' judgement</th>
<th>Support for judgement</th>
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<td>Inadequate</td>
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<tr>
<td>Allocation concealment (selection bias)</td>
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<td>A coin flip for the first participant and then pairs of patients as they became available</td>
</tr>
<tr>
<td>Incomplete outcome data (attrition bias)</td>
<td>Low risk</td>
<td>All participants completed the study and there were no losses to follow-up, no treatment withdrawals, no trial group changes</td>
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</table>
Beurskens 2003 (Continued)

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<tr>
<th>Bias</th>
<th>Authors’ judgement</th>
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<tbody>
<tr>
<td>Selective reporting (reporting bias)</td>
<td>Low risk</td>
<td>The published reports include all expected outcomes</td>
</tr>
<tr>
<td>Other bias</td>
<td>Low risk</td>
<td>There were no other sources of bias</td>
</tr>
<tr>
<td>Blinding of participants and personnel (performance bias) All outcomes</td>
<td>High risk</td>
<td>Participant blinding not done</td>
</tr>
<tr>
<td>Blinding of outcome assessment (detection bias) All outcomes</td>
<td>Low risk</td>
<td>The outcome assessors were unaware of the allocation</td>
</tr>
</tbody>
</table>

Flores 1998

Methods
Analysis: the participants were divided, for purposes of analysis, into those with and those without electromyographic evidence of denervation
Duration: until functional recovery was achieved according to the May Scale, with evaluations every 14 days
Follow-up: not described.
Center: Medicina Física y Rehabilitacion Department, Hospital General Regional Num 1, Culiacán, Sinaloa, México
Design: randomised clinical trial

Participants
N = 149
Diagnosis: EMG 8 days after onset. Excluded other causes of facial paralysis
Duration of the palsy: acute cases acute of onset within 1 to 3 days
Gender: both sexes (males 61 and females 88)
Race: not mentioned
Age: median 33 (3 to 60) years
Setting: clinic
History/comorbidities: normal glycaemia and arterial pressure

Interventions
1. Prednisone (1 mg/kg /day) up to 14 days. N = 72
2. Infrared treatment for 20 min and faradic stimulation (10 to 15 stimulation/min in motor points not described). N = 77

Outcomes
Clinical history and May Scale (grade I - complete recovery, II - complete recovery with facial asymmetry with movements between 2 to 6 months, and III - incomplete recovery with asymmetry, synkinesis for more than 6 months)

Notes
**Flores 1998**  (Continued)

<table>
<thead>
<tr>
<th>Random sequence generation (selection bias)</th>
<th>Unclear risk</th>
<th>Unclear</th>
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<tbody>
<tr>
<td>Allocation concealment (selection bias)</td>
<td>Unclear risk</td>
<td>Allocation not described</td>
</tr>
<tr>
<td>Incomplete outcome data (attrition bias)</td>
<td>High risk</td>
<td>Drop out: 29 people (19.26%) dropped out and the study does not describe the exact reason for drop out or the groups they were allocated to. Reasons: participants requested another medication or they did not adhere to the treatment</td>
</tr>
<tr>
<td>Selective reporting (reporting bias)</td>
<td>Low risk</td>
<td>The published reports include all expected outcomes</td>
</tr>
<tr>
<td>Other bias</td>
<td>High risk</td>
<td>The intervention group (electrotherapy) was compared with an active group (prednisolone)</td>
</tr>
<tr>
<td>Blinding of participants and personnel</td>
<td>High risk</td>
<td>Participant blinding not done</td>
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<tr>
<td>Blinding of outcome assessment (detection bias)</td>
<td>High risk</td>
<td>Assessor blinding not done</td>
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</tbody>
</table>

**Manikandan 2007**

<table>
<thead>
<tr>
<th>Methods</th>
<th>Analysis: the authors used Wilcoxon signed-rank test and Mann Whitney U-test to compare the Facial Grading Scale scores within each group</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>Duration: 3 months of therapy</td>
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<tr>
<td></td>
<td>Follow-up: 3 months. Until the end of the therapy</td>
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<tr>
<td></td>
<td>Center: Kasturba Hospital, Manipal, Karnataka, India</td>
</tr>
<tr>
<td></td>
<td>Design: randomised clinical trial</td>
</tr>
<tr>
<td></td>
<td>N = 59 participants.</td>
</tr>
<tr>
<td></td>
<td>Diagnosis: unilateral Bell's palsy</td>
</tr>
<tr>
<td></td>
<td>Excluded people with diseases of the central nervous system, sensory loss over the face, recurrence of facial paralysis and who were uncooperative during the study</td>
</tr>
<tr>
<td></td>
<td>Duration of the palsy: a mean duration of 2 weeks</td>
</tr>
<tr>
<td></td>
<td>Gender: both sexes (males 24 and females 37)</td>
</tr>
<tr>
<td></td>
<td>Race: not mentioned</td>
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<tr>
<td></td>
<td>Age: median of 35 years old</td>
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<td></td>
<td>Setting: neurorehabilitation unit</td>
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<td></td>
<td>History/comorbidities: not described</td>
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</table>
### Interventions

1. Exercises (facial neuromuscular re-education) on an individual basis taught to patients, 5 to 10 repetitions, 3 x/day, for 3 months. N = 29
2. Fixed protocol of electrical stimulation (3 x/day, for six days in 2 weeks. 90 contractions with galvanic current in each muscle plus 10 contractions with faradic current in each facial nerve trunk, intensity until minimal visible contraction) plus gross facial expression exercises taught to patients for 3 months. N = 30

Participants in both the groups were instructed to use a hand-held mirror during the exercise. Facial massage was given and strapping was applied to the face to maintain the symmetry.

### Outcomes

Facial Grading Scale (facial symmetry at: rest, movement and synkinesis) before and after 3 months

### Notes

### Risk of bias

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<tr>
<th>Bias</th>
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<tbody>
<tr>
<td>Random sequence generation (selection bias)</td>
<td>Low risk</td>
<td>Adequate</td>
</tr>
<tr>
<td>Allocation concealment (selection bias)</td>
<td>Low risk</td>
<td>Randomisation using 6 blocks with 10 in each block</td>
</tr>
<tr>
<td>Incomplete outcome data (attrition bias) All outcomes</td>
<td>Low risk</td>
<td>Adverse events: 2 participants in group 2 developed mild synkinesis post treatment. Drop outs: one participant from group 1 and two from group 2 dropped out before the completion of the study with reasons stated</td>
</tr>
<tr>
<td>Selective reporting (reporting bias)</td>
<td>Low risk</td>
<td>The published reports include all expected outcomes</td>
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<td>Other bias</td>
<td>High risk</td>
<td>The study time was very short (90 days). There was no follow-up</td>
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<tr>
<td>Blinding of outcome assessment (detection bias) All outcomes</td>
<td>High risk</td>
<td>Assessor blinding not done</td>
</tr>
</tbody>
</table>
### Mosforth 1958

#### Methods

**Analysis:** The participants were divided, for purposes of analysis, into those with and those without electromyographic evidence of denervation.

**Duration:** the treatment was given daily until the active contractions returned and then thrice weekly until recovery was virtually complete or the condition seemed stationary (2 to 6 months).

**Follow-up:** 1 year.

**Center:** Department of Electromyography Leeds General Infirmary.

**Design:** controlled randomised trial.

#### Participants

- **N = 86** people with Bell’s palsy
- **Diagnosis:** clinically excluding other causes. Complete or partial paralysis of one side of the face, sudden onset.
- **Duration of the palsy:** less than 14 days (mean 5.2).
- **Gender:** both sexes males 40 and females 43.
- **Race:** not mentioned.
- **Age:** 37.5 years old (3 to 79 years).
- **Setting:** clinic.
- **History/comorbidities:** the groups were comparable at baseline.

#### Interventions

1. Auto-massage of the face plus infrared for 10 min plus interrupted galvanic stimulation of 11 muscles of the face 3 times for 30 contractions (pulse 100 msec). **N = 44**
2. Massage. **N = 42**

#### Outcomes

**Electrical examination**

Grade of paralysis estimated visually as a percentage of the function of the normal side.

#### Notes

**Risk of bias**

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<tr>
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<td>A prepared list</td>
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<td>One patient from group 1 and two from group 2 dropped out before the completion of the study with reasons</td>
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<td>The published reports include all expected outcomes</td>
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<tr>
<td>Other bias</td>
<td>Low risk</td>
<td>There was no other bias</td>
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</tbody>
</table>

*Physical therapy for Bell's palsy (idiopathic facial paralysis) (Review)*

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<table>
<thead>
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<tbody>
<tr>
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<td>Randomisation is not clear</td>
</tr>
<tr>
<td>Risk of bias</td>
<td>Risk assessment</td>
<td>Comments</td>
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<td>Allocation concealment (selection bias)</td>
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<td>Low risk</td>
<td>The published reports include all expected outcomes</td>
</tr>
<tr>
<td>Other bias</td>
<td>High risk</td>
<td>Data extraction was performed by a translator. It was not possible to contact the authors. The study time was very short (30 days)</td>
</tr>
<tr>
<td>Blinding of participants and personnel (performance bias) All outcomes</td>
<td>High risk</td>
<td>Participant blinding not described</td>
</tr>
<tr>
<td>Blinding of outcome assessment (detection bias) All outcomes</td>
<td>High risk</td>
<td>Assessor blinding not described</td>
</tr>
</tbody>
</table>

**Qu 2005**

**Methods**
- Analysis: according to House-Brackmann criteria, the treatment outcome was categorised as: cure, excellent, improved or ineffective
- Duration: 58 days. The treatment period was 5 courses; 10 days constituted one course.
- Follow-up: until the end of the therapy
- Center: Zigui County Second Hospital, Hubei 443600, China
- Design: randomised clinical trial

**Participants**
- N = 90 people with Bell’s palsy
- Diagnosis: not described. Patients with virus infections, a cold, fatigue before onset, pain in auricularis posterior, facial muscle paralysis, hyperacusia, gustatory anaesthesia of two-thirds of the tongue or secondary onset of herpes zoster were included. Exclusion criteria: trauma, ear disease, and cerebellar disease
- Duration of the palsy: lasting for less than 1 week
- Gender: both sexes. In observation group: (M/F) = 16/14; in control group I: 14/16; in control group II: 15/15
- Race: Chinese
- Age: experimental group: mean age 43.5 years (from 7 years to 70 years); in control group I: mean age 41.6 years (from 9 years to 68 years); in control group II: mean age 42.5 years (from 8 years to 71 years)
- Setting: outpatient hospital
- History/comorbidities: not mentioned
### Interventions

1. Experimental group: facial exercises and acupuncture. $N = 30$
2. Control 1: acupuncture only. $N = 30$
3. Control 2: facial exercises only. $N = 30$

### Outcomes

House-Brackmann Grading was grouped into four kinds (cure, excellent, improved and ineffective) after two months

### Notes

### Risk of bias

<table>
<thead>
<tr>
<th>Bias</th>
<th>Authors' judgement</th>
<th>Support for judgement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Random sequence generation (selection bias)</td>
<td>High risk</td>
<td>Based on the order of arrival</td>
</tr>
<tr>
<td>Allocation concealment (selection bias)</td>
<td>High risk</td>
<td>Not done</td>
</tr>
<tr>
<td>Incomplete outcome data (attrition bias)</td>
<td>Low risk</td>
<td>All patients completed the study and there were no losses to follow-up, no treatment withdrawals, no trial group changes and no major adverse events, but there was no follow-up</td>
</tr>
<tr>
<td>Selective reporting (reporting bias)</td>
<td>Low risk</td>
<td>The published reports include all expected outcomes</td>
</tr>
<tr>
<td>Other bias</td>
<td>High risk</td>
<td>The study time was very short (58 days). There was no follow-up</td>
</tr>
<tr>
<td>Blinding of participants and personnel (performance bias)</td>
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</tr>
<tr>
<td>Blinding of outcome assessment (detection bias)</td>
<td>High risk</td>
<td>Assessor blinding not described</td>
</tr>
</tbody>
</table>
### Methods
Analysis: each group has patients with three different severities: mild, moderate and severe. The degree of recovery, time to recovery and complications were used to evaluate the results
Follow-up: during the treatment, i.e. 12 weeks (between 10/2000 and 11/2003)
Center: Central Hospital of Nanyanz, Manyang, Henan Province, China
Design: controlled randomised trial

### Participants
N = 145 people with idiopathic facial palsy
Diagnosis: severity based on the function of facial muscles and complaints of patients
Duration of the palsy: not mentioned
Gender: both sexes males 85 and females 60
Race: not mentioned
Age: 7 to 74 years old (average: 45)
Setting: hospital
History/comorbidities: not mentioned

### Interventions
1. Conventional therapy plus facial rehabilitation exercises (movements using facial muscles, exercises performed daily under the tutoring of clinicians). N = 85
2. Conventional therapy only. N = 60
Both groups received the same pharmacological treatment, described as conventional therapy but neither the medicine nor the dosage was described

### Outcomes
Grade of paralysis estimated visually as a percentage of the function of the normal side. The outcome measures were times when the patient started to recover and completely recovered; the percentage of completely recovered patients within 12 weeks. The measurements took place once a week by clinicians but the results were presented as standard mean differences. No baseline level was indicated

### Notes

### Risk of bias

<table>
<thead>
<tr>
<th>Bias</th>
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</tr>
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<tbody>
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<td>Unclear risk</td>
<td>Unclear</td>
</tr>
<tr>
<td>Allocation concealment (selection bias)</td>
<td>Unclear risk</td>
<td>Allocation not mentioned</td>
</tr>
</tbody>
</table>

| Incomplete outcome data (attrition bias) | Low risk          | Facial muscle synkineses were reported in one participant in the mild and one in the moderate group. In the group of participants with severe disease, 12 had complications in the control group and 4 in the training group, but drop outs were not described. There was no follow-up |
| All outcomes                          | Low risk          | The published reports include all expected outcomes |
| Selective reporting (reporting bias)   | Low risk          |                                                     |
**Wen 2004** *(Continued)*

<table>
<thead>
<tr>
<th>Other bias</th>
<th>High risk</th>
<th>The study duration was very brief (3 months)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blinding of participants and personnel (performance bias) All outcomes</td>
<td>High risk</td>
<td>Participant blinding not described</td>
</tr>
<tr>
<td>Blinding of outcome assessment (detection bias) All outcomes</td>
<td>High risk</td>
<td>Assessor blinding not described</td>
</tr>
</tbody>
</table>

**Wong 2004**

**Methods**

Analysis: improvement index = (scores after treatment - scores before treatment)/scores after treatment  
Duration: 1 month (30 days)  
Follow-up: 1 month. Until the end of the therapy  
Center: Neurology Department of West China Hospital  
Design: randomised clinical trial

**Participants**

N = 74 people with Bell’s palsy  
Diagnosis: diagnosed as facial nerve paralysis by Neurology Department of West China Hospital. Exclusion caused central, traumatic or auditory facial nerve paralysis  
Duration of the palsy: less than 1 month  
Gender: both sexes males 1 and females 0.79 (therapy) and males 1 and females 0.41 (control)  
Race: Chinese  
Age: therapy group mean 41.56 (SD 14.47) years old, and control group 40.87 (SD 13.46) years  
Setting: hospital  
History/comorbidities: not mentioned

**Interventions**

1. Drug plus physical treatment plus massage plus acupuncture plus functional exercise. N = 43  
   - 1 to 7 days - drug treatment and physical treatment.  
   - 8 to 14 days - drug treatment, physical treatment, functional exercise and massage and acupuncture treatment  
   - 14 to 30 days - physical treatment, functional exercise and massage and acupuncture treatment

2. Drug plus physical treatment plus massage plus acupuncture. N = 31  
   - 1 to 7 days - drug treatment and physical treatment.  
   - 8 to 14 days - physical treatment and massage and acupuncture treatment  
   - 14 to 30 days - physical treatment and massage and acupuncture treatment

Drug treatment (cortisone 30 mg daily in the morning or 10 mg 3 x daily for 7 days, decreased dosage on the 7th day, and stopped on the 14th day; mecobalamin 500 mg 2 x daily; vitamin B2 10 mg)
**Wong 2004** (Continued)

<table>
<thead>
<tr>
<th>Outcomes</th>
<th>Scores of facial muscular function: Portmann Scores (frowning, eyes closing, moving nose, smiling, whistling, and plumping the face, each movement graded 3 scores, adding 2 scores for the impression of quiet state)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Notes</td>
<td>This same research group have two trials (Wong 2004; Wang 2004) published in the same year with the same study design, similar groups, similar outcomes and similar results described in the abstract, but we could not source Wang 2004, reason to classified it in studies awaiting classification category</td>
</tr>
</tbody>
</table>

### Risk of bias

<table>
<thead>
<tr>
<th>Bias</th>
<th>Authors’ judgement</th>
<th>Support for judgement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Random sequence generation (selection bias)</td>
<td>Low risk</td>
<td>Adequate</td>
</tr>
<tr>
<td>Allocation concealment (selection bias)</td>
<td>Low risk</td>
<td>Randomised numbers by the computer</td>
</tr>
<tr>
<td>Incomplete outcome data (attrition bias)</td>
<td>Low risk</td>
<td>All participants completed the study and there were no losses to follow-up, no treatment withdrawals, no trial group changes and no major adverse events, but there was no follow-up</td>
</tr>
<tr>
<td>Selective reporting (reporting bias)</td>
<td>Low risk</td>
<td>The published reports include all expected outcomes</td>
</tr>
<tr>
<td>Other bias</td>
<td>High risk</td>
<td>There was no exact criterion to measure the symptoms. The study time was very short (30 days)</td>
</tr>
<tr>
<td>Blinding of participants and personnel (performance bias)</td>
<td>High risk</td>
<td>Participant blinding not described</td>
</tr>
<tr>
<td>Blinding of outcome assessment (detection bias)</td>
<td>High risk</td>
<td>Assessor blinding not described</td>
</tr>
</tbody>
</table>
## Methods
Analysis: the participants were analysed according to the grade of recovery after 14 and 21 days during the therapy to evaluate the results
Treatment duration: 20 days
Follow-up: not done
Center: not described
Design: randomised clinical trial

## Participants
N = 60 people with idiopathic facial palsy
Diagnosis: according to typical signs and symptoms of facial nerve paralysis. Duration of the palsy: not mentioned
Gender: both sexes males 28 and females 32. Treatment group M/F: 12/18; control group: M/F: 16/14
Race: Chinese
Age: 15 to 58 years. Treatment group: 37.8 +/- 11.25; range: 18 to 56 years; control group: 39.6 +/- 10.5, range: 15 to 58 years.
Setting: hospital
History/comorbidities: not mentioned

## Interventions
1. “commercial rapid therapeutic device” treatment. N = 30
2. Control group: acupuncture only. N = 30
Length of session: 10 days. Duration of treatment 21 days
Patients in both groups received standard treatments of that group daily. Which treatment was not mentioned

## Outcomes
Outcomes were: cured, improved and no effect
Each outcome based on a combination of signs and symptoms but the results were only reported as the final judgment rather than scores of different clinical signs and symptoms
Cured: disappearance of all signs and symptoms, facial symmetry and function of mimetic muscle fully restored after treatment
Improved: facial symmetry improved or restored; however, during movement, paralysis persisted after treatment
No effect: signs and symptoms unchanged after treatment
Outcome assessment: 14th day and 21st day during the treatment

## Notes
It was not possible to define the “commercial rapid therapeutic device”

### Risk of bias

<table>
<thead>
<tr>
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<tbody>
<tr>
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<td>Randomisation is not clear</td>
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</tr>
</tbody>
</table>
Selective reporting (reporting bias) & Low risk & The published reports include all expected outcomes \\
Other bias & High risk & Two different treatment resources were compared (physical therapy with acupuncture). The kind of physical therapy used was not described. Very brief treatment duration (21 days) \\
Blinding of participants and personnel (performance bias) & High risk & Participant blinding not described \\
Blinding of outcome assessment (detection bias) & High risk & Assessor blinding not described \\

Zhang 2005

Methods

Analysis: The participants were analysed according the grade of recovery after one month of therapy to evaluate the results.
Treatment duration: 14 days. Treatment once every other day for 14 days
Follow-up: not done
Center: not described
Design: randomised clinical trial

Participants

N = 61 people with idiopathic facial palsy
Diagnosis: according to the criteria for facial nerve inflammation in “Diagnosis and curative effect handbook for disease in Chinese Traditional Medicine”.
Duration of the palsy: not mentioned, probably only acute cases
Gender: both sexes. Treatment group: M/F: 18/13; control group: M/F: 17/13
Race: Chinese
Age: treatment group: 43.3 +/- 16.8 years; control group: 42.8 +/- 17.9 yrs
Setting: hospital
History/comorbidities: not mentioned

Interventions

1. Combination of acupuncture and facial muscle training. N = 31
2. Acupuncture only. N = 30

Outcomes

The outcome was reported as 4 classes: fully recovered, highly effective, effective and no effect. The effectiveness was judged on the measure of facial muscle strength.
Full recovery: muscle strength grade V. Full functional recovery
Highly effective: muscle strength grade IV or increased by over 3 grades, functions mostly recovered
Effective: muscle strength grade III or increased by 2 grades, functions partially recovered
No effect: muscle strength grade 0 to I or increased less than 1 grade, no change in
Zhang 2005  (Continued)

| Functions | Measurements were at day 14 |

Notes

**Risk of bias**

<table>
<thead>
<tr>
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</tr>
<tr>
<td>Other bias</td>
<td>High risk</td>
<td>The study time was very short (14 days). There was no follow-up</td>
</tr>
<tr>
<td>Blinding of participants and personnel (performance bias)</td>
<td>High risk</td>
<td>Participant blinding not described</td>
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<tr>
<td>Blinding of outcome assessment (detection bias)</td>
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<td>Assessor blinding not described</td>
</tr>
</tbody>
</table>

Abbreviations: TENS, transcutaneous electrical nerve stimulation; MRI, magnetic resonance imaging; SD, standard deviation.

**Characteristics of excluded studies  [ordered by study ID]**

<table>
<thead>
<tr>
<th>Study</th>
<th>Reason for exclusion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adour 1971</td>
<td>A RCT of decompression surgery for Bell's palsy. The non surgical group received prednisolone</td>
</tr>
<tr>
<td>Aleev 1973</td>
<td>Not a RCT. A case series</td>
</tr>
<tr>
<td>Balliet 1982</td>
<td>Not a RCT. Four people with traumatic facial paralysis</td>
</tr>
<tr>
<td>Reference</td>
<td>Details</td>
</tr>
<tr>
<td>---------------</td>
<td>-------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Bernardes 2004</td>
<td>Not a RCT. A retrospective study to delineate the contribution of myofunctional exercises during the flaccid phase of the facial paralysis between participants with traumatic and spontaneous paralysis</td>
</tr>
<tr>
<td>Beurskens 2004c</td>
<td>A description of the mime facial exercises</td>
</tr>
<tr>
<td>Brach 1999</td>
<td>Not a RCT. A case study that proposed a treatment-based category based on signs and symptoms</td>
</tr>
<tr>
<td>Brown 1978</td>
<td>Not a RCT. A case study that described two participants treated with biofeedback in both clinic and home environment</td>
</tr>
<tr>
<td>Cai 2010</td>
<td>There is no participants with idiopathic facial palsy, only traumatic facial palsy</td>
</tr>
<tr>
<td>Casler 1990</td>
<td>This is a controlled trial about surgery</td>
</tr>
<tr>
<td>Coulson 2006a</td>
<td>There were only 2 participants with idiopathic facial palsy</td>
</tr>
<tr>
<td>Coulson 2006b</td>
<td>Not a RCT. A study of 2 cases following removal of a vestibular schwannoma</td>
</tr>
<tr>
<td>Cronin 2003</td>
<td>Not a RCT. A retrospective case review. There are others causes of facial palsy including Ramsay Hunt. There were only 3 participants with idiopathic facial palsy. The groups were not comparable at baseline. Twenty-four participants received neuromuscular facial retraining and the other 6 were the control group</td>
</tr>
<tr>
<td>Cui 2009</td>
<td>A comparison study of two different acupuncture treatments.</td>
</tr>
<tr>
<td>Dalla-Toffola 2005</td>
<td>Not a RCT. A retrospective study</td>
</tr>
<tr>
<td>Danile 1982</td>
<td>Not a RCT. Iontophoresis was applied in 50 participants with idiopathic facial palsy without a comparison group</td>
</tr>
<tr>
<td>Diao 2002</td>
<td>The “manipulation” used in the study is a Chinese traditional medicine stimulus. It is not the same manipulation used in physical therapy practice</td>
</tr>
<tr>
<td>Dubravica 1996</td>
<td>Unclear how the groups were divided and if the participants were randomised. The 2 groups undertook kinesiotherapy plus electrostimulation 5 weeks before the study and it could have interfered with the results</td>
</tr>
<tr>
<td>Fombeur 1988</td>
<td>The study divided 2 groups with 20 participants each with facial palsy of various origins</td>
</tr>
<tr>
<td>Goulart 2002</td>
<td>Not a RCT. A nonsystematic review of the literature</td>
</tr>
<tr>
<td>Guo 2006</td>
<td>Treatment group was treated with electro-acupuncture</td>
</tr>
<tr>
<td>Gómez-Benítez 1995</td>
<td>Not a RCT. Describes the physical therapy of 42 consecutive participants with peripheric facial palsy without describing the cause and without a control group</td>
</tr>
<tr>
<td>Hou 2008</td>
<td>This RCT compared results of a “experimental group” using acupuncture plus laser with a “control group” using medication</td>
</tr>
</tbody>
</table>
Klingler 1982  |  This controlled trial concerns therapy with cortisone, antirheumatics and diuretics to treat facial palsy  
Koyama 2005  |  Not a RCT  
Krukowska 2004  |  Both groups received physical therapy. The two groups had different number of participants (21 and 16 individuals)  
Li 2005  |  The "manipulation" used in the study is a Chinese traditional medicine. It is not manipulation as used in physical therapy practice  
Lobzin 1989  |  Not a RCT. This is two studies with 32 participants with neuritis and neuropathy of the facial nerve treated with an electromyography feedback device without a comparison group  
Lu 2006  |  A quasi-RCT. The participants were grouped according to admission sequence (August, 2001 to August 2003 were the control group; September 2003 to August 2005 were the experimental group)  
Manca 1997  |  Not a RCT. A study of 20 participants with facial paralysis treated with EMG biofeedback  
Murakami 1993  |  Not a randomised trial. One group of people treated with low reactive-level laser therapy (11) compared with one group treated with stellate ganglion block (26) and another group with a combination of both (15)  
Nakamura 2003  |  There were only 10 participants with idiopathic facial palsy. 27 people with complete facial nerve palsy who had no response to electrical stimulation were randomly allocated into 2 groups: 12 treated with training method of biofeedback rehabilitation to prevent synkinesis and 15 as a control without treatment  
Ortega-Torres 2009  |  A RCT that compared outcomes between 69 participants treated with laser irradiation (Arsenide of Galio) and 69 subjects treated with hot packs, massage, electrostimulation and exercises for 10 sessions  
Penteado 2009  |  Not a RCT. A case-series study, comparing two groups. The first group with 17 participants was submitted to the Chevalier method and the second group with 10 participants served as control  
Romero 1982  |  Not a RCT. Biofeedback training was applied to 10 participants with chronic facial palsy (at least 1-year evolution) selected from a group of 957 facial paralyses cases. Only 6 individuals had idiopathic facial palsy  
Ross 1991  |  A RCT with 31 people with long standing facial paresis (minimum of 18 months) but there were only 4 participants with idiopathic facial palsy  
Segal 1995a  |  Not a RCT. A preliminary study with 10 participants which compared a neuromuscular retraining program (5 participants) to a group with the same treatment plus small movements to limit synkinesis (5 participants). 1 person did not have idiopathic facial palsy and it is not possible to analyse the data excluding this participant  
Segal 1995b  |  Not a RCT. A study of 25 people (5 with idiopathic paralysis) that proposed an exercise program based on home exercises and weekly 50 to 60 minute sessions at the clinic. Reassessment was made at 2.5 month intervals for up to 10 months with the House-Brackmann Facial Grading System and synkinesis measure. All idiopathic participants changed from House grade 4 to grade 3 in 5 to 10 months  
Shiau 1995  |  Not a RCT. The assessment was randomised and not the participants
Continued

<table>
<thead>
<tr>
<th>Study</th>
<th>Description</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Taverner 1966</td>
<td>This is a randomised clinical trial of adrenocorticotropic hormone injections</td>
<td></td>
</tr>
<tr>
<td>Tessitore 2009</td>
<td>Not a RCT. 20 individuals with facial palsy of unknown etiology were compared with other 9 participants as a control group</td>
<td></td>
</tr>
<tr>
<td>Yang 2009a</td>
<td>A comparative study of 2 different acupuncture treatments</td>
<td></td>
</tr>
<tr>
<td>Yang 2009b</td>
<td>A comparative study of 2 different acupuncture treatments</td>
<td></td>
</tr>
<tr>
<td>Zhao 2005</td>
<td>A controlled trial about stellate ganglion block and acupuncture</td>
<td></td>
</tr>
</tbody>
</table>

Abbreviations: EMG, electromyography; RCT, randomised controlled trial.

**Characteristics of studies awaiting assessment**  [ordered by study ID]

**Chen 1995**

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Value</th>
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</thead>
<tbody>
<tr>
<td>Methods</td>
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</tr>
<tr>
<td>Participants</td>
<td></td>
</tr>
<tr>
<td>Interventions</td>
<td></td>
</tr>
<tr>
<td>Outcomes</td>
<td></td>
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<tr>
<td>Notes</td>
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**Shen 1998**

<table>
<thead>
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<tbody>
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<td>Participants</td>
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</tr>
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<td>Study</td>
<td>Methods</td>
</tr>
<tr>
<td>------------</td>
<td>---------</td>
</tr>
<tr>
<td>Tang 2002</td>
<td>Not known</td>
</tr>
<tr>
<td>Wang 1995a</td>
<td>Not known</td>
</tr>
<tr>
<td>Wang 1995b</td>
<td>Not known</td>
</tr>
<tr>
<td>Wang 1999</td>
<td>Not known</td>
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<tr>
<td>Study</td>
<td>Country</td>
</tr>
<tr>
<td>---------</td>
<td>---------</td>
</tr>
<tr>
<td>Wang 2004</td>
<td>China</td>
</tr>
<tr>
<td>Yao 1994</td>
<td>China</td>
</tr>
<tr>
<td>Zhang 2003</td>
<td>China</td>
</tr>
<tr>
<td>Zhuo 1990</td>
<td>China</td>
</tr>
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</table>
## DATA AND ANALYSES

### Comparison 1. Electrostimulation versus control

<table>
<thead>
<tr>
<th>Outcome or subgroup title</th>
<th>No. of studies</th>
<th>No. of participants</th>
<th>Statistical method</th>
<th>Effect size</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Incomplete recovery after 6 and 12 months</td>
<td>1</td>
<td>172</td>
<td>Risk Ratio (M-H, Fixed, 95% CI)</td>
<td>1.23 [0.76, 1.99]</td>
</tr>
<tr>
<td>1.1 6 months</td>
<td>1</td>
<td>86</td>
<td>Risk Ratio (M-H, Fixed, 95% CI)</td>
<td>1.30 [0.68, 2.50]</td>
</tr>
<tr>
<td>1.2 12 months</td>
<td>1</td>
<td>86</td>
<td>Risk Ratio (M-H, Fixed, 95% CI)</td>
<td>1.15 [0.55, 2.36]</td>
</tr>
<tr>
<td>2 Mean Facial Grading Scale after 3 months</td>
<td>1</td>
<td></td>
<td>Mean Difference (IV, Fixed, 95% CI)</td>
<td>Totals not selected</td>
</tr>
<tr>
<td>2.1 Rest score</td>
<td>1</td>
<td></td>
<td>Mean Difference (IV, Fixed, 95% CI)</td>
<td>0.0 [0.0, 0.0]</td>
</tr>
<tr>
<td>2.2 Movement score</td>
<td>1</td>
<td></td>
<td>Mean Difference (IV, Fixed, 95% CI)</td>
<td>0.0 [0.0, 0.0]</td>
</tr>
<tr>
<td>2.3 Total score</td>
<td>1</td>
<td></td>
<td>Mean Difference (IV, Fixed, 95% CI)</td>
<td>0.0 [0.0, 0.0]</td>
</tr>
<tr>
<td>3 Incomplete recovery after 3 months</td>
<td>1</td>
<td></td>
<td>Risk Ratio (M-H, Fixed, 95% CI)</td>
<td>Totals not selected</td>
</tr>
<tr>
<td>4 Mean House-Brackmann Facial Grading Systems</td>
<td>1</td>
<td></td>
<td>Mean Difference (IV, Fixed, 95% CI)</td>
<td>Totals not selected</td>
</tr>
<tr>
<td>5 Motor synkinesia after treatment</td>
<td>2</td>
<td>142</td>
<td>Risk Ratio (M-H, Fixed, 95% CI)</td>
<td>1.52 [0.71, 3.30]</td>
</tr>
<tr>
<td>5.1 After three months</td>
<td>1</td>
<td>56</td>
<td>Risk Ratio (M-H, Fixed, 95% CI)</td>
<td>5.0 [0.25, 99.67]</td>
</tr>
<tr>
<td>5.2 After six months</td>
<td>1</td>
<td>86</td>
<td>Risk Ratio (M-H, Fixed, 95% CI)</td>
<td>1.31 [0.59, 2.94]</td>
</tr>
</tbody>
</table>

### Comparison 2. Electrostimulation versus prednisone

<table>
<thead>
<tr>
<th>Outcome or subgroup title</th>
<th>No. of studies</th>
<th>No. of participants</th>
<th>Statistical method</th>
<th>Effect size</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Incomplete recovery after six months (all participants)</td>
<td>1</td>
<td></td>
<td>Risk Ratio (M-H, Fixed, 95% CI)</td>
<td>Totals not selected</td>
</tr>
<tr>
<td>2 Incomplete recovery six months according severity</td>
<td>1</td>
<td></td>
<td>Risk Ratio (M-H, Fixed, 95% CI)</td>
<td>Totals not selected</td>
</tr>
<tr>
<td>2.1 Infrahordal lesion (mild cases)</td>
<td>1</td>
<td></td>
<td>Risk Ratio (M-H, Fixed, 95% CI)</td>
<td>0.0 [0.0, 0.0]</td>
</tr>
<tr>
<td>2.2 Suprachordal lesion (severe cases)</td>
<td>1</td>
<td></td>
<td>Risk Ratio (M-H, Fixed, 95% CI)</td>
<td>0.0 [0.0, 0.0]</td>
</tr>
<tr>
<td>3 Mean time to complete recovery (in days)</td>
<td>1</td>
<td></td>
<td>Mean Difference (IV, Fixed, 95% CI)</td>
<td>Subtotals only</td>
</tr>
<tr>
<td>3.1 Infrahordal lesion (mild cases)</td>
<td>1</td>
<td>102</td>
<td>Mean Difference (IV, Fixed, 95% CI)</td>
<td>-7.42 [-13.13, -1.17]</td>
</tr>
<tr>
<td>3.2 Suprachordal lesion (severe cases)</td>
<td>1</td>
<td>47</td>
<td>Mean Difference (IV, Fixed, 95% CI)</td>
<td>-33.94 [-63.40, -4.48]</td>
</tr>
</tbody>
</table>
### Comparison 3. Exercise versus waiting list

<table>
<thead>
<tr>
<th>Outcome or subgroup title</th>
<th>No. of studies</th>
<th>No. of participants</th>
<th>Statistical method</th>
<th>Effect size</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Recovery on Facial Grading Scale (Sunnybrook scale)</td>
<td>1</td>
<td></td>
<td>Mean Difference (IV, Fixed, 95% CI)</td>
<td>Totals not selected</td>
</tr>
<tr>
<td>2 Recovery on Facial Disability Index-physical</td>
<td>1</td>
<td></td>
<td>Mean Difference (IV, Fixed, 95% CI)</td>
<td>Totals not selected</td>
</tr>
<tr>
<td>2.1 FDI-physical</td>
<td>1</td>
<td></td>
<td>Mean Difference (IV, Fixed, 95% CI)</td>
<td>0.0 [0.0, 0.0]</td>
</tr>
<tr>
<td>2.2 FDI-social</td>
<td>1</td>
<td></td>
<td>Mean Difference (IV, Fixed, 95% CI)</td>
<td>0.0 [0.0, 0.0]</td>
</tr>
<tr>
<td>3 Recovery on House Brackmann grading system</td>
<td>1</td>
<td></td>
<td>Risk Ratio (M-H, Fixed, 95% CI)</td>
<td>Totals not selected</td>
</tr>
<tr>
<td>3.1 4 days</td>
<td>1</td>
<td></td>
<td>Risk Ratio (M-H, Fixed, 95% CI)</td>
<td>0.0 [0.0, 0.0]</td>
</tr>
<tr>
<td>3.2 7 days</td>
<td>1</td>
<td></td>
<td>Risk Ratio (M-H, Fixed, 95% CI)</td>
<td>0.0 [0.0, 0.0]</td>
</tr>
<tr>
<td>3.3 15 days</td>
<td>1</td>
<td></td>
<td>Risk Ratio (M-H, Fixed, 95% CI)</td>
<td>0.0 [0.0, 0.0]</td>
</tr>
</tbody>
</table>

### Comparison 4. Exercise versus conventional treatment

<table>
<thead>
<tr>
<th>Outcome or subgroup title</th>
<th>No. of studies</th>
<th>No. of participants</th>
<th>Statistical method</th>
<th>Effect size</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Incomplete recovery three months after randomisation</td>
<td>1</td>
<td></td>
<td>Risk Ratio (M-H, Fixed, 95% CI)</td>
<td>Subtotals only</td>
</tr>
<tr>
<td>2 Mean time from the beginning of the recovery (in weeks)</td>
<td>1</td>
<td></td>
<td>Mean Difference (IV, Fixed, 95% CI)</td>
<td>Subtotals only</td>
</tr>
<tr>
<td>2.1 Participants with mild paralysis</td>
<td>1</td>
<td>43</td>
<td>Mean Difference (IV, Fixed, 95% CI)</td>
<td>-0.30 [-0.79, 0.19]</td>
</tr>
<tr>
<td>2.2 Participants with moderate paralysis</td>
<td>1</td>
<td>47</td>
<td>Mean Difference (IV, Fixed, 95% CI)</td>
<td>-1.40 [-2.22, -0.58]</td>
</tr>
<tr>
<td>3 Mean time from completion of recovery (in weeks)</td>
<td>1</td>
<td></td>
<td>Mean Difference (IV, Fixed, 95% CI)</td>
<td>Subtotals only</td>
</tr>
<tr>
<td>3.1 Participants with mild paralysis</td>
<td>1</td>
<td>43</td>
<td>Mean Difference (IV, Fixed, 95% CI)</td>
<td>-0.40 [-1.09, 0.29]</td>
</tr>
<tr>
<td>3.2 Participants with moderate paralysis</td>
<td>1</td>
<td>47</td>
<td>Mean Difference (IV, Fixed, 95% CI)</td>
<td>-2.10 [-3.15, -1.05]</td>
</tr>
<tr>
<td>4 Motor synkinesia after treatment</td>
<td>1</td>
<td></td>
<td>Risk Ratio (M-H, Fixed, 95% CI)</td>
<td>Totals not selected</td>
</tr>
<tr>
<td>4.1 After three months</td>
<td>1</td>
<td></td>
<td>Risk Ratio (M-H, Fixed, 95% CI)</td>
<td>0.0 [0.0, 0.0]</td>
</tr>
</tbody>
</table>
Comparison 5. Exercise plus acupuncture versus acupuncture

<table>
<thead>
<tr>
<th>Outcome or subgroup title</th>
<th>No. of studies</th>
<th>No. of participants</th>
<th>Statistical method</th>
<th>Effect size</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Number of participants without recovery</td>
<td>2</td>
<td>121</td>
<td>Risk Ratio (M-H, Fixed, 95% CI)</td>
<td>0.33 [0.09, 1.16]</td>
</tr>
<tr>
<td>1.1 After 14 days</td>
<td>1</td>
<td>61</td>
<td>Risk Ratio (M-H, Fixed, 95% CI)</td>
<td>0.16 [0.02, 1.26]</td>
</tr>
<tr>
<td>1.2 After 60 days</td>
<td>1</td>
<td>60</td>
<td>Risk Ratio (M-H, Fixed, 95% CI)</td>
<td>0.67 [0.12, 3.71]</td>
</tr>
<tr>
<td>2 Portmann Score</td>
<td>1</td>
<td></td>
<td>Mean Difference (IV, Fixed, 95% CI)</td>
<td>Totals not selected</td>
</tr>
<tr>
<td>3 Mean House Brackmann score</td>
<td>1</td>
<td></td>
<td>Mean Difference (IV, Fixed, 95% CI)</td>
<td>Totals not selected</td>
</tr>
</tbody>
</table>

Comparison 6. Electrotherapy plus acupuncture versus acupuncture

<table>
<thead>
<tr>
<th>Outcome or subgroup title</th>
<th>No. of studies</th>
<th>No. of participants</th>
<th>Statistical method</th>
<th>Effect size</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Number of participants without recovery</td>
<td>1</td>
<td></td>
<td>Risk Ratio (M-H, Fixed, 95% CI)</td>
<td>Totals not selected</td>
</tr>
<tr>
<td>1.1 Shortwave diathermy plus acupuncture versus acupuncture</td>
<td>1</td>
<td></td>
<td>Risk Ratio (M-H, Fixed, 95% CI)</td>
<td>0.0 [0.0, 0.0]</td>
</tr>
</tbody>
</table>

Comparison 7. Physical therapy versus acupuncture

<table>
<thead>
<tr>
<th>Outcome or subgroup title</th>
<th>No. of studies</th>
<th>No. of participants</th>
<th>Statistical method</th>
<th>Effect size</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Number of participants without recovery</td>
<td>1</td>
<td></td>
<td>Risk Difference (M-H, Fixed, 95% CI)</td>
<td>Totals not selected</td>
</tr>
<tr>
<td>1.1 Physical therapy versus acupuncture</td>
<td>1</td>
<td></td>
<td>Risk Difference (M-H, Fixed, 95% CI)</td>
<td>0.0 [0.0, 0.0]</td>
</tr>
</tbody>
</table>
Analysis 1.1. Comparison 1 Electrostimulation versus control, Outcome 1 Incomplete recovery after 6 and 12 months.

Review: Physical therapy for Bell's palsy (idiopathic facial paralysis)

Comparison: 1 Electrostimulation versus control

Outcome: 1 Incomplete recovery after 6 and 12 months

<table>
<thead>
<tr>
<th>Study or subgroup</th>
<th>Electrotherapy n/N</th>
<th>Massage + IV n/N</th>
<th>Risk Ratio M-H,Fixed 95% CI</th>
<th>Weight</th>
<th>Risk Ratio M-H,Fixed 95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 6 months</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mosforth 1958</td>
<td>15/44</td>
<td>11/42</td>
<td>52.4 % 1.30 [0.68, 2.50]</td>
<td>52.4 %</td>
<td>1.30 [0.68, 2.50]</td>
</tr>
<tr>
<td>Subtotal (95% CI)</td>
<td>44</td>
<td>42</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>52.4 % 1.30 [0.68, 2.50]</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>15 (Electrotherapy)</td>
<td>11 (Massage + IV)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| Test for overall effect: Z = 0.79 (P = 0.43)  
Heterogeneity: not applicable |
|                  | 2 12 months        |                 |                             |        |                             |
| Mosforth 1958    | 12/44              | 10/42           | 47.6 % 1.15 [0.55, 2.36]    | 47.6 % | 1.15 [0.55, 2.36]            |
| Subtotal (95% CI)| 44                 | 42              |                             |        |                             |
|                  |                    |                 | 47.6 % 1.15 [0.55, 2.36]    |        |                             |
|                  | 12 (Electrotherapy)| 10 (Massage + IV) |
| Test for overall effect: Z = 0.37 (P = 0.71)  
Heterogeneity: not applicable |
|                  | Total (95% CI)     |                 |                             |        |                             |
|                  | 88                 | 84              | 100.0 % 1.23 [0.76, 1.99]   |        |                             |
|                  | 27 (Electrotherapy)| 21 (Massage + IV) |
| Heterogeneity: Chi^2 = 0.07, df = 1 (P = 0.80); I^2 = 0.0% |
| Test for overall effect: Z = 0.83 (P = 0.41)  
Test for subgroup differences: Chi^2 = 0.07, df = 1 (P = 0.80), I^2 = 0.0% |

Physical therapy for Bell's palsy (idiopathic facial paralysis) (Review)  
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Analysis 1.2. Comparison 1 Electrostimulation versus control, Outcome 2 Mean Facial Grading Scale after 3 months.

Review: Physical therapy for Bell’s palsy (idiopathic facial paralysis)

Comparison: 1 Electrostimulation versus control

Outcome: 2 Mean Facial Grading Scale after 3 months

<table>
<thead>
<tr>
<th>Study or subgroup</th>
<th>Electrical Stimulation</th>
<th>Control</th>
<th>Mean Difference</th>
<th>Mean Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>Mean(SD)</td>
<td>n</td>
<td>Mean(SD)</td>
</tr>
<tr>
<td>1 Rest score</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Manikandan 2007</td>
<td>28</td>
<td>5 (5)</td>
<td>28</td>
<td>5 (4.5)</td>
</tr>
<tr>
<td>2 Movement score</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Manikandan 2007</td>
<td>28</td>
<td>74 (14)</td>
<td>28</td>
<td>6 (16.7)</td>
</tr>
<tr>
<td>3 Total score</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Manikandan 2007</td>
<td>28</td>
<td>66 (22)</td>
<td>28</td>
<td>54 (18.9)</td>
</tr>
</tbody>
</table>

Analysis 1.3. Comparison 1 Electrostimulation versus control, Outcome 3 Incomplete recovery after 3 months.

Review: Physical therapy for Bell’s palsy (idiopathic facial paralysis)

Comparison: 1 Electrostimulation versus control

Outcome: 3 Incomplete recovery after 3 months

<table>
<thead>
<tr>
<th>Study or subgroup</th>
<th>Electro stimulation</th>
<th>Control</th>
<th>Risk Ratio</th>
<th>Risk Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n/N</td>
<td>n/N</td>
<td>M-H,Fixed,95% CI</td>
<td>M-H,Fixed,95% CI</td>
</tr>
<tr>
<td>Alakram 2010</td>
<td>3/11</td>
<td>3/11</td>
<td>1.00 [ 0.26, 3.91 ]</td>
<td></td>
</tr>
</tbody>
</table>

Favours electro Favours control
### Analysis 1.4. Comparison 1 Electrostimulation versus control, Outcome 4 Mean House-Brackmann Facial Grading Systems.

**Review:** Physical therapy for Bell’s palsy (idiopathic facial paralysis)

**Comparison:** 1 Electrostimulation versus control

**Outcome:** 4 Mean House-Brackmann Facial Grading Systems

<table>
<thead>
<tr>
<th>Study or subgroup</th>
<th>Electro stimulation</th>
<th>Control</th>
<th>Mean Difference</th>
<th>Mean Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>Mean(SD)</td>
<td>N</td>
<td>Mean(SD)</td>
</tr>
<tr>
<td>Alakram 2010</td>
<td>8</td>
<td>6.375 (1.505)</td>
<td>8</td>
<td>6.880 (0.640)</td>
</tr>
</tbody>
</table>

Favours control  Favours electro

### Analysis 1.5. Comparison 1 Electrostimulation versus control, Outcome 5 Motor synkinesia after treatment.

**Review:** Physical therapy for Bell’s palsy (idiopathic facial paralysis)

**Comparison:** 1 Electrostimulation versus control

**Outcome:** 5 Motor synkinesia after treatment

<table>
<thead>
<tr>
<th>Study or subgroup</th>
<th>Electricalstimulation</th>
<th>Control</th>
<th>Risk Ratio</th>
<th>Weight</th>
<th>Risk Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n/N</td>
<td>n/N</td>
<td>M-H,Fixed,95% CI</td>
<td></td>
<td>M-H,Fixed,95% CI</td>
</tr>
<tr>
<td>1 After three months</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Manikandan 2007</td>
<td>2/28</td>
<td>0/28</td>
<td>5.8 %</td>
<td>5.00</td>
<td>[ 0.25, 99.67 ]</td>
</tr>
<tr>
<td><strong>Subtotal (95% CI)</strong></td>
<td>28</td>
<td>28</td>
<td>5.8 %</td>
<td>5.00</td>
<td>[ 0.25, 99.67 ]</td>
</tr>
</tbody>
</table>

Total events: 2 (Electricalstimulation), 0 (Control)

Heterogeneity: not applicable

Test for overall effect: Z = 1.05 (P = 0.29)

2 After six months

| Mosforth 1958   | 11/44                  | 8/42    | 94.2 %     | 1.31   | [ 0.59, 2.94 ] |
| **Subtotal (95% CI)** | 44                   | 42       | 94.2 %     | 1.31   | [ 0.59, 2.94 ] |

Total events: 11 (Electricalstimulation), 8 (Control)

Heterogeneity: not applicable

Test for overall effect: Z = 0.66 (P = 0.51)

| Total (95% CI) | 72 | 70 | 100.0 % | 1.52 | [ 0.71, 3.30 ] |

Total events: 13 (Electricalstimulation), 8 (Control)

Heterogeneity: $\chi^2 = 0.74, df = 1 (P = 0.39)$; $I^2 = 0.0$

Test for overall effect: Z = 1.07 (P = 0.28)

Test for subgroup differences: $\chi^2 = 0.72, df = 1 (P = 0.40)$; $I^2 = 0.0$
Analysis 2.1. Comparison 2 Electrostimulation versus prednisone, Outcome 1 Incomplete recovery after six months (all participants).

Review: Physical therapy for Bell’s palsy (idiopathic facial paralysis)

Comparison: 2 Electrostimulation versus prednisone

Outcome: 1 Incomplete recovery after six months (all participants)

<table>
<thead>
<tr>
<th>Study or subgroup</th>
<th>Electrostimulation</th>
<th>Prednisone</th>
<th>Risk Ratio</th>
<th>Risk Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n/N</td>
<td>n/N</td>
<td>M-H, Fixed 95% CI</td>
<td>M-H, Fixed 95% CI</td>
</tr>
<tr>
<td>Flores 1998</td>
<td>10/77</td>
<td>11/72</td>
<td>0.85 [ 0.38, 1.88 ]</td>
<td></td>
</tr>
</tbody>
</table>

0.2 0.5 1 2 5 5
Favours electro Favours prednisone

Analysis 2.2. Comparison 2 Electrostimulation versus prednisone, Outcome 2 Incomplete recovery six months according severity.

Review: Physical therapy for Bell’s palsy (idiopathic facial paralysis)

Comparison: 2 Electrostimulation versus prednisone

Outcome: 2 Incomplete recovery six months according severity

<table>
<thead>
<tr>
<th>Study or subgroup</th>
<th>Electrostimulation</th>
<th>Prednisone</th>
<th>Risk Ratio</th>
<th>Risk Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n/N</td>
<td>n/N</td>
<td>M-H, Fixed 95% CI</td>
<td>M-H, Fixed 95% CI</td>
</tr>
<tr>
<td>1 Infrachordal lesion (mild cases)</td>
<td>Flores 1998</td>
<td>0/47</td>
<td>0/55</td>
<td>0.0 [ 0.0, 0.0 ]</td>
</tr>
<tr>
<td>2 Suprachordal lesion (severe cases)</td>
<td>Flores 1998</td>
<td>11/30</td>
<td>10/17</td>
<td>0.62 [ 0.34, 1.15 ]</td>
</tr>
</tbody>
</table>

0.2 0.5 1 2 5 5
Favours electro Favours prednisone
### Analysis 2.3. Comparison 2 Electrostimulation versus prednisone, Outcome 3 Mean time to complete recovery (in days).

**Review:** Physical therapy for Bell’s palsy (idiopathic facial paralysis)

**Comparison:** 2 Electrostimulation versus prednisone

**Outcome:** 3 Mean time to complete recovery (in days)

<table>
<thead>
<tr>
<th>Study or subgroup</th>
<th>Electrostimulation</th>
<th>Prednisone</th>
<th>Mean Difference</th>
<th>Weight</th>
<th>Mean Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>Mean(SD)</td>
<td>N</td>
<td>Mean(SD)</td>
<td>IV,Fixed,95% CI</td>
</tr>
<tr>
<td>1 Infraclavicular lesion (mild cases)</td>
<td>Flores 1998</td>
<td>47</td>
<td>22.78 (8.92)</td>
<td>55</td>
<td>30.2 (19.35)</td>
</tr>
<tr>
<td><strong>Subtotal (95% CI)</strong></td>
<td></td>
<td>47</td>
<td>55</td>
<td></td>
<td>100.0 %</td>
</tr>
<tr>
<td>Heterogeneity: not applicable</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Test for overall effect: Z = 2.54 (P = 0.011)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 Supraclavicular lesion (severe cases)</td>
<td>Flores 1998</td>
<td>30</td>
<td>81.56 (44.53)</td>
<td>17</td>
<td>115.5 (52.13)</td>
</tr>
<tr>
<td><strong>Subtotal (95% CI)</strong></td>
<td></td>
<td>30</td>
<td>17</td>
<td></td>
<td>100.0 %</td>
</tr>
<tr>
<td>Heterogeneity: not applicable</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Test for overall effect: Z = 2.26 (P = 0.024)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Test for subgroup differences: Chisq = 3.00, df = 1 (P = 0.08), I² = 67%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Analysis 3.1. Comparison 3 Exercise versus waiting list, Outcome 1 Recovery on Facial Grading Scale (Sunnybrook scale).

**Review:** Physical therapy for Bell’s palsy (idiopathic facial paralysis)

**Comparison:** 3 Exercise versus waiting list

**Outcome:** 1 Recovery on Facial Grading Scale (Sunnybrook scale)

<table>
<thead>
<tr>
<th>Study or subgroup</th>
<th>Treatment</th>
<th>Control</th>
<th>Mean Difference</th>
<th>Mean Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>Mean(SD)</td>
<td>N</td>
<td>Mean(SD)</td>
</tr>
<tr>
<td>Beurskens 2003</td>
<td>16</td>
<td>54.9 (18.2)</td>
<td>18</td>
<td>34.5 (16.2)</td>
</tr>
</tbody>
</table>

-100 -50 0 50 100

Favours электro Favours prednisone

-50 -25 0 25 50

Favours control Favours exercises

---

**Physical therapy for Bell’s palsy (idiopathic facial paralysis) (Review)**

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Analysis 3.2. Comparison 3 Exercise versus waiting list, Outcome 2 Recovery on Facial Disability Index-physical.

Review: Physical therapy for Bell’s palsy (idiopathic facial paralysis)

Comparison: 3 Exercise versus waiting list

Outcome: 2 Recovery on Facial Disability Index-physical

<table>
<thead>
<tr>
<th>Study or subgroup</th>
<th>Facial exercises</th>
<th>Control</th>
<th>Mean Difference</th>
<th>IV/Fixed 95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean(SD)</td>
<td>Mean(SD)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 FDI-physical</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Beurskens 2003</td>
<td>73.5 (16.8)</td>
<td>63.2 (17.9)</td>
<td>10.30 [ -1.37, 21.97 ]</td>
<td></td>
</tr>
<tr>
<td>2 FDI-social</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Beurskens 2003</td>
<td>80.7 (12.2)</td>
<td>66.2 (16.4)</td>
<td>14.50 [ 4.85, 24.15 ]</td>
<td></td>
</tr>
</tbody>
</table>

Analysis 3.3. Comparison 3 Exercise versus waiting list, Outcome 3 Recovery on House Brackmann grading system.

Review: Physical therapy for Bell’s palsy (idiopathic facial paralysis)

Comparison: 3 Exercise versus waiting list

Outcome: 3 Recovery on House Brackmann grading system

<table>
<thead>
<tr>
<th>Study or subgroup</th>
<th>Facial exercises</th>
<th>Control</th>
<th>Risk Ratio</th>
<th>M-H Fixed 95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n/N</td>
<td>n/N</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 4 days</td>
<td></td>
<td></td>
<td>0.40 [ 0.02, 8.78 ]</td>
<td></td>
</tr>
<tr>
<td>Barbara 2010</td>
<td>0/9</td>
<td>1/11</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 7 days</td>
<td></td>
<td></td>
<td>1.22 [ 0.09, 16.92 ]</td>
<td></td>
</tr>
<tr>
<td>Barbara 2010</td>
<td>1/9</td>
<td>1/11</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 15 days</td>
<td></td>
<td></td>
<td>2.04 [ 0.66, 6.29 ]</td>
<td></td>
</tr>
<tr>
<td>Barbara 2010</td>
<td>5/9</td>
<td>3/11</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Analysis 4.1. Comparison 4 Exercise versus conventional treatment, Outcome 1 Incomplete recovery three months after randomisation.

**Review:** Physical therapy for Bell's palsy (idiopathic facial paralysis)

**Comparison:** 4 Exercise versus conventional treatment

**Outcome:** 1 Incomplete recovery three months after randomisation

<table>
<thead>
<tr>
<th>Study or subgroup</th>
<th>Facial exercises</th>
<th>Control</th>
<th>Risk Ratio</th>
<th>Risk Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n/N</td>
<td>n/N</td>
<td>M-H,Fixed,95% CI</td>
<td>M-H,Fixed,95% CI</td>
</tr>
<tr>
<td>Wen 2004</td>
<td>6/85</td>
<td>7/60</td>
<td>0.61 [ 0.21, 1.71 ]</td>
<td></td>
</tr>
<tr>
<td><strong>Subtotal (95% CI)</strong></td>
<td>0</td>
<td>0</td>
<td>0.0 [ 0.0, 0.0 ]</td>
<td></td>
</tr>
</tbody>
</table>

Total events: 6 (Facial exercises), 7 (Control)

Heterogeneity: not applicable

Test for overall effect: Z = 0.0 (P < 0.00001)

---

### Analysis 4.2. Comparison 4 Exercise versus conventional treatment, Outcome 2 Mean time from the beginning of the recovery (in weeks).

**Review:** Physical therapy for Bell's palsy (idiopathic facial paralysis)

**Comparison:** 4 Exercise versus conventional treatment

**Outcome:** 2 Mean time from the beginning of the recovery (in weeks)

<table>
<thead>
<tr>
<th>Study or subgroup</th>
<th>Facial exercises</th>
<th>Control</th>
<th>Mean Difference</th>
<th>Weight</th>
<th>Mean Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>Mean(SD)</td>
<td>N</td>
<td>Mean(SD)</td>
<td>IV,Fixed,95% CI</td>
</tr>
<tr>
<td>Wen 2004</td>
<td>24</td>
<td>2.1 (0.7)</td>
<td>19</td>
<td>2.4 (0.9)</td>
<td>100.0 %</td>
</tr>
<tr>
<td><strong>Subtotal (95% CI)</strong></td>
<td>24</td>
<td></td>
<td>19</td>
<td></td>
<td>100.0 %</td>
</tr>
</tbody>
</table>

Test for overall effect: Z = 1.19 (P = 0.23)

Test for subgroup differences: Chi² = 5.04, df = 1 (P = 0.02), I² = 80%

---

Physical therapy for Bell's palsy (idiopathic facial paralysis) (Review) 
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### Analysis 4.3. Comparison 4 Exercise versus conventional treatment, Outcome 3 Mean time from completion of recovery (in weeks).

**Review:** Physical therapy for Bell’s palsy (idiopathic facial paralysis)

**Comparison:** 4 Exercise versus conventional treatment

**Outcome:** 3 Mean time from completion of recovery (in weeks)

<table>
<thead>
<tr>
<th>Study or subgroup</th>
<th>Facial exercise</th>
<th>Control</th>
<th>Mean Difference</th>
<th>Weight</th>
<th>Mean Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>Mean(SD)</td>
<td>N</td>
<td>Mean(SD)</td>
<td>N/Fixed 95% CI</td>
</tr>
<tr>
<td>1 Participants with mild paralysis</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wen 2004</td>
<td>24</td>
<td>3.8 (1.2)</td>
<td>19</td>
<td>4.2 (1.1)</td>
<td>100.0%</td>
</tr>
<tr>
<td><strong>Subtotal (95% CI)</strong></td>
<td>24</td>
<td></td>
<td>19</td>
<td></td>
<td>100.0%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Heterogeneity: not applicable</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Test for overall effect: Z = 1.14 (P = 0.26)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 Participants with moderate paralysis</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wen 2004</td>
<td>31</td>
<td>7.2 (1.8)</td>
<td>16</td>
<td>9.3 (1.7)</td>
<td>100.0%</td>
</tr>
<tr>
<td><strong>Subtotal (95% CI)</strong></td>
<td>31</td>
<td></td>
<td>16</td>
<td></td>
<td>100.0%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Heterogeneity: not applicable</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Test for overall effect: Z = 3.93 (P = 0.00004)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Test for subgroup differences: Ch^2 = 7.07, df = 1 (P = 0.01), I^2 = 86%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

-10 -5 0 5 10
Favours treatment Favours control
### Analysis 4.4. Comparison 4 Exercise versus conventional treatment, Outcome 4 Motor synkinesia after treatment.

Review: Physical therapy for Bell’s palsy (idiopathic facial paralysis)

Comparison: Exercise versus conventional treatment

Outcome: Motor synkinesia after treatment

<table>
<thead>
<tr>
<th>Study or subgroup</th>
<th>Exercises</th>
<th>Control</th>
<th>Risk Ratio</th>
<th>Risk Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n/N</td>
<td>n/N</td>
<td>M-H,Fixed,95% CI</td>
<td>M-H,Fixed,95% CI</td>
</tr>
<tr>
<td>1 After three months</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wen 2004</td>
<td>4/85</td>
<td>12/60</td>
<td>0.24 [0.08, 0.69]</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.005</td>
<td>0.1</td>
<td>1</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>200</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Analysis 5.1. Comparison 5 Exercise plus acupuncture versus acupuncture, Outcome 1 Number of participants without recovery.

Review: Physical therapy for Bell’s palsy (idiopathic facial paralysis)

Comparison: Exercise plus acupuncture versus acupuncture

Outcome: Number of participants without recovery

<table>
<thead>
<tr>
<th>Study or subgroup</th>
<th>ACP + Exercises</th>
<th>Acupuncture (ACP)</th>
<th>Risk Ratio</th>
<th>Weight</th>
<th>Risk Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n/N</td>
<td>n/N</td>
<td>M-H,Fixed,95% CI</td>
<td></td>
<td>M-H,Fixed,95% CI</td>
</tr>
<tr>
<td>1 After 14 days</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Zhang 2005</td>
<td>1/31</td>
<td>6/30</td>
<td>0.16 [0.02, 1.26]</td>
<td>67.0 %</td>
<td>0.16 [0.02, 1.26]</td>
</tr>
<tr>
<td></td>
<td>0.01</td>
<td>0.1</td>
<td>1</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td></td>
<td>100</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Subtotal (95% CI)</td>
<td>31</td>
<td>30</td>
<td>67.0 %</td>
<td>0.16 [0.02, 1.26]</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Total events: 1 (ACP + Exercises), 6 (Acupuncture (ACP))

Heterogeneity: not applicable

Test for overall effect: Z = 1.74 (P = 0.082)

2 After 60 days

| Zhang 2005 | 2/30 | 3/30 | 33.0 % | 0.67 [0.12, 3.71] |
| Subtotal (95% CI) | 30 | 30 | 33.0 % | 0.67 [0.12, 3.71] |
|                   |                 |                   |            |        |

Total events: 2 (ACP + Exercises), 3 (Acupuncture (ACP))

Heterogeneity: not applicable

Test for overall effect: Z = 0.46 (P = 0.64)

Total (95% CI) 61 60 | 100.0 % | 0.33 [0.09, 1.16] |

(Continued ...)
Analysis 5.2.  Comparison 5 Exercise plus acupuncture versus acupuncture, Outcome 2 Portmann Score.

Review:  Physical therapy for Bell’s palsy (idiopathic facial paralysis)

Comparison:  5 Exercise plus acupuncture versus acupuncture

Outcome:  2 Portmann Score

<table>
<thead>
<tr>
<th>Study or subgroup</th>
<th>Facial exercise</th>
<th>Control</th>
<th>Mean Difference</th>
<th>Mean Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>Mean(SD)</td>
<td>N</td>
<td>Mean(SD)</td>
</tr>
<tr>
<td>Wong 2004</td>
<td>43</td>
<td>18.72 (1.77)</td>
<td>31</td>
<td>10.25 (3.75)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>N</th>
<th>Mean(SD)</th>
<th>IV,Fixed,95% CI</th>
<th>IV,Fixed,95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

-0.16 0.01 1 10 100

Favours exercises  Favours control
### Analysis 5.3. Comparison 5 Exercise plus acupuncture versus acupuncture, Outcome 3 Mean House Brackmann score.

**Review:** Physical therapy for Bell's palsy (idiopathic facial paralysis)

**Comparison:** 5 Exercise plus acupuncture versus acupuncture

**Outcome:** 3 Mean House Brackmann score

<table>
<thead>
<tr>
<th>Study or subgroup</th>
<th>EXERC plus ACPT</th>
<th>ACP</th>
<th>Mean Difference</th>
<th>Mean Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>Mean(SD)</td>
<td>N</td>
<td>Mean(SD)</td>
</tr>
<tr>
<td>Qu 2005</td>
<td>30</td>
<td>4.2 (1.6)</td>
<td>30</td>
<td>9.5 (2.4)</td>
</tr>
</tbody>
</table>

-10 -5 0 5 10
Favours exercises Favours control

### Analysis 6.1. Comparison 6 Electrotherapy plus acupuncture versus acupuncture, Outcome 1 Number of participants without recovery.

**Review:** Physical therapy for Bell's palsy (idiopathic facial paralysis)

**Comparison:** 6 Electrotherapy plus acupuncture versus acupuncture

**Outcome:** 1 Number of participants without recovery

<table>
<thead>
<tr>
<th>Study or subgroup</th>
<th>Favours experimental</th>
<th>Control</th>
<th>Risk Ratio</th>
<th>Risk Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n/N</td>
<td>n/N</td>
<td>M-H,Fixed,95% CI</td>
<td>M-H,Fixed,95% CI</td>
</tr>
<tr>
<td>1 Shortwave diathermy plus acupuncture versus acupuncture</td>
<td>Pan 2004</td>
<td>1/38</td>
<td>2/37</td>
<td>0.49 [ 0.05, 5.14 ]</td>
</tr>
</tbody>
</table>

0 5 10 20
Favours physical therapy Favours control
Analysis 7.1. Comparison 7 Physical therapy versus acupuncture, Outcome 1 Number of participants without recovery.

Review: Physical therapy for Bell's palsy (idiopathic facial paralysis)

Comparison: 7 Physical therapy versus acupuncture

Outcome: 1 Number of participants without recovery

<table>
<thead>
<tr>
<th>Study or subgroup</th>
<th>Physical therapy</th>
<th>Acupuncture</th>
<th>Risk Difference</th>
<th>Risk Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n/N</td>
<td>n/N</td>
<td>M-H,Fixed,95% CI</td>
<td>M-H,Fixed,95% CI</td>
</tr>
<tr>
<td>1 Physical therapy versus acupuncture</td>
<td>Yang 2001</td>
<td>0/30</td>
<td>0/30</td>
<td>0.0 [-0.06, 0.06]</td>
</tr>
</tbody>
</table>

![Risk Difference Graph]

Favours physical therapy  Favours acupuncture

ADDITIONAL TABLES

Table 1. Electrostimulation for Bell's palsy (idiopathic facial paralysis)

Electrostimulation for Bell's palsy (idiopathic facial paralysis)

| Patient or population: patients with Bell's palsy (idiopathic facial paralysis) |
| Setting: ambulatory care |
| Intervention: electrostimulation |

<table>
<thead>
<tr>
<th>Outcomes</th>
<th>Illustrative comparative risks* (95% CI)</th>
<th>Relative effect (95% CI)</th>
<th>No of Participants (studies)</th>
<th>Quality of the evidence (GRADE)</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assumed risk</td>
<td>Corresponding risk</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Control</td>
<td>Electrostimulation</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Incomplete recovery after six months</td>
<td>26 per 100 (18 to 65)</td>
<td>RR 1.30 (0.68 to 2.5)</td>
<td>86 (1 study)</td>
<td>⊕⊕⊕ moderate</td>
<td>No significant difference</td>
</tr>
<tr>
<td>Incomplete recovery after 12 months</td>
<td>24 per 100 (13 to 56)</td>
<td>27 per 100 (13 to 56)</td>
<td>RR 1.15 (0.55 to 2.36)</td>
<td>86 (1 study)</td>
<td>⊕⊕⊕ moderate¹</td>
</tr>
<tr>
<td>-----------------------------------</td>
<td>-----------------------</td>
<td>-----------------------</td>
<td>------------------------</td>
<td>-------------</td>
<td>------------------</td>
</tr>
</tbody>
</table>

**Motor synkinesis six months after onset**
Follow-up: 6 months

<table>
<thead>
<tr>
<th></th>
<th>11 per 100 (8 to 38)</th>
<th>17 per 100 (8 to 38)</th>
<th>RR 1.52 (0.71 to 3.3)</th>
<th>142 (2 studies)</th>
<th>⊕⊕ low¹,²</th>
<th>From the limited results we inferred that no further change was likely between 3 and 6 months, so pooled data for the 2 time points. No significant difference</th>
</tr>
</thead>
</table>

**Adverse effects attributable to the intervention - not measured**

<table>
<thead>
<tr>
<th></th>
<th>See comment</th>
<th>See comment</th>
<th>Not estimable</th>
<th>-</th>
<th>See comment</th>
<th>The studies did not report on adverse events</th>
</tr>
</thead>
</table>

*The basis for the assumed risk (e.g. the median control group risk across studies) is provided in footnotes. The corresponding risk (and its 95% confidence interval) is based on the assumed risk in the comparison group and the relative effect of the intervention (and its 95% CI).

CI: Confidence interval; RR: Risk ratio;

**GRADE Working Group grades of evidence**

**High quality:** Further research is very unlikely to change our confidence in the estimate of effect.

**Moderate quality:** Further research is likely to have an important impact on our confidence in the estimate of effect and may change the estimate.

**Low quality:** Further research is very likely to have an important impact on our confidence in the estimate of effect and is likely to change the estimate.

**Very low quality:** We are very uncertain about the estimate.

¹ Assessor and participants were not blinded.

² Insufficient sample size and brief follow-up (one study had a follow-up of three months and the other six months).
Table 2. Electrostimulation compared to prednisone for Bell’s palsy (idiopathic facial paralysis)

<table>
<thead>
<tr>
<th>Outcomes</th>
<th>Illustrative comparative risks* (95% CI)</th>
<th>Relative effect (95% CI)</th>
<th>No of Participants (studies)</th>
<th>Quality of the evidence (GRADE)</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assumed risk</td>
<td>Corresponding risk</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Prednisone</td>
<td>Electrostimulation</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Incomplete recovery after six months</td>
<td>15 per 100 (6 to 29)</td>
<td>RR 0.85 (0.38 to 1.88)</td>
<td>149</td>
<td>⊕⊕⊕⊕  very low1,2,3</td>
<td>Methodological bias restricted the findings. Only the control group was treated with prednisone, an active treatment</td>
</tr>
<tr>
<td>Number of participants without recovery</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Follow-up: 6 months</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Incomplete recovery after 12 months - not measured</td>
<td>See comment</td>
<td>See comment</td>
<td>Not estimable</td>
<td>-</td>
<td>See comment</td>
</tr>
<tr>
<td>Number of participants without recovery</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Follow-up: 12 months</td>
<td></td>
<td></td>
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<tr>
<td>Motor synkinesis six months after onset - not reported</td>
<td>See comment</td>
<td>See comment</td>
<td>Not estimable</td>
<td>-</td>
<td>See comment</td>
</tr>
<tr>
<td>Number of participants without recovery</td>
<td></td>
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<tr>
<td>Follow-up: 6 months</td>
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<tr>
<td>Adverse effects attributable to the intervention - not measured</td>
<td>See comment</td>
<td>See comment</td>
<td>Not estimable</td>
<td>-</td>
<td>See comment</td>
</tr>
<tr>
<td>Number of participants without recovery</td>
<td></td>
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<tr>
<td>Follow-up: 6 months</td>
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</tbody>
</table>

*The basis for the assumed risk (e.g. the median control group risk across studies) is provided in footnotes. The corresponding risk (and its 95% confidence interval) is based on the assumed risk in the comparison group and the relative effect of the intervention (and its 95% CI).
CI: Confidence interval; RR: Risk ratio;
Table 2. Electrostimulation compared to prednisone for Bell's palsy (idiopathic facial paralysis) (Continued)

<table>
<thead>
<tr>
<th>GRADE Working Group grades of evidence</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>High quality:</strong> Further research is very unlikely to change our confidence in the estimate of effect.</td>
</tr>
<tr>
<td><strong>Moderate quality:</strong> Further research is likely to have an important impact on our confidence in the estimate of effect and may change the estimate.</td>
</tr>
<tr>
<td><strong>Low quality:</strong> Further research is very likely to have an important impact on our confidence in the estimate of effect and is likely to change the estimate.</td>
</tr>
<tr>
<td><strong>Very low quality:</strong> We are very uncertain about the estimate.</td>
</tr>
</tbody>
</table>

2. The intervention group (electrotherapy) was compared with an active group (prednisolone).
3. High number of drop outs (19.26%) with group allocation not defined.

**APPENDICES**

Appendix 1. MEDLINE search strategy

1. exp facial nerve diseases/
2. bell palsy/
3. facial paralysis/ or hemifacial paralysis/
4. ((bell$ or facial$ or hemifacial$ or unilateral$ or nerve$ or cranial$) adj3 (pals$ or paralys$ or paresi$ or spasm$)).mp.
5. or/1-4
6. exp exercise movement techniques/ or exp physical therapy modalities/
7. physical therapy.mp.
8. physio$.mp.
9. rehabilitation.mp.
10. exp Rehabilitation/
11. exercise$ therapy.mp.
12. Physical Fitness/
13. physical fitness.mp.
14. Motor Activity/
15. physical activit$.mp.
16. kinesiotherapy.mp.
17. stretch$.mp.
18. strengthen$.mp.
19. Physical Endurance/
20. endurance.mp.
21. "Biofeedback (Psychology)"/
22. biofeedback.mp.
23. Electromyography/
24. electromyography.mp.
25. electromyogram$.mp.
26. short-wave therapy/ or ultrasonic therapy/
27. (ultrasonic therapy or short wave therapy).mp.
28. Lasers/
29. laser$.mp.
30. iontophor$.mp.
31. manipulat$.mp
32. Cryotherapy/
33. cryotherap$.mp.
34. or/6-33
35. 34 and 5
36. randomised controlled trial.pt.
37. controlled clinical trial.pt.
38. randomised controlled trials/
39. random allocation/
40. double-blind method/
41. single-blind method/
42. or/36-41
43. animals/ not humans/
44. 42 not 43
45. clinical trial.pt.
46. exp clinical trials/
47. (clin$ adj25 trial$).ti,ab.
48. ((singl$ or doubl$ or tripl$ or trebl$) adj25 (blind$ or mask$)).ti,ab.
49. placebo/
50. placebo$.ti,ab.
51. random$.ti,ab.
52. research design/
53. or/45-52
54. 53 not 43
55. 54 not 44
56. comparative study/
57. exp evaluation studies/
58. follow up studies/
59. prospective studies/
60. (control$ or prospectiv$ or volunteer$).ti,ab.
61. or/56-60
62. 61 not 43
63. 62 not (44 or 55)
64. 44 or 55 or 63
65. 35 and 64
66 65 and 20080221:20100506.(ed). (124)
67 randomised controlled trial.pt. (290189)
68 controlled clinical trial.pt. (81509)
69 randomized.ab. (197790)
70 placebo.ab. (118731)
71 drug therapy.fs. (1376978)
72 randomly.ab. (143672)
73 trial.ab. (204591)
74 groups.ab. (965803)
75 or/67-74 (2533157)
76 (animals not (animals and humans)).sh. (3388815)
77 75 not 76 (2148022)
78 35 and 77 (401)
79 78 not 65 (185)
80 78 and 66 (49)
81 79 or 80 (234)
Appendix 2. EMBASE search strategy

1. exp nerve paralysis/
2. bell palsy/
3. facial nerve paralysis/ or hemifacial spasm/
4. ((bell$ or facial$ or hemifacial$ or unilateral$ or nerve$ or cranial$) adj3 (pals$ or paralys$ or paresi$ or spasm$)).mp.
5. or/1-4
6. exp physiotherapy/ or exp kinesiotherapy/
7. physical therapy.mp.
8. physio$.mp.
9. exp Rehabilitation/
10. exp Rehabilitation/ therapy.mp.
11. physical fitness.mp.
12. Motor Activity/
13. physical activit$.mp.
14. kinesiotherapy.mp.
15. stretch$.mp.
16. strengthen$.mp.
17. Physical Stress/
18. endurance.mp.
19. psychophysiology/
20. biofeedback.mp.
21. Electromyography/
22. electromyography.mp.
23. electromyogram$.mp.
24. diathermy/ or ultrasound therapy/
25. (ultrasonic therapy or short wave therapy).mp.
26. Laser/
27. laser$.mp.
28. iontophor$.mp.
29. manipulat$.mp.
30. Cryotherapy/
31. cryotherap$.mp.
32. or/6-33
33. 34 and 5
34. Randomized Controlled Trial/
35. Clinical Trial/
36. Multicenter Study/
37. Controlled Study/
38. Double Crossover Procedure/
39. Single Crossover Procedure/
40. Double Blind Procedure/
41. Single Blind Procedure/
42. exp RANDOMIZATION/
43. phase 2 clinical trial/ or phase 3 clinical trial/ or phase 4 clinical trial/
44. (clin$ adj25 trial$).tw.
45. phase 3 clinical trial/ or phase 4 clinical trial/
46. major randomized study	.
47. placebo$.tw.
48. random$.tw.
49. or/47-51
50. 49 and 51
51. (singl$ or doubl$ or tripl$ or trebl$) adj25 (blind$ or mask$)).tw.
Appendix 3. EBSCOhost CINAHL search strategy

S45 S44 and S26
S44 S43 or S42 or S41 or S40 or S39 or S38 or S37 or S36 or S35 or S34 or S33 or S32 or S31 or S30 or S29 or S28 or S27
S43 TI random* or AB random*
S42 (TI (cross?over or placebo* or control* or factorial or sham? or dummy) ) or ( AB (cross?over or placebo* or control* or factorial or sham? or dummy) )
S41 (TI (clin* or intervention* or compar* or experiment* or preventive or therapeutic) or AB (clin* or intervention* or compar* or experiment* or preventive or therapeutic) ) and ( TI (trial*) or AB (trial*) )
S40 (TI (meta?analys* or systematic review*) ) or ( AB (meta?analys* or systematic review*) )
S39 (TI (single* or doubl* or tripl* or trebl*) or AB (single* or doubl* or tripl* or trebl*) ) and ( TI (blind* or mask*) or AB (blind* or mask*) )
S38 ARAB design*
S37 PT clinical trial or PT systematic review
S36 (MH "Factorial Design")
S35 (MH "Concurrent Prospective Studies") or (MH "Prospective Studies")
S34 (MH "Meta Analysis")
S33 (MH "Solomon Four-Group Design") or (MH "Static Group Comparison")
S32 (MH "Quasi-Experimental Studies")
S31 (MH "Placebos")
S30 (MH "Double-Blind Studies") or (MH "Triple-Blind Studies")
S29 (MH "Clinical Trials")
Appendix 4. LILACS search strategy

((Pt ENSAIO CONTROLADO ALEATÓRIO OR Pt ENSAIO CLÍNICO CONTROLADO OR Mh ENSAIOS CONTROLADOS ALEATÓRIOS OR Mh DISTRIBUIÇÃO ALEATÓRIA OR Mh MÉTODO DÚPLICO-CEGO OR Mh MÉTODO SIMPLES-CEGO) AND NOT (Ct ANÍMULOS AND NOT (Ct HUMANO AND Ct ANÍMULOS)) OR (Pt ENSAIO CLÍNICO OR Ex E05.318.760.535$) OR (Tw clin$ AND (Tw trial$ OR Tw ensa$ OR Tw estud$ OR Tw experiment$ OR Tw investiga$)) OR ((Tw sing$ OR Tw simples$ OR Tw doubl$ OR Tw doble$ OR Tw duplica$ OR Tw trebl$ OR Tw trip$) AND (Tw blind$ OR Tw cego$ OR Tw cego$ OR Tw mask$ OR Tw mascar$)) OR Mh PLACEBOS OR Tw placebo$ OR (Tw random$ OR Tw random$ OR Tw acaso$ OR Tw acaso$ OR Tw aleator$) OR (Mh PROJETOS DE PESQUISA) AND NOT (Ct ANÍMULOS AND NOT (Ct HUMANO AND Ct ANÍMULOS)) OR (Ct ESTUDO COMPARATIVO OR Ex E05.337$ OR Mh SEGUIMENTOS OR Mh ESTUDOS PROSPECTIVOS OR Tw controlo$ OR Tw prospectivo$ OR Tw volunt$ OR Tw voluntário$) AND NOT (Ct ANÍMULOS AND NOT (Ct HUMANO AND Ct ANÍMULOS)) [Palavras]

AND

PARALYSIS$ or (INFLAMMATORY MONONEUROPATHIES$) or (PERIPHERAL NERVOUS SYSTEM DISEASES$) or (HERPES ZOSTER) or NEURALGIAS$ or HERPETIC or POSTHERPES or POST-HERPES or (DIABETIC NEUROPATHIES$) or NEURITIS$ or (PERIPHERAL NERVES$) or (NERVE TRAUMA) or (NERVE GRAFT) or (NERVE COMPRESSION SYNDROMES$) or (ENTRAPMENT NEUROPATHIES$) or (BELL PALSY) or (FACIAL PARALYSIS$) or (CRANIAL NERVE PALSY$) or (CRANIAL NERVE INJURIES$) or (FACIAL NERVE DISEASE$) [Palavras]

AND

(PHYSICAL THERAPY) or PHYSIOTHERAPY or REHABILITATION or (EXERCISE THERAPY) or (PHYSICAL EDUCATION TRAINING) or (PHYSICAL FITNESS$) or (PHYSICAL ACTIVITIES$) or KINESIOTHERAPIES$ or STRETCHING or STRENGTH-
ENING or ENDURANCE or BIOFEEDBACK or ELECTROMYOGRAPHY or ELECTROMYOGRAPHYS or ELECTROMYOGRAMS or BIOFEEDBACK or ULTRASONS or LASERS or (SHORT WAVE THERAPY) or IONTOPHORS or MANIPULAT$ or CRYOTHERAPY [Palavras]

Appendix 5. PEDro search strategy
Abstract & Titles: facial palsy
Therapy: no selection
Body part: no selection
Subdiscipline: no selection
Method: no selection
When searching: match all search terms (AND)

WHAT’S NEW
Last assessed as up-to-date: 21 February 2011.

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<tr>
<th>Date</th>
<th>Event</th>
<th>Description</th>
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<tr>
<td>20 January 2012</td>
<td>Amended</td>
<td>Editorial correction. No change in content.</td>
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HISTORY

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<th>Description</th>
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<tr>
<td>19 August 2011</td>
<td>New search has been performed</td>
<td>The review has been updated: new searches were performed and new databases included, 'Summary of findings' tables were constructed with GRADE assessments, new relevant studies were added, comments about other systematic reviews were included. Studies have been assessed using the 2008 Cochrane 'Risk of bias tool.</td>
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<tr>
<td>28 March 2011</td>
<td>New citation required and conclusions have changed</td>
<td>Two authors withdrew and there is one new author (JS Valbuza). Change to conclusions</td>
</tr>
<tr>
<td>19 March 2008</td>
<td>Amended</td>
<td>Converted to new review format.</td>
</tr>
</tbody>
</table>
CONTRIBUTIONS OF AUTHORS
LJT suggested the review, reviewed the literature wrote the primary version of the protocol and the review. JSV revised the paper and the findings of the included studies. VPV revised the protocol, the language and the search strategy. GFP gave specialist contributions. All authors approved the final text of the review.

DECLARATIONS OF INTEREST
LJT is co-author of the Cochrane overview of reviews, Interventions for Bell’s Palsy (idiopathic facial paralysis).
JSV, GFP: none known

SOURCES OF SUPPORT
Internal sources
- No sources of support supplied

External sources
- Cochrane Neuromuscular Disease Group, UK.

DIFFERENCES BETWEEN PROTOCOL AND REVIEW
The primary outcome was changed to incomplete recovery “preferably” six months after randomisation, because few trials lasted more than six months. The authors decided to include shorter trials and highlight their high risk of bias. Clinical trial databases were added to the searches (Current Controlled Trials, the National Research Register [NRR] archive, the US National Institutes of Health the Australian New Zealand Clinical Trial Registry). The ‘Risk of bias’ tool was changed. The GRADE method of assessment was used to create ‘Summary of findings’ tables. There was a change in authorship.

INDEX TERMS
Medical Subject Headings (MeSH)
*Physical Therapy Modalities; Acupuncture Therapy; Bell Palsy [*therapy]; Electric Stimulation Therapy [methods]; Exercise Therapy [methods]; Facial Muscles; Hot Temperature [therapeutic use]; Massage [methods]; Randomized Controlled Trials as Topic

MeSH check words
Humans