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# Poststroke Dysphagia

# Dysphagie post-AVC : évaluation de l'acupuncture

## 1. Systematic Reviews and Meta-Analysis

### 1.1. Generic Acupuncture

#### 1.1.1. Liao 2026 (Sustained efficacy)

Liao Z, Xu K, Gao L, Huang M, Jin H. Sustained efficacy of acupuncture in post-stroke dysphagia: a systematic review and meta-analysis. Front Neurol. 2026;17:1889347. https://doi.org/10.3389/fneur.2026.1889347

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| **Background** | Post-stroke dysphagia is a common complication of stroke with important consequences for recovery and quality of life. This systematic review and meta-analysis evaluated the short-term and sustained long-term efficacy (≥3 months after treatment) and safety of acupuncture for post-stroke dysphagia. |
| **Methods** | Web of Science, PubMed, Embase, the Cochrane Library, VIP, Wanfang, CNKI, and CBM were searched from inception to March 18, 2026, for randomized controlled trials published in English or Chinese. Two reviewers independently performed study selection, data extraction, and risk-of-bias assessment. Meta-analyses were conducted using Review Manager 5.4 and Stata 18.0. |
| **Results** | **Twenty-three RCTs involving 2,224 patients** were included. In the short term, acupuncture improved the Water Swallowing Test (WST) effective rate (RR = 1.50, 95% CI 1.31-1.73; *p* < 0.001) and reduced Standardized Swallowing Assessment (SSA) scores (MD = -3.33, 95% CI -4.46 to -2.19; *p* < 0.001). Benefits remained statistically significant at ≥3 months for WST effective rate (RR = 1.38, 95% CI 1.21-1.58; *p* < 0.001), SSA scores (MD = -4.92, 95% CI -6.54 to -3.31; *p* < 0.001), and SWAL-QOL (MD = 23.56; *p* = 0.010). Subgroup analyses suggested greater WST improvement when acupuncture was initiated during the subacute/recovery phase. Electroacupuncture showed a possible advantage for WST (*p* = 0.08), but not for SSA (*p* = 0.56). Acupuncture-related adverse events were limited to mild local reactions (RD = 0.11; *p* < 0.001). |
| **Conclusion** | Acupuncture may improve swallowing function and quality of life in post-stroke dysphagia, with effects apparently sustained for at least 3 months after treatment. Certainty of evidence was low to moderate for short-term outcomes, low for long-term WST and SSA outcomes, and very low for long-term SWAL-QOL, mainly because of performance bias, publication bias, and imprecision from limited long-term sample sizes. |

#### 1.1.2. Wilkinson 2026

Wilkinson G, Everton LF, Bath PM, Benfield JK. Swallowing therapy for dysphagia in acute and

subacute stroke. Cochrane Database Syst Rev. 2026;8:CD000323.
https://doi.org/10.1002/14651858.CD000323.pub4

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| **Rationale** | Post-stroke dysphagia ((PSD) impaired swallowing following stroke), increases risk of death, yet the effects of potential treatments are unclear. This review updates the 2018 review. |
| **Objectives** | To assess the effects of swallowing therapies on swallowing impairment (SI) among stroke survivors with dysphagia, within six months of stroke onset. |
| **Methods** | *Search methods*: We searched MEDLINE, Embase, OVID, three other databases and trials registries on 31 July 2025. *Eligibility criteria*: Randomised controlled trials (RCTs) that compared interventions for PSD with usual care. *Outcomes:* Critical outcome: SI. Important outcomes: dysphagia at end of trial (DET), penetration/aspiration scale (PAS) score, chest infection or pneumonia (CI/P), and decannulation. *Risk of bias:* We assessed risk of bias using the Cochrane Risk of bias 1 tool (RoB 1). *Synthesis methods:* We calculated odds ratios (ORs), mean differences (MDs) and standardised mean differences (SMDs), with 95% confidence intervals (CIs), using random-effects models. We assessed the certainty of evidence with GRADE. *Included studies:* We included 181 trials with 11,500 participants (140 new trials (8840 participants) in this update) that compared usual care with **acupuncture**, behavioural interventions, drug interventions, neuromuscular electrical stimulation (NMES), pharyngeal electrical stimulation (PES), physical stimulation, theta burst stimulation (TBS), transcranial direct current stimulation (tDCS), transcranial magnetic stimulation (TMS), vagal nerve stimulation and combined interventions. |

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| **Synthesis of results** | **Acupuncture** may reduce SI but effects are uncertain (SMD -1.20, 95% CI -1.50 to -0.90; 37 RCTs, 3335 participants; very low-certainty evidence); probably reduces DET (OR 0.40, 95% CI 0.33 to 0.47; 36 RCTs, 3647 participants) and PAS (MD -0.90, 95% CI -1.25 to -0.56; 8 RCTs, 496 participants) (both moderate-certainty evidence); and may reduce CI/P (OR 0.47, 95% CI 0.25 to 0.85; 4 RCTs, 426 participants; low-certainty evidence). Behavioural interventions may reduce SI (SMD -1.17, 95% CI -1.60 to -0.74; 26 RCTs, 1224 participants) and DET (OR 0.41, 95% CI 0.30 to 0.57; 9 RCTs, 958 participants), and have little to no effect on decannulation (OR 0.17, 95% CI 0.01 to 3.88, 1 RCT, 22 participants), but effects are uncertain (all very low-certainty evidence); and may reduce PAS (MD -0.99, 95% CI -1.42 to -0.55; 16 RCTs, 586 participants) and CI/P (OR 0.45, 95% 0.27 to 0.76; 8 RCTs, 784 participants) (both low-certainty evidence). Drug interventions may reduce SI but effects are uncertain (SMD -0.89, 95% CI -1.62 to -0.15; 3 RCTs, 140 participants; very low-certainty evidence); may have little to no effect on DET (OR 0.48, 95% CI 0.07 to 3.35; 1 RCT, 17 participants; low-certainty evidence); and probably reduce CI/P (drug therapy: 27% versus control: 87%, OR 0.06, 95% CI 0.01 to 0.21; 1 RCT, 60 participants; moderate-certainty evidence). NMES probably reduces SI (SMD -0.69, 95% CI -1.01 to -0.37; 20 RCTs, 866 participants; moderate-certainty evidence); and may reduce DET (OR 0.43, 95% CI 0.28, 0.67; 7 RCTs, 383 participants) but not PAS (MD -0.71, 95% CI -1.75 to 0.34; 6 RCTs, 155 participants) or CI/P (OR 0.30, 95% CI 0.03 to 3.03; 4 RCTs, 189 participants) though the effects are uncertain (all very low-certainty evidence). PES may have little to no effect on SI (SMD -0.15, 95% CI -0.46 to 0.16; 5 RCTs, 272 participants), but may reduce PAS (MD -0.74, 95% CI -1.44 to -0.03; 5 RCTs, 195 participants) and CI/P (OR 0.33, 95% CI 0.12 to 0.93; 2 RCTs, 88 participants); all low-certainty evidence. PES probably has little to no effect on DET (DET: 68% control: 78%; OR 0.55, 95% CI 0.15 to 2.11; 3 RCTs, 66 participants) but probably increases decannulation (OR 0.09, 95% CI 95% CI 0.03 to 0.28; 2 RCTs, 98 participants; moderate-certainty evidence). Physical stimulation may reduce SI (SMD -0.78, 95% CI -1.29 to -0.26; 3 RCTs, 228 participants), DET (OR 0.29, 95% CI 0.14 to 0.60; 4 RCTs, 350 participants), and CI/P (OR 0.20, 95% CI 0.05 to 0.76; 1 RCT, 96 participants); all low-certainty evidence. TBS may reduce SI (SMD -0.81, 95% CI -1.06 to -0.56; 5 RCTs, 280 participants; low-certainty evidence) and PAS but effects are uncertain (MD -1.26, 95% CI -2.04 to -0.48; 5 RCTs, 280 participants; very low-certainty evidence). tDCS: probably reduces SI (SMD -0.63, 95% CI -0.81 to -0.44; 14 RCTs, 496 participants; moderate-certainty evidence), may reduce DET (OR 0.28, 95% CI 0.09 to 0.88; 3 RCTs, 118 participants; low-certainty evidence), but effects on PAS are unclear (MD -0.82, 95% CI -1.83 to 0.18; 4 RCTs, 135 participants; very low-certainty evidence). TMS: may reduce SI (SMD -1.03, 95% CI -1.38 to -0.69; 17 RCTs, 661 participants; low-certainty evidence) and likely reduces PAS (MD -1.19, 95% CI -1.53 to -0.85; 12 RCTs, 519 participants; moderate-certainty evidence). Vagus nerve stimulation probably reduces SI (SMD -1.27, 95% CI -1.97 to -0.58; 1 RCT, 39 participants; moderate-certainty evidence). Combined therapies probably reduce SI (SMD -1.45, 95% CI -2.04 to -0.85; 8 RCTs, 334 participants), but not CI/P (OR 0.08, 95% CI 0.00 to 1.47; 1 RCT, 70 participants) (both moderate-certainty evidence), and may make little to no difference to DET (OR 0.19, 95% CI 0.03 to 1.34; 2 RCTs, 65 participants; low-certainty evidence). |
| **Authors' conclusions** | Conclusions from our analyses are limited by small trials at high or unclear risk of bias, publication bias and inconsistent results. Large high-quality trials on specific interventions are needed. |

### 1.1.3. Yue 2026

Yue J, Wang X, Li C, Wang L, Li X. Comparative efficacy of different interventions for post-stroke cricopharyngeal achalasia: a systematic review and network meta-analysis. Front Neurol. 2026;17:1802305. https://doi.org/10.3389/fneur.2026.1802305

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| **Objective** | This study aims to employ network meta-analysis to systematically compare and evaluate the efficacy of various interventions for post-stroke cricopharyngeal achalasia. |
| **Methods** | We searched 10 databases and trial registries from inception to December 3, 2025, to identify randomized controlled trials (RCTs) on cricopharyngeal achalasia after stroke. Two investigators independently screened studies, extracted data, and assessed risk of bias. The outcome indicators included effective rate, videofluoroscopic swallowing study (VFSS) score, Functional Oral Intake Scale (FOIS) score, and Standardized Swallowing Assessment (SSA) score. |
| **Results** | A total of 36 articles covering 13 interventions were included. Network meta-analysis revealed: ① Regarding the evaluation of effective rate, the top three interventions based on SUCRA values were: balloon dilation combined with repetitive transcranial magnetic stimulation (rTMS) (91.8%) > balloon dilation combined with electromyographic biofeedback (EMGBF) (82.8%) > balloon dilation combined with **acupuncture (79.4%)**; ② For the VFSS assessment, the highest SUCRA rankings were: balloon dilation combined with acupuncture (92.0%) > balloon dilation combined with tongue pressure resistance feedback (TPRF) (79.6%) > balloon dilation combined with botulinum toxin type A (BTX-A) (78.4%); ③ Concerning the FOIS evaluation, the top three SUCRA values were: balloon dilation combined with BTX-A (87.4%) > balloon dilation combined with transcranial direct current stimulation (tDCS) (83.0%) > balloon dilation combined with acupuncture (76.8%); ④ In the SSA evaluation, the leading interventions by SUCRA were: balloon dilation combined with acupuncture (80.0%) > balloon dilation combined with BTX-A (69.5%) > balloon dilation combined with rTMS (68.5%). |
| **Conclusion** | Intervention efficacy varied across outcome measures. **Balloon dilation combined with acupuncture** may be the optimal intervention for improving VFSS scores and reducing SSA scores. Balloon dilation combined with BTX-A may be optimal for improving FOIS scores, and balloon dilation combined with rTMS may be optimal for increasing the effective rate. However, given the small sample sizes of included studies, inadequate allocation concealment and blinding, and potential publication bias for some outcomes, the present findings should be interpreted with caution. Further high-quality studies are warranted to validate these results. |

### 1.1.4. Zhang B 2025

Zhang B, Wong KP, Guo C, Chen SC, Fu S, Kang R, Xiao Q, Qin J. Effects of Non-Pharmacological Interventions on the Swallowing Function of Patients With Post-Stroke Dysphagia: A Systematic Review and Network Meta-Analysis. J Oral Rehabil. 2025 Jan;52(1):109-120. https://doi.org/10.1111/joor.13901

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| **Backgound** | Post-stroke dysphagia can lead to serious complications and appropriate rehabilitation can significantly improve swallowing function. However, the best rehabilitation method for post-stroke dysphagia patients is not clear at the present stage, so it is necessary to conduct a comprehensive network meta-analysis and systematic review of different interventions for dysphagia. |
| **Objective** | To compare the effectiveness and ranking of different interventions for improving swallowing function, and feeding and daily function in patients with post-stroke dysphagia. |
| **Methods** | Seven databases were searched from the date of inception to September 1, 2022. Two investigators independently conducted literature searches, selected randomized controlled trials on dysphagia interventions, and assessed study quality. Network meta-analysis was conducted by using Stata software. |

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| **Results** | A total of 33 studies involving 1,341 patients were included. According to the ranking probabilities, **acupuncture** was rated as the most effective of all interventions to enhance patients' swallowing function (surface under cumulative ranking curve values [SUCRCV]: 99.0%, standardized mean difference [SMD]: -2.40, 95% confidence interval [CI]: -3.38 to -1.43), followed by the chin tuck against resistance exercise (CTAR, SUCRA: 89.9%, SMD: -1.83, 95% CI: -2.69 to -0.97). Among all the interventions, acupuncture was the most effective for feeding and daily function (SUCRCV: 88.4%, SMD: -1.62, 95% CI: -2.94 to -0.30). |
| **Conclusions** | The results showed that **acupuncture was the most effective in the rehabilitation of patients with post-stroke dysphagia**, followed by CTAR. Considering that CTAR is a low-cost and highly feasible intervention, we suggest that CTAR should be selected as a rehabilitation measure for patients with post-stroke dysphagia to improve their swallowing function. |

### 1.1.5. Zhang J 2025

Zhang J, Wu M, Li X, Yu D, Jia H, Wang B, Wang Y, Su Y, Wei X, Zhu L. Effect of Acupuncture on Dysphagia after Stroke: A Meta-Analysis and Trial Sequential Analysis of Randomized Controlled Trials. Meta-Analysis Cerebrovasc Dis. 2025;54(6):995-1015. https://doi.org/10.1159/000544743

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| **Background** | Poststroke dysphagia (PSD) is a highly prevalent dysfunction after stroke, characterized by high mortality and seriously affecting the quality of life of patients. Previous studies have shown that acupuncture improves symptoms of PSD. However, repeated tests of significance may exaggerate type I errors. The aim of the study was to update the evidence on the effectiveness and safety of acupuncture for PSD using a meta-analysis and trial sequential analysis (TSA). |
| **Methods** | A comprehensive search of PubMed, Embase, Cochrane Library, and Web of Science was conducted to identify randomized controlled trials evaluating the effects of acupuncture on PSD. Trials published up to September 15, 2024, meeting the predetermined inclusion criteria, were included. |
| **Results** | **Twenty studies involving 1,718 participants** were included. Combined acupuncture with rehabilitation therapies significantly improved the Standard Swallowing Assessment (mean difference [MD] = -3.64, 95% confidence interval [CI]: -4.72 to -2.56, $p < 0.0001$), Video Fluoroscopic Swallowing Study scale (MD = 1.49, 95% CI: 0.89 to 2.09, $p < 0.0001$), Water Swallow Test (MD = -0.72, 95% CI: -0.96 to -0.47, $p < 0.0001$), and Swallowing Quality of Life Questionnaire (MD = 16.56, 95% CI: 9.94 to 23.18, $p < 0.0001$). TSA indicated that the sample size exceeded the required information size. In addition, acupuncture showed safety for PSD treatment (relative ratio = 1.23, 95% CI: 0.70 to 2.17, $p = 0.48$); however, the sample size was insufficient. |
| **Conclusion** | TSA demonstrated the positive effects of acupuncture on swallowing function in patients with PSD. Nonetheless, high-quality trials are needed to validate the safety of acupuncture. |

### 1.1.6. Zhuang 2024

Zhuang Y, Wang X, Yin X, Li X, Liu W. Exploration of treatment methods for patients with post-stroke dysphagia: a network meta-analysis. Biotechnol Genet Eng Rev. 2024 Apr;40(1):436-453. https://doi.org/10.1080/02648725.2023.2184044

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| **Objective** | To compare the effects of various therapies in patients with post-stroke dysphagia. |

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| **Methods** | Data sources: We searched databases between January 1980 and 2022. Study eligibility criteria: Randomized controlled trials (RCTs) on therapy for dysphagia after stroke. |
| **Study appraisal and synthesis methods** | The outcomes were improvement in dysphagia, case fatality, and chest infection or pneumonia, reported as OR (odd ratio), 95% CrI (confidence interval), and SUCRA (the surface under the cumulative ranking curve analysis) score. Forty-two randomized controlled trials (2,993 patients, seven therapies, and one control) were included. In the improvement of dysphagia analysis, the following therapies were superior to the control: **Acupuncture**, behavioral interventions, drug therapy, neuromuscular electrical stimulation (NMES) and pharyngeal electrical stimulation (PES). In the case fatality analysis, OR and 95% CrI indicated none of the therapies were superior to the control. In the chest infection or pneumonia analysis, OR values showed that no therapy was superior to the control. Our Network Meta-analysis suggests that commonly used therapies for dysphagia after stroke have equal efficacies. |

### 1.1.7. Luo 2023 (combined with balloon dilation)

Luo J, Huang B, Zheng H, Yang Z, Xu M, Xu Z, Ma W, Lin R, Feng Z, Wu M, Cui S. Acupuncture combined with balloon dilation for post-stroke cricopharyngeal achalasia: A meta-analysis of randomized controlled trials. Front Neurosci. 2023 Jan 12;16:1092443. https://doi.org/10.3389/fnins.2022.1092443

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| **Background** | The purpose of this study was to systematically evaluate the effectiveness of acupuncture combined with balloon dilatation in patients with post-stroke cricopharyngeal achalasia (CPA) according to the effective rate, videofluoroscopy swallowing study (VFSS) score and standardized swallowing function assessment scale (SSA) score through Meta-analysis. |
| **Methods** | English and Chinese language literature published before July 24,2022 were searched in ten electronic databases. The identified articles were screened, data were extracted, and the methodological quality of the included trials was assessed. Using RevMan 5.4.1 software to perform Meta-analysis. |
| **Results** | **10 studies with 517 patients** with post-stroke CPA were included. Meta-analysis showed that the effective rate of the experience group was higher than that of the control group [OR = 0.62; 95% CI (2.32, 13.05); I 2 = 0%; p = 0.0001]. Compared to the control group, the SSA score was lower in the experience group [MD = -4.22; 95% CI (-4.57, -3.87); I 2 = 42%; p < 0.00001]. In terms of VFSS scores, the experience group showed greater efficacy differences than control group [MD = 1.53; 95% CI (1.32, 1.75); I 2 = 0%; p < 0.00001]. The subgroup analysis of VFSS score based on the average course of disease (<1 month vs. ≥1 month) showed no significant difference. The subgroup analysis based on average age (>60 years vs. ≤60 years) showed the VFSS score of the experience group was significantly higher than that of the control group, and the effect may be better in the subgroup older than 60 years. The subgroup analysis based on the treatment course (>30 days vs. ≤30 days) showed the VFSS score of the experience group was significantly higher than that of the control group, and the effect may be better in the subgroup the treatment course>30 days. |
| **Conclusion** | Acupuncture combined with balloon dilatation may be an effective method for treating post-stroke CPA. Compared with balloon dilatation, acupuncture combined with balloon can significantly improve the swallowing function of patients, and it is also effective for patients of different courses, ages, and treatment course, while patients over 60 years old and the treatment course over 30 days may have better clinical outcomes. |

### 1.1.8. Zhu 2023

Zhu H, Deng X, Luan G, Zhang Y, Wu Y. Comparison of efficacy of non-pharmacological intervention for post-stroke dysphagia: a systematic review and Bayesian network meta-analysis. BMC Neurosci. 2023 Oct 16;24(1):53. https://doi.org/10.1186/s12868-023-00825-0

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| **Backgound** | Increasingly, non-pharmacological interventions are being identified and applied to post-stroke dysphagia. Nevertheless, there is insufficient evidence to assess which type of interventions are more effective. |
| **Methods** | In this study, the randomized controlled trials of non-pharmacological interventions on post-stroke dysphagia were retrieved from the relevant databases. Including 96 studies and 12 non-drug treatments. Then, and the network meta-analysis is carried out by statistical software. |
| **Results** | The results show: In the aspects of videofluoroscopic swallowing study (VFSS), Standardized Swallowing Assessment (SSA), swallowing-quality of life (SWAL-QOL), Water swallow test (WST); **Acupuncture** + electrotherapy + rehabilitation training, **acupuncture** + rehabilitation training + massage, electrotherapy + rehabilitation training, **acupuncture** + electrotherapy + rehabilitation training, electrotherapy, **acupuncture** + rehabilitation training + **acupoints sticking application** have significant effects in post-stroke dysphagia. Compared with other interventions, they have more advantages in improving the above indicators. |
| **Conclusion** | A substantial number of high-quality randomized clinical trials are still necessary in the prospective to validate the therapeutic effectiveness of non-pharmacological interventions in post-stroke dysphagia and the results of this Bayesian network meta-analysis. |

### 1.1.9. Balcerak 2022

Balcerak P, Corbiere S, Zubal R, Kägi G. Post-stroke Dysphagia: Prognosis and Treatment-A Systematic Review of RCT on Interventional Treatments for Dysphagia Following Subacute Stroke. Front Neurol. 2022 Apr 25;13:823189. https://doi.org/10.3389/fneur.2022.823189

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| **Purpose** | Post-stroke dysphagia is an underdiagnosed but relevant complication, associated with worse outcome, dependency and quality of life of stroke survivors. Detailed mechanisms of post-stroke dysphagia are not very well understood, but established therapeutic concepts are needed. Different interventional studies have been published dealing with post-stroke dysphagia. This systematic review wants to collect and give an overview over the published evidence. |
| **Methods** | PubMed, Embase, Cochrane, CINAHL were searched for relevant interventional studies on post-stroke dysphagia in the (sub-)acute setting (within 3 months of stroke onset). The search has been filtered for randomized trials with an inactive control and the relevant data extracted. |
| **Results** | After initially finding 2,863 trials, finally **41 trials** have been included. Seven different therapeutic concepts have been evaluated (**Acupuncture**, behavioral/physical therapy, drug therapy, neuromuscular electrical stimulation, pharyngeal electrical stimulation, transcranial direct current stimulation and repetitive transcranial magnetic stimulation). Studies of all modalities have shown some effect on post-stroke dysphagia with several studies raising concerns about the potential bias. |
| **Conclusion** | The amount and quality of studies are not enough to suggest certain therapies. Some therapeutical concepts (intensive physical therapy, transcranial magnetic stimulation, drug therapy) seem to be good potential therapeutic options, but further research is needed. |

### 1.1.10. Jiang 2022

Jiang H, Zhang Q, Zhao Q, Chen H, Nan X, Liu M, Yin C, Liu W, Fan X, Meng Z, Du Y. Manual Acupuncture or Combination of Rehabilitation Therapy to Treat Poststroke Dysphagia: A Systematic Review and Meta-Analysis of Randomized Controlled Trials. Evid Based Complement Alternat Med. 2022 Oct 15;2022:8803507. https://doi.org/10.1155/2022/8803507

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| **Background and Objective** | Poststroke dysphagia is one of the most common stroke complications with high morbidity and long course, while acupuncture treatment is easily accepted by patients due to its reliability, feasibility, simple operation, low price, and quick effect. Our objective was to evaluate the efficacy of manual acupuncture in poststroke dysphagia patients. |
| **Methods** | Databases including Medline, Web of Science, PubMed, Cochrane Library databases, EMBASE, CNKI (China National Knowledge Infrastructure), WanFang (WanFang Database), and VIP (Chongqing VIP) were searched from inception until Aug 19, 2022. Data were analyzed using Revman 5.3, Stata 14.0, and TSA 0.9.5.10 Beta software. Evidence quality evaluation was performed by using GRADE profiler 3.6. |
| **Results** | A total of **33 randomized control trials (RCTs) enrolled 2680 patients**. Meta-analysis results revealed that compared to rehabilitation, acupuncture decreased water swallow test (WST) and standard swallowing assessment (SSA) scores. Meanwhile, in contrast to rehabilitation alone, integration of acupuncture with rehabilitation effectively decreased WST and SSA scores; improved swallowing scores of videofluoroscopic swallowing study (VFSS), swallowing scores of Fujishima Ichiro, Barthel index (BI), and swallowing quality of life questionnaire (SWAL-QOL); reduced the aspiration rates as well as aspiration pneumonia; and shortened the duration of empty swallowing and the duration of 5 mL water swallowing. Pooled analysis did not reveal any significant differences in dysphagia outcome severity scores (DOSS) ($p=0.15 > 0.05p$) between the acupuncture group combined with rehabilitation group and the rehabilitation group alone. After the risk-of-bias assessment, these studies were not of low quality, except in terms of allocation concealment and blindness. Evidence quality evaluation showed that allocation concealment and blindness led to a downgrade and primary outcomes' evaluation of acupuncture combined with rehabilitation were ranked as moderate-quality evidence while acupuncture alone was ranked as low-quality. |
| **Conclusion** | This meta-analysis provided positive pieces of evidences that acupuncture and acupuncture combined with rehabilitation were better than using rehabilitation alone in the treatment of poststroke dysphagia. |

### 1.1.11. Wang 2022

Wang P, Ma X, Huang J, Li J, Ma L, Xu D, Yan P. Effect of acupuncture treatment on dysphagia caused by pseudobulbar paralysis after stroke: a systematic review and meta-analysis. Ann Palliat Med. 2022 Jul;11(7):2257-2264. https://doi.org/10.21037/apm-21-3551.

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| **Background** | The efficacy of acupuncture in the treatment of dysphagia caused by pseudobulbar paralysis after stroke is lack of evidence-based medicine. Our objective was to synthesize the efficacy of acupuncture in treating dysphagia caused by pseudobulbar paralysis after stroke. |

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| **Methods** | A comprehensive literature search was performed in 9 databases [PubMed, Web of Science, Embase, Cochrane, Chinese BioMedical Literature Database (CBM), China National Knowledge Infrastructure (CNKI), WanFang Data, Chinese Science and Technology Periodicals database (VIP), and Open Grey online database] to screen eligible randomized controlled studies that evaluated the effect of acupuncture in dysphagia caused by pseudobulbar paralysis after stroke. The search time limit is from establishing the database to October 1, 2020. The random-effects model was used to calculate the significant effect size. |
| **Results** | A total of **7 studies comprising 637 participants** were included in our meta-analysis. The results showed that compared with rehabilitation, acupuncture had a significant effect on improving dysphagia caused by pseudobulbar paralysis after stroke [the significant effective size: risk ratio (RR)sig =1.51; 95% confidence interval (CI): 1.30-1.75; I2=0%]. In the subgroup analyses, the RRsig of acupuncture + rehabilitation vs. rehabilitation was 1.56 (95% CI: 1.30-1.87; I2=0%), and the RRsig of acupuncture vs. rehabilitation was 1.38 (95% CI: 1.08-1.76; I2=0.8%). |
| **Discussion** | Acupuncture can be used as an effective treatment for dysphagia caused by pseudobulbar paralysis after stroke. Acupuncture combined with rehabilitation therapy has better effects. |

### 1.1.12. Zhong 2022

Zhong LL, Zheng Y, Lau AY, Wong N, Yao L, Wu X, Shao T, Lu Z, Li H, Yuen CS, Guo J, Lo S, Chau J, Chan KW, Ng BFL, Bian Z, Yu EC. Would integrated Western and traditional Chinese medicine have more benefits for stroke rehabilitation? A systematic review and meta-analysis. Stroke Vasc Neurol. 2022 Feb;7(1):77-85. https://doi.org/10.1136/svn-2020-000781

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| **Background** | Stroke is a major cause of death or long-term disability worldwide. Many patients with stroke receive integrative therapy consisting of Western medicine (WM) and routine rehabilitation in conjunction with Chinese medicine (CM), such as acupuncture and Chinese herbal medicine. However, there is no available evidence on the effectiveness of the combined use of WM and CM interventions in stroke rehabilitation. |
| **Aims** | The purpose of this meta-analysis is to evaluate the results of all individual studies to assess the combined use of CM and WM in stroke rehabilitation compared with WM only. |
| **Methods** | The Preferred Reporting Items for Systematic Reviews and Meta-Analysis guidelines were followed. MEDLINE, EMBASE, Cochrane and China National Knowledge Infrastructure (CNKI) were searched. The included outcomes were dependency, motor function, depression and swallowing function. Subgroup analysis was performed, and publication bias was assessed using funnel plots. |
| **Summary of review** | 58 studies and 6339 patients were included in the meta-analysis. **Subgroup analysis revealed that combined therapy comprising both acupuncture and WM had a superior effect on improving dependency and swallowing function** compared with standard WM therapy alone. Potential superiority of combined therapy comprising CM and WM in improving depression compared with standard WM therapy was also found. |

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| **Conclusions** | Our results indicate that the combined use of CM and WM could be more efficacious in stroke rehabilitation compared with the use of WM therapy alone. However, most studies were short in duration (2 to 4 weeks) and prone to different types of biases, which prevents making any conclusion regarding the long-term effects and raises concerns regarding true efficacy in context of high likelihood of Hawthorn bias. So, more randomised controlled trials with more rigorous design and longer duration of treatment and follow-up need to be conducted to compare WM alone versus WM and CM combined. |

### 1.1.13. Lu 2021

Lu Y, Chen Y, Huang D, Li J. Efficacy of acupuncture for dysphagia after stroke: a systematic review and meta-analysis. Ann Palliat Med. 2021;10(3):3410-3422. [218335]. doi

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| **Background** | The risk of dysphagia after stroke is extremely high. The efficacy of acupuncture in the treatment of dysphagia after stroke lacks high-level evidence-based medical support. This study aimed to systematically evaluate the clinical value of acupuncture therapy in patients with dysphagia after stroke. |
| **Methods** | A electronic search of six databases were used to screen for randomized controlled trials (RCTs) of acupuncture treatment of patients with dysphagia after stroke. The search time was from the establishment of the database to 18 October 2020, and the search languages were limited to Chinese and English. The literature was screened and the data extracted independently by two researchers. The Cochrane System Evaluation Manual was used to evaluate the quality of the included literature. |
| **Results** | A total of **39 RCTs** were included, of which 36 studies reported the effective rate of acupuncture treatment for dysphagia. The effective rate of the experimental group was higher than that of the control group [relative risk (RR) =1.23, 95% confidence interval (CI): 1.19 to 1.27, P<0.00001]. The drinking test grading score of patients in the experimental group was lower than that of the control group [mean difference (MD) =-0.75, 95% CI: -1.11 to -0.41, P<0.0001] in 8 studies. The swallowing scores of patients in the experimental group were lower than those in the control group (MD =-4.63, 95% CI: -5.68 to -3.59, P<0.00001) in 8 studies. The Fujishima eating-swallowing rating score of the experimental group was higher than that of the control group [standardized mean difference (SMD) =1.92, 95% CI: 1.30 to 2.54, P<0.00001] in 3 studies. The score of the dysphagia-specific quality of life scale of the experimental group was higher than that of the control group (SMD =2.02, 95% CI: 0.82 to 3.22, P=0.0001) in 5 studies. The VFSS of the experimental group was higher than that of the control group (MD =2.53, 95% CI: 1.89 to 3.17, P<0.00001) in 5 studies. |
| **Conclusions** | The existing evidence supports that acupuncture therapy can significantly improve the swallowing function of patients with dysphagia. |

### 1.1.14. Zhong 2021

Zhong L, Wang J, Li F, Bao X, Liu H, Wang P. The Effectiveness of Acupuncture for Dysphagia after Stroke: A Systematic Review and Meta-Analysis. Evid Based Complement Alternat Med. 2021. [216622]. doi

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| **Objectives** | This study reviewed and evaluated existing evidence of the efficacy of acupuncture as a clinical treatment for dysphagia after stroke. |

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| **Methods** | Five English and four Chinese databases were searched from inception to March 2020. All randomized controlled trials (RCTs) incorporating acupuncture or acupuncture combined with other interventions for the treatment of dysphagia after stroke were enrolled. All data were independently assessed and extracted by two authors. The bias risk assessment recommended by the Cochrane Collaboration's tool was used to assess the quality of the selected studies. This meta-analysis was conducted by using RevMan 5.3. Pooled analyses were calculated by the mean difference (MD) and 95% confidence interval (CI). Heterogeneity was assessed by the I 2 test. |
| **Results** | **Thirty-five studies involving 3024 patients** were analyzed. The meta-analysis showed that the therapeutic efficacy of acupuncture combined with other interventions was better than that of the control group for the standardized swallowing assessment (SSA) score (MD = -3.78, 95% CI: -4.64 to -2.91, P < 0.00001), Ichiro Fujishima rating scale (IFRS) score (MD = 1.68, 95% CI: 1.16 to 2.20, P < 0.00001), videofluoroscopic swallowing study (VFSS) score (MD = 2.26, 95% CI: 1.77 to 2.74, P < 0.00001), and water swallowing test (WST) score (MD = -1.21, 95% CI: -1.85 to -0.57, P= 0.0002). In studies reporting adverse effects, no serious outcome from an adverse event was confirmed. |
| **Conclusion** | This systematic review indicated that acupuncture could be an effective therapy for treating dysphagia after stroke although stricter evaluation standards and rigorously designed RCTs are needed. |

### 1.1.15. Tang 2020 ☆

Tan Shiyun. [Meta analysis of acupuncture combined with swallowing function training in the treatment of dysphagia after stroke]. China Medical Herald. 2020. [212935].

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| **Objective** | To evaluate the efficacy and safety of acupuncture combined with functional training in the treatment of dysphagia after stroke. |
| **Methods** | CNKI, VIP, Wanfang database, Pub Med, Cochrance Library and Embase were retrieved from September 2019. Randomized controlled test (RCT) were selected, the included studies were analyzed with Rev Man 5. 3 software, and the publication bias was evaluated with Cochrane systematic evaluation tools. |
| **Results** | A total of **12 RCT** were included. Clinical effect of experimental group was better than that of control group (RR = 1. 22, 95%CI [1. 15, 1. 29], Z = 6. 68, P < 0. 000 01). The effect of drinking water test between the two groups had no significant difference (SMD =-0. 47, 95%CI [-2. 23, 1. 39], Z = 0. 50, P = 0. 62). The effect of drinking water test (after elimination) in experimental group was better than that in control group (SMD =-0. 76, 95%CI [-1. 09, -0. 43], Z = 4. 54, P <0. 000 01). The video fluoroscopy swallowing study (VFSS) in experimental group was better than that in control group (MD = 1. 54, 95%CI [0. 96, 2. 13], Z = 5. 19, P < 0. 000 01). VFSS (after elimination) in experimental group was better than that in control group (MD = 1. 82, 95%CI [1. 37, 2. 28], Z = 7. 83, P < 0. 000 01). |
| **Conclusion** | Acupuncture combined with swallowing function training is a good clinical effect in treating dysphagia after stroke. However, the included literatures have a certain publication bias, high inter-study heterogeneity, and the trial design is not rigorous enough. Therefore, more well-designed large sample clinical trials are still needed to be verified. |

### 1.1.16. Ling 2019

Ling Xin Li, Kai Deng. Acupuncture combined with swallowing training for poststroke dysphagia: a meta-analysis of randomised controlled trials Acupuncture in Medicine. 2019;37(2):81-90. [203689].

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| **Objective** | This meta-analysis aimed to assess the efficacy and safety of the combination of acupuncture with swallowing training for poststroke dysphagia. |
| **Method** | Nine electronic databases (including PubMed and China National Knowledge Infrastructure) were searched from their inception through June 2016. Seventeen studies were included in this meta-analysis. Data on 1479 eligible patients were extracted, and the relative risk (RR) and standard mean difference (SMD) with 95% CI for the effective rate (ER), swallowing function assessment (SFA), individual activity (IA), eg., modified Barthel Index (MBI) and quality of life (QOL) were evaluated. |
| **Results** | The pooled ER (RR 1.26, 95% CI 1.19 to 1.34, P<0.001, 14 studies) and SFA (SMD 1.06, 95% CI 0.79 to 1.32, P<0.001, five studies) suggested that combination therapy yielded a significantly higher ER and improved the SFA scores to a greater degree than swallowing training alone in patients with poststroke dysphagia. The pooled QOL score (SMD 1.06; 95% CI -0.04 to 2.17, P=0.06, two studies) did not differ between groups. The MBI data (SMD 1.47, 95% CI 1.07 to 1.87, P<0.001, one study) showed significant improvement in IA. Some evidence of publication bias was observed for the ER, although the trim-and-fill analysis and fail-safe number indicated no influence of publication bias on its pooled effect size. There was no evidence of publication bias of any other outcome measures. |
| **Conclusion** | This study showed that acupuncture combined with swallowing training may improve the ER, swallowing function and activities of daily life of patients with poststroke dysphagia compared with conventional swallowing training alone. |

### 1.1.17. Ma 2019

Ma Li, Feng Yu, Ai Liwei. [Meta-Analysis of Acupuncture Combined with Rehabilitation Training for Post-Stroke Dysphagia]. Journal of Clinical Acupuncture and Moxibustion. 2019;35(10):75. [203181].

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| **Objective** | To systematically evaluate the efficacy and safety of acupuncture combined with rehabilitation training in the treatment of post - stoke dysphagia. |
| **Methods** | The relative literatures were retrieved from the databases of Cochrane library, Pubmed, Chinese biomedical literature database ( CBM), China National Knowledge Infrastructure ( CNKI), WanFang and VIP. The retneval time was from the database establishment to September 20 1 8. Two researchers independently conducted literature screening and data extraction, the quality evaluation of the included studies was eva1uated by using the Cochrane systematic eva1uation manual, and the Meta - analysis was carried out with RevMan 5. 3 software. |
| **Results** | 12 pieces of references involving 921 patients were included. Meta analysis showed that the clinical efficacy of acupuncture combined with rehabilitation training group was superior to the control group in terms of the clinical curative effect [ RR = 3. 64, 95% CI (2. 31, 5. 73), P< 0. 000 01 ], water swa1low test [ MD = - 0. 80, 95% CI ( - 0. 88, - 0. 72), P< 0. 000 01 ], Fujishima ingestion - swallowing function rating [ MD = 2. 00, 95% CI (1. 80, 2. 20), P z 0. 000 01], SSA scores [ MD = - 5. 98, 95 % CI ( - 7. 04, - 4. 9 1), P< 0. 000 01], and SWAL - QOL scores [MD = 14. 50, 95% CI (8. 64, 20. 36), P< 0. 000 01 ]. |
| **Conclusion** | : This systematic eva1uation confirmed that the efficacy and safety of acupuncture combined with rehabilitation training was relatively reliable in the treatment of post - stroke dysphagia, but due to the low quality of the included literatures, a high - qua1ity, large -sample, double - blinded and multi - center RCTs were still needed to be designed for the efficacy verification. |

### 1.1.18. Tang Q 2019

Tang Qiang, Zhao Xiaoqian, Zhu Luwen. [Systematic evaluation and meta-analysis of the effect of acupuncture combined with rehabilitation training on dysphagia after stroke. West China Medical Journal. 2019;5:531-538. [201721].

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| **Objective** | To systematically evaluate the effectiveness of acupuncture combined with rehabilitation training compared with simple rehabilitation training or acupuncture treatment of dysphagia after stroke and make clear whether the effect of acupuncture combined with rehabilitation training is better than simple rehabilitation training or acupuncture treatment. |
| **Methods** | Six databases including China National Knowledge Infrastructure, Wanfang Data, Chongqing VIP, PubMed, Cochrance Library, and Embase were searched by computer for the randomized controlled trials on acupuncture combined with rehabilitation training treatment of post-stroke dysphagia, which were published from January 1 st, 2010 to December 31 st, 2018. After literature including, excluding, and screening, RevMan 5.3 software was used to conduct a meta-analysis. |
| **Results** | A total of **22 studies** were included, including **1 987 patients**. All the included studies took simple rehabilitation training or rehabilitation training combined with sham acupuncture as the control. Meta-analysis of efficiency and outcome measures for relevant studies showed that: compared with simple rehabilitation training, the effectiveness of acupuncture combined with rehabilitation training on post-stroke dysphagia was higher [17 studies included; odds ratio=3.66, 95% confidence interval(CI)(2.66, 5.05), P<0.000 01], the video fluoroscopy swallowing study score of acupuncture combined with rehabilitation training after treatment was higher[8 studies included; mean difference(MD)=2.31, 95%CI(1.75, 2.87), P<0.000 01], and the Standardized Swallowing Assessment score of acupuncture combined with rehabilitation training after treatment was lower [6 studies included; MD=-3.20, 95%CI(-3.78,-2.61), P<0.000 01]; at the same time the Watian Drinking Water Test score of acupuncture combined with rehabilitation training after treatment was lower [6 studies included; MD=-0.65, 95%CI(-0.91,-0.39),P<0.000 01]. |
| **Conclusions** | Acupuncture combined with rehabilitation training is effective in dysphagia after stroke, and the combined effect is better than simple rehabilitation training. However, due to the limitations of quality of included literature and sample size, the above results and conclusions still require high quality and large sample studies to testify. |

### 1.1.19. Tang XR 2019

Tang Xiao-Rong, Wang Lin, Huang Pei-Dong, Lan Jun-Chao, Xu Neng-Gui. [Meta-analysis of Acupuncture Combined with Rehabilitation Therapy for Treatment of Dysphagia After Stroke]. Journal of Guangzhou University of Traditional Chinese Medicine. 2019;4:514-520. [201735].

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| **Objective** | To systematically evaluate the effectiveness and safety of acupuncture combined with rehabilitation therapy for the treatment of dysphagia after stroke. |
| **Methods** | Randomized clinical trials(RCTs)of acupuncture combined with rehabilitation therapy versus rehabilitation alone or/and conventional western medicine(control group)for the treatment of dysphagia after stroke issued in the periodicals enrolled in the databases of CBM,CNKI,VIP and Wanfang were analyzed. The literature quality of the qualified RCTs was evaluated, and then RevMan 5.3 software was used for the Meta-analysis. |

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| **Results** | **Sixteen RCTs** involving a total of **1 780 cases** were included the analysis. The results of Meta-analysis showed that acupuncture combined with rehabilitation therapy had higher total effective rate(RR = 1.22,95%CI[1.16,1.28],Z = 7.80,P<0.01),and had stronger effect on improving the scores of Kubota Water Swallowing Test(MD =-0.66, 95% CI[-0.78,-0.53], Z =10.62) and dysphagia scale(MD = 2.01,95%CI[1.78,2.24],Z = 17.30)than the control group(P<0.01). |
| **Conclusion** | Acupuncture combined with rehabilitation therapy exerts certain effects for the treatment of dysphagia after stroke ;for the quality of the included studies is low, the conclusion still need high-quality RCTs to verify. |

### 1.1.20. Bath 2018

Bath PM , Lee HS, Everton LF. Swallowing therapy for dysphagia in acute and subacute stroke. Cochrane Database Syst Rev. 2018. [193050].

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| **Background** | Dysphagia (swallowing problems), which is common after stroke, is associated with increased risk of death or dependency, occurrence of pneumonia, poor quality of life, and longer hospital stay. Treatments provided to improve dysphagia are aimed at accelerating recovery of swallowing function and reducing these risks. This is an update of the review first published in 1999 and updated in 2012. |
| **Objectives** | To assess the effects of swallowing therapy on death or dependency among stroke survivors with dysphagia within six months of stroke onset. |
| **Methods** | Search methods. We searched the Cochrane Stroke Group Trials Register (26 June 2018), the Cochrane Central Register of Controlled Trials (CENTRAL; 2018, Issue 6) in the Cochrane Library (searched 26 June 2018), MEDLINE (26 June 2018), Embase (26 June 2018), the Cumulative Index to Nursing and Allied Health Literature (CINAHL) (26 June 2018), Web of Science Core Collection (26 June 2018), SpeechBITE (28 June 2016), ClinicalTrials.Gov (26 June 2018), and the World Health Organization International Clinical Trials Registry Platform (26 June 2018). We also searched Google Scholar (7 June 2018) and the reference lists of relevant trials and review articles. Selection criteria. We sought to include randomised controlled trials (RCTs) of interventions for people with dysphagia and recent stroke (within six months). Data collection and analysis. Two review authors independently applied the inclusion criteria, extracted data, assessed risk of bias, used the GRADE approach to assess the quality of evidence, and resolved disagreements through discussion with the third review author (PB). We used random-effects models to calculate odds ratios (ORs), mean differences (MDs), and standardised mean differences (SMDs), and provided 95% confidence intervals (CIs) for each. The primary outcome was functional outcome, defined as death or dependency (or death or disability), at the end of the trial. Secondary outcomes were case fatality at the end of the trial, length of inpatient stay, proportion of participants with dysphagia at the end of the trial, swallowing ability, penetration aspiration score, or pneumonia, pharyngeal transit time, institutionalisation, and nutrition. |

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| **Main results** | We added 27 new studies (1777 participants) to this update to include a total of 41 trials (2660 participants).. We assessed the efficacy of swallowing therapy overall and in subgroups by type of intervention: **acupuncture (11 studies)**, behavioural interventions (nine studies), drug therapy (three studies), neuromuscular electrical stimulation (NMES; six studies), pharyngeal electrical stimulation (PES; four studies), physical stimulation (three studies), transcranial direct current stimulation (tDCS; two studies), and transcranial magnetic stimulation (TMS; nine studies). Swallowing therapy had no effect on the primary outcome (death or dependency/disability at the end of the trial) based on data from one trial (two data sets) (OR 1.05, 95% CI 0.63 to 1.75; 306 participants; 2 studies; $I^2$ = 0%; P = 0.86; moderate-quality evidence). Swallowing therapy had no effect on case fatality at the end of the trial (OR 1.00, 95% CI 0.66 to 1.52; 766 participants; 14 studies; $I^2$ = 6%; P = 0.99; moderate-quality evidence). Swallowing therapy probably reduced length of inpatient stay (MD -2.9, 95% CI -5.65 to -0.15; 577 participants; 8 studies; $I^2$ = 11%; P = 0.04; moderate-quality evidence). Researchers found no evidence of a subgroup effect based on testing for subgroup differences (P = 0.54). Swallowing therapy may have reduced the proportion of participants with dysphagia at the end of the trial (OR 0.42, 95% CI 0.32 to 0.55; 1487 participants; 23 studies; $I^2$ = 0%; P = 0.00001; low-quality evidence). Trial results show no evidence of a subgroup effect based on testing for subgroup differences (P = 0.91). Swallowing therapy may improve swallowing ability (SMD -0.66, 95% CI -1.01 to -0.32; 1173 participants; 26 studies; $I^2$ = 86%; P = 0.0002; very low-quality evidence). We found no evidence of a subgroup effect based on testing for subgroup differences (P = 0.09). We noted moderate to substantial heterogeneity between trials for these interventions. Swallowing therapy did not reduce the penetration aspiration score (i.e. it did not reduce radiological aspiration) (SMD -0.37, 95% CI -0.74 to -0.00; 303 participants; 11 studies; $I^2$ = 46%; P = 0.05; low-quality evidence). Swallowing therapy may reduce the incidence of chest infection or pneumonia (OR 0.36, 95% CI 0.16 to 0.78; 618 participants; 9 studies; $I^2$ = 59%; P = 0.009; very low-quality evidence). |
| **Authors' conclusions** | Moderate- and low-quality evidence suggests that swallowing therapy did not have a significant effect on the outcomes of death or dependency/disability, case fatality at the end of the trial, or penetration aspiration score. However, swallowing therapy may have reduced length of hospital stay, dysphagia, and chest infections, and may have improved swallowing ability. However, these results are based on evidence of variable quality, involving a variety of interventions. Further high-quality trials are needed to test whether specific interventions are effective. |

### 1.1.21. Li 2018 ☆☆

Li LX, Deng K, Qu Y. Acupuncture Treatment for Post-Stroke Dysphagia: An Update Meta-Analysis of Randomized Controlled Trials. Chin J Integr Med. 2018;24(9):686-95. [193406].

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| **Objective** | To explore the effectiveness and safety of acupuncture in patients with post-stroke dysphagia by an update meta-analysis. |
| **Methods** | Potentially eligible RCTs aimed to evaluate the effects of acupuncture vs. Non-acupuncture treatments, such as rehabilitation training or routine medication on the swallowing difficulty after stroke were searched from PubMed, Cochrane Library, China National Knowledge Infrastructure, and other database from the earliest record to June 2016. Patient demographics, regimens for acupuncture, type of controls, methods of randomization, and measurements of the clinical symptoms of dysphagia were retrieved. The relative risk (RR) and 95% confidence interval (CI) of effective rate of dysphagia was calculated after intervention performed following admission. Subgroup analyses and a metaregression analysis were performed to describe the heterogeneity. |

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| **Results** | Twenty-nine RCTs comprising 2,190 patients were included. The included studies had a medium quality grade based on the Consolidated Standards of Reporting Trials (CONSORT) and Standards for Reporting Interventions in Clinical Trials of Acupuncture (STRICTA) checklist. Acupuncture therapy provided a higher effective rate compared with nonacupuncture treatments [RR=1.33, 95% confidence interval (CI), 1.25 to 1.43]. Subgroup and meta-regression analyses suggested that acupuncture intensity and measurement method were main sources of heterogeneity and resulted in a significant difference for pooled effect size. No severe adverse events were documented in these RCTs. |
| **Conclusions** | Our meta-analysis provides a new evidence supporting the efficacy and safety of acupuncture in treatment to post-stroke dysphagia in short-term compared with rehabilitation or medication. More high-quality and large-scale research studies are needed. |

### 1.1.22. Ye 2017 ☆☆

Ye Q, Xie Y, Shi J, Xu Z, Ou A, Xu N. Systematic Review on Acupuncture for Treatment of Dysphagia after Stroke. Evid Based Complement Alternat Med. 2017. [171652].

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| **ObjectivE** | To assess the therapeutic efficacy of acupuncture for dysphagia after stroke. |
| **Methods** | Seven electronic databases were searched from their inception until 31 September 2016. All randomized controlled trials (RCTs) incorporating acupuncture or acupuncture combined with other interventions for treatment of dysphagia after stroke were enrolled. Then they were extracted and assessed by two independent evaluators. Direct comparisons were conducted in RevMan 5.3.0 software. |
| **Results** | **6010 patients of 71 papers** were included. The pooled analysis of efficacy rate of 58 studies indicated that acupuncture group was superior to the control group with moderate heterogeneity (RR = 1.17, 95% CI: 1.13 1.21, Z = 9.08, and P < 0.00001); meta-analysis of the studies using blind method showed that the efficacy rate of acupuncture group was 3.01 times that of control group with no heterogeneity (RR = 3.01, 95% CI: 1.95 4.65, Z = 4.97, and P < 0.00001). Only 13 studies mentioned the safety evaluation. |
| **Conclusion** | The result showed that the acupuncture group was better than control group in terms of efficacy rate of dysphagia after stroke. And the combining result of those researches using blind method was more strong in proof. Strict evaluation standard and high-quality RCT design are necessary for further exploration. |

### 1.1.23. Yu 2016 ☆

Yu Chuan, Shen Bin, Xu Shi-Wen. [Systematic Review of Acupuncture-moxibustion for Deglutition Disorders after Cerebral Stroke]. Shanghai Journal of Acupuncture and Moxibustion. 2016;35(9):1126-112. [191548].

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| **Objective** | To evaluate the clinical efficacy of acupuncture-moxibustion in treating deglutition disorders after cerebral stroke. |
| **Method** | By computer and manual literature retrieval, eligible randomized controlled trials (RCTs) were collected for systematic review by using the Cochrane method, and the meta analysis was performed by using Revman 5.2. |

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| **Result** | **Nine studies** were recruited, covering **577 subjects** of deglutition disorders due to cerebral stroke. The total effective rate of the treatment group was significantly higher than that of the control group [RR=0.36, 95%CI (0.25,0.50), Z=5.80 (P<0.00001)]. The treatment group was superior to the control group in improving the water drinking test ($\chi 2$=108.73, P<0.00001). |
| **Conclusion** | Acupuncture can produce a content therapeutic efficacy in treating deglutition disorders due to cerebral stroke, which still requires high-quality large-sample-size clinical RCTs for further verification. |

### 1.1.24. Geeganage 2012 ☆

Geeganage C, Beavan J, Ellender S, Bath PM. Interventions for Dysphagia and Nutritional Support in Acute and Subacute Stroke. Cochrane Database Syst Rev. 2012. [167025].

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| **Objectives** | Dysphagia (swallowing problems) are common after stroke and can cause chest infection and malnutrition. Dysphagic, and malnourished, stroke patients have a poorer outcome. OBJECTIVES: To assess the effectiveness of interventions for the treatment of dysphagia (swallowing therapy), and nutritional and fluid supplementation, in patients with acute and subacute (within six months from onset) stroke. |
| **Methods** | SEARCH METHODS: We searched the Cochrane Stroke Group Trials Register (February 2012), MEDLINE (1966 to July 2011), EMBASE (1980 to July 2011), CINAHL (1982 to July 2011) and Conference Proceedings Citation Index- Science (CPCI-S) (1990 to July 2011). We also searched the reference lists of relevant trials and review articles, searched Current Controlled Trials and contacted researchers (July 2011). For the previous version of this review we contacted the Royal College of Speech and Language Therapists and equipment manufacturers. SELECTION CRITERIA: Randomised controlled trials (RCTs) in dysphagic stroke patients, and nutritional supplementation in all stroke patients, where the stroke occurred within six months of enrolment. DATA COLLECTION AND ANALYSIS: Two review authors independently applied the inclusion criteria, assessed trial quality, and extracted data, and resolved any disagreements through discussion with a third review author. We used random-effects models to calculate odds ratios (OR), 95% confidence intervals (95% CI), and mean differences (MD). The primary outcome was functional outcome (death or dependency, or death or disability) at the end of the trial. |

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| **Results** | We included 33 studies involving 6779 participants.Swallowing therapy: **acupuncture**, drug therapy, neuromuscular electrical stimulation, pharyngeal electrical stimulation, physical stimulation (thermal, tactile), transcranial direct current stimulation, and transcranial magnetic stimulation each had no significant effect on case fatality or combined death or dependency. **Dysphagia at end-of-trial was reduced by acupuncture (number of studies (t) = 4, numbers of participants (n) = 256; OR 0.24; 95% CI 0.13 to 0.46; P < 0.0001; I(2) = 0%)** and behavioural interventions (t = 5; n = 423; OR 0.52; 95% CI 0.30 to 0.88; P = 0.01; I(2) = 22%). Route of feeding: percutaneous endoscopic gastrostomy (PEG) and nasogastric tube (NGT) feeding did not differ for case fatality or the composite outcome of death or dependency, but PEG was associated with fewer treatment failures (t = 3; n = 72; OR 0.09; 95% CI 0.01 to 0.51; P = 0.007; I(2) = 0%) and gastrointestinal bleeding (t = 1; n = 321; OR 0.25; 95% CI 0.09 to 0.69; P = 0.007), and higher feed delivery (t = 1; n = 30; MD 22.00; 95% CI 16.15 to 27.85; P < 0.00001) and albumin concentration (t = 3; n = 63; MD 4.92 g/L; 95% CI 0.19 to 9.65; P = 0.04; I(2) = 58%). Although looped NGT versus conventional NGT feeding did not differ for end-of-trial case fatality or death or dependency, feed delivery was higher with looped NGT (t = 1; n = 104; MD 18.00%; 95% CI 6.66 to 29.34; P = 0.002). Timing of feeding: there was no difference for case fatality, or death or dependency, with early feeding as compared to late feeding. Fluid supplementation: there was no difference for case fatality, or death or dependency, with fluid supplementation. Nutritional supplementation: there was no difference for case fatality, or death or dependency, with nutritional supplementation. However, nutritional supplementation was associated with reduced pressure sores (t = 2; n = 4125; OR 0.56; 95% CI 0.32 to 0.96; P = 0.03; I(2) = 0%), and, by definition, increased energy intake (t = 3; n = 174; MD 430.18 kcal/day; 95% CI 141.61 to 718.75; P = 0.003; I(2) = 91%) and protein intake (t = 3; n = 174; MD 17.28 g/day; 95% CI 1.99 to 32.56; P = 0.03; I(2) = 92%). |
| **Conclusions** | There remains insufficient data on the effect of swallowing therapy, feeding, and nutritional and fluid supplementation on functional outcome and death in dysphagic patients with acute or subacute stroke. **Behavioural interventions and acupuncture reduced dysphagia**, and pharyngeal electrical stimulation reduced pharyngeal transit time. Compared with NGT feeding, PEG reduced treatment failures and gastrointestinal bleeding, and had higher feed delivery and albumin concentration. Nutritional supplementation was associated with reduced pressure sores, and increased energy and protein intake. |

### 1.1.25. Wong 2012 ☆

Wong IS, Ng KF, Tsang HW. Acupuncture for dysphagia following stroke: a systematic review. European Journal of Integrative Medicine. 2012;4(2). [160591].

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| **Objectives** | This systematic review reports an update evaluation and critically appraise on available randomized controlled trials (RCTs) which investigated the effectiveness of acupuncture on dysphagia in stroke rehabilitation. |
| **Methods** | A literature search was performed to identify all RCTs that investigated the therapeutic effect of acupuncture on dysphagia after stroke from 1966 to 2011. The recruited studies were classified according to the types of participants, types of intervention, outcome measures and results. The corresponding methodological qualities of the recruited studies were also evaluated using Cochrane risk-of-bias criteria and the Physiotherapy Evidence Database (PEDro) scale. |
| **Results** | The current review was based on **nine RCTs** that showed a positive effect of acupuncture and conventional rehabilitation on dysphagia compared to conventional rehabilitation alone. All the studies reported short-term effect of acupuncture on dysphagia and no follow-up data were available. |

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| **Conclusions** | The current review appeared to reveal that **acupuncture together with conventional rehabilitation has positive effect on dysphagia after stroke**. However, with the concerns in the methodology of the studies in this systematic review, a larger sample, multi-centre, well designed RCTs with homogeneity of outcome measures needs to be carried out before recommending acupuncture as a standard treatment to patients with dysphagia after stroke. |

### 1.1.26. Long 2012 ☆

Long YB, Wu XP. A meta-analysis of the efficacy of acupuncture in treating dysphagia in patients with a stroke. Acupuncture in Medicine. 2012;30(4):291-7. [165311].

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| **Background** | Dysphagia, or deglutition difficulty, is a common manifestation in patients with a stroke and its management is an important aspect of rehabilitation. Acupuncture, a complementary and alternative therapy, is the subject of growing public interest for treatment of stroke. |
| **Objective** | A meta-analysis was performed to study the effect of acupuncture for treatment of dysphagia in patients affected by a stroke. |
| **Methods** | Randomised controlled trials (RCTs) comparing acupuncture treatment with non-acupuncture treatment of dysphagia in patients with a stroke were identified from the databases of PubMed, Embase, Cochrane Library and CBM disc (China Biological Medicine Database). Eligible investigations were included and data on the effectiveness of acupuncture were extracted and synthesised by meta-analysis using RevMan 5.1.4. Results were expressed as OR for dichotomous data; 95% CIs were also calculated. |
| **Results** | Seventy-two RCTs (3208 patients in the treatment group and 2926 patients in the control group) were identified. Details of randomisation and blinding were not reported and information on withdrawals and dropouts was missing in most of included reports. Meta-analysis showed that the effectiveness of treatment in the group receiving acupuncture was higher than that in the non-acupuncture group (OR=5.17, 95% CI 4.18 to 6.38; p<0.00001). However, the study quality was generally low and of insufficient quality to make recommendations about using acupuncture in the rehabilitation of patients with dysphagia due to stroke. |
| **Conclusions** | **Acupuncture might be beneficial** in the rehabilitation of patients with dysphagia caused by stroke, and the evidence justifies future high-quality studies. |

### 1.1.27. He 2009 ☆

He J, Zheng M, He CQ, Lan Q, Qu Y, Gao Q, Wang L, Yong YH, Guan M. [Systematic Assessment of Acupoint Stimulating Therapy for Deglutition Disorders after Apoplexy]. Chinese Acupuncture and Moxibustion. 2009;29(1):66-71. [154981].

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| **Objectives** | To assess the therapeutic effect of acupoint stimulating therapy on deglutition disorders after apoplexy, so as to provide basis for clinical treatment and further study. |
| **Methods** | According to Cochrane systematic assessment method of evidence-based medicine, Meta analysis on randomized controlled trials or half randomized controlled trials of acupoint stimulating therapy for deglutition disorders after apoplexy were made. |
| **Results** | In 37 Chinese literatures, 3 697 patients in total were enrolled, and the results indicated that the effective rate of acupoint stimulating therapy on deglutition disorders after apoplexy was better than that in the control group [RR was 1.38, 95% CI (1.28, 1.49), Z = 8.38, P < 0.01]; and the cured rate also was better than that of the control group [RR was 2.56, 95% CI (2.15, 3.04), Z = 10.70, P < 0.01]. |

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| **Conclusions** | The **therapeutic effect of acupoint stimulating therapy on deglutition disorders after apoplexy is better than that of the control group**, but more randomized, double blind, controlled trials with good designs are needed to confirm this result. |

### 1.1.28. Xie 2008 Ø

Xie Y, Wang L, He J, Wu T. Acupuncture for dysphagia in acute stroke. Cochrane Database Syst Rev. 2008. 3:CD006076. [110840].

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| **Background** | Dysphagia after acute stroke is associated with poor prognosis, particularly if prolonged. Acupuncture has been widely used for this complication in China. However, its therapeutic effect is unclear. |
| **Objectives** | To determine the therapeutic effect of acupuncture for dysphagia after acute stroke compared with placebo, sham or no acupuncture intervention. |
| **Methods** | Search strategy: We searched the Cochrane Stroke Group Trials Register (last searched September 2007), the Chinese Stroke Trials Register and the Trials Register of the Cochrane Complementary Medicine Field (last searched January 2007) and the Cochrane Central Register of Controlled Trials (CENTRAL) (The Cochrane Library, Issue 2, 2007). In January 2007 we searched the following databases from the first available date; MEDLINE, EMBASE, CINAHL, AMED, CISCOM, BIOSIS Previews, ProQuest Digital Dissertations, Science Citation Index, ISI Proceedings, ACUBRIEFS, ACP Journal Club, Books@Ovid and Journals@Ovid, Chinese Biological Medicine Database, Chinese scientific periodical database of VIP INFORMATION, China periodical in China National Knowledge Infrastructure, Chinese Evidence-Based Medicine Database, Science China, Chinese Social Science Citation Index, and the Chinese Science and Technology Document Databases. We also searched databases of ongoing trials, conference proceedings, and grey literature, handsearched three Chinese journals and contacted authors and researchers. Selection criteria: We included all truly randomised controlled trials that evaluated the effect of acupuncture, irrespective of type, in patients with dysphagia within 30 day after the onset of ischaemic or haemorrhagic stroke. All types of acupuncture interventions were eligible. The control intervention could be placebo acupuncture, sham acupuncture, or no acupuncture. The primary outcome was recovery of normal feeding. The secondary outcomes were case fatality, deterioration, late disability, length of hospital stay, quality of life, feeding tube removal, aspiration pneumonia and nutritional measures. Data Collection and analysis: Two review authors independently selected trials, assessed trial quality, and extracted data. Disagreements were resolved by a third review author. |
| **Main results** | Only one trial of 66 participants was included. In the acupuncture group, 12 out of 34 participants recovered to normal feeding (35.3%). In the control group, seven out of 32 participants recovered to normal feeding (21.9%). The relative risk of recovery was 1.61 with a 95% confidence interval of 0.73 to 3.58. No statistical significance was detected. |
| **Authors' conclusions** | There is **not enough evidence** to make any conclusion about the therapeutic effect of acupuncture for dysphagia after acute stroke. High quality and large scale randomised controlled trials are needed. |

### 1.1.29. Wang 2006 ☆

Wang LP, Xie Y. [Systematic Evaluation on Acupuncture and Moxibustion for Treatment of Dysphagia after Stroke]. Chinese Acupuncture and Moxibustion. 2006;26(2):141-6. [125957].

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| **Objectives** | To assess the therapeutic effect and potential adverse effect of acupuncture in treatment of dysphagia after stroke. |
| **Methods** | A systematic review including all the relevant randomized controlled trials (RCTs) or quasi-RCTs of acupuncture and moxibustion for treatment of dysphagia after stroke were performed using the method recommended by the cochrane collaboration |
| **Results** | Seven papers including 506 cases met the enrolled criteria. All of the trials were of lower methodological quality. Meta-analysis of enrolled 6 trials showed that the acupuncture group had a better therapeutic effect on dysphagia after stroke than the control group (RR 1.17, 95% CI 1.08, 1.27, Z=3.78, P=0.0002). The mortality and the occurrence of pneumonia were similar between acupuncture and control groups (RR 0.25, 95% CI 0.03, 2.18 and RR 3.02, 95% CI 0.093, 23.10, respectively). The treatment group significantly reduced in time of the thick barium through pharynx examined by videofluorography (WMD -7.23, 95% CI -13.18,-1.28) |
| **Conclusions** | A reliable conclusion can not be drawn from the present data because of the defects in methodological quality, especially no long-term terminal outcome events, although **it appears a tendency that acupuncture can improve dysphagia after stroke in short-term with no adverse effect**. Therefore, it is necessary to perform more multi central randomized controlled trials in good internal validity and high quality in future. |

## 1.2. Special outcome

### 1.2.1. Aspiration caused by post-stroke dysphagia

#### 1.2.1.1. Li 2024

Li H, Li J, Wang X, Zhang Z. A systematic review and meta-analysis of acupuncture in aspiration caused by post-stroke dysphagia. Front Neurol. 2024 Jun 10;15:1305056. https://doi.org/10.3389/fneur.2024.1305056

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| **Objective** | This systematic review and meta-analysis aims to systematically evaluate the effectiveness and safety of acupuncture in the treatment of aspiration caused by post-stroke dysphagia. |
| **Methods** | A computer search was conducted in nine databases, including the China National Knowledge Infrastructure (CNKI), China Science and Technology Journal (VIP), Wan-fang Database, China Biomedical Literature Database (CBM), PubMed, Web of Science, Cochrane Library, Embase, and Chinese Clinical Trial Registry (ChiCTR), from their inception until April 2024. Clinical randomized controlled trials comparing acupuncture combined therapy or single therapy with control interventions for the treatment of aspiration caused by post-stroke dysphagia were included. The primary outcome measure was the Penetration Aspiration Scale (PAS), and secondary outcome measures included the overall effective rate, video fluoroscopic swallowing study (VFSS), and hyoid bone displacement. The statistical analysis was performed using RevMan 5.3 and Stata 16.0. |

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| **Results** | A total of **16 articles involving 1,284 patients** were included. The meta-analysis results showed that acupuncture combined therapy or single therapy was more effective in improving PAS scores compared to conventional rehabilitation therapy or balloon dilation of the catheter [WMD = -1.05, 95% CI (-1.30, -0.80), Z = 0.82, p = 0.00 < 0.05]. It was also more effective in improving VFSS scores [WMD = 1.32, 95% CI (0.08, 2.55), Z = 2.09, p = 0.04 < 0.05] and hyoid bone displacement [WMD = 2.02, 95% CI (0.86, 3.18), Z = 3.41, p = 0.00 < 0.05]. Additionally, acupuncture had a higher overall effective rate [WMD = 1.21, 95% CI (1.14, 1.29), Z = 5.76, p = 0.00 < 0.05] and a lower incidence of adverse events. Sensitivity analysis indicated that the literature had minimal impact on the results, and bias tests showed no publication bias. |
| **Conclusion** | Acupuncture combined therapy and acupuncture single therapy can effectively improve aspiration caused by post-stroke dysphagia with a low incidence of adverse events. However, due to the low quality of the included literature, more high-quality randomized controlled trials are still needed to confirm the effectiveness and safety of acupuncture in the treatment of aspiration caused by post-stroke dysphagia. |

## 1.3. Special Acupuncture Techniques

### 1.3.1. Electroacupuncture

#### 1.3.1.1. Yue 2026

Yue M, Chen X, Yang X, Wang Z, Yu H, Wang H, Luo Q, Ma Z, Jiang Y, Qiu Y, Shi J. The effect and optimal parameters of electroacupuncture on post-stroke dysphagia: a meta-analysis of randomized controlled trials. Front Neurol. 2026 Jan 12;16:1673716. https://doi.org/10.3389/fneur.2025.1673716

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| **Objective** | This research aimed to assess the effectiveness of electroacupuncture in treating post-stroke dysphagia (PSD) and to investigate the optimal stimulation parameters. |
| **Methods** | We conducted a comprehensive review of eight databases (PubMed, Web of Science, Cochrane Library, Embase, CBM, CNKI, Wan Fang, and VIP). Randomized controlled trials (RCTs) on electroacupuncture for PSD published up to March 19, 2025 were included. Outcomes included VFSS and WST. Two independent reviewers performed ROB 2 assessments. Parameter frequency analysis used R (v4.5.1). Meta-analyses were conducted with RevMan 5.4 and Stata SE 18. |
| **Results** | **Thirty RCTs involving 2,290 patients** were included. Overall efficiency favored electroacupuncture (RR = 1.29, 95% CI: 1.23–1.34, p < 0.0001; I2 = 13%, fixed-effects). Mean differences showed improvement on VFSS (MD = 1.67, 95% CI: 1.26–2.09, p < 0.01; I2 = 57%) and WST (MD = -0.75, 95% CI: -0.93 to -0.57, p < 0.01; I2 = 54%). Aspiration pneumonia was reduced (RR = 0.41, 95% CI: 0.25–0.68, p = 0.0005; I2 = 8%). Subgroup analyses indicated superiority of dense-sparse waveforms (Ds-W) (RR = 1.58, p = 0.003) and of parameter combinations ≥30 min + Ds-W (RR = 1.55, p = 0.03). Other parameter subgroups showed no significant differences. |
| **Conclusion** | Electroacupuncture combined with dysphagia training is more effective than single interventions in PSD. Dense-sparse waveforms may further enhance efficacy. However, elevated risk of bias across trials limits evidence certainty, underscoring the need for high-quality RCTs to define optimal electroacupuncture parameters (PROSPERO: CRD420251014881). |

#### 1.3.1.2. Huang 2020

Huang J, Shi Y, Qin X, Shen M, Wu M, Huang Y. Clinical Effects and Safety of Electroacupuncture for

the Treatment of Poststroke Dysphagia: A Comprehensive Systematic Review and Meta-Analysis. Evid Based Complement Alternat Med. 2020. [212885]. doi

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| **Objectives** | Electroacupuncture (EA), an extension of acupuncture, which is based on traditional acupuncture combined with modern electrotherapy, is commonly used for poststroke dysphagia (PSD) in clinical treatment and research. However, there is still a lack of sufficient evidence to recommend the routine use of EA for PSD. The aim of this study was to assess the efficacy and safety of EA in the treatment of PSD. |
| **Methods** | Randomized controlled trials (RCTs) evaluating the effects of EA on PSD were identified through a comprehensive literature search of the PubMed, Embase, Cochrane Library, Web of Science, Chinese National Knowledge Infrastructure, Chinese Biomedical Database, and VIP databases from their inception to July 2020. The quality assessment of the included trials was performed based on the guidance of the Cochrane Reviewers' Handbook, and meta-analysis (MA) was performed by using the RevMan 5.3 software. |
| **Results** | **Sixteen trials** were identified, and these included **1,216 patients** with PSD. The results demonstrated that EA in combination with swallowing rehabilitation training (SRT) was significantly superior to SRT alone with regard to effective rate (OR 5.40, 95% CI [3.78, 7.72], P < 0.00001, water swallow test (WST) (MD -0.78, 95% CI [-1.07, -0.50], P < 0.00001), the video fluoroscopic swallowing study (VFSS) (MD 1.47, 95% CI [1.11, 1.84], P < 0.00001), the Ichiro Fujishima Rating Scale (IFRS) (MD 1.94, 95% CI [1.67, 2.22], P < 0.00001), and the incidence of aspiration pneumonia (IAP) (OR 0.20, 95% CI [0.06, 0.61], P=0.005). |
| **Conclusions** | The results showed that EA was better than the control treatment in terms of the effective rate, WST, VFSS, IFRS, and IAP of dysphagia after stroke. Strict evaluation standards and high-quality RCT designs are necessary for further exploration. |

#### 1.3.1.3. Zhang 2017

Zhang Yi, Zhang Xia-Hui, Xiong You-Long, Chen Zhi-Hong, Du Fu-Sheng, Shen Jian-Ping, Zhu Li-Juan, Shi Jing. [Meta-analysis of Randomized Controlled Trials on Electro-acupuncture in the Treatment of Dysphagia after Stroke]. Journal of Clinical Acupuncture and Moxibustion. 2017;33(8):75-79. [52365].

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| **Objective** | To evaluate the clinical efficacy of electro-acupuncture in the treatment of dysphagia after stroke, to analyze the current research status, and to provide reference for clinical application. |
| **Methods** | Randomized controlled trials on electro-acupuncture for dysphagia after stroke were retrieved from CBM, CNKI, Wanfang Data, VIP, PubMed, Embase, and Cochrane from May 2016 since the establishment of the database. The literatures were screened by two reviewers according to the inclusion-exclusion criteria, and the methodological quality was assessed by Cochrane score. Review manager 5.2 software was used for Meta-analysis. |
| **Results** | A total of **12 literatures** were included in the study, with a total of **824 patients**. The results of Meta-analysis showed that there were significant differences between the electro-acupuncture group and the control group in terms of the total efficacy, effective rate, and Kubota water swallow test. |
| **Conclusion** | Electro-acupuncture has a good therapeutic effect on dysphagia after stroke. However, the study needs more support with high-quality researches due to the limits of the number and quality of the included literatures. |

### 1.3.2. Nape acupuncture / Acupuncture occipitale

#### 1.3.2.1. Shi 2026

Shi H, Yang Y, Lou H, Chen S. Effectiveness of nape acupuncture for post-stroke dysphagia: a meta-analysis and trial sequential analysis of randomized controlled trials. Front Neurol. 2026;17:1720302. https://doi.org/10.3389/fneur.2026.1720302

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| **Background** | This systematic review aimed to evaluate the efficacy and safety of nape acupuncture in improving swallowing function and quality of life in patients with post-stroke dysphagia (PSD), thereby providing evidence-based support for clinical treatment strategies. |
| **Methods** | A comprehensive literature search was conducted across eight databases: CNKI, VIP, WanFang, CBM, PubMed, Web of Science, Cochrane Library, and Embase. All randomized controlled trials (RCTs) investigating nape acupuncture for PSD, published from database inception to September, 2025, were included. Methodological quality was assessed using the Cochrane Risk of Bias tool for RCTs. Statistical analyses were performed using RevMan 5.4, Stata 17.0, and TSA software, including subgroup analyses, sensitivity analyses, and trial sequential analysis to identify sources of heterogeneity and assess the robustness of results. Adverse events were collected to provide data for evaluating the safety of nape acupuncture treatment, and the GRADE approach was used to assess the quality of the results. |
| **Results** | A total of **21 eligible RCTs involving 1,995 participants** were included in the meta-analysis. Results demonstrated that both nape acupuncture alone and nape acupuncture combined with other therapies significantly improved swallowing function in video fluoroscopic swallow study (VFSS): [Mean difference (MD) = 1.22, 95% confidence interval (CI) (0.94, 1.51), $p < 0.00001$], standardized swallowing assessment (SSA): [MD = -3.59, 95% CI (-4.35, -2.84), $p < 0.00001$], and total effective rate: [Odds ratio (OR) = 3.69, 95% CI (2.70, 5.04), $p < 0.00001$]. Moreover, it also exerted a positive effect on improving patients' quality of life in swallowing quality of life questionnaire (SWAL-QOL): [MD = 13.42, 95% CI (9.46, 17.37), $p < 0.00001$], and barthel index (BI): [MD = 9.2, 95% CI (3.99, 14.4), $p < 0.005$]. TSA provides sufficient information to support the conclusion, but due to issues such as high heterogeneity, the GRADE system rates the quality of evidence as moderate to very low. |
| **Conclusion** | Nape acupuncture, either alone or in combination with other therapies, significantly improves swallowing function and quality of life in patients with PSD, with a favorable safety profile characterized by minimal adverse events. |

#### 1.3.2.2. Tang 2022

Tang Y, Liang R, Gao W, Zhang S, Liang B, Zhu L. A meta-analysis of the effect of nape acupuncture combined with rehabilitation training in the treatment of dysphagia after stroke. Medicine (Baltimore). 2022 Nov 18;101(46):e31906. https://doi.org/10.1097/MD.0000000000031906.

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| **Background** | To systematically evaluate the general efficacy of nape acupuncture combined with rehabilitation training for the treatment of post-stroke dysphagia and in the recovery of swallowing function. |
| **Methods** | Three English databases (PubMed, Excerpta Medica Database, Cochrane Library) and three Chinese databases (China National Knowledge Infrastructure, Wanfang Data, CQVIP) were searched using the date range January 1, 2001-January 1, 2022. Study Selection: Randomized controlled trials (RCT) of nape acupuncture combined with rehabilitation for the treatment of dysphagia after stroke with appropriate evaluation methods were included in the study. |

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| **Results** | The results indicated that nape acupuncture combined with rehabilitation training led to higher clinical effectiveness (odds ratio (OR) =4.25 and 95% confidence interval (CI)=[2.94, 6.15]), higher videofluoroscopic swallowing study scores(VFSS) (weighted mean difference (WMD)=1.33; 95% CI=[1.09, 1.58]), and lower Standardized Swallowing Assessment (SSA) scores (WMD = -2.57, 95% CI=[-3.51, -1.62]) in patients with post-stroke dysphagia compared with rehabilitation training alone. |
| **Conclusions** | This Meta-analysis suggested that nape acupuncture combined with rehabilitation training is more effective in the treatment of dysphagia after stroke than rehabilitation alone. |

#### 1.3.2.3. Hu 2015 ☆

Hu Tian-Jun, Wang Xiu-Lian, Yu Jie, Chen Gui-Rong, He Yang-Zi. [A Meta-analysis of the Therapeutic Effect of Nape Acupuncture on Post-stroke dysphagia in Domestic Literature]. Shanghai Journal of Acupuncture & Moxibustion. 2015. 34(12):1250-54. (chi). [187549].

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| **Objective** | To investigate the clinical effect of nape acupuncture on post-stroke dysphagia by a meta-analysis. |
| **Method** | Domestic literature on clinical randomized controlled trials of nape acupuncture treatment of post-stroke dysphagia published from Jun. 2004 to Jun. 2014 were obtained by a computer search of China National Knowledge Internet (CNKI), Wanfang Data medical information system (WF), VIP information resource system (VIP) and Chinese Biomedical Literature Database (CBM) combined with a manual search of Jinan University library journal database. Literature inclusion and exclusion criteria were established to extract data and the qualities of the included studies were assessed using a Jadad rating scale. A meta-analysis was made using the software Review Manager 5.2. |
| **Result** | A total of **17 articles were included with 1158 patients**. The results of meta-analysis showed that there were statistically significant differences in the total efficacy rate [OR=3.99, 95% CI (2.83, 5.63), P<0.00001] and the cure rate [OR=2.67, 95% CI (2.03, 3.53), P<0.00001] between the nape acupuncture and control groups. |
| **Conclusion** | **Nape acupuncture has clinically a good therapeutic effect on post-stroke dysphagia**. Multi-center, large-sample and high-quality studies are still needed for validation because the qualities of the included articles are lower, which is one of the factors influencing the assessment. |

### 1.3.3. Tongue acupuncture

#### 1.3.3.1. Li 2023

Li L, Xu F, Yang S, Kuang P, Ding H, Huang M, Guo C, Yuan Z, Xiao X, Wang Z, Zhang P. Tongue acupuncture for the treatment of post-stroke dysphagia: a meta-analysis of randomized controlled trials. Front Neurosci. 2023 May 25;17:1124064. https://doi.org/10.3389/fnins.2023.1124064

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| **Objectives** | Post-stroke dysphagia is the most common neurological impairment after stroke. The swallowing process is controlled by a network made up of the cerebral cortex, subcortical area, and brainstem structure. The disruption of the swallowing network after stroke leads to dysphagia. The affected swallowing muscles after stroke mainly include the laryngeal muscles (suprahyoid muscle and thyrohyoid muscle) and infrahyoid muscle. These muscles experience kinematic effects and muscle strength weakens, resulting in reduced movement in the swallowing process. Acupuncture can change the excitability of cerebral cortical nerve cells, promote the recovery of neurological function, and enhance neuromuscular excitability, ultimately improving the control of swallowing-related nerves and muscles and promoting swallowing functional recovery. In this meta-analysis, we systematically evaluate the clinical efficacy of acupuncture in the treatment of post-stroke dysphagia. |
| **Methods** | Randomized controlled trials of tongue acupuncture therapy for post-stroke dysphagia were searched and selected from seven electronic databases (PubMed, CBM, Cochrane, Embase, CNKI, VPCS, and Wan fang). The Cochrane Collaboration tool was used to conduct methodological quality assessment. Rev. Man 5.4 software was utilized to perform data analysis. |
| **Results** | A total of **15 studies with 1,094 patients** were included. Meta-analysis Showed that WST score WST score (MD = -0.56, 95% CI (-1.23, 0.12), Z = 1.62, p < 0.00001), SSA score (MD = -1.65, 95% CI (-2.02, -1.28), Z = 8.77, p < 0.00001). These results suggested that the treatment group (tongue acupuncture or tongue acupuncture combined with other therapies) was superior to the control group in reducing WST scores and SSA scores. The clinical efficacy of the tongue acupuncture group was better compared with the control group (MD = 3.83, 95% CI (2.61, 5.62), Z = 6.88, p < 0.00001). |
| **Conclusion** | The meta-analysis showed that the total effective rate of patients with dysphagia after stroke in the treatment group (acupuncture, tongue acupuncture, and acupuncture combined with other therapy) was higher than that in the control group. These results indicated that acupuncture, tongue acupuncture, and acupuncture combined with other therapy can improve post-stroke dysphagia. |

### 1.3.4. Scalp acupuncture

#### 1.3.4.1. Chen 2026

Chen G, Wang W, Li H, Zhang H. Effects and safety of scalp acupuncture on swallowing function in patients with post-stroke dysphagia: A meta-analysis. Eur J Integr Med. 2026 Jan;81:102598. https://doi.org/10.1016/j.eujim.2025.102598

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| **Background** | Post-stroke dysphagia (PSD) is a frequent and disabling complication after stroke. Scalp acupuncture (SA) is used clinically to improve swallowing function, but its safety and effectiveness remain uncertain. |
| **Objective** | To evaluate the safety and feasibility of scalp acupuncture on swallowing function in patients with post-stroke dysphagia. |
| **Methods** | China National Knowledge Infrastructure, Wanfang Data, VIP Database, SinoMed, PubMed, Cochrane Library, Embase, and Web of Science were searched from inception to 26 April 2025. Eighteen randomized controlled trials involving 1410 patients were included. Risk of bias was assessed using Cochrane RoB 2.0. Meta-analyses were conducted using Stata 18.0. |

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| **Results** | Compared with conventional interventions alone, SA combined with conventional treatment significantly reduced water swallowing test scores (SMD −1.00, 95 % CI −1.35 to −0.66), reduced standardized swallowing assessment scores (MD −3.78, 95 % CI −4.89 to −2.68), increased swallowing quality of life scores (MD 33.26, 95 % CI 12.79 to 53.73), reduced videofluoroscopic dysphagia scale scores (MD 6.28, 95 % CI 4.01 to 8.55), and increased Barthel index scores (MD 11.62, 95 % CI 9.76 to 13.48). High heterogeneity was observed for WST, SSA, and SWAL-QOL outcomes. Funnel plot analysis suggested no publication bias for WST scores. Sensitivity analyses showed robust results for WST and SSA, with heterogeneity mainly affecting SWAL-QOL. Evidence quality was high for most outcomes and low for SWAL-QOL. |
| **Conclusion** | Scalp acupuncture combined with conventional interventions may improve swallowing function, quality of life, and activities of daily living in patients with post-stroke dysphagia. However, the conclusions are limited by heterogeneity, low-quality evidence for some outcomes, insufficient follow-up, and unclear reporting of adverse events. High-quality multicenter double-blind trials with standardized protocols are required. |

#### 1.3.4.2. Wang 2026

Wang L, Zhang C, Yu R, Yang H, Wang X, Wang Y, Song L, Ma D. Efficacy of scalp acupuncture for post stroke dysphagia: A systematic review and meta-analysis of randomized controlled trials. Medicine (Baltimore). 2026;105(17):e48369. https://doi.org/10.1097/MD.0000000000048369

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| **Background** | Stroke persists as a paramount global health priority, maintaining persistently elevated incidence and mortality metrics across epidemiological registries. Post-stroke dysphagia, serving as a critical determinant of functional prognosis, imposes multidimensional burdens spanning aspiration pneumonia risk, nutritional compromise, and psychosocial well-being. This neurogenic deglutition disorder has consequently catalyzed clinical innovation in rehabilitation modalities, with scalp acupuncture emerging as a promising neuromodulatory intervention. |
| **Methods** | We conducted a systematic search of 8 databases for randomized controlled trials (RCTs) assessing scalp acupuncture treatment for post-stroke dysphagia. The primary outcomes included clinical efficacy, while the secondary outcomes comprised the Kubota Water Swallowing Test (WST), standardized swallowing assessment (SSA), videofluoroscopic dysphagia scale (VDS), and adverse events. Rigorous evaluation of potential biases within the selected studies was performed by the Cochrane Handbook (version 5.1.0) for systematic reviews of interventions. Heterogeneity among studies was addressed through sensitivity analysis. |
| **Results** | Based on data derived from 20 RCTs involving 1278 participants, the meta-analysis revealed significant clinical effective rate in the application of scalp acupuncture for post-stroke dysphagia [odds ratio = 4.45, 95% confidence interval (CI) (3.04, 6.51), P < .01], improvement in the Kubota WST [mean differences (MD) = -0.82, 95% CI (-1.04, -0.59), P < .00001], SSA [MD = -4.01, 95% CI (-4.59, -3.42), P < .00001], VDS [MD = -5.75, 95% CI (-8.33, -3.17), P < .0001], in comparison with the conventional rehabilitation protocols. Only one study reported adverse events. |
| **Conclusion** | Current evidence suggests that scalp acupuncture therapy may be an effective measure for post-stroke dysphagia. |

# 2. Overviews of Systematic Reviews

## 2.1. Xu 2025

Xu F, Wang X, Dai F, Ye Y, Su X, Hu P, Cheng H. The efficacy of acupuncture for post-stroke dysphagia: an overview of systematic reviews and meta-analyses. Front Neurosci. 2025 Aug 28;19:1640471. https://doi.org/10.3389/fnins.2025.1640471

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| **Background** | Acupuncture has been widely used in clinical rehabilitation as an adjunctive therapy for post-stroke dysphagia (PSD). Although numerous meta-analyses have evaluated its efficacy, a comprehensive assessment of the methodological quality and evidence strength of these reviews is still lacking. |
| **Methods** | Two researchers independently searched eight databases for relevant literature, screened studies according to predefined criteria, and extracted data from eligible systematic reviews and meta-analyses. Methodological quality, reporting completeness, risk of bias, and evidence strength were evaluated using AMSTAR 2, PRISMA-A, ROBIS, and GRADE, respectively. The GROOVE tool was used to assess overlap among original studies via corrected covered area (CCA). |
| **Results** | **Nineteen meta-analyses were included**. Based on AMSTAR 2, four reviews were rated as low quality and fourteen as critically low. Major reporting deficiencies included lack of protocol registration, incomplete search strategies, inadequate risk of bias assessments, and missing funding disclosures. Only six studies were judged to be at low risk of bias. Overlap among original studies was slight (CCA = 2.86%). Among 68 outcome indicators, 11.76% were graded as moderate quality, 50% as low quality, and 38.24% as critically low (GRADE). Among moderate-quality outcomes, electroacupuncture plus swallowing rehabilitation therapy (SRT) was superior to SRT alone (OR = 5.40, 95% CI 3.78–7.72), and acupuncture plus SRT also outperformed SRT alone (RR = 1.26, 95% CI 1.19–1.34). Significant improvements in swallowing function were reported using the Water Swallowing Test (WMD = -0.69, 95% CI -0.78 to -0.60) and the Penetration Aspiration Scale (MD = -1.02, 95% CI -1.27 to -0.78). |
| **Conclusion** | Acupuncture appears to be a promising adjunctive therapy for post-stroke dysphagia, but the overall quality of evidence remains low. More rigorously designed and transparently reported studies are needed to strengthen the evidence base and guide clinical decision-making. |

## 2.2. Tian 2019

Tian ZY, Liao X, Gao Y, Liang SB, Zhang CY, Xu DH, Liu JP, Robinson N. An Overview of Systematic Reviews and Meta- analyses on Acupuncture for Post-acute Stroke Dysphagia. Geriatrics (Basel). 2019;4(4). [203220].

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| **Background** | Many randomized controlled trials (RCTs) and systematic reviews (SRs) on acupuncture treatment for post-acute stroke dysphagia have been published. Conflicting results from different SRs necessitated an overview to summarize and assess the quality of this evidence to determine whether acupuncture is effective for this condition. The aim was to evaluate methodological quality and summarizing the evidence for important outcomes. |
| **Methods** | Seven databases were searched for SRs and/or meta-analysis of RCTs and quasi-RCTs on acupuncture for post-acute stroke dysphagia. Two authors independently identified SRs and meta-analyses, collected data to assess the quality of included SRs and meta analyses according to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) and the revised Assessment of Multiple Systematic Reviews (AMSTAR 2). |

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| **Results** | Searches yielded 382 SRs, 31 were included. The quality of 22 SRs was critically low, five SRs were low, and four Cochrane SRs were moderate when evaluated by AMSTAR2. A total of 17 SRs reported 85.2-96.3% of PRISMA items. Five SRs included explanatory RCTs, 16 SRs included pragmatic RCTs, and 10 SRs included both. |
| **Conclusion** | Currently, evidence on the effectiveness of acupuncture on post-acute stroke dysphagia is of a low quality. The type of study appeared to have no direct influence on the result, but the primary outcome measures showed a relationship with the quality of SRs. High quality trials with large sample sizes should be the focus of future research. |

# 3. Clinical Practice Guidelines

⊕ positive recommendation (regardless of the level of evidence reported)
Ø negative recommendation (or lack of evidence)

## 3.1. Stroke Foundation (Australia, New-Zealand) 2022 Ø

Australian and New Zealand Clinical Guidelines for Stroke Management - Chapter 3 : Acute medical and surgical management. https://app.magicapp.org/#/guideline/QnoKGn.

For patients with stroke, acupuncture should not be used for treatment of dysphagia in routine practice other than as part of a research study. (Long et al. 2012) [Weak recommendation against].

## 3.2. European Stroke Organisation & European Society for Swallowing Disorders (ESO, ESWS) 2021 ⊕

Dziewas R, Michou E, Trapl-Grundschober M, Lal A, Arsava EM, Bath PM, Clavé P, Glahn J, Hamdy S, Pownall S, Schindler A, Walshe M, Wirth R, Wright D, Verin E. European Stroke Organisation and European Society for Swallowing Disorders guideline for the diagnosis and treatment of post-stroke dysphagia. Eur Stroke J. 2021 Sep;6(3):LXXXIX-CXV. https://doi.org/10.1177/23969873211039721

Recommendation 10: In patients with post-stroke dysphagia, we suggest that acupuncture may be used to rehabilitate swallowing function. Quality of evidence: Moderate ⊕⊕⊕. Strength of recommendation: Weak for intervention ↑?

## 3.3. Canadian Partnership for Stroke Recovery (CPSR, Canada) 2018 ⊕

Evidence-based review of stroke rehabilitation: 18th edition, Canadian Partnership for Stroke Recovery (CPSR). 2018. [197578]. URL/

*Dysphagia and Aspiration Following Stroke*. There is level 2 evidence that acupuncture combined with physical therapy is more effective in treating dysphagia than physical therapy alone.

## 3.4. Stroke Foundation (SF, Australie) 2017 Ø

Clinical Guidelines for Stroke Management 2017 : Summary – Speech Pathology Melbourne: Stroke Foundation. 2017;:19P. [203838].

Weak recommendation : AGAINST, For patients with stroke, acupuncture should not be used for treatment of dysphagia in routine practice other than as part of a research study.

## 3.5. American Heart Association/American Stroke Association (AHA, ASA, USA) 2016 ⊕

Winstein CJ, Stein J, Arena R, Bates B, Cherney LR, Cramer SC, Deruyter F, Eng JJ, Fisher B, Harvey RL, Lang CE, MacKay-Lyons M, Ottenbacher KJ, Pugh S, Reeves MJ, Richards LG, Stiers W, Zorowitz RD et al. Guidelines for Adult Stroke Rehabilitation and Recovery: A Guideline for Healthcare Professionals From the American Heart Association/American Stroke Association. Stroke. 2016;47(6):e98-e169. [198716].

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| Acupuncture may be considered as a adjunctive treatment for dysphagia. Iib B. |

## 3.6. Royal College of Physicians (RCP, UK) 2016 ⊕

National clinical guideline for stroke. Royal College of Physicians. 2016:178p. [196712].

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| There was some evidence that acupuncture and behavioural interventions (dietary modification, swallowing exercises and environmental changes including positioning) may reduce dysphagia, although the specific components of each remain unclear. |

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