

Targeted Update

Intensive speech and language therapy for aphasia following stroke

This is a Targeted Update of the Cochrane Review Brady MC, Kelly H, Godwin J, Enderby P. Speech and language therapy for aphasia following stroke. Cochrane Database of Systematic Reviews 2012, Issue 5. Art. No.: CD000425. DOI: 10.1002/14651858.CD000425.pub3.

Latest search was performed: 9 September 2015 by the review authors as part of a full review update.

Results of the search, list of new references, details of updates to methods, study characteristics, risk of bias assessments and details of data analyses with forest plots can be found in the [Supplementary material](#).

This Targeted Update document was prepared by Hanna Bergman¹ and Nuala Livingstone². Data were taken from the draft full review update that was carried out by the review authors and accepted for publication by the Cochrane Stroke Group editorial team. The abstract was adapted from the draft full review update.

¹ Enhance Reviews, UK; ² Cochrane Editorial Unit, UK.



What's a Targeted Update?

Targeted Updates are two to three-page documents that use the Cochrane Review as their foundation, but focus on updating only one or two important comparisons, and the seven most relevant outcomes. They include an updated Summary of Findings table and Abstract, and use Cochrane methodology. The full search results, risk of bias assessments, analyses, and references do not form part of the Targeted Update, but are available as supplementary information. Targeted Updates are intended for use by policy makers.

What's the context for this Targeted Update?

The Norwegian Health Directorate commissioned this Targeted Update to help develop a guideline.

What's new

The comparisons 'intensive language therapy versus no language therapy' and 'high intensity language therapy versus low intensity language therapy' were included in this Targeted Update. Nine studies with 399 participants providing data were identified.

Findings suggest that intensive language therapy may make little or no difference in improving language function in patients with aphasia following stroke, as compared to no treatment. However, intensive language therapy probably improves some language functions as compared to low intensity therapy.

This Targeted Update is based on a Cochrane review that has a wider scope, included 57 studies, and concluded that language therapy of any intensity may be associated with improved language function compared to no treatment.

Up-to-date as of September 2015.

Intensive speech and language therapy (SLT) for aphasia following stroke:

- May make little or no difference to functional communication and receptive and expressive language when compared to no treatment;
- Probably improves functional communication and auditory comprehension, but may make little or no difference to other receptive and expressive language functions when compared to low intensity SLT.

Background

Aphasia is an acquired language impairment following brain damage that affects some or all language modalities, including expression and understanding of speech, and reading and writing. Approximately one-third of stroke patients experience aphasia.

Objectives

The objective of this Targeted Review was to assess the effectiveness of (a) intensive (≥ 5 times/week) speech and language therapy (SLT) for aphasia following stroke compared to no treatment, and (b) high intensity (≥ 5 times/week) SLT for aphasia following stroke compared to low intensity SLT.

Search methods

In September 2015 we searched MEDLINE, CINAHL, AMED, Cochrane Library Databases (CDSR, DARE, CENTRAL, HTA), EMBASE, LLBA, SpeechBITE, and the Cochrane Stroke Group Trials Register. We also searched major trials registers ClinicalTrials.gov, the Stroke Trials Registry, Current Controlled Trials, and WHO ICTRP. In addition, the International Journal of Language and Communication Disorders (1969 to 2005) was hand-searched, as were reference lists of relevant articles.

Selection criteria

Randomised controlled trials (RCTs) comparing intensive (≥ 5 times/week) SLT (formal intervention that aims to improve language and communication abilities, activity, and participation) with either (1) no SLT or (2) low intensity SLT (< 5 times/week).

Data collection and analysis

Two review authors independently assessed the eligibility and quality of trials. Mean differences (MD) with 95% confidence intervals (CI) were calculated for continuous data. Meta-analyses were performed unless heterogeneity was considerable ($I^2 > 80\%$), and a random effects model was used. All reasonable efforts were made to seek missing data from investigators, and for several studies unpublished data were used.

Main Results

We included nine RCTs, published from 1986 to 2014, involving 399 participants in this Targeted Update. Eight ongoing RCTs comparing intensive SLT with either no SLT or low intensity SLT were identified.

For several of the included studies the risk of bias was unclear as the randomisation process and allocation concealment were not adequately described in the report.

There was low quality evidence that intensive SLT may make little or no difference to Functional communication (MD 0.30 (95% CI -0.16 to 0.77)), Receptive language (auditory: MD 0.45 (-3.47 to 4.52), and reading comprehension: MD 3.07 (-3.79 to 10.11)) or Expressive language (naming: MD 2.48 (-3.94 to 8.91)), written language: MD 9.08 (-2.50 to 20.42), repetition: MD 1.30 (-3.48 to 6.02)), compared to no language therapy. We are uncertain about the effect on Expressive language: fluency, as the evidence was of very low quality.

There was moderate quality evidence that high intensity SLT probably improves Functional communication (MD 11.75 (4.09 to 19.40), 2 studies, 54 participants) and auditory comprehension (MD 3.47 (0.40 to 6.59), 3 studies, 76 participants), compared to low intensity SLT. There was low quality evidence that high intensity SLT may make little or no difference to Receptive language (reading comprehension: MD 1.71 (-3.03 to 6.45) and Expressive language (naming: MD 0.88 (-0.36 to 2.14); repetition: MD 0.66 (-3.62 to 4.86)), compared to low intensity SLT. Further, fluency may be improved (MD 0.96 (0.23 to 1.11), low quality evidence), and we are uncertain about Written language, as the quality of the evidence was very low.

Implications and conclusions

There is some evidence that intensive SLT may make little or no difference in improving language functions for people with aphasia following stroke compared to no therapy. Therapy at high intensity probably improves functional communication and auditory comprehension compared to low intensity therapy. The Cochrane review this Targeted Update is based on has a wider scope and concluded that language therapy of any intensity may be associated with improved language function.

The quality of the evidence was mostly low due to imprecision in the results and unclear risk of bias. Therefore, further research is very likely to have an important impact on these estimates.

Summary of Findings 1: Intensive speech and language therapy for aphasia following stroke

3

Patients and setting: Stroke patients in the chronic phase (>3 months) with aphasia. Studies were set in China, Germany, Italy, Sweden, and USA.

Comparison: Intensive language therapy (5-8 times / week) versus no language therapy

Outcome	Plain language summary	Absolute effect		Relative effect (95% CI) N° of participants & studies	Certainty of the evidence (GRADE)
		No language therapy	Intensive language therapy		
Functional communication Measured by ANELT; AAT (Spontaneous Speech); FCP; assessed by ANELT ¹	Intensive language therapy may make little or no difference to functional communication in patients with aphasia following stroke after 2-12 weeks of treatment.	Mean score: 1.88**	Mean score: 2.18	MD 0.30 (-0.16 to 0.77)* Based on data from 247 patients in 5 studies	⊕⊕⊕⊕ LOW ^{2,3}
		Difference 0.30 higher (0.16 lower to 0.77 higher)			
Receptive language: auditory comprehension Measured by NGA; Token Test; assessed by Token Test ⁴	Intensive language therapy may make little or no difference to auditory comprehension in patients with aphasia following stroke after 2-12 weeks of treatment.	Mean score: 26.83**	Mean score: 27.28	MD 0.45 (-3.47 to 4.52)* Based on data from 229 patients in 4 studies	⊕⊕⊕⊕ LOW ^{2,3}
		Difference 0.45 higher (3.47 lower to 4.52 higher)			
Receptive language: reading comprehension Measured by RCBA; AAT subtest; assessed by RCBA ⁵	Intensive language therapy may make little or no difference to reading comprehension in patients with aphasia following stroke after 2-12 weeks of treatment.	Mean score: 75.03**	Mean score: 78.1	MD 3.07 (-3.79 to 10.11)* Based on data from 115 patients in 3 studies	⊕⊕⊕⊕ LOW ^{2,3}
		Difference 3.07 higher (3.79 lower to 10.11 higher)			
Expressive language: naming Measured by NGA, AAT subtest; assessed by NGA ⁶	Intensive language therapy may make little or no difference to naming in patients with aphasia following stroke after 2-3 weeks of treatment.	Mean score: 6.6**	Mean score: 9.08	MD 2.48 (-3.94 to 8.91)* Based on data from 126 patients in 2 studies	⊕⊕⊕⊕ LOW ^{3,7}
		Difference 2.48 higher (3.94 lower to 8.91 higher)			
Expressive language: written Measured by PICA Graphic; AAT subtest; assessed by PICA ⁸	Intensive language therapy may make little or no difference to writing in patients with aphasia following stroke after 2-12 weeks of treatment.	Mean score: 68.57**	Mean score: 77.65	MD 9.08 (-2.50 to 20.42)* Based on data from 115 patients in 3 studies	⊕⊕⊕⊕ LOW ^{2,3}
		Difference 9.08 higher (2.50 lower to 20.42 higher)			
Expressive language: repetition Measured by NGA, AAT subtest; assessed by NGA ⁹	Intensive language therapy will probably make little or no difference to repetition in patients with aphasia following stroke after 2-3 weeks of treatment.	Mean score: 6.96**	Mean score: 8.26	MD 1.30 (-3.48 to 6.02)* Based on data from 126 participants in 2 studies	⊕⊕⊕⊕ MODERATE ³
		Difference 1.30 higher (3.48 lower to 6.02 higher)			
Expressive language: fluency Measured by RWFT	It is uncertain whether Intensive language therapy will improve fluency in patients with aphasia following stroke after 4 weeks of treatment.	Mean score: 21	Mean score: 25	MD 4.00 (-0.53 to 8.53) Based on data from 18 patients in 1 study	⊕⊕⊕⊕ VERY LOW ^{1,10}
		Difference 4.00 higher (0.53 lower to 8.53 higher)			

AAT= Aachen Aphasia Test; ANELT= Amsterdam-Nijmegen Everyday Language Test; CI= confidence interval; FCP= Functional Communication Profile; MD= mean difference; NGA= Norsk Grunntest for Afasi; PICA= Porch Index of Communicative Abilities; RCBA= Reading Comprehension Battery for Aphasia; RWFT= Regensburg Word Fluency Test

* Analysed with SMD and back-estimated to MD to enable interpretation, see footnotes for further details. **Based on mean score for representative study, see footnotes for further details.

¹ Two of the five studies used the ANELT. Scores were back-estimated to the ANELT from the SMD 0.17 (-0.09 to 0.43) using the control group SD 1.7799 from the representative study Laska 2011. ² Downgraded on level for design: Inadequate description of randomisation process and allocation concealment. ³ Downgraded one level for imprecision: total population size was <400. ⁴ Three of the four studies used the Token Test. Scores were back-estimated to the Token Test from the SMD 0.03 (-0.23 to 0.30) using the control group SD 15.0787 from the representative study Mattioli 2014. ⁵ Two of the three studies used the RCBA. Scores were back-estimated to the RCBA from the SMD 0.17 (-0.21 to 0.56) using the control group SD 18.06 from the representative study Wertz 1986. ⁶ One of the two studies used the NGA. Scores were back-estimated to the NGA from the SMD 0.39 (-0.21 to 1.40) using the control group SD 6.3608 from the representative study Laska 2011. ⁷ Downgraded one level for inconsistency: Considerable heterogeneity (I²=62%). ⁸ Two of the three studies used the PICA. Scores were back-estimated to the PICA from the SMD 0.40 (-0.11 to 0.90) using the control group SD 22.69 from the representative study Wertz 1986. ⁹ One of the two studies used the NGA. Scores were back-estimated to the NGA from the SMD 0.21 (-0.56 to 0.97) using the control group SD 6.21 from the representative study Laska 2011. ¹⁰ Downgraded two levels for imprecision: Only 18 participants

Summary of Findings 2: High versus low intensity speech and language therapy for aphasia following stroke

4

Patients and setting: Stroke patients in the chronic phase (>3 months) with aphasia. Studies were set in Australia, Germany, Italy, and Portugal.

Comparison: High intensity language therapy (5-7 times / week) versus low intensity language therapy (1-3 times / week)

Outcome	Plain language summary	Absolute effect		Relative effect (95% CI) N° of participants & studies	Certainty of the evidence (GRADE)
		Low intensity language therapy	High intensity language therapy		
Functional communication Measured by FCP	High intensity language therapy probably improves functional communication compared to low intensity language therapy after 4-10 weeks of treatment.	Mean score: 40.50	Mean score: 52.25	MD 11.75 (4.09 to 19.40) Based on data from 84 patients in 2 studies	⊕⊕⊕⊕ MODERATE ¹
Receptive language: auditory comprehension Measured by Token Test, AAT Comprehension subtest; assessed by Token Test ²	High intensity language therapy probably improves auditory comprehension compared to low intensity language therapy after 5 weeks to 6 months of treatment.	Mean score: 16.71**	Mean score: 20.18	MD 3.47 (0.40 to 6.59)* Based on data from 76 patients in 3 studies	⊕⊕⊕⊕ MODERATE ¹
Receptive language: reading comprehension Measured by AAT (Portuguese version)	High intensity language therapy may make little or no difference to reading comprehension compared to low intensity language therapy after 10 weeks of treatment.	Mean score: 37.29	Mean score: 39	MD 1.71 (-3.03 to 6.45) Based on data from 25 patients in 1 study	⊕⊕⊕⊕ LOW ³
Expressive language: naming Measured by AAT naming subset and LAAB; assessed by LAAB ⁴	High intensity language therapy may make little or no difference to naming compared to low intensity language therapy after 5 weeks to 6 months of treatment.	Mean score: 7.25**	Mean score: 8.13	MD 0.88 (-0.36 to 2.14)* Based on data from 59 patients in 3 studies	⊕⊕⊕⊕ LOW ^{1,5}
Expressive language: written Measured by AAT	It is uncertain whether High intensity language therapy will improve writing compared to low intensity language therapy after 10 weeks to 6 months of treatment.	Mean score: 13.14	Mean score: 16.7	MD 3.56 (-5.91 to 13.03) Based on data from 42 patients in 2 studies	⊕⊕⊕⊕ VERY LOW ^{1,5,6}
Expressive language: repetition Measured by AAT repetition subset and LAAB; assessed by AAT ⁷	High intensity language therapy may make little or no difference to repetition compared to low intensity language therapy after 5 weeks to 6 months of treatment.	Mean score: 53.14**	Mean score: 53.80	MD 0.66 (-3.62 to 4.86)* Based on data from 59 patients in 3 studies	⊕⊕⊕⊕ LOW ^{1,5}
Expressive language: fluency Measured by LAAB	High intensity language therapy may improve fluency compared to low intensity language after 10 weeks of treatment.	Mean score: 2.5	Mean score: 3.17	MD 0.67 (0.23 to 1.11) Based on data from 25 patients in 1 study	⊕⊕⊕⊕ LOW ³

AAT= Aachen Aphasia Test; CI= confidence interval; FCP= Functional Communication Profile; LAAB= Lisbon Aphasia Assessment Battery; MD= mean difference; SMD= standard mean difference

* Analysed with SMD and back-estimated to MD to enable interpretation, see footnotes for further details. **Based on mean score for representative study, see footnotes for further details.

¹ Downgraded one level for imprecision: Total population size was <400. ²Two of the four studies used the Token Test. Scores were back-estimated to the Token Test from the SMD 0.69 (0.08 to 1.31) using the control group SD 5.03 from the representative study SP-I-RiT. ³ Downgraded two levels for imprecision: Only 25 participants. ⁴ One of the three studies used the LAAB. Scores were back-estimated to the LAAB from the SMD 0.37 (-0.15 to 0.89) using the control group SD 2.4 from the representative study SP-I-RiT. ⁵ Downgraded one level for design: Inadequate description of randomization process and allocation concealment. ⁶ Downgraded one level for inconsistency: Heterogeneity was considerable (I²=82%). ⁷ Two of the three studies used the AAT. Scores were back-estimated to the AAT from the SMD 0.08 (-0.44 to 0.59) using the control group SD 8.23 from the representative study Pulvermuller 2001.

Forest plot 1: Intensive speech and language therapy for aphasia following stroke*

Patients and setting: Stroke patients in the chronic phase (>3 months) with aphasia. Studies were set in China, Germany, Italy, Sweden, and USA.

Comparison: Intensive language therapy (5-8 times / week) versus no language therapy

Outcome	Forest plot	Certainty of the evidence (GRADE)																																																																																																																																																																																																												
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* Forest plot for primary outcome. Forest plots for all outcomes are presented in Supplementary materials.

AAT= Aachen Aphasia Test; ANELT= Amsterdam-Nijmegen Everyday Language Test; SLT= Speech and Language Therapy

Forest plot 2: High versus low intensity speech and language therapy for aphasia following stroke*

Patients and setting: Stroke patients in the chronic phase (>3 months) with aphasia. Studies were set in Australia, Germany, Italy, and Portugal.

Comparison: High intensity language therapy (5-7 times / week) versus low intensity language therapy (1-3 times / week)

Outcome	Forest plot	Certainty of the evidence (GRADE)																																																																																																									
<p>Functional communication</p> <p>High intensity language therapy probably improves functional communication compared to low intensity language therapy after 4-10 weeks of treatment.</p>	<table border="1"> <thead> <tr> <th rowspan="2">Study or Subgroup</th> <th colspan="3">High Intensity SLT</th> <th colspan="3">Low Intensity SLT</th> <th rowspan="2">Weight</th> <th rowspan="2">Mean Difference IV, Random, 95% CI</th> </tr> <tr> <th>Mean</th> <th>SD</th> <th>Total</th> <th>Mean</th> <th>SD</th> <th>Total</th> </tr> </thead> <tbody> <tr> <td colspan="9">2.1.1 Functional Communication Profile</td> </tr> <tr> <td>SP-I-RIT</td> <td>58.23</td> <td>6.52</td> <td>13</td> <td>48.88</td> <td>10.85</td> <td>12</td> <td>72.7%</td> <td>9.35 [2.26, 16.44]</td> </tr> <tr> <td>VERSE I</td> <td>50.231</td> <td>27.3032</td> <td>32</td> <td>32.119</td> <td>25.7642</td> <td>27</td> <td>27.3%</td> <td>18.11 [4.55, 31.67]</td> </tr> <tr> <td>Subtotal (95% CI)</td> <td></td> <td></td> <td>45</td> <td></td> <td></td> <td>39</td> <td>100.0%</td> <td>11.75 [4.09, 19.40]</td> </tr> <tr> <td colspan="9">Heterogeneity: Tau² = 7.91; Chi² = 1.26, df = 1 (P = 0.26); I² = 21%</td> </tr> <tr> <td colspan="9">Test for overall effect: Z = 3.01 (P = 0.003)</td> </tr> <tr> <td colspan="9">Total (95% CI)</td> </tr> <tr> <td colspan="9">Heterogeneity: Tau² = 7.91; Chi² = 1.26, df = 1 (P = 0.26); I² = 21%</td> </tr> <tr> <td colspan="9">Test for overall effect: Z = 3.01 (P = 0.003)</td> </tr> <tr> <td colspan="9">Test for subgroup differences: Not applicable</td> </tr> </tbody> </table> <p style="text-align: center;">Favours Low Intensity Favours High Intensity</p>	Study or Subgroup	High Intensity SLT			Low Intensity SLT			Weight	Mean Difference IV, Random, 95% CI	Mean	SD	Total	Mean	SD	Total	2.1.1 Functional Communication Profile									SP-I-RIT	58.23	6.52	13	48.88	10.85	12	72.7%	9.35 [2.26, 16.44]	VERSE I	50.231	27.3032	32	32.119	25.7642	27	27.3%	18.11 [4.55, 31.67]	Subtotal (95% CI)			45			39	100.0%	11.75 [4.09, 19.40]	Heterogeneity: Tau ² = 7.91; Chi ² = 1.26, df = 1 (P = 0.26); I ² = 21%									Test for overall effect: Z = 3.01 (P = 0.003)									Total (95% CI)									Heterogeneity: Tau ² = 7.91; Chi ² = 1.26, df = 1 (P = 0.26); I ² = 21%									Test for overall effect: Z = 3.01 (P = 0.003)									Test for subgroup differences: Not applicable									<p>⊕⊕⊕⊕ MODERATE</p>
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* Forest plot for primary outcome. Forest plots for all outcomes are presented in Supplementary materials.

SLT= Speech and Language Therapy