

## COCHRANE CAM REVIEW: SUMMARY OF FINDINGS

# Music Therapy for Acquired Brain Injury

Vigdis Underland, MS; Ingvil Sæterdal, PhD; Elin Strømme Nilsen, MS

Vigdis Underland, MS; Ingvil Sæterdal, PhD; and Elin Strømme Nilsen, MS, are all researchers at the Nordic Cochrane Centre's Norwegian branch, Norwegian Knowledge Centre for Health Services, Oslo. (*Altern Ther Health Med.* 2011;17(2):16-17.)

Corresponding author: Elin Strømme Nilsen, MS  
E-mail address: [esn@nokc.no](mailto:esn@nokc.no)

**A**s part of its efforts to disseminate the results of Cochrane reviews to a wider audience, the Cochrane Complementary and Alternative Medicine (CAM) Field develops Summary of Findings (SoF) tables and then uses these tables as a basis for its consumer summaries. In each SoF table, the most important outcomes of the review, the effect of the intervention on each outcome, and the quality of the evidence for each outcome are presented. The process of developing the SoF table involves deciding which outcomes to present for which time points and evaluating the strength and quality of the evidence for the outcomes. The Cochrane CAM Field contacted the authors of this review to request clarification on any points that are not understood in the Cochrane review and also to request their review of the SoF. In this article, review authors in the Cochrane Collaboration reviewed the effect of music therapy for acquired brain injury.

### ACQUIRED BRAIN INJURY AND MUSIC THERAPY

Acquired brain injury includes a range of conditions that involve a rapid onset of brain injury such as trauma to the head, stroke, postsurgical damage, lack of oxygen to the brain, infections, or inflammation. These injuries can result in impairment of language, sensory processing, cognition, and motor skills. One main goal with rehabilitation after acquired brain injury is to restore motor function. One approach to achieve this goal is with the help of music therapy, which is postulated to exert direct physiological effects through the autonomic nervous system and thereby stimulate brain functions involved in, for instance, motor skills.

When examining the efficacy of music interventions, there is a distinction between music interventions administered by medical or health care professionals (music medicine) and those administered by trained music therapists (music therapy).

Interventions are categorized as music medicine when passive listening to pre-recorded music is offered by medical personnel. For example, a compact disc may be offered to a patient for relaxation or distraction; however, no systematic therapeutic

process is present. In contrast, music therapy requires the implementation of a music intervention by a trained music therapist, the presence of a therapeutic process, and the use of personally tailored music experiences. These personal music experiences include for example listening to music, singing or vocal activities to music, performing music on an instrument, or composing music.

Interventions used in music therapy in rehabilitation range from listening to music to reduce pain to the use of rhythmic auditory stimulation to stimulate motor functions. Rhythmic auditory stimulation involves the use of a strong rhythmic pulse while performing a motor skill like walking or reaching arm movements. The rhythmic stimulus is used to enhance the different motor skills for a prescribed period of time in order to achieve more functional patterns that eventually should be performed without rhythmic facilitation.

The studies included below all used rhythmic auditory stimulation as their mode of music therapy and compared it with neurodevelopmental treatment. Neurodevelopmental treatment is a hands-on treatment approach that was developed to enhance the function of adults and children who have difficulties in controlling movement resulting from neurological challenges such as stroke and head injury. Techniques include inhibition of atypical movement patterns and facilitation of more typical movement patterns to encourage increased functional skill development.

### WHAT DOES THE RESEARCH SAY?

Not all research provides the same quality of evidence. The higher the quality, the more certain we are about what the research says about an effect. The words *will* (high-quality evidence), *probably* (moderate-quality evidence), and *may* (low-quality evidence) describe how certain we are about the effect.

After searching for all relevant studies, the review authors found seven studies that they included in the review. Three of the studies used rhythmic auditory stimulation as the intervention, and two of these three studies examined the effects of rhythmic auditory stimulation vs standard neurodevelopmental therapy. The findings of these studies on improvement in gait as measured by changes in gait velocity, cadence, and stride length are summarized below.

The studies showed that for people with acquired brain injury, music therapy

- may increase gait velocity (walking distance per minute),
- may increase gait stride length (length of each step), and
- may increase gait cadence (number of steps per minute).

**TABLE 1 Results**

What Was Measured*	Control	Music Therapy**	Quality of Evidence
Mean gait velocity (m/min)	26	14.32 more (10.98-17.67 more)	⊕⊕OO Low
Mean gait stride length (m)	0.68	0.23 longer (0.14-0.32 longer)	⊕⊕OO Low
Mean gait cadence (steps/min)	75	16.71 (3.40- 30.01 more)	⊕⊕OO Low

\*A better result is indicated by a higher score.  
\*\*The numbers in parentheses show the range of the actual effect.

**TABLE 2 Summary of Findings: Rhythmic Auditory Stimulation Compared to Neurodevelopmental Treatment for Acquired Brain Injury**

**Patient or population:** Patients with acquired brain injury

**Settings:** Hospital and research centers

**Intervention:** Rhythmic auditory stimulation

**Comparison:** Neurodevelopmental treatment

Outcomes	Illustrative Comparative Risks (95% CI)		No. of Participants (Studies)	Quality of the Evidence (GRADE)
	Assumed risk	Corresponding risk		
	Neurodevelopmental treatment	Rhythmic auditory stimulation		
Gait velocity (m/min)	The mean gait velocity in the control groups was 26.	The mean gait velocity in the intervention groups was 14.32 higher (10.98-17.67 higher).	98 (2 <sup>2</sup> )	⊕⊕OO Low <sup>1,3</sup>
Gait stride length (m)	The mean gait stride length in the control groups was 0.68.	The mean gait stride length in the intervention groups was 0.23 higher (0.14-0.32 higher).	98 (2 <sup>2</sup> )	⊕⊕OO Low <sup>1,3</sup>
Gait cadence steps/min	The mean gait cadence in the control groups was 75.	The mean gait cadence in the intervention groups was 16.71 higher (3.4-30.01 higher).	98 (2 <sup>2</sup> )	⊕⊕OO Low <sup>1,3</sup>

CI: Confidence interval

GRADE Working Group grades of evidence

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

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

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

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

<sup>1</sup> Only two small studies with a total of 98 participants.

<sup>2</sup> Thaut 1997, Thaut 2007.

<sup>3</sup> Wide CI.

## SUMMARY OF FINDINGS

Table 2 summarizes the findings of studies of rhythmic auditory stimulation vs neurodevelopmental treatment for acquired brain injury.

## WHERE DOES THIS INFORMATION COME FROM?

The Cochrane Collaboration is an independent global network of volunteers dedicated to summarizing research about health care.

This information is taken from this Cochrane Review: Bradt J, Magee WL, Dileo C, Wheeler BL, McGilloway E. Music therapy for acquired brain injury. *Cochrane Database Syst Rev.* 2010 Jul 7;(7):CD006787. Review.

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