Treatment Intervention Advisory Committee Review and Determination

Date: July 25, 2014

To: DHS/DLTC

From: Wisconsin Department of Health Services Autism and other Developmental Disabilities, Treatment Intervention Advisory Committee: Lana Collet-Klingenberg, Ph.D. (chairperson)

RE: Determination of Music Therapy as a proven and effective treatment for individuals with autism spectrum disorder and/or other developmental disabilities

☐ This is an initial review

☒ This is a re-review. The initial review was 4/9/12, with re-reviews on 8/7/12, & 7/22/13

Section One: Literature Review and Determination

Please find below a statement of our determination as to whether or not the committee views Music Therapy as a proven and effective treatment for children with autism spectrum disorder and/or other developmental disabilities. In subsequent sections you will find documentation of our review process including a description of the proposed treatment, a synopsis of review findings, a listing of the literature considered, and the treatment review evidence checklist. In reviewing treatments presented to us by DHS/DLTC, we implement a review process that carefully and fully considers all available information regarding a proposed treatment. Our determination is limited to a statement regarding how established a practice is in regard to quality research. We do not make funding decisions.

In the case of Music Therapy, please refer to the attached reference listing that details the reviewed research. The committee's conclusion is that Music Therapy has emerging evidence (DHS 107 – Promising as a Proven & Effective Treatment). Specifically, the practice of Improvisational Music Therapy has emerging empirical support based on the following:

- The National Autism Center's National Standards Project classified Music Therapy as an Emerging Treatment that may produce favorable outcomes but requires additional high quality studies to be considered proven and effective.
- There exists one published high quality group design study that demonstrates the effectiveness of Improvisational Music Therapy on initiation of engagement behavior and compliance with therapists' interpersonal demands when compared to toy play therapy (Kim, Wigram, & Gold, 2009).
- There is also research suggesting Auditory-Motor Mapping Training (Wan, Banzen, Baars, Libenson, Zipse, et al., 2011), Developmental Speech and Language Training Through Music (Lim, 2010), and Music Therapy incorporated with Applied Behavior Analysis Verbal Behavior Approach (Lim & Draper, 2011) have emerging evidence as treatments of children with ASD.

Please note that all of these published treatment studies were conducted with children, not adolescents. Furthermore, Improvisational Music Therapy was found to be effective when targeting initiation of

engagement behavior (e.g., spontaneously interacts with therapist, initiates a change during ongoing interactions with therapist) and responding and complying with therapist initiation of interactions. Please see the list of studies reviewed following section Two.

Section Two: Rationale for Focus on Research Specific to Comprehensive Treatment Packages (CTP) or Models

In the professional literature, there are two classifications of interventions for individuals with Autism Spectrum Disorder (National Research Council, 2001; Odom et al., 2003; Rogers & Vismara, 2008):

(a) **Focused intervention techniques** are individual practices or strategies (such as positive reinforcement) designed to produce a specific behavioral or developmental outcome, and

(b) **Comprehensive treatment models** are "packages" or programs that consist of a set of practices or multiple techniques designed to achieve a broader learning or developmental impact.

To determine whether a treatment package is proven and effective, the Treatment Intervention Advisory Committee (TIAC) will adopt the following perspective as recommended by Odom et al. (2010):

The individual, focused intervention techniques that make up a comprehensive treatment model may be evidence-based. The research supporting the effectiveness of separate, individual components, however, does *not* constitute an evaluation of the comprehensive treatment model or "package." The TIAC will consider and review only research that has evaluated the efficacy of implementing the comprehensive treatment *as a package*. Such packages are most often identifiable in the literature by a consistently used name or label.

National Research Council. (2001). *Educating children with autism.* Washington, DC: National Academy Press.

Odom, S. L., Brown, W. H., Frey, T., Karusu, N., Smith-Carter, L., & Strain, P. (2003) Evidence-based practices for young children with autism: Evidence from single-subject research design. *Focus on Autism and Other Developmental Disabilities, 18,* 176-181.

Odom, S. L., Boyd, B. A., Hall, L. J., & Hume, K. (2010). Evaluation of comprehensive treatment models for individuals with Autism Spectrum Disorders. *Journal of Autism and Developmental Disorders, 40,* 425-436.

Rogers, S., & Vismara, L. (2008). Evidence-based comprehensive treatments for early autism. *Journal of Clinical Child and Adolescent Psychology, 37,* 8-38.

Description of Proposed Treatment

Improvisational Music Therapy involves the interactive use of live music for engaging children with autism to meet therapeutic goals and objectives.

Synopsis of Review

The published empirical literature on Improvisational Music Therapy continues to be problematic given limitations involving lack of empirical studies (versus case reports), detailed subject characteristics, treatment integrity data, experimental control, and maintenance data. Furthermore, rater bias and small samples sizes negatively impacting test power plague research on music therapy as a treatment for children with autism. Whipple's (2012) most recent review of the Music Therapy literature stated that music therapy research must focus on increasing sample sizes and assessing the efficacy of specific music therapy applications. As a result, Improvisational Music Therapy does not have sufficient empirical support to be considered an established or well established treatment for children and adolescents on the Autism Spectrum.

Literature Reviewed

Accordino, R., Comer, R., & Heller, W.B. (2007). Searching for music's potential: A critical examination of research on music therapy with individuals with autism. *Research in Autism Spectrum Disorders, 1,* 101- 115.

Aldridge, D., Gustorff, D., & Neugebauer, L. (1995). A preliminary study of creative music therapy in the treatment of children with developmental delay. *The Arts in Psychotherapy, 22,* 189-205.

Boso, M., Emanuele, E., Minazzi. V., Abbamonte, M., & Politi, P. (2007). Effect of long-term interactive music therapy on behavior profile and musical skills in young adults with severe autism. The Journal of Alternative and Complementary Medicine, 12(7), 709-712.

Brownell, M.D. (2002). Musically adapted social stories to modify behaviors in students with autism: Four case studies. *Journal of Music Therapy, 39,* 117-144.

Edgerton, C.L. (1994). The effects of improvisational music therapy on the communicative behaviors of autistic children. *Journal of Music Therapy, 31(1),* 81-93.

Finnigan, E., & Starr, E. (2010). Increasing social responsiveness in a child with autism: A comparison of music and non-music interventions. *Autism, 14,* 321-348.

Gattino, G.S., dos Santos Riesgo, R., Longo, D., Leite, J.C.L., & Faccini, L.S. (2011). Effects of relational music therapy on communiation of children with autism: A randomized controlled study. *Nordic Journal of Music Therapy, 20,* 142-154.

Gold, C. Wigram, T., & Elefant, C. (2010). Music therapy for autism spectrum disorder. *The Cochrane Collaboration.* JohnWiley & Sons, Ltd.

Gooding, L.F. (2011). The effects of a music therapy social skills training program on improving social competence in children and adolescents with social skills deficits. *Journal of Music*

Therapy, 48 440-162.

Kaplan, R.S., & Steele, A.L. (2005). An analysis of music therapy program goals and outcomes for clients with diagnoses on the Autism Spectrum. *Journal of Music Therapy* ,42(1), 2-19.

Katagiri, J. (2009). The effect of background music and song texts on the emotional understanding of children with autism. *Journal of Music Therapy, 46,* 15-31.

Kern, P., Wakeford, L., & Aldridge, D (2007). Improving the performace of a young child with autism during self-care tasks using embedded song interventions: A case study. *Music Therapy Perspectives, 25 (1),* 43-51.

Kern, P., Wolery, M., & Aldridge, D. (2007). Use of songs to promote independence in morning greeting routines for young children with autism. *Journal of Autism and Developmental Disorders, 37,* 1264-1271.

*Kern, P., & Aldridge, D. (2006). Using embedded music therapy interventions to support outdoor play of young children with autism in an inclusive community-based child care program. *Journal of Music Therapy*, 43(4), 270-294.

*Kim, J., Wigram, T., & Gold, C. (2008). The effects of improvisational music therapy on joint attention behaviors in autistic children: A randomized controlled study. *Journal of Autism and Developmental Disorders*, 38, 1758-1766.

Kim, J., Wigram, T., & Gold, C. (2009). Emotional, motivational, and interpersonal responsiveness of children with autism in improvisational music therapy. *Autism, 13(4),* 389-409.

Lim, H.A. (2010). Effect of "developmental speech and language training through music" on speech production in children with autism spectrum disorders. *Journal of Music Therapy, 47 (1),* 2-26.

Lim, H.A. (2010) Use of music in the applied behavioral analysis verbal behavior approach for children with autism spectrum disorders. *Music Therapy Perspectives, 28(2),* 95-105.

Lim, H.A., & Draper, E. (2011). The effects of music therapy incorporated with applied behavior analysis verbal behavior approach for children with autism spectrum disorders. *Journal of Music Therapy, 48(4),* 532-550.

*Lundqvist, L., Andersson, G., Viding, J. (2009). Effects of vibroacoustic music on challenging behaviors in individuals with autism and developmental disabilities. *Research in Autism Spectrum Disorders, 3*, 390-400.

Silverman, M.J. (2008). Nonverbal communication, music therapy, and autism: A review of the literature and case example. *Journal of Creativity in Mental Health, 3*, 3-19.

Sorel, S. (2010). Presenting Carly and Elliot: Exploring roles and relationships in a mother-son dyad in Nordoff-Robbins music therapy. *Qualitative Inquiries in Music Therapy, 5,* 173-238.

Standley, J.M. (1996). A meta-analysis on the effects of music as reinforcement for education/therapy objectives. *Journal of Research in Music Education, 44,* 105-133.

Walworth, D.D. (2007). The use of music therapy with the SCERTS Model for children with autism spectrum disorders. Journal of Music Therapy, 45(1), 2-22.

Wan, C.Y., Bazen, L., Baars, R., Libenson, A., Zipse, L., et al. (2011). Auditory-motor mapping training as an intervention to facilitate speech output in non-verbal children with autism: A proof of concept study. *PLoS ONE, 6(9),* e25505.

Whipple, J. (2004). Music in intervention for children and adolescents with autism: A meta-analysis. *Journal of Music Therapy, 41,* 90-106.

Whipple, J. (2012). Music therapy as an effective treatment for young children with autism spectrum disorders: A meta-analysis. In P. Kern & M. Humpal (Eds.) *Early Childhood Music Therapy and Autism Spectrum Disorders* (pp 58-76). London: Jessica Kingsley Publishers.

Wigram, T. & Gold, C. (2006). Music therapy in the assessment and treatment of autistic spectrum disorders: Clinical application and research evidence. *Child: Care, Health and Development,* 32(5), 535-542.

Wimpory, D. Chadwick. P., & Nash, S. (1995). Brief report: Musical interaction therapy fo children with autism: An evaluative case study with two-year follow up. *Journal of Autism and Developmental Disorders,* 25(5), 541-552.

* These studies were brought to our attention in an email dated 4/23/14 by Laurie Farnan, MMT, MT-BC, WMTR, Retired Senior Therapist, DHS, on behalf of the AMTA Wisconsin Chapter for Music Therapy in which she asked for our review and conclusions about these three articles. Attached to this memo are Study Inclusion and Design Checklists for each of these studies.

Section Three: DLTC-TIAC Treatment Review Evidence Checklist

Name of Treatment: Music therapy

Level 1- Well Established or Strong Evidence (DHS 107 - Proven & Effective Treatment))

- ☐ Other authoritative bodies that have conducted extensive literature reviews of related treatments (e.g., National Standards Project, National Professional Development Center) have approved of or rated the treatment package as having a strong evidence base; authorities are in agreement about the level of evidence.
- ☐ There exist ample high quality studies that demonstrate experimental control and favorable outcomes of treatment package
  - o Minimum of two group studies or five single subject studies or a combination of the two
  - o Studies were conducted across at least two independent research groups
  - o Studies were published in peer reviewed journals
- ☐ There is a published procedures manual for the treatment, or treatment implementation is clearly defined (i.e., replicable) within the studies
- ☐ Participants (i.e., N) are clearly identified as individuals with autism spectrum disorders or developmental disabilities

Notes: At this level, include ages of participants and disabilities identified in body of research

Level 2 – Established or Moderate Evidence (DHS 107 - Proven & Effective Treatment)

- ☐ Other authoritative bodies that have conducted extensive literature reviews of related treatments (e.g., National Standards Project, NPDC) have approved of or rated the treatment package as having at least a minimal evidence base; authorities may not be in agreement about the level of evidence
- ☐ There exist at least two high quality studies that demonstrate experimental control and favorable outcomes of treatment package
  - o Minimum of one group study or two single subject studies or a combination of the two
  - o Studies were conducted by someone other than the creator/provider of the treatment
  - o Studies were published in peer reviewed journals
- ☐ Participants (i.e., N) are clearly identified as individuals with autism spectrum disorders or developmental disabilities

Notes: At this level, include ages of participants and disabilities identified in body of research

Level 3 – Emerging Evidence (DHS 107 – Promising as a Proven & Effective Treatment)

☒ Other authoritative bodies that have conducted extensive literature reviews of related treatments (e.g., National Standards Project, NPDC) have recognized the treatment package as having an emerging evidence base; authorities may not be in agreement about the level of evidence

The National Autism Center's National Standards Project classified Music Therapy as an Emerging Treatment that may produce favorable outcomes but requires additional high quality studies to be considered proven and effective.

☒ There exists at least one high quality study that demonstrates experimental control and favorable outcomes of treatment package

- May be one group study or single subject study
- Study was conducted by someone other than the creator/provider of the treatment
- Study was published in peer reviewed journal

Kim, J., Wigram, T., & Gold, C. (2009). Emotional, motivational, and interpersonal responsiveness of children with autism in improvisational music therapy. *Autism, 13 (4),* 389-409.

☒ Participants (i.e., N) are clearly identified as individuals with autism spectrum disorders or developmental disabilities

Notes: At this level, include ages of participants and disabilities identified in body of research

3 – 5 years old

Level 4 – Insufficient Evidence (Experimental Treatment)

☐ Other authoritative bodies that have conducted extensive literature reviews of related treatments (e.g., National Standards Project, NPDC) have not recognized the treatment package as having an emerging evidence base; authorities are in agreement about the level of evidence

☐ There is not at least one high quality study that demonstrates experimental control and favorable outcomes of treatment package

- Study was conducted by the creator/provider of the treatment
- Study was not published in a peer reviewed journal

☐ Participants (i.e., N) are not clearly identified as individuals with autism spectrum disorders or developmental disabilities

Notes:

Level 5 – Untested (Experimental Treatment) &/or Potentially Harmful

☐ Other authoritative bodies that have conducted extensive literature reviews of related treatments (e.g., National Standards Project, NPDC) have not recognized the treatment package as having an emerging evidence base; authorities are in agreement about the level of evidence.

☐ There are no published studies supporting the proposed treatment package

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☐ There exists evidence that the treatment package is potentially harmful
- Authoritative bodies have expressed concern regarding safety/outcomes
- Professional bodies (i.e., organizations or certifying bodies) have created statements regarding safety/outcomes

Notes: At this level, please specify if the treatment is reported to be potentially harmful, providing documentation

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Date: July 25, 2014

Committee Members Completing Initial Review of Research Base: Lana Collet-Klingenberg, Tia Schultz

Committee Decision on Level of Evidence to Suggest the Proposed Treatment is Proven and Effective:
Level 3 – Emerging Evidence (DHS 107 – Promising as a Proven & Effective Treatment)

References Supporting Identification of Evidence Levels:

Chambless, D.L., Hollon, S.D. (1998). Defining empirically supported therapies. *Journal of Consulting and Clinical Psychology, 66(1)* 7-18.

Chorpita, B.F. (2003). The frontier of evidence-based practice. In A.E. Kazdin & J.R. Weisz (Eds.). *Evidence-based psychotherapies for children and adolescents* (pp. 42-59). New York: The Guilford Press.

Odom, S. L., Collet-Klingenberg, L., Rogers, S. J., & Hatton, D. (2010). Evidence-based practices in interventions for children and youth with autism spectrum disorders. *Preventing School Failure, 54(4),* 275-282.

Article Reference:	Kern, P., & Aldridge, D. (2006). Using embedded music therapy interventions to support outdoor play of young children with autism in an inclusive community-based child care program. *Journal of Music Therapy, 18*(4), 270-294.
IV Description	Music hut on playground, teacher modeling, peer buddies
DV	Interactive behaviors, play, engagement
# in study	4
Age ranges	3 – 5 yrs
Diagnoses	Autism
Design	Multiple baseline across children
Study Results	Musical adaptation of playground did not improve social interactions but it facilitated play and involvement with peers. Peer mediation increased peer interactions.
Reviewer Comments	Limitations – no maintenance or generalization procedures implemented; small sample size

Single-Case Design EBP Inclusion Criteria Checklist

Instructions: Read each item and check the appropriate box. If you check "NO" at any time, the article can be discarded as it will not be included as evidence for a practice.

Item	YES	NO	Rationale
Does the dependent variable align with the research question or purpose of the study?	X		
Was the dependent variable clearly defined such that another person could identify an occurrence or non-occurrence of the response?	X		
Does the measurement system align with the dependent variable and produce a quantifiable index?	X		
Did a secondary observer collect data on the dependent variable for at least 20% of sessions across conditions?	X		
Was mean interobserver agreement (IOA) 80% or greater OR kappa of .60 or greater?	X		
Is the independent variable described with enough information to allow for a clear understanding about the critical differences between the baseline and intervention conditions, or were references to other material used if description	X		
Was the baseline described in a manner that allows for a clear understanding of the differences between the baseline and intervention conditions?	X		
Are the results displayed in graphical format showing repeated measures for a single case (e.g., behavior, participant, group) across time?	X		
Do the results demonstrate changes in the dependent variable when the independent variable is manipulated by the experimenter at three different points in time or across three phase repetitions? *Alternating treatment designs require at least 4 repetitions of the alternating sequence.	X		MB across children

Article Reference:	Kim, J., Wigram, T., & Gold, C. (2008). The effects of improvisational music therapy on joint attention behaviors in autistic children: A randomized controlled study. Journal of Autism and Developmental Disorders, 38, 1758-1766.
IV Description	Improvisational music therapy – musical attunement that is responsive to child's movement and expression; compared to play therapy in this study
DV	Joint attention measured via eye contact and turn-taking
# in study	15
Age ranges	3 – 5 yrs
Diagnoses	Autism
Design	RCT with SCR - Repeated measures comparison, between conditions and within subjects
Study Results	Improvisation music therapy resulted in overall joint attention scores, as well as in greater eye contact and turn taking than did the play condition
Reviewer Comments	Limitations – small sample size (ended with 10 due to attrition; ANOVA for one measure were not statistically significant; parent and professional measures did not compare; higher levels of joint attention (pointing and showing) were not affected by IV

Group Design EBP Inclusion Criteria Checklist

Instructions: Read each item and check the appropriate box. If you check "NO" at any time, the article can be discarded as it will not be included as evidence for a practice.

Item	YES	NO	Rationale
Does the study have experimental and control/comparative groups?	X		
Were appropriate procedures used to increase the likelihood that relevant characteristic of participants in the sample were comparable across conditions?	X		
Was there evidence for adequate reliability for the key outcome measures? And/ or when relevant, was inter-observer reliability assessed and reported to be at an acceptable level?	?		Reliability mentioned but not clearly reported
Were outcomes for capturing the intervention's effect measured at appropriate times (at least pre- and post-test)?	X		
Was the intervention described and specified clearly enough that critical aspects could be understood?	X		
Was the control/comparison condition(s) described?	X		
Were data analysis techniques appropriately linked to key research questions and hypotheses?	X		
Was attrition NOT a significant threat to internal validity?	?		30% attrition of participants
Does the research report statistically significant effects of the practice for individuals with ASD for at least one outcome variable?	X		
Were the measures of effect attributed to the intervention? (no obvious unaccounted confounding factors)	X		Questionable due to low sample size and author identified limitations

Article Reference:	Lundqvist, L., Andersson, G., Viding, J., (2009). Effects ofvibroacoustic music on challenging behaviors in individuals with autism and developmental disabilities. Research in Autism Spectrum Disorders,3, 390-400.
IV Description	Vibroacoustic music
DV	Challenging behaviors: self-injurious, stereotypical and aggressive destructive behaviors
# in study	20 (13 men, 7 women)
Age ranges	22 – 57 years
Diagnoses	Developmental disabilities; intellectual disabilities; ASD (10)
Design	RCT
Study Results	Reduction in challenging behavior
Reviewer Comments	Study done with adults

Group Design EBP Inclusion Criteria Checklist

Instructions: Read each item and check the appropriate box. If you check "NO" at any time, the article can be discarded as it will not be included as evidence for a practice.

Item	YES	NO	Rationale
Does the study have experimental and control/comparative groups?	X		No strict control group but participants were divided in two groups and half were treated at a atime
Were appropriate procedures used to increase the likelihood that relevant characteristic of participants in the sample were comparable across conditions?	X		
Was their evidence for adequate reliability for the key outcome measures? And/or when relevant, was inter-observer reliability assessed and reported to be at an acceptable level?		X	No mention of reliability for behavioral observations or assistants' measures
Were outcomes for capturing the intervention's effect measured at appropriate times (at least pre- and post-test)?	X		
Was the intervention described and specified clearly enough that critical aspects could be understood?	X		
Was the control/comparison condition(s) described?	X		
Were data analysis techniques appropriately linked to key research questions and hypotheses?	X		
Was attrition NOT a significant threat to internal validity?	X		
Does the research report statistically significant effects of the practice for individuals with ASD for at least one outcome variable?	X		
Were the measures of effect attributed to the intervention? (no obvious unaccounted confounding factors)	X		