

Music Therapy for Animals – A New Day Dawns **Narda G. Robinson, DO, DVM, MS**

For those times when everyone in the practice – doctors, techs, and patients – are feeling crabby and out of sorts, a new, non-toxic solution has arrived. It takes effect almost immediately, and the entire room seems to settle down to a balanced state of calm. What is it? Music therapy for dogs. Called *Through a Dog's Ear* (www.throughadogsear.com) and based on psychoacoustic research, this new compilation of music therapy has dogs not barking, but resting. Through the combined efforts of sound researcher Joshua Leeds, board-certified veterinary neurologist Susan Wagner, Juilliard-trained Lisa Spector, and the Apollo Chamber Ensemble, the science of music therapy is slowly advancing into the veterinary profession. Observers readily find that listeners' breathing normalizes, ambient noise subsides, and all of a sudden, life seems more livable. One can only hope that this book and CD combo will inspire us all to reflect on the negative toll that constant noise bombardment (screaming kids, endless television drone, family arguments) can take on our non-human family members, and even ourselves.

Some call music a “universal language”,¹ but is it really? In other words, do all non-humans respond to music favorably? Studies in birds indicate that both human and nonhuman species perceive music in a similar manner.² Birds, like humans, preferred classical to modern music, as well as classical music over silence.³ Perhaps this is because birdsong sometimes resembles music, or vice versa, given the close ties between the two.⁴ On the contrary, primates prefer silence to even slow tempo musical stimuli.⁵ What dogs and cats prefer may depend on the context and the individual.

Therapeutic music has existed in the human medical setting since the 1800's, upon the invention of the phonograph.⁶ Soporific sound to encourage sleep was introduced in the surgical setting back then, and added as an audio analgesia aid. In contemporary times, music therapy is resurging in popularity, especially as evidence is now notating its neurophysiologic benefits and appropriate clinical applications. For example, soothing music played in the post-anesthesia care unit improves comfort and reduced pain.⁷ Music reduces anxiety in mechanically ventilated patients and in older adults undergoing cardiovascular surgery.^{8,9} Classical music reduces potentially detrimental physiologic and psychological responses to percutaneous coronary

¹ Avers L, Mathur A, and Kamat D. Music therapy in pediatrics. *Clinical Pediatrics*. 2007;46(7):575-579.

² Watanabe S, Uozumi M, and Tanaka N. Discrimination of consonance and dissonance in Java sparrows. *Behavioural Processes*. 2005;70:203-208.

³ Gess A. Birds like music, too. [Letter to the Editor]. *Science*. 2007;317:1864.

⁴ Baptista LF and Keister RA. Why birdsong is sometimes like music. *Perspectives in Biology and Medicine*. 2005;48(3):426-443.

⁵ McDermott J and Hauser MD. Nonhuman primates prefer slow tempos but dislike music overall. *Cognition*. 2007;104(3):654-668.

⁶ Barrera ME, Rykov MH, and Doyle SL. The effects of interactive music therapy on hospitalized children with cancer: a pilot study. *Psycho-Oncology*. 2002;11:379-388.

⁷ hertzer KE and Keck JF. Music and the PACU environment. *Journal of PeriAnesthesia Nursing*. 2001;16(2):90-102.

⁸ Lee OKA, Chung YFL, Chan MF, et al. Music and its effect on the physiological responses and anxiety levels of patients receiving mechanical ventilation: a pilot study. *Journal of Clinical Nursing*. 2005;14:

⁹ Twiss E, Seaver J, and McCaffrey R. The effect of music listening on older adults undergoing cardiovascular surgery. *Nursing in Critical Care*. 200;11(5):224-231.

interventions, along with lower pain scores.¹⁰ Relaxing music reduces pain after dressing changes for vascular wounds.¹¹ Both classical and self-selected relaxing music reduce negative emotional states and levels of sympathetic nervous system arousal (i.e., pulse and respiratory rates) following stress, compared to heavy metal and mere sitting in silence.¹² The main adverse effects from music therapy arise from either incorrect music or tempo selection for the listener's specific problem, or to musicogenic seizures, so far only reported in humans.¹³

How does music therapy work? More than merely a relaxant, music causes changes in brain activity, neurohumoral, cardiovascular, and immune responses, although the genre and tempo influence the direction of those changes.^{14 15 16 17} Music listening during the early period after stroke improves cognitive recovery and buoys the mood.¹⁸ Functional brain imaging studies demonstrate that listening to music induces brain-wide alterations in processing functions related to attention, semantic, music-syntactic, memory, and motor functions.¹⁹ Thus, instead of allowing brain-injured patients to languish in silence for most of the day without any interaction or activity, music therapy researchers are finding that the neural plasticity window in this post-injury phase could instead be filled with auditory provocation that reduces depression and improves brain function.²⁰ Even during brain development and maturation, exposure to music modifies protein expression in key brain areas for verbal learning, mood, and memory.²¹

Do the same changes take place in the canine brain? What musical triggers, rhythms, and genres should be prescribed for dogs undergoing rehabilitation for brain and spinal cord injury versus behavioral interventions for aggression or separation anxiety? Should canine athletes exercise to hip hop? While seemingly endless questions arise as we enter this new domain of music therapy for dogs, the most important step has already taken place...the first one.

¹⁰ Chan MF. Effects of music on patients undergoing a C-clamp procedure after percutaneous coronary interventions: A randomized controlled trial. -- *Heart Lung*. 2007;36:431-439.

¹¹ F.M. Kane, E.E. Brodie and A. Coull et al., The analgesic effect of odour and music upon dressing change, *Br J Nurs* 13 (2004), pp. S4-S12

¹² Labbe E, Schmidt N, Babin J, et al. Coping with stress: the effectiveness of different types of music. *Appl Psychophysiol Biofeedback*. 2007;32:163-168.

¹³ Avanzini G. Musicogenic seizures. *Ann NY Acad Sci*. 2003;999:95-102.

¹⁴ Learidi S, Pietroletti R, Angeloni G, et al. Randomized clinical trial examining the effect of music therapy in stress response to day surgery. *British Journal of Surgery*. 2007;94:943-947.

¹⁵ Nakamura T, Tanida M, Niijima A, et al. Auditory stimulation affects renal sympathetic nerve activity and blood pressure in rats. *Neuroscience Letters*. 2007;416:107-112.

¹⁶ Conrad C, Niess H, Jauch K-W et al. Overture for growth hormone: requiem for interleukin-6? *Crit Care Med*. 2007;35(12):2709-2713.

¹⁷ Angelucci F, Ricci E, Padua L, et al. Music exposure differentially alters the levels of brain-derived neurotrophic factor and nerve growth factor in the mouse hypothalamus. *Neuroscience Letters*. 2007;429: 152-155.

¹⁸ Sarkamo T, Terveniemi M, Laitinen S, et al. Music listening enhances cognitive recovery and mood after middle cerebral artery stroke. *Brain*. 2008;131:866-876.

¹⁹ Sarkamo T, Terveniemi M, Laitinen S, et al. Music listening enhances cognitive recovery and mood after middle cerebral artery stroke. *Brain*. 2008;131:866-876.

²⁰ Thaut MH. Neural basis of rhythmic timing networks in the human brain. *Ann NY Acad Sci*. 2003;999:364-373.

²¹ Xu F, Cai R, Xu J, et al. Early music exposure modifies GluR2 protein expression in rat auditory cortex and anterior cingulate cortex. *Neuroscience Letters*. 2007;420:179-183.