



Letter from Dr. Pierpont to Kim Iles
Chatham, Ontario
re. Wind Turbine Syndrome

February 16, 2008

Dear Ms. Iles,

Yes, there are indeed medical problems caused by noise and vibration from current, upwind, three-bladed industrial wind turbines. I am in the process of preparing a paper for publication in a medical journal documenting the consistency of these problems from family to family, the study subjects being a collection of families in several countries who have been driven from their homes by problems with sleep, headaches, tinnitus, equilibrium, concentration, memory, learning, mood, and child behavior—problems which started when the turbines went into operation and which resolve when the family is away from the turbines. These problems all occur in proximity to recently built industrial turbines, put into operation in 2005, 2006, and 2007.

The ear is indeed the most sensitive receptor for noise and vibration. This does not mean, however, that if you cannot hear it, it cannot hurt you. The ear does more than hear. A number of the effects of noise and vibration from wind turbines appear to be mediated by the inner ear, which is a complex organ, only one of whose functions is detecting certain sorts of vibration as noise. The inner ear also detects movement, acceleration, and position relative to gravity. Inner ear (vestibular) signals ramify throughout the central nervous system, influencing brain functions related to sleep, vision, hearing, movement, digestion, thinking, and learning and memory. My data indicate that one of the principal effects in Wind Turbine Syndrome is vestibular detection of either airborne pressure waves or solid-borne vibration (via bone conduction), which is influencing the vestibular system as if the body or head were moving, when it's not.

People disturbed by noise and vibration from industrial wind turbines generally can hear the

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noise when it bothers them, though it may not seem particularly loud. Several people I have interviewed speak favorably of living next to an elevated urban train line, compared to living at their rural home next to wind turbines. They can sleep with traffic or train noise, but not with the wind turbine noise/vibration. They consistently described a penetrating and intrusive quality to the wind turbine noise, several describing in different ways a very disturbing feeling that the noise is somehow inside their bodies. This latter effect suggests detection of vibration in body cavities, especially since people who say this generally localize the feeling to their chest or their head.

Published research from Sweden (doctoral thesis by Pedersen and published papers incorporated into the thesis) shows that the percentage of annoyed people (which include people who move out or undertake major house renovations to try to do something about the noise) goes up at 37.5-40 dBA.¹ This is probably because A-weighted noise representations are not capturing the parts of the wind turbine noise and vibration spectrum which are disturbing. The Pedersen studies are also based on modeled noise, not actual measurements, though there is a close correlation between actual dBA measurements and the Swedish governmental modeling protocols, the author says. Even if we do not know exactly what parts of the noise and vibration spectrum are bothersome, and to what extent these are represented in a dBA measurement, we have in the Pedersen research clear evidence that when noise is modeled prior to wind turbine construction, the allowed levels of noise should not exceed 37.5 to 40 dBA outside of dwellings. Because the noise level is especially important at night, and it is at night that there tends to be a "stable atmosphere," with cool, still air at ground level and a brisk wind at turbine hub height, modeling of noise prior to wind turbine construction should use both a 37.5 to 40 dBA ceiling of tolerability, and van den Berg's models of noise propagation in a stable atmosphere.²

Based on my 3½ years of researching Wind Turbine Syndrome (WTS), including interviews with scores of people around the world who clearly suffer from WTS, it is my strong clinical recommendation (in line with the *French National Academy of Medicine*) that industrial wind turbines be sited a minimum of 1½ miles away from homes, schools, hospitals, places of business, and anywhere else people regularly congregate.

Sincerely,



Nina Pierpont, MD, PhD

¹ Eja Pedersen, "Human response to wind turbine noise: Perception, annoyance and moderating factors," PhD. Dissertation, Occupational & Environmental Medicine, Department of Public Health and Community Medicine, Institute of Medicine, The Sahlgrenska Academy, Goteborg University, 2007, 86 pp.

² G.P. van den Berg, "Effects of the wind profile at night on wind turbine sound," *Journal of Sound and Vibration* 277 (2004):955-970.