

Risk of Harm ¹ and Industrial Wind Energy Facilities

Physicians as Health Advocates

A Commentary by Carmen Krogh, BScPharm ^{2,3}

January, 2013

1. Purpose

The purpose of this commentary is:

- § To share some examples of comments received from those reporting adverse health issues to their family physician;
- § To share a snapshot of some of the peer reviewed and other evidence; and
- § To encourage that those reporting adverse health ask their family physicians to invoke the precautionary principle; and
- § To encourage their family physicians to advocate for the health and social well-being of families regarding the siting of industrial wind energy facilities in quiet rural areas.

2. Background

Rural physicians are frequently the first medical practitioners consulted by those reporting adverse health effects associated with the start up of wind turbine facilities near their homes.

Many family physicians have been responsive to their patients' reports and started investigations to determine a diagnosis and initiate mitigation and remedial actions.

Based on the author's research and commentary received from some of those reporting adverse health effects to their physicians, indications are that some family physicians appear to be uncertain about the correlation of adverse health effects and industrial wind energy facilities.

¹ "This case has successfully shown that the debate should not be simplified to one about whether wind turbines can cause harm to humans. The evidence presented to the Tribunal demonstrates that they can, if facilities are placed too close to residents. The debate has now evolved to one of degree." Case Nos.: 10-121/10-122 Erickson v. Director, Ministry of the Environment Environmental Review Tribunal, Decision

² See Appendix I for background about the Author

³ This commentary and the attachment are provided for public use.

3. The symptoms

McMurtry (2011) details the commonly reported symptoms:

“Third-order criteria (at least three of the following occur or worsen following the initiation of IWTs):

Otological and vestibular

- a) Tinnitus
- b) Dizziness
- c) Difficulties with balance
- d) Ear ache
- e) Nausea

Cognitive

- a) Difficulty in concentrating
- b) Problems with recall or difficulties with remembering significant information

Cardiovascular

- a) Hypertension
- b) Palpitations
- c) Enlarged heart (cardiomegaly)

Psychological

- a) Mood disorder, i.e., depression, anxiety
- b) Frustration
- c) Feelings of distress
- d) Anger

Regulatory Disorders

- a) Difficulty in diabetes control
- b) Onset of thyroid disorders or difficulty controlling hypo- or hyperthyroidism

Systemic

- a) Fatigue
- b) Sleepiness”¹

A December 2010 report commissioned by the Ontario Ministry of Environment, submitted as evidence during the Environmental Review Tribunal and released December 2011 by the Ministry notes:

“Stress symptoms associated with noise annoyance, and in particular low frequency annoyance, include sleep interference, headaches, poor concentration, mood swings...”²

The authors of the Colby et al (2009), prepared for the American Wind Energy Association and Canadian Wind Energy Association report determined the documented “wind turbine syndrome” symptoms (sleep disturbance, headache, tinnitus, ear pressure, dizziness,

vertigo, nausea, visual blurring, tachycardia, irritability, problems with concentration and memory, and panic episodes associated with sensations of internal pulsation or quivering when awake or asleep are symptoms)" are not new and have been published previously in the context of "annoyance"" and are the "well-known stress effects of exposure to noise".³

4. Observations

This is a complex and challenging topic. The many variables such as siting design and proximity, wind direction and speed, terrain, house construction, a variety of noise emissions, and electrical pollution to name a few, associated with wind energy facilities can affect the assortment and description of symptoms being reported.

To assist with this topic, some examples of comments received from those reporting adverse health issues are listed below:

- § When individuals visited their family physician, some comment they felt there was a lack of understanding of the effects associated with the wind energy facilities. They sensed disbelief that they were being harmed by these facilities.
- § Some comment on an inability to adequately articulate or describe the physical and other sensations being experienced.
- § Some feel they were characterized as being jealous and/or resentful because they weren't receiving economic benefits and/or they didn't like the look of the turbines, and/or they were anti-wind or against green energy.
- § A few comment that their family physician declined the peer reviewed and other references offered.
- § Some report they were given medication to treat their sleep disturbance, anxiety, stress, depression, nausea, vertigo, migraine/headaches, chest sensations, palpitations, joint pain, exhaustion and other symptoms. Some report the medication did not solve the issues as the source i.e. the wind energy facilities, were still operating in close proximity to their homes.
- § Some report that in their attempt to sleep, alcohol was taken with a sleep aid and that as time went on, more alcohol and extra doses of the sleep aid were required in order to fall asleep and/or remain asleep.
- § In some cases, some report their symptoms were attributed as NOCEBO effects and they were imagining it or it was all in their heads and this was what was making them ill.

§ Some report a feeling of being dismissed/discounted. This caused them additional pain, hurt, grief and a sense of being doubted. Some report that they decided to not describe the full extent of their symptoms and are reluctant to share further information with their physician.

Some report they are hesitant to elaborate on the degradation in their quality of life, the significant changes to their living environment, the negative changes in their health status, and the social-economic impacts. This reluctance could deprive the family physician of information relating to disruptive noise levels, vibration, pulsation and other and the associated symptoms.

These comments could have significant ramifications as in some cases, the family physician may not be receiving all the facts which could hamper or misdirect the clinical investigation.

5. Physicians as health advocates

The role of the physician as a health advocate^{4, 5, 6, 7, 8} is known to many health care professionals.

During an Ontario Environmental Review Tribunal, Dr. Robert McMurtry, former Dean of Medicine and Assistant Deputy Minister (Health Canada) supported the role of physicians as health advocates:

“Finally, there is health advocate. It is our responsibility to speak on behalf of issues that would be health promoting, as opposed to health harming. That advocacy may take many forms; certainly when you teach on your research, or when you are part of the community. Physicians are part of the community and should be a contributing member to it, and in that contribution they should be a health advocate.”⁹

To facilitate a clinical diagnosis, Dr. Robert McMurtry authored and published in a peer reviewed journal " *Toward a Case Definition of Adverse Health Effects in the Environs of Industrial Wind Turbines (Facilitating a Clinical Diagnosis)*".¹⁰ (See attached)

6. A snapshot of evidence [See Appendix II]

Appendix II provides a brief overview of the evidence. However, this overview is not intended to be exhaustive. Additional references are available on request.

7. Conclusion

There is sufficient evidence to support that some are negatively affected by industrial wind energy facilities cited in close proximity to their homes. Associations, symptoms and causation have been acknowledged through peer reviewed and published references, testimony under oath, and/or disclosure evidence and/or witness statements and through other references briefly summarized in Appendix II.

It is proposed that a precautionary approach be taken before continuing with further wind energy development.

The World Health Organization stated with respect to noise in general:

“In all cases, noise should be reduced to the lowest level achievable in a particular situation. Where there is a reasonable possibility that public health will be damaged, action should be taken to protect public health without awaiting full scientific proof.”¹¹

The rural family physician is typically the first point of contact regarding adverse health associated with industrial wind energy facilities.

The efforts of the many family physicians who have responded to their patients' issues is acknowledged and appreciated.

Based on the evidence, there is an opportunity to invoke the precautionary principle and to advocate for the health and social well-being of families regarding the siting of industrial wind energy facilities in quiet rural areas.

Respectfully submitted,

Carmen Krogh, BScPharm
Ontario, Canada
Carmen.krogh@gmail.com

Attachments

1. Dr. Robert McMurtry, Toward a Case Definition of Adverse Health Effects in the Environs of Industrial Wind Turbines (Facilitating a Clinical Diagnosis)
2. Summary_references_November 1_2012 [A summary of some peer reviewed and conference articles, their abstracts and citations, regarding adverse health effects and wind turbines]

Appendix I:

About Carmen Krogh, BScPharm

- § Held senior executive positions at a teaching hospital, a professional organization and Health Canada (PMRA).
- § A former Director of Publications and Editor in Chief of the *Compendium of Pharmaceuticals and Specialties (CPS)*, the book used by physicians, nurses, and health professionals for prescribing information in Canada.
- § Author or co-author of five peer reviewed and published references on the topic of adverse health effects from industrial wind turbines with more pending.
- § Presented three papers at InterNoise 2012 New York City (co-author of a fourth).
- § Presented with a colleague to the Canadian *Standing Senate Committee on Energy, the Environment and Natural Resources, October 18, 2011*.
- § Has researched this topic for over four years.
- § Volunteers her time and expenses, and self supports research and other activities such as education regarding the science related to wind turbine health effects including meeting with physicians, health and other authorities, locally, provincially, and federally.
- § Invited educational presentations throughout Ontario, and other venues - Alberta, Saskatchewan, Quebec, Nova Scotia, California, Vermont, Massachusetts.
- § In March 2009, Krogh, CME, with Lorrie Gillis, N. Kouwen (scrutinizer) initiated a self reporting health survey. WindVOiCe (Wind Vigilance for Ontario Communities) follows the principles for Health Canada's *Canada Vigilance Programs* for self reporting suspected adverse events for prescription and consumer products, vaccines and other. The result of this research is published in a special edition of a peer reviewed scientific journal ¹² and is cited in the British Medical Journal; ¹³ The Brown County Board of Health (Wisconsin) USA; ¹⁴ and Nissenbaum et al (2012). ¹⁵
- § Researched societal impacts relating to this topic. This article has also been published in a peer reviewed journal. ¹⁶

Appendix II

A snapshot of evidence

The potential for industrial wind turbines to harm humans is stated in an Ontario Environmental Review Tribunal Decision, July 18, 2011 which involved 26 witnesses from around the world. The Tribunal was conducted under oath:

“This case has successfully shown that the debate should not be simplified to one about whether wind turbines can cause harm to humans. The evidence presented to

the Tribunal demonstrates that they can, if facilities are placed too close to residents. The debate has now evolved to one of degree.”¹⁷

The Ontario Environmental Review Tribunal Decision, July 18, 2011 also stated:

“The Tribunal has found above that “serious harm to human health” includes both direct impacts (e.g., a passer-by being injured by a falling turbine blade or a person losing hearing) or indirect impacts (e.g., a person being exposed to noise and then exhibiting stress and developing other related symptoms). This approach is consistent with both the WHO definition of health and Canadian jurisprudence on the topic.”¹⁸

The World Health Organization defines health:

“Health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity” (World Health Organization [WHO], 1948). Many jurisdictions, including the Canadian federal, provincial, and territorial governments and health officials have accepted WHO’s definition of health (Health Canada, 2004, vol. 1, p. 1-1).”¹⁹

“The World Health Organization acknowledges the importance of social justice. It states:

“Social justice is a matter of life and death. It affects the way people live, their consequent chance of illness, and their risk of premature death.” (2008, p. 3)²⁰

WHO (2009) discusses the impact of “disturbances of activities” and states:

“Physiological experiments on humans have shown that noise of a moderate level acts via an indirect pathway and has health outcomes similar to those caused by high noise exposures on the direct pathway. The indirect pathway starts with noise induced disturbances of activities such as communication or sleep.”²¹

See an Ontario Freedom of Information (FOI) entitled “fess up or delete” for details on the direct and indirect pathway.²²

A December 2010 report commissioned by the Ontario Ministry of Environment, submitted as evidence during the Environmental Review Tribunal and released December 2011 by the Ministry notes:

“The audible sound from wind turbines, at the levels experienced at typical receptor distances in Ontario, is nonetheless expected to result in a non-trivial percentage of persons being highly annoyed. As with sounds from many sources, research has

shown that annoyance associated with sound from wind turbines can be expected to contribute to stress related health impacts in some persons."

"Stress symptoms associated with noise annoyance, and in particular low frequency annoyance, include sleep interference, headaches, poor concentration, mood swings..."²³

Peer reviewed and published research comments that wind energy was initially welcomed into communities.

Krogh (2011)

"My research demonstrates that IWTs were initially welcomed into communities. The reported adverse impacts were unexpected..."²⁴

Nissenbaum et al (2011) et al.:

"Most respondents in the present study welcomed the IWT installations as offering economic benefits..."²⁵

Shepherd et al (2011):

"... wind turbines were initially welcomed by many communities due to their environmental credentials..."²⁶

Shepherd et al (2011), Nissenbaum et al (2011) and Krogh et al (2011), are cited in a March 2012 peer reviewed editorial published in the British Medical Journal.²⁷

Nissenbaum et al. (2012) published a cross-sectional study involving two rural sites concluding:

"... that the noise emissions of IWTs disturbed the sleep and caused daytime sleepiness and impaired mental health in residents living within 1.4 km of the two IWT installations studied. Industrial wind turbine noise is a further source of environmental noise, with the potential to harm human health. Current regulations seem to be insufficient to adequately protect the human population living close to IWTs. Our research suggests that adverse effects are observed at distances even beyond 1 km..."²⁸

An Ontario, Canada Freedom of Information request states:

“It appears compliance with the minimum setbacks and the noise study approach currently being used to approve the siting of WTGs will result or likely result in adverse effects...” [Ontario Ministry of Environment, memorandum, Ontario Senior Environmental Officer, April 9, 2010]

The authors of the Colby et al (2009), prepared for the American Wind Energy Association and Canadian Wind Energy Association report determined the documented “wind turbine syndrome” symptoms (sleep disturbance, headache, tinnitus, ear pressure, dizziness, vertigo, nausea, visual blurring, tachycardia, irritability, problems with concentration and memory, and panic episodes associated with sensations of internal pulsation or quivering when awake or asleep are symptoms) are not new and have been published previously in the context of “annoyance” and are the “well-known stress effects of exposure to noise”.²⁹

Note that the term “annoyance” is acknowledged as an adverse health effect.^{30, 31, 32, 33}

References

-
- ¹ Robert Y. McMurtry, Toward a Case Definition of Adverse Health Effects in the Environs of Industrial Wind Turbines: Facilitating a Clinical Diagnosis Bulletin of Science Technology & Society 2011 31: 316, DOI: 10.1177/0270467611415075, <http://bst.sagepub.com/content/31/4/316>
- ² HGC (2010) Low frequency Noise and Infrasound Associated with Wind Turbine Generation Systems, A Literature Review, Ontario Ministry of Environment RFP December 2010
- ³ Colby, W. D., Dobie, R., Leventhall, G., Lipscomb, D. M., McCunney, R. J., Seilo, M. T., & Søndergaard, B. (2009). Wind turbine sound and health effects: An expert panel review 2009. Prepared for American Wind Energy Association and Canadian Wind Energy Association. http://www.canwea.ca/pdf/talkwind/Wind_Turbine_Sound_and_Health_Effects.pdf
- ⁴ College of Physicians and Surgeons of Ontario www.cpso.on.ca
- ⁵ Royal College of Physicians and Surgeons of Canada, CanMeds, <http://www.royalcollege.ca/portal/page/portal/rc/canmeds/framework>
- ⁶ The University of Toronto Medical Faculty, contact amy.lee@utoronto.ca
- ⁷ Canadian Medical Association’s Code of Ethics, contact chantal.nadeau@cma.ca
- ⁸ The College of Family Physicians Canada, info@cfpc.ca
- ⁹ Case Nos.: 10-121/10-122 Erickson v. Director, Ministry of the Environment Environmental Review Tribunal, Testimony Dr. Robert McMurtry, February 16, 2011, pg 62
- ¹⁰ Robert Y. McMurtry, Toward a Case Definition of Adverse Health Effects in the Environs of Industrial Wind Turbines: Facilitating a Clinical Diagnosis Bulletin of Science Technology & Society 2011 31: 316, DOI: 10.1177/0270467611415075, <http://bst.sagepub.com/content/31/4/316>
- ¹¹ World Health Organization. (1999). Guidelines for community noise. Geneva; OMS, 1999, p 94. Ilus, Berglund, B., Lindvall, T., and Schwela, D. H.
- ¹² Krogh, CME, Gillis, L, Kouwen, N, and Aramini, J, (2011), WindVOiCe, a Self-Reporting Survey: Adverse Health Effects, Industrial Wind Turbines, and the Need for Vigilance Monitoring, Bulletin of Science Technology & Society 2011 31: 334, DOI: 10.1177/0270467611412551, <http://bst.sagepub.com/content/31/4/334>
- ¹³ Hanning C, Evans A, Wind turbine noise, British Medical Journal March 8, 2012 :BM J2012;344:e 1527

-
- ¹⁴ Brown County Board of Health Resolution Requesting Emergency State Aid for Families Suffering Around Industrial Wind Turbines, January 18, 2012, Green Bay, Wisconsin, USA
- ¹⁵ Nissenbaum, Michael A., Aramini, Jeffery J., Hanning, Christopher D., Effects of industrial wind turbine noise on sleep and health *Noise & Health*, September-October 2012, Volume 14, p243, www.noiseandhealth.org
- ¹⁶ Krogh, CME, (2011), Industrial Wind Turbine Development and Loss of Social Justice? *Bulletin of Science Technology & Society* 2011 31: 321, DOI: 10.1177/0270467611412550, <http://bst.sagepub.com/content/31/4/321>
- ¹⁷ Case Nos.: 10-121/10-122 Erickson v. Director, Ministry of the Environment Environmental Review Tribunal, Decision, p 207
- ¹⁸ Case Nos.: 10-121/10-122 Erickson v. Director, Ministry of the Environment Environmental Review Tribunal, Decision, p190
- ¹⁹ World Health Organization. (1948). Preamble to the constitution of the World Health Organization as adopted by the International Health Conference, New York, 19-22 June, 1946; signed on 22 July 1946 by the representatives of 61 States (Official records of the World Health Organization, no. 2, p. 100) and entered into force on 7 April 1948. Cited Krogh, CME, (2011), Industrial Wind Turbine Development and Loss of Social Justice? *Bulletin of Science Technology & Society* 2011 31: 321, DOI: 10.1177/0270467611412550, <http://bst.sagepub.com/content/31/4/321>
- ²⁰ Krogh, CME, (2011), Industrial Wind Turbine Development and Loss of Social Justice? *Bulletin of Science Technology & Society* 2011 31: 321, DOI: 10.1177/0270467611412550, <http://bst.sagepub.com/content/31/4/321>
- ²¹ World Health Organization, Night Noise Guidelines For Europe, (2009) Retrieved from http://www.euro.who.int/data/assets/pdf_file/0017/43316/E92845.pdf
- ²² Freedom of Information request, Fess up or Delete www.ontario-wind-resistance.org
- ²³ HGC (2010) Low frequency Noise and Infrasound Associated with Wind Turbine Generation Systems, A Literature Review, Ontario Ministry of Environment RFP December 2010
- ²⁴ Krogh, CME, (2011), Industrial Wind Turbine Development and Loss of Social Justice? *Bulletin of Science Technology & Society* 2011 31: 321, DOI: 10.1177/0270467611412550, <http://bst.sagepub.com/content/31/4/321>
- ²⁵ Nissenbaum M, Aramini J, Hanning C. Adverse health effects of industrial wind turbines: a preliminary report. Proceedings of 10th International Congress on Noise as a Public Health Problem (ICBEN), 2011, London, UK. Curran Associates, 2011.
- ²⁶ Evaluating the impact of wind turbine noise on health-related quality of life by Daniel Shepherd, David McBride, David Welch, Kim N. Dirks, Erin M. Hill. *Noise & Health*, September-October 2011, 13:54,333-9
- ²⁷ Hanning C, Evans A, Wind turbine noise, *British Medical Journal* March 8, 2012 :BM J2012;344:e 1527
- ²⁸ Nissenbaum, Michael A., Aramini, Jeffery J., Hanning, Christopher D., Effects of industrial wind turbine noise on sleep and health *Noise & Health*, September-October 2012, Volume 14, p243, www.noiseandhealth.org
- ²⁹ Colby, W. D., Dobie, R., Leventhall, G., Lipscomb, D. M., McCunney, R. J., Seilo, M. T., & Søndergaard, B. (2009). Wind turbine sound and health effects: An expert panel review 2009. Prepared for American Wind Energy Association and Canadian Wind Energy Association. http://www.canwea.ca/pdf/talkwind/Wind_Turbine_Sound_and_Health_Effects.pdf
- ³⁰ Health Canada. (2005). Community noise annoyance. Retrieved from <http://www.hc-sc.gc.ca/hl-vs/iyh-vs/life-vie/community-urbain-eng.php#he>
- ³¹ Michaud, D. S., Keith, S. E., & McMurchy, D. (2005). Noise annoyance in Canada. *Noise Health*, 7, 39-47
- ³² Maschke, C., & Niemann, A. (2007). Health effects of annoyance induced by neighbour noise. *Noise Control Engineering Journal*, 55, 348-356
- ³³ Suter, A. H. (1991). Noise and its effects. Administrative Conference of the United States. Retrieved from <http://www.nonoise.org/library/suter/suter.htm>