Response to McCunney et al.: Wind Turbines and Health: An Examination of a Proposed Case Definition

Sir,

Some people living in the environs of industrial wind turbines (IWTs) report experiencing adverse health effects (AHE/IWT). Reported effects include annoyance, sleep disturbance, stress-related health impacts and reduced quality of life. In some cases, families have effectively abandoned their homes, been billeted by wind energy developers or have negotiated financial agreements with developers.[1]

McMurtry and Krogh[2] presented Diagnostic criteria for adverse health effects in the environs of wind turbines to assist medical practitioners presented with patients reporting AHE/IWTs. Noise and Health published the views of McCunney et al.[3] that presented critical commentary on these AHE/IWT diagnostic criteria as well as its predecessor, which were presented by McMurtry.[4]

In this response, McMurtry and Krogh presented a critical analysis of the commentary contained in the presentation of McCunney et al.

References cited to support the content of this response include the following:

Peer-reviewed references;
References written by or for members of the wind energy industry;
Expert testimony;
Other References

‘Key Points’

McCunney et al. asserted that they contrasted the McMurtry and Krogh criteria with the Institute of Medicine guidelines for the development of clinical guidelines and itemized ‘key points’[3] in the two tables reproduced below.

In the work of McCunney et al., Table 2 states ‘[a]ll of the symptoms and conditions in the case definition are common and nonspecific, and have numerous causes’. [3]

The medical significance of this table item remains a mystery as numerous medical conditions have common symptoms. The third-order criteria presented in the case definition by McMurtry and Krogh[2] are symptoms consistent with the ‘well-known stress effects of exposure to noise’, [1,5] which ‘... are familiar to environmental noise control officers and other “on the ground” professionals’. [5]

McCunney et al.’s co-authors, Drs. Colby and McCunney and others, were paid by the wind industry to prepare a report that examined the potential health impacts of wind turbines.[6] Their report shows Colby et al. stating that their authors ‘undertook extensive review, analysis, and discussion of the large body of peer reviewed literature on sound and health effects in general, and on sound produced by wind turbines’.[5]

On the basis of this review, Colby et al. determined the documented symptoms of ‘wind turbine syndrome’ (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 not new’ and have been published previously in the context of ‘annoyance’[5] and are the ‘well-known stress effects of exposure to noise’. [5]

The key aspect is that these symptoms cluster in some affected individuals exposed to IWTs. It is important that a simple method be available for family practitioners to assess appropriately the range of symptoms reported. McMurtry and Krogh have outlined such a method.

The next item listed by McCunney et al. in Table 2 states ‘[t]he case definition lacks the requirement to confirm reports of symptoms with medical records and diagnostic studies’. [3]

This statement is erroneous. McMurtry and Krogh have specified that a licensed practitioner must conduct a thorough history, physical examination and investigation and rule out alternative explanations before ‘presumed diagnosis’ of AHE/IWT is warranted.[2] To achieve the category of ‘confirmed diagnosis’ McMurtry and Krogh have specified...
that additional investigative procedures are required and have proposed sophisticated investigative procedures, such as "measurements electrophysiologically and by biomarkers." \[^2\]

Reader feedback has since commented that given the accumulation of evidence for a causal link between sleep disturbance and cardiovascular disease, it is not prudent to wait for serious events to accrue. Therefore, it would be expedient to measure intermediate phenotypes, such as biomarker, which are known to lie along the pathophysiological pathway between health and disease.

In the article by McCunney \textit{et al.}, the third item that ‘all medical information, with two exceptions, is subjective’ \[^3\] in Table 2 is irrelevant. It is a normal clinical practice for physicians to diagnose and treat patients displaying subjective symptoms. For example, this practice assists with incidence and surveillance of arthritis\[^7\] and management of postoperative and other pain such as migraine headache.

McCunney \textit{et al.} expressed concern that ‘the case definition does not meet essential criteria for clinical guidelines, most notably by lack of committee involvement in the development of the guidelines, as the AHE/IWT reflects two authors perspective.’ \[^3\] McCunney \textit{et al.} then present the reader with contradictory information in Table 3 stating that the case definition was ‘... developed by one author’. \[^3\] As described by McMurtry\[^4\], the origin of the criteria and their genesis stemmed from a 3-day symposium during which 11 experts presented their perspectives. \[^8\] The symposium proceedings were published in a special edition of a peer-reviewed journal. \[^9\] McCunney \textit{et al.} omitted the disclosure of this information.

McCunney \textit{et al.} alleged that McMurtry and Krogh ‘... lack of indication of potential conflicts of interest’ \[^3\] and stated that the conflicts of interest statement was ‘not done’. \[^3\] McCunney \textit{et al.} provided no explanation or reference to support these allegations.

As health professionals, McMurtry\[^10\] and Krogh\[^11\] understand the obligation of authors to declare conflicts of interest. Had McCunney \textit{et al.} approached McMurtry and Krogh with these unsupported allegations, they would have been advised there is no undeclared conflict of interest. McMurtry and Krogh declare they: complied fully with the Journal of the Royal Society of Medicine conflict of interest requirements; and at no time have McMurtry or Krogh: been paid to serve as experts on IWTs; received funding or grants to publish on IWTs; received financial remuneration for their services or research on IWTs.

McMurtry and Krogh would have further advised that the obligation to state potential conflicts of interest would also extend to the authors of McCunney \textit{et al.} Any statement of potential conflicts of interest should include Drs. McCunney, Mundt and Colby relationships with the wind industry including, but not limited to, payments received from the wind industry to serve as experts and/or prepare reports for the wind industry that examined the potential health impacts of wind turbines. McCunney \textit{et al.} disclosed that some of its authors served as experts in several litigation matters on behalf of wind farm developers and wind turbine manufacturers. \[^13\] This declaration by McCunney \textit{et al.} is incomplete as it omits disclosure of payments received for other services, such as payments to prepare report(s) for the wind industry that examined the potential health impacts of wind turbines. \[^6\]

The criticism by McCunney \textit{et al.} of research based on self-reports including that of the validated questionnaires is puzzling given such a practice in research is widely utilized in medical and psychological clinical research. The World Health Organization LARES study provided a relevant example of research that employed a health questionnaire filled in by/for individuals (including children) \[^12\] and concluded ‘... for chronically strong annoyance a causal chain exists between the three steps health – strong annoyance – increased morbidity.’ \[^13\]

Drs. Colby and McCunney themselves also have cited research based on self-reporting questionnaires (i.e. Møller and Lydolf, 2002; Mirowska and Mróz, 2000) in support of the Colby \textit{et al.} determination that ‘wind turbine syndrome’ symptoms are the ‘well-known stress effects of exposure to noise’. \[^5\]

McCunney \textit{et al.} state in Table 3, ‘Data collection method given: Not done’. \[^3\] Once again, McCunney \textit{et al.} have presented readers with erroneous information. Under the heading ‘Methods’ McMurtry and Krogh state:

‘A revised case definition was developed through a variety of methods including a review of self-reporting surveys published in the peer-reviewed literature and other sources; interviews and correspondence with neighbours reporting health effects; incident reports posted on the Internet; testimony under oath during judiciary proceedings of neighbours reporting health effects; personal dialogue with physicians; and grey literature. We searched PubMed and Google Scholar for articles published since 2000 that included the terms “wind turbine health”, “wind turbine survey”, “wind turbine symptoms”, “wind turbine self reports” and “wind turbine noise”. A PubMed search with the search term “case definition” obtained additional background relating to case definitions for emerging diagnostic challenges’. \[^2\]

Another item listed by McCunney \textit{et al.} in Table 3 concerned quality of evidence. The quality of the papers quoted in McMurtry and Krogh is affirmed by other peer-reviewed publications such as the meta-analysis presented by Onakpoya \textit{et al.}\[^14\] McMurtry and Krogh citations included the clinical review of Jeffery \textit{et al.}, which confirmed the reported ‘... effects from exposure to IWTs are consistent with well-known stress effects from persistent unwanted sound’. \[^11\] Also cited was the 2010
review written by a member of the Canadian Wind Energy Association (CanWEA), which concluded ‘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’.[15]

The final item listed by McCunney et al. in Table 3 stated ‘Evidence supporting recommendations: Not done’. [3] This statement has the potential to mislead readers as McMurtry and Krogh provided citations throughout to support its content. McMurtry and Krogh’s recommendation that a licensed practitioner conduct a thorough history, physical examination and investigation and rule out alternative explanations is consistent with ‘... the requirement to confirm reports of symptoms with medical records and diagnostic studies’[13] listed by McCunney et al. in Table 2.

Combinatorics

McCunney et al. presented a display of ‘combinatorics’ claiming ‘[t]he point of this exercise was to quantitatively evaluate the scientific validity of the proposed case definition if it were to be used as intended.’[3]

Beginning a mathematical exercise with erroneous assumptions will inevitably lead to misleading results as has occurred in McCunney et al. McMurtry and Krogh’s[2] diagnostic criteria required that all of the four first-order criteria be either positive or not. If all of the four diagnostic criteria were not positive, then no further investigation was indicated. If all four were positive, then the next step was to advance to the second-order criteria, which required that three of the four be positive before establishing a ‘probable diagnosis’. Third-order criteria were not required to achieve ‘probable diagnosis’. Investigative steps were next required to determine if ‘presumed diagnosis’ was warranted. The calculations presented by McCunney et al. do not reflect these case definition requirements and are simply irrelevant.

The ‘risks to patients’[13] claimed in the conclusions of McCunney et al. is not supportable. McMurtry and Krogh have published in a medical journal as the case definition is intended to be used by licensed medical practitioners trained in diagnostic procedures. The case definition requires application of professional medical judgement and diligence including the conduct of a thorough history, physical examination and investigation to rule out alternative explanations. It is not intended to be used in mechanical mathematical exercises absent of medical diagnostic diligence. McCunney et al. cannot claim its exercise quantitatively evaluates ‘... the scientific validity of the proposed case definition if it were to be used as intended.’[3] McCunney et al.’s exercise in math has the potential to mislead readers as it fails to use the case definition as it is presented and intended.

Discussion

McMurtry and Krogh invited, and have received, commentary, which to date has been positive and constructive. Critical commentary can be informative when accurate, and relevant. Conversely, commentary based on erroneous and irrelevant information has the potential to mislead readers and should be viewed with caution.

McCunney et al. should have focused their commentary on the current version of the case definition. Instead, McCunney et al. erratically jump between the 2014 ‘revised case definition’[22] and the superseded McMurtry [4] with much of its commentary focused on the latter.

It has been acknowledged that the manuscript by McCunney et al. was ‘rejected’ by a peer-reviewed Canadian medical journal before being accepted by Noise and Health.[16]

The references cited in this analysis support the conclusion that the examination by McCunney et al. contains erroneous and irrelevant commentary, which has the potential to mislead readers.

This critical analysis of McCunney et al. cites references that confirm that reported AHE/IWT are consistent with well-known stress effects from persistent unwanted sound.[1,5] Annoyance is an acknowledged health effect.[17-19] A causal chain exists between strong annoyance and increased morbidity,[13] and chronically strong annoyance must be classified as a serious human health risk.[20]

The CanWEA has published a media release, which advised those impacted by wind turbine annoyance stating: ‘The association has always acknowledged that a small percentage of people can be annoyed by wind turbines in their vicinity. . . . When annoyance has a significant impact on an individual’s quality of life, it is important that they consult their doctor’.[21]

McMurtry and Krogh’s diagnostic criteria is a tool provided to assist practicing physicians who are presented with such patients. The first- and second-order criteria identified individuals who domicile with IWTs in their vicinity and who were experiencing symptoms including annoyance or an impact on their quality of life. These criteria were in keeping with the acknowledgements and advice contained in CanWEA’s 2011 media release. Third-order criteria were used to enhance the understanding of patients’ illness experience and were not essential for satisfying the Diagnostic Criteria.

The content of the article by McCunney et al. suggests that its authors may not have understood the procedure presented for diagnosing patients suffering from ‘annoyance’ and the ‘well-known stress effects of exposure to noise’. While this response does not address all the weaknesses contained in the analysis by McCunney et al., it is our hope it will help clarify understanding of this diagnostic tool. We invite readers to explore the work of McMurtry and Krogh, and as always we welcome constructive commentary.
McMurtry and Krogh: Response to McCombey et al. wind turbine proposed case definition

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There are no conflicts of interest.

Robert Y. McMurtry1,2, Carmen M. E. Krogh3

1Schulich School of Medicine and Dentistry, Western University, London, 2Prince Edward County, Family Health Team, Picton, 3Independent Health Researcher, Killaloe, Canada

Address for correspondence: Ms. Carmen Marie Eveline Krogh, Independent Health Researcher, Killaloe, Canada. E-mail: carmen.krogh@gmail.com

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