Recent evidence on psychogenic aspects of ‘wind turbine syndrome’

A “communicated” disease?
• Critics claim BOTH acute & delayed health effects
• Wind farms established in US, Europe for >20 years
• Earliest reports of health harms 2002, extensive increase after 2009
• Why the 10 year delay???
• A “communicated” disease?
Esperance, WA (1993 .. 19yrs) Codrington, Vic (2001 .. 11yrs)
Psychogenic illness: A constellation of symptoms suggestive of organic illness, but without an identifiable cause, that occurs between two or more people who share beliefs about those symptoms.

Sociogenic illness: a medical condition that occurs to multiple individuals within a social group, but does not seem to have a common organic cause.
Psychogenic illness

- “Infections ... if you fear them, you call them upon you.”
- Francis Bacon (1561 – 1626)
Nocebo Phenomena in Medicine

Their Relevance in Everyday Clinical Practice

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SUMMARY

Background: Nocebo phenomena are common in clinical practice and have recently become a popular topic of research and discussion among basic scientists, clinicians, and ethicists.

Methods: We selectively searched the PubMed database for articles published up to December 2011 that contained the key words “nocebo” or “nocebo effect.”

Results: By definition, a nocebo effect is the induction of a symptom perceived as negative by the patient, treatment and/or by the suggestion of negative expectations. A nocebo response is a negative symptom induced by the patient’s own negative expectations and/or by negative suggestions from clinical staff in the absence of any treatment. The underlying mechanisms include learning by Pavlovian conditioning and reaction to expectations induced by verbal information or suggestion. Nocebo responses may occur through unintentional negative suggestion on the part of physicians and nurses. Information about possible complications and negative expectations on the patient’s part increases the likelihood of adverse effects. Adverse events under treatment with medications sometimes come about by a nocebo effect.

Conclusion: Physicians face an ethical dilemma, as they are required not just to inform patients of the potential complications of treatment, but also to minimize the likelihood of these complications, i.e., to avoid inducing them through the potential nocebo effect of thorough patient information. Possible ways out of the dilemma include emphasizing the fact that the proposed treatment is usually well tolerated, or else getting the patient’s permission to inform less than fully about its possible side effects. Communication training in medical school, residency training, and continuing medical education would be desirable so that physicians can better expel the power of words to patients’ benefit, rather than their detriment.

Words are the most powerful tool a doctor possesses, but words, like a two-edged sword, can maim as well as heal.” – Bernard Lown (1).

Doctor–patient communication and the patient’s treatment expectations can have considerable consequences, both positive and negative, on the outcome of a course of medical therapy. The positive influence of doctor–patient communication, treatment expectations, and sham treatments, termed placebo effect, has been known for many years (2) and extensively studied (1). The efficacy of placebo has been demonstrated for subjective symptoms such as pain and nausea (1). The Scientific Advisory Board of the German Medical Association published a statement on placebo in medicine in 2010 (2).

Method

The opposite of the placebo phenomenon, namely nocebo phenomena, have only recently received wider attention from basic scientists and clinicians. A search of the PubMed database on 5 October 2011 revealed 151 publications on the topic of “nocebo,” compared with over 150,000 on “placebo.” Stripping away from the latter all articles in which “only” placebo-controlled drug trials were reported left around 2200 studies investigating current knowledge of the placebo effect. In comparison, the data on the nocebo effect are sparse. Of the 151 publications, only just over 20% were empirical studies; the rest were letters to the editor, commentaries, editorials, and reviews (Figure).

Our intention here is to portray the neurobiological mechanisms of nocebo phenomena. Furthermore, in order to sensitize clinician to the nocebo phenomena in their daily work, we present studies on nocebo phenomena in randomized placebo-controlled trials.
Thoroughly modern worries
The relationship of worries about modernity to reported symptoms, health and medical care utilization


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Received 30 August 2000; accepted 20 February 2001
The telephone

British Medical Journal 1889, Sept 21: pp671-72

THE TELEPHONE AS A CAUSE OF EAR TROUBLES. As civilisation advances, new diseases are not only discovered, but are actually produced by the novel agencies which are brought to bear on man’s body and mind. The increase of insanity throughout the world is unquestionably due to the “storm and stress” of our crowded modern life, and almost every addition which science makes to the convenience of the majority seems to bring with it some new form of suffering to the few. Railway travelling has its amari aliquid in the shape of slight but possibly not unimportant jolting of the nervous centres; the electric light has already created a special form of ophthalmia, and now we have the telephone indicted as a cause of ear troubles, which react on the spirits, and indirectly on the general health. M. Gelis has observed, not in women only, but in strong-minded and able-bodied men, symptoms of what we may call “aural overpressure” caused by the condition of almost constant strain of the auditory apparatus, in which persons who use the telephone much have to spend a considerable portion of each working day. In some cases, also, the ear seemed to be irritated, by the constantly recurring sharp tinkle of the bell, or by the nearness of the sounds conveyed through the tube, into a state of over-sensitiveness which made it intolerant of sound, as the eye, when inflamed or irritable, becomes unable to bear the light. The patients suffered from nervous excitability, with buzzing noises in the ear, giddiness, and neuralgic pains. In addition to these subjective symptoms, M. Gelis in some cases found objective lesions, such as a subinflammatory condition of the membrana tympani. A similar condition of things is often seen in persons who spend a large portion of their lives amid the jar and crash of machinery. All the trouble speedily vanishes if the ear is allowed a sufficient measure of physiological rest; this it can only obtain by the cause of the evil being withdrawn. The victims of “telephone tinnitus,” if we may so baptise this latest addition to the ills that flesh is heir to, seem all to be of markedly nervous organisation, and the moral may be drawn that such persons should not use the telephone. Mr. Edison has already done something to increase the plague of “nerves” which afflicts our generation, and, if his brilliant career as an inventor is not cut short, there can be little doubt that he will do yet more.
Televisions, microwaves, electric blankets, computer screens, powerlines, wifi, smart meters
Mobile phones & towers

PHONE FEAR

—we’re Telstra guinea pigs, say tower neighbours

By CHRIS HUTCHINGS

TELSTRA is using families as “guinea pigs” and using “standover tactics” in its bid to put a mobile telephone tower at Berkshire Park, residents have claimed.

More than 30 residents are fighting plans by the telecommunication company to put the 50-metre tower in a private five-acre block in either Government or Spence roads.

Residents said they fear adverse health effects from the non-thermal radiation and say the tower will lower property values.

But a Telstra spokesperson said the standover accusation was “a cheap shot” and said their towers emitted barely “hundreds” of the amount the Federal Government considered safe.

Residents’ spokeswoman Helen Vardy said they wanted the tower sited within the Castle.

To page 2
Growth of mobile phones, Australia 1999-2009
Brain cancer incidence, Australia 1980-2007

- Flat-line incidence over 30 yrs
- Women showing slight downturn
The cause of Neurasthenia

“...wireless telegraphy, science, steam power, newspapers and the education of women; in other words modern civilization”

George Miller Beard 1881
Why is “wind turbine syndrome” most likely to be psychogenic?

- 18 Reviews of Evidence (2002-2013) – all negative
- MANY symptoms & diseases attributed (221!!!)
- Reports mostly confined to webpages of opponents
- Zero recognition in the scientific literature
Zero entries in PubMed for “wind turbine syndrome”
Is there anything not caused by wind farms?

- Anxiety and panic
- Cancer
- Cardiovascular disease
- Chest
- Cold sores (herpes)
- Diabetes
- Diarrhoea
- Disrupted relationships
- Ear pain
- Echindas disoriented
- Epilepsy
- Exacerbations of chronic disease (e.g. fibromyalgia, scleroderma, diabetes, hyperthyroidism)
- Eye pain
- Falls and equilibrium problems
Is there anything *not* caused by wind farms?

- Frequent urination
- Gastrointestinal upsets & indigestion
- Headache and
- Hearing loss
- Hypertension
- Inability to conceive
- Joint & muscle pain
- Loss of energy
- Malformations in chickens, cattle
- Multiple periods (4-5) per month
- Muscle twitches
- Multiple sclerosis
- Motion sickness
- Nausea
- Nerve pain & tingling
- Nosebleeds
Is there anything *not* caused by wind farms?

- Palpitations
- Paralysis
- Perforated eardrum
- Poor appetite
- Poor concentration and
- Poor wound healing
- Stomach ulcers
- Stress & irritability
- Tachycardia
- Tinnitus
- Vertigo
- Vomiting up blood
- Weight gain
- Weight loss
Many attributed problems very common in all populations

- 22,389 volunteer blood donors in New Zealand aged 16-84 years.

Results: Even in a relatively young, non-clinical cohort: lack of sleep (34%), snoring (33%), high blood pressure (20%)

Direct health effects from noise and WTS

- “There is no evidence that the audible or sub-audible sounds emitted by wind turbines have any direct adverse physiological effects.” Source: Colby 2009 review
- “… surveys of peer-reviewed scientific literature have consistently found no evidence linking wind turbines to human health concerns.” Source: CanWEA
- “… low level frequency noise or infrasound emitted by wind turbines is minimal and of no consequence... Further, numerous reports have concluded that there is no evidence of health effects arising from infrasound or low frequency noise generated by wind turbines.” Source: NHMRC 2010
“What is apparent is that numerous websites have been constructed by individuals or groups to support or oppose the development of wind turbine projects ... The majority of information posted on these websites cannot be traced back to a scientific, peer-reviewed source and is typically anecdotal in nature. In some cases, the information contained on and propagated by internet websites and the media is not supported, or is even refuted, by scientific research. This serves to spread misconceptions about the potential impacts of wind energy on human health...” Source: Knopper & Ollson review
**Annoyance**

- “The perception of noise depends in part on the individual - on a person’s hearing acuity and upon his or her subjective tolerance for or dislike of a particular type of noise. For example, a persistent “whoosh” might be a soothing sound to some people even as it annoys others.” *Source: NRC 2007*

- “... there is no scientific evidence that noise at levels created by wind turbines could cause health problems other than annoyance...” *Source: Eja Pedersen 2003 Review*
“... being annoyed can lead to increasing feelings of powerlessness and frustration, which is widely believed to be at least potentially associated with adverse health effects over the longer term.” *Source: Ad Hoc Expert Group on Noise and Health*

“Wind turbine annoyance has been statistically associated with wind turbine noise, but found to be more strongly related to visual impact, attitude to wind turbines and sensitivity to noise.” *Source: Knopper & Ollson review*

“... self reported health effects like feeling tense, stressed, and irritable, were associated with noise annoyance and not to noise itself...” *Source: Knopper & Ollson review*
“... it is probable that some persons will inevitably exhibit negative responses to turbine noise wherever and whenever it is audible, no matter what the noise level.” Source: Fiumicelli review
“... annoyance was strongly correlated with a negative attitude toward the visual impact of wind turbines on the landscape...” *Source: NHMRC 2010*

“Respondents tended to report more annoyance when they also noted a negative effect on landscape, and ability to see the turbines was strongly related to the probability of annoyance.” *Source: Minnesota Health Dept 2009*
“Further, sounds, such as repetitive but low intensity noise, can evoke different responses from individuals... Some people can dismiss and ignore the signal, while for others, the signal will grow and become more apparent and unpleasant over time... These reactions may have little relationship to will or intent, and more to do with previous exposure history and personality.”
Source: Minnesota Health Dept 2009

“There is a possibility of learned aversion to low frequency noise, leading to annoyance and stress...”
Source: Leventhall 2005 review
“Complaints about low frequency noise come from a small number of people but the degree of distress can be quite high. There is no firm evidence that exposure to this type of sound causes damage to health, in the physical sense, but some people are certainly very sensitive to it.” Source: Ad Hoc Expert Group on Noise and Health
“There is no consistent evidence of any physiological or behavioral effect of acute exposure to infrasound in humans.” Source: UK HPA Report

Other infrasound sources: sea, storms, ceiling fans, motors, sub-woofers, heartbeat, respiration
Community & Social Response to Wind Turbines

- The perception of sound as noise is a subjective response that is influenced by factors related to the sound, the person, and the social/environmental setting. These factors result in considerable variability in how people perceive and respond to sound... Factors that are consistently associated with negative community response are fear of a noise source...

Source: Oregon review
“... people who benefit economically from wind turbines are less likely to report noise annoyance, despite exposure to similar sound levels as those people who are not economically benefiting.” Source: NHMRC 2010

“Landowners... may perceive and respond differently (potentially more favorably) to increased sound levels from a wind turbine facility, particularly if they benefit from the facility or have good relations with the developer...” Source: Oregon review
“The level of annoyance or disturbance experienced by those hearing wind turbine sound is influenced by individuals’ perceptions of other aspects of wind energy facilities, such as turbine visibility, visual impacts, trust, fairness and equity, and the level of community engagement during the planning process.”

Source: Oregon review
My study of complaints

- **Setting** All (n=51) Australian wind farms (with 1634 turbines) operating from 1993–2012.

- **Methods** Records of complaints about noise or health obtained from wind farm companies regarding residents living near 51 Australian wind farms, expressed as proportions of estimated populations residing within 5km of wind farms, and corroborated with complaints in submissions to 3 government public enquiries and news media records and court affidavits.
Results

• There are large spatio-temporal variations in wind farm noise and health complaints.

• 33/51 (64.7%) of Australian wind farms including 17/34 (50%) with turbine size >1MW have never been subject to noise or health complaints. These 33 farms have some 21,592 residents within 5km of their turbines and have operated complaint-free for a cumulative total of 267 years.

• Western Australia and Tasmania have seen no complaints.
Results

Only 131 individuals across Australia representing approximately 1 in 250 residents living within 5km of wind farms appear to have ever complained, with 94 (72%) of these being residents near 6 wind farms which have been targeted by anti wind farm groups.

About 1 in 87 (126/10901) of those living near turbines >1MW have ever complained.

The large majority 104/131 (79%) of health and noise complaints commenced after 2009 when anti wind farm groups began to add health concerns to their wider opposition. In the preceding years, health or noise complaints were rare despite large and small turbined wind farms having operated for many years.