

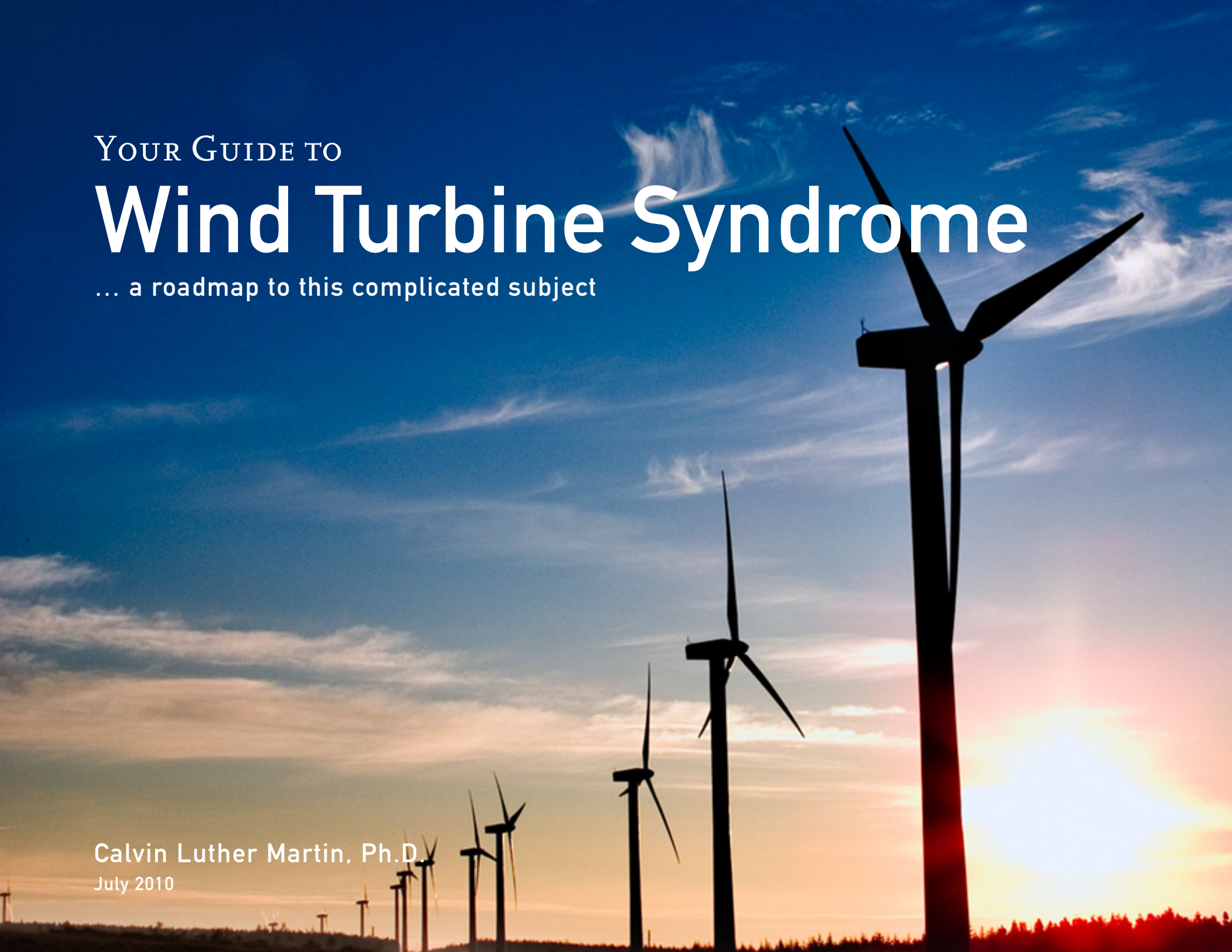
YOUR GUIDE TO

Wind Turbine Syndrome

... a roadmap to this complicated subject

Calvin Luther Martin, Ph.D.

July 2010

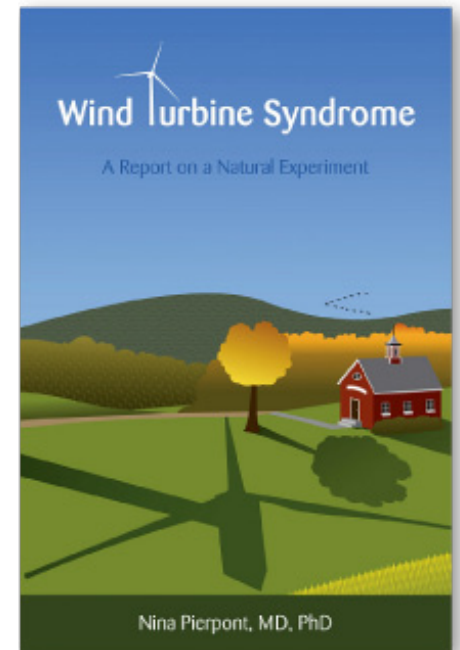


THE SYMPTOMS

Wind Turbine Syndrome (WTS) is the clinical name [Dr. Nina Pierpont](#) has given to the constellation of symptoms experienced by many (not all) people who find themselves living near industrial wind turbines.

- **sleep disturbance**
- **headache**
- **tinnitus (pronounced “tin-uh-tus”: ringing or buzzing in the ears)**
- **ear pressure**
- **dizziness (a general term that includes vertigo, lightheadedness, sensation of almost fainting, etc.)**
- **vertigo (clinically, vertigo refers to the sensation of spinning, or the room moving)**
- **nausea**
- **visual blurring**
- **tachycardia (rapid heart rate)**
- **irritability**
- **problems with concentration and memory**
- **panic episodes associated with sensations of internal pulsation or quivering, which arise while awake or asleep**

As wind turbines spring up like mushrooms around people's homes, Wind Turbine Syndrome has become an industrial plague. (See victims' Diaries & Reports and [Videos](#)). Nina Pierpont has been researching this “plague” for the past five years, and in November 2009 she published her results, *Wind Turbine Syndrome: A Report on a Natural Experiment* (Santa Fe, NM: K-Selected Books, 2009). Click on [Read Peer Reviews](#) to read the referee reports (all by medical school and university faculty). For purchase information, see [Buy the book](#). For an in-depth radio interview with Dr. Pierpont, wherein she explains what's going on with WTS, [click here](#). (With thanks to Radio [CFCO](#), Ontario, Canada, 2-28-08, “Ask the Health Expert.” Be sure your speakers are turned up.)



Before proceeding, a clarification. On August 2, 2009, The Independent, one of the UK's largest national newspapers, published a [superb story](#) on Nina Pierpont's research. (It's rare that the media gets WTS right. Margareta Pagano, the reporter who interviewed Pierpont, got it right.) Her article needs a correc-

tion, however, especially since portions of her report were reprinted verbatim in scores of newspapers and blogs around the world. Ms. Pagano wrote:

“Living too close to wind turbines can cause heart disease, tinnitus, vertigo, panic attacks, migraines and sleep deprivation, according to groundbreaking research to be published later this year by an American doctor.”

The problem is the claim “wind turbines can cause heart disease.” Dr. Pierpont did not say this in her interview, nor does she write this in her book. Somehow, between the interview and the printing of the article, that (erroneous) statement crept into the text. Since newspaper articles are often edited by several levels of editor, it’s conceivable another editor quite innocently inserted that line, confusing tachycardia with heart disease. (After all, these people are not clinicians.)



Nina Pierpont subsequently contacted Ms. Pagano to point out this needs correcting:

“My current research does not establish a connection between heart disease and wind turbine exposure, only between a rapid heart rate as part of a panic-like response (VVVD, as described in today’s article) and wind turbine exposure. However, there is a substantial body of European (including UK) research showing that environmental noise exposure in general increases the risk for cardiovascular disease. This is an area in need of further research with regard to wind turbine exposure.

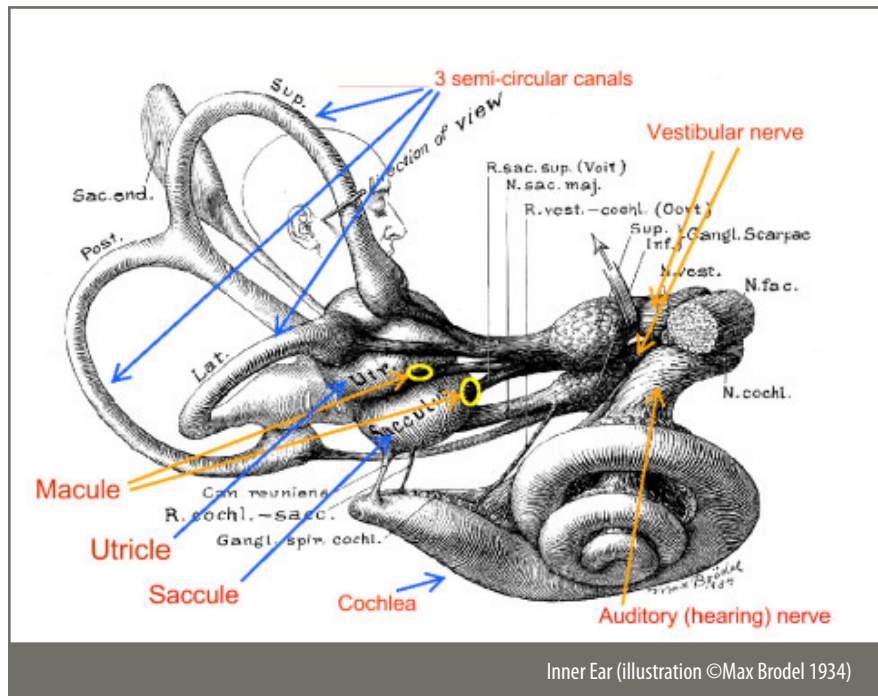
“Thank you to the Editors for endorsing responsible development that scrutinizes both positives and negatives of new technologies.”

THE HUMAN EAR

To understand Wind Turbine Syndrome one must first understand the function of the human vestibular system: the utricle, saccule, and semicircular canals. Three tiny organs in the inner ear. The utricle and saccule, together, constitute the otolith organs. The otolith organs and the semicircular canals are not involved in hearing per se—that would be the cochlea—but are dedicated to detecting *balance* and *motion* and *position*, with far-reaching

consequences for parts of the brain controlling cognition, mood, and certain physiologic functions (such as vertigo and nausea).

The vestibular system happens to be an ancient “command and control” center dreamed up and refined by Mother Nature over millions of years, long before there were human beings. We find a nearly identical command and control apparatus in fish and amphibians and a host of other vertebrates (back-boned animals), for whom it continues to perform important functions of cognition and behavior—just as it does in you and me.



Inner Ear (illustration ©Max Brodel 1934)

Expose Mother Nature’s vestibular command and control center to wind turbines and the result is chaos. Low frequency noise (LFN) from turbines appears to send false signals to these exquisitely sensitive structures, causing dizziness, vertigo, and nausea, along with cognitive and memory deficits, along with anxiety and panic attacks. Yes, the latter behavioral symptoms are in fact tied to the inner ear, as any up-to-date otolaryngologist (Ear, Nose, Throat surgeon) can tell you.

Bear in mind that WTS is a constellation of symptoms, including sleeplessness and tinnitus (caused by cochlear disturbance). And bear in mind that WTS appears to derail several of the body’s sensory systems, besides the inner ear. Even so, the vestibular structures of the inner ear are critical to understanding the pathophysiology of Wind Turbine Syndrome. (The eyes, of course, serve as another organ of balance, motion, and position-sense, and are most definitely disturbed by turbine shadow flicker, resulting in false signals sent to the brain. Pierpont explores shadow flicker in her book; I will not be discussing it further in this overview.)



Drawing by R. Forrest Martin



RE-THINKING TURBINES

Let's stand back for a moment. We need to re-think the notion of turbines solely as electricity-producing machines and wake up to the fact that, for all practical purposes, they function equally as *low frequency noise-producing machines*. People often object vehemently to turbines because they consider them ugly and outsized for their community. (Turn up your speakers and listen to [Bob Lucas's "Green Energy Blue."](#))

Others object because they lower property value. (That's true, they do [hammer property value](#).)

What eclipses eyesore and property value is the low frequency noise. It's a major health issue. This is more than a "nuisance." As Nina Pierpont puts it, "People experiencing WTS are not *annoyed*, they are *sick!*"

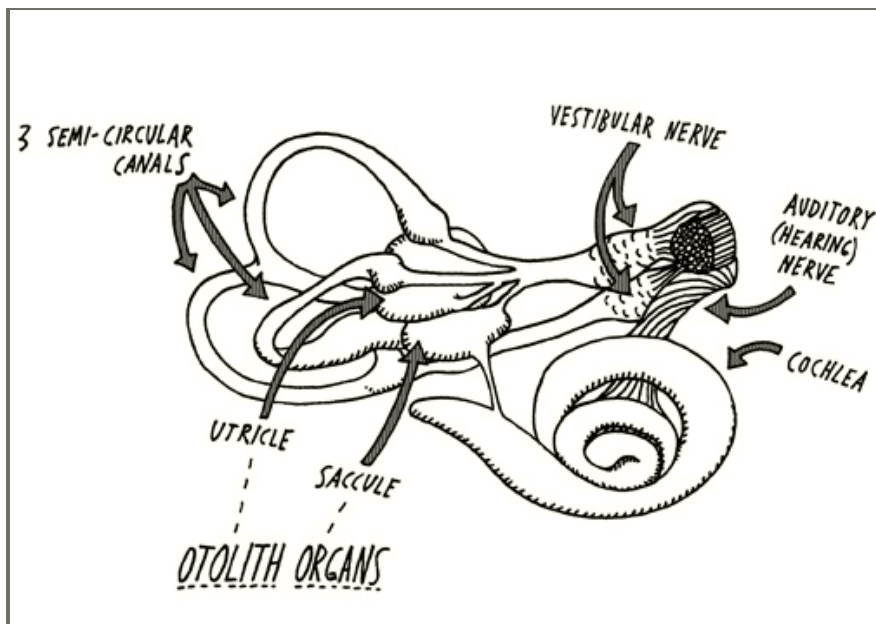
Folks who visit a wind farm and stand beneath a turbine generally have no idea that the vestibular organs of the inner ear, along with other motion, balance, and position sensors throughout the body, are being jack-hammered by a low frequency noise they can barely hear. (The amount of LFN produced during one's visit depends, of course, on whether the turbines are in fact generating, wind direction and wind speed, whether it's day or nighttime, and the degree of moisture in the air.)

Nice 5 bdrm house. Brand new. Wrap-around deck. 2 car garage. Views! Nestled in new windfarm! Escape to rural Wisconsin!

Butler Ridge Project near Iron Ridge, Wisconsin, May 2, 2009, with thanks to [Better Plan Wisconsin](#). (WTS.com has taken editorial liberties with this photo.)

Anyhow, people stand next to a turbine and exclaim, “Gee, my cochlea [the organ within the inner ear that picks up audible sound] hears almost nothing at all! Merely a whooshing noise! Sounds like a humming refrigerator, just like the developer said! What’s the problem?”

Now for the bad news. The utricle, saccule, and semicircular canals don’t register the “refrigerator-like” audible noise but, rather, the less apparent yet health-threatening sub-audible vibration. Hence, people don’t say, “Gee, despite my cochlea detecting only a mild hum, my utricle, saccule, and semicircular canals are sending weird signals! Come to think of it, my other organs of balance, motion, and position are, as well! Hey, what’s going on??!!” (Incidentally, noise and vibration are one and the same in physics.)



Drawing by R. Forrest Martin

Organs of balance, motion, and position may (and do) respond rapidly and alarmingly in some people—for instance, when visiting a windfarm and standing, marveling, beneath a turbine for 10 minutes. But for most of us the effect takes longer to sink in—not till turbines are up and running, 1000’ or 1500’ or more from one’s back door and exposure is 24/7. Then, for people like [this Nova Scotia family](#) (right), it’s too late.



d’Entremont home, Nova Scotia

Likewise for Barbara Ashbee (a realtor, incidentally) and her husband Dennis. They used to live here. (They count themselves among the lucky ones. The wind developer bought them out, after which Barbara & Dennis had to sign a gag agreement. The developer refuses to buy out the d’Entremonts, above, who remain homeless—camping out with various relatives. Yes, their family is broken up as a result.)



But I digress. Who is especially susceptible to WTS? That's easy to answer. "Statistically significant risk factors for symptoms during exposure include *pre-existing migraine disorder, motion sensitivity, or inner ear damage* (pre-existing tinnitus, hearing loss, or industrial noise exposure)" (Pierpont 2009). Motion sensitivity? If you got car-sick as a kid, or get seasick, you're at high risk. How many people suffer from pre-existing migraine disorder? Studies show it's a substantial proportion of the population (6% for males, 18% for females)—all human populations studied so far.

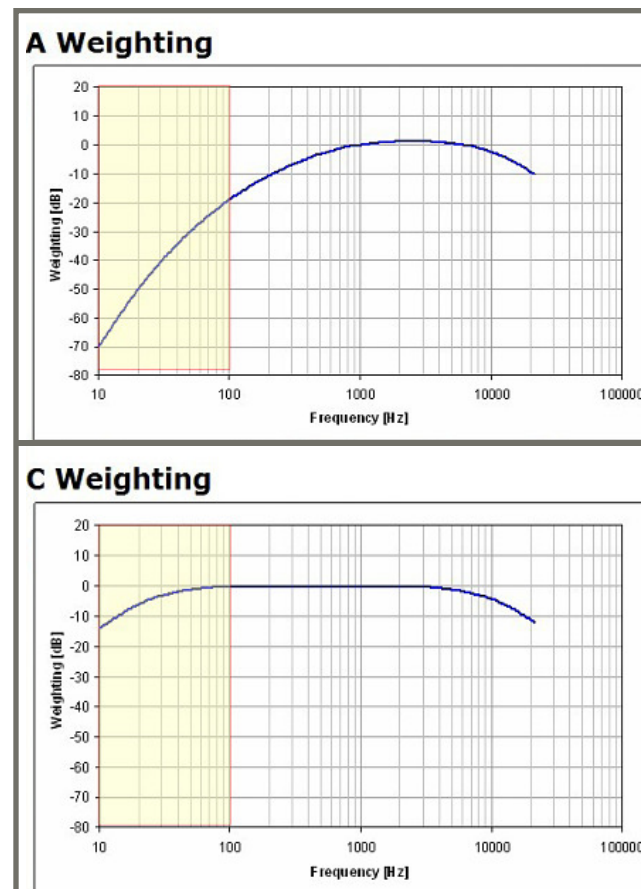
Again, the chief culprit appears to be low frequency noise.

NOISE

Tragically, most people living near turbines, or contemplating turbines for their community, fail to grasp the magnitude of all this. This happens in part because the developers get away with what are basically deceptive noise measurements. How are they deceptive? Because wind developers insist on using A-weighted (dBA) measurements. *A-weighting filters out nearly all the low frequency noise and, even lower, infrasound, both of which are produced in abundance by turbines.*

Take a look at the following graphs (right), showing the difference between dBA and dBC noise measurements.

- dB = decibel
- "A" refers to *A-filtering* (also known as *A-weighting*)
- "C" refers to *C-filtering* (*C-weighting*)
- therefore dBA = *noise measurement with an A-filter (or A-weighted filter)*
- and dBC = *noise measurement with a C-filter (or C-weighted filter)*



With appreciation to diracdelta.co.uk

It's obvious that a C-weighted filter picks up vastly more noise (literally, exponentially more) in the low frequency and infrasound range—the yellow zone on both graphs. It's equally obvious that an A-weighted filter picks up exponentially less and less LFN and infrasound as the frequency drops. (Notice that the noise data are plotted on logarithmic graph paper. This explains why the intervals between levels of frequency are unequal. Frequency is measured in Hz = Hertz.)

A-weighting is designed to pick up what the human ear normally hears in conversation. It filters out almost all the lower range of sound—the sound we barely hear (depending on how low it is), *sound that is detected as vibration by the inner ear's vestibular organs together with a variety of other motion, position, and balance sensors throughout the body.* A-weighting, in short, is designed to measure what the cochlea (the organ we hear with) detects, not

what the utricle, saccule, semi-circular canals and other organs of motion, position, and balance detect.

Using A-weighted filters is a cheap trick by wind developers and the acousticians who work for them. And people suffer as a result. Rephrasing this, wind developers swindle everyone by using pseudoscience: scrupulously taking A-weighted noise measurements (dBA) without measuring for the proverbial elephant in the room—the low frequency noise. With A-weighted filters, they can get away with the claim that their turbines are no louder than a refrigerator, a library reading room, or a babbling brook—which is all technically true, but irrelevant. What their literature neglects to point out is that the 400-foot-tall whirling “refrigerator” (turbine) they just installed in your backyard is also producing major low frequency noise/vibration—something my refrigerator, local library reading room, and backyard babbling brook don't produce. And yours don't, either.



German windplant. (This photo was not enhanced in any manner; this is exactly how the windplant appears to the naked eye.)

When the developers show up to do their sound measurements prior to construction or after you complain about the noise from their damn turbines, their “engineers” whip out—you guessed it!—an A-filtered noise meter. Not C-filtered. (Yes, Dorothy, this is The Land of Oz, and wind developers are that corny, childish, and sleazy.)

The good news is that LFN can be adequately detected using a C-weighted filter. However, even with a C-weighted filter combined with A-weighted readings, taking proper measurements is a tricky, highly specialized, and complicated business. Easily botched—or fudged. (See [How Loud Is Too Loud?](#))

Fudged? Does this suggest fudging?

“When our town council went to a windfarm [open house] hosted by the Canadian Wind Energy Association, first they were treated to gourmet snacks on the bus and given the wonderful story on wind. Then they brought them right underneath the turbines to show them how quiet they were. The councilors said the turbines were turning like crazy and yet were as quiet as a mouse.

“Being suspicious, my husband checked the Sygration site and, lo and behold, for that time period the turbines were not producing any energy. Though not a turbine technician, my husband is an industrial

mechanic and said this could be done very easily by just disengaging the clutch that actually runs the rotors, and it’s all done from a remote computer.

“We presented this information to our town council, but they wouldn’t believe the nice wind fellows would do something like that.”

—Maureen Anderson (Ontario, Canada), 9/6/09



Wisconsin windfarm (photo courtesy of Gerry Meyer)

“Calvin Luther Martin is correct [that] wind farm noise measurements must be obtained secretly to ensure normal wind turbine operating conditions. Rick James has made it clear that wind farm operators can and do reduce the noise emission quickly if someone is spotted measuring the wind farm noise.

“Over many decades of industrial noise emission measurements, I have learned the best atmospheric conditions (worst case for noise impacted residents) for obtaining the highest immission noise level is during an otherwise quiet night, when the atmosphere is stable. For wind farm noise immission measurements, this means a clear night with only a slight breeze (<2m/s) from the wind farm near ground level and the wind turbines operating near full power. I normally informed only the local law enforcement before my night measurements, so they could address any calls from residents concerned about my presence in the street.

“We would be interested in any wind farm noise data you care to share with us. Please do glance through “How Loud Is Too Loud?” referenced at the end of Calvin’s message, to better understand the dBA and dBC noise data we desire, to better understand the nature of the noise impact on residents. Your results would be even more valuable if you found an opportunity to also measure the noise immission environment on the same or similar night with the wind turbines not operating.”

—George Kamperman, P.E., 9/6/09

Bd. Cert. Member Institute of Noise Control Engineers
Fellow Member Acoustical Society of America

Wind developers add insult to injury by flatly denying any health effects from their LFN-generating turbines. Whose LFN, I emphasize, they refuse to measure, whether properly or improperly. They refuse because (a) they either deny LFN exists, or (b) if they grudgingly acknowledge it does, they claim it’s so minuscule as to be inconsequential. Their rule of thumb being, “if you can’t hear it, it can’t hurt you”—a notion that has been refuted by recent research. (See especially the work of Todd et al. in the [attached References](#) from Pierpont’s 2009 report.)





“The University of Ballarat has begun investigating noise levels near Waubra Wind Farm [Australia], with residents claiming low frequency turbine sound is affecting their health. Some say they have experienced headaches, nausea and sleep deprivation since the turbines began operating. . . .

“University of Ballarat engineering lecturer Graeme Hood said previous monitoring results indicated a high level of infrasound. ‘It’s like having a truck going past your place constantly, although you can’t hear it,’ Mr Hood said. . . .

“Acciona Energy, which owns Waubra Wind Farm, says it is monitoring post-construction noise to ensure it complies with industry standards. But Mr Hood said the standards did not take infrasound into account. . . .”

In summary, WTS seems to be triggered by the organs of motion, position, and balance being commandeered by turbine low frequency noise. The result is that these organs send scrambled signals to brain centers controlling memory, concentration, learning, emotions (including panic & anxiety), sleep, balance, and so on. See the above list.

The clinical literature is clear on what frequencies cause what pathologies. For instance, Todd et al. have demonstrated that 100 Hz sets off fire alarms in the utricle and saccule (see, for example, “[Tuning and sensitivity of the human vestibular system to low-frequency vibration](#)”). One hundred (100) Hz is low-frequency. (Note that at 100 Hz, A-weighting reduces sound measurement by a factor of 1000 [30 dB]. At 31 Hz, A-weighting reduces sound measurement by a factor of 10,000 [40 dB].)

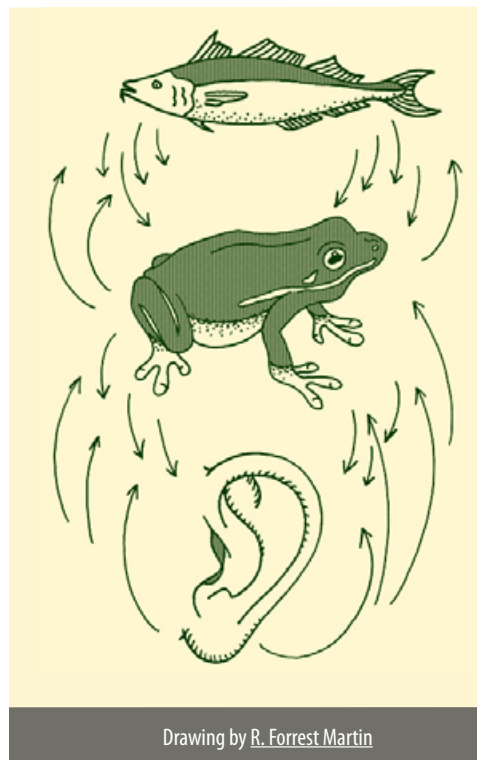
The clinical literature likewise shows symptoms down around 10 Hz and below in what is technically considered the infrasound range..

“Most exciting, Todd et al. provide direct experimental evidence that at the 100 Hz tuning peak, the vestibular organs (probably utricle) of normal humans are much more sensitive than the cochlea to low-frequency bone-conducted sound/vibration. The researchers applied vibration directly to the skin over the bony mastoid prominence behind the subjects’ ears, adjusting the power by measuring the tiny whole-head acceleration produced by each vibration force and frequency. They were able to elicit and measure neural signals of the vestibulo-ocular reflex (OVEMP) at vibration intensities 15 dB below the subjects’ hearing thresholds.

“In other words, the amount of vibration/bone-conducted sound was so small that the subjects could not hear it, yet the vestibular parts of their inner ears still responded to the vibration and transmitted signals into the balance and motion networks in the brain, resulting in specific types of eye muscle activation. Since dB is a base 10 logarithmic measure, 15 dB below means a signal 0.0316 ($10^{-1.5}$), or about 3%, of the power or amplitude of the signal these normal subjects could hear.

“The researchers note that ‘the very low thresholds we found are remarkable as they suggest that humans possess a frog- or fish-like sensory mechanism which appears to exceed the cochlea for detection of substrate-borne low-frequency vibration and which until now has not been properly recognized.’

“Thus the potential exists, in normal humans, for stimulation of balance signals from the inner ear by low-frequency noise and vibration, even when the noise or vibration does not seem especially loud, or even cannot be heard. In the presence of pre-existing inner ear pathology, thresholds for vestibular stimulation by noise or vibration are even lower than in normal subjects.



“Each part of the body has its own resonance frequency with regard to vibration. When an object is vibrated at its resonance frequency, the vibration is amplified. The resonant frequency of the thoraco-abdominal system, as it moves vertically towards and away from the lungs, lies between 4 and 8 Hz for adult humans. Vibrations between 4 and 6 Hz set up resonances in the trunk with amplification up to 200%. Related chest and abdominal effects are found in the same frequency range. Vibrations in the 4-8 Hz range influence breathing movements, 5-7 Hz can cause chest pains, 4-10 Hz abdominal pains, and 4-9 Hz a general feeling of discomfort. In small children under 40 pounds, the vertical resonance or power absorption peaks at 7.5 Hz, as opposed to 4-5 Hz for adults.”

—Pierpont, “Report for Clinicians,” ch. 2 in *Wind Turbine Syndrome* (2009)



WTS VICTIMS

People suffering from Wind Turbine Syndrome feel desperate. Oftentimes they feel they are losing their minds. This being neither surprising nor unreasonable, given that they are losing their ability to concentrate and remember things. And they panic. (The panic is not because they're weenies, but because low frequency noise acting on vestibular organs triggers panic. Panic is an inevitable neurological response to LFN.)

Ironically, all this is a normal response to vestibular signals. Except that the vestibular signals in this instance are happening under unnatural conditions, and are sending a mish-mash of mis-information to targeted brain centers.

Consider the following diary entry by Ann Wirtz (Wisconsin).

“Completely exhausted, I went to bed at around 10 p.m. I fell asleep quite fast, as usual. At 12:05 I woke up and looked at the clock. I tried to think, “Sleep, sleep, sleep, and don’t wake up.” But it was no use; I was wide awake.

“I had the feeling I often get of pressure in the room. I went out on our back porch. I sat down and could feel the eerie sensation even stronger outdoors. I had a feeling of pressure—the sensation you have for those few seconds when you are at the

top of a rollercoaster, just before you go down. But this [feeling] is constant.

“I also felt the swoosh, swoosh of the turbines. It was [not] real loud, yet the feeling to me was very strong. The swoosh, swoosh sensation, along with the pressure, made me feel nauseous.”



Picture it this way. Ann’s utricle, saccule, and semi-circular canals are screaming at her brain, *“Oh my God, Ann is upside down and spinning!”* Alternatively, *“Oh my God, it’s 1 a.m., and Ann is on a wild and crazy carnival ride!”*

In reality, Ann is sitting on her back porch in her bathrobe at 1 a.m., wondering why she can’t get back to sleep. Her brain says, *“No, you’re wrong! You only think you’re sitting on your porch listening to peepers and the gentle swish of turbines. I, your brain, know for a fact you’re on the North Atlantic in a ridiculously*

small boat and there's a helluva storm tossing you around like a cork, and I'm trying like the dickens to keep your motion, position, and balance in proper order."

VVVD

As Pierpont explains in her report, Ann's weird midnight symptoms were likely a result of her vestibular apparatus being hijacked by turbine LFN, as outlined above. Alternatively, they were caused by a clinical phenomenon which Pierpont has christened *Visceral Vibratory Vestibular Disturbance* (VVVD), whereby LFN *literally vibrates internal organs*, thus setting off stretch, pressure, and vibration receptors and detectors (called visceral graviceptors, see Balaban) in and around internal organs.

Symptoms of VVVD resemble those of vestibular disturbance, with the added sensation of internal quivering or "crawling." "When the turbines get into a particular position (facing me)," reports one of Pierpont's subjects, "I get real nervous, almost like tremors going through your body. . . . It's more like



a vibration from outside. . . . Your whole body feels it, as if something was vibrating me, like sitting in a vibrating chair but my body's not moving."

Visceral Vibratory Vestibular Disturbance (VVVD). For all you WTS sufferers who wonder what the heck is happening to you: What you're experiencing is a new clinical phenomenon. Yeah, you're making medical history. You're the guinea pigs for VVVD.

This is why Pierpont subtitled her book, "A Report on a Natural Experiment." *You're the experiment!* No clinician would get away with performing this outrageous experiment on people, but the wind developers pull it off because they claim ignorance. And when Pierpont and other physicians point out that they are messing with people's health, the windies have the gall simply and flatly to deny it—relying on advice from acousticians. (Hello! Acousticians and physicists are not clinicians.) Or they rely on advice from wind turbine salesmen and engineers, likewise not clinicians.



The outrage doesn't end there. The windies like to tell anyone within earshot that Pierpont's sample size (10 families, 37 people) is too small to establish any connection between the turbines next door and people's symptoms. (Wind developers are salesmen. Keep this in mind. And corporate environmentalists, for the most part, are wind developer skills. Keep this in mind, too. Neither wind developers, corporate environmentalists, politicians, public agency bureaucrats, or Barack Obama, for that matter, are clinicians.)

The windy crowd doesn't understand that *Pierpont's sample size was large enough to establish statistical significance on the question she was addressing, which was, "What aspects of a person's past medical history make him (her) susceptible to becoming sick when exposed to wind turbines?"*

This man—not a salesman, not a wind company consultant, not an acoustician or physicist, not a corporate environmentalist or politician or government job holder—grasps the significance of the statistical significance Pierpont has demonstrated. Unlike the above list of "nots," this man is an expert on the subject of LFN and vestibular dysfunction. Unlike the above crowd, he is worth listening to. Dr. Black is an Ear, Nose, Throat (ENT) physician. In fact, he's more than that; he's considered by fellow physicians to be the gold standard in otolaryngology and neuro-otology (ENT) research. Ironically, the American government also considers him the gold standard, for he regularly consults for the US Navy and NASA on vestibular disorders in astronauts and deep sea navy divers. (See F. Owen Black, MD, FACS.¹)



“Dr. Pierpont has clinically defined a new group of human subjects who respond to low frequency, relatively high amplitude forces acting upon the sensory and other body systems. Her rigorous clinical observations are consistent with reports of the deleterious effects of infrasound on humans, including, but not limited to, the low frequency sonar effects on divers. There are clinical conditions (such as dehiscence superior semicircular canals) that might explain some of Dr. Pierpont’s clinical symptom review, but this relatively rare condition cannot explain all of her observations.

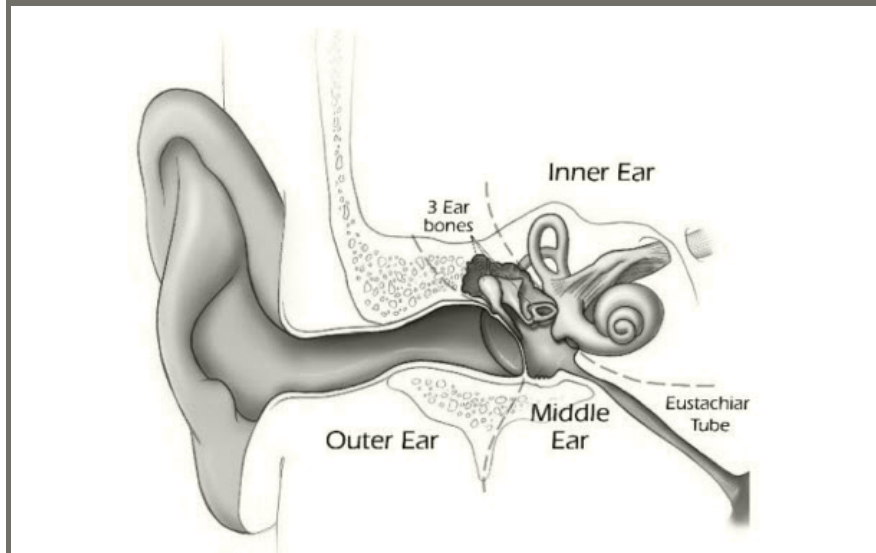
“Dr. Pierpont’s astute collection of observations should motivate a well-controlled, multi-site, multi-institutional prospective study.”

—F. Owen Black, MD, FACS, Senior Scientist and Director of Neuro-Otology Research, Legacy Health System, Portland, Oregon. Dr. Black is widely considered to be one of the foremost balance, spatial orientation, and equilibrium clinical researchers in America.

After reading this, you'd think responsible setbacks *à la* Nina Pierpont would be a no-brainer. The fact that clinically responsible setbacks are ignored by the above crowd is a scandal of large proportions. And getting larger by the



“I believe [Pierpont’s] study is an important initial contribution to understanding the effects of low frequency pressures on the inner ear and other organs.”



day, as Barack Obama and Congress pour billions of dollars into the pockets of this completely unregulated industry.

Yes, Dorothy, this is The Land of Oz, and wind developers and their skills are that brazen, sleazy and, if I understand the Geneva Convention’s definition of torture, criminal.²

Torture? Here’s what a woman named Nikki was doing at 10:42 pm on June 28, 2009. Tell me if this meets the definition.

“ . . . I began to feel a periodic vibration. It was strange. I even looked through the bed to see if a toy was vibrating or a cell phone was left there. Okay here is the part that may sound very strange and quite frankly has me very worried. Today the windmills were very loud and turning quickly. It is dark now so I can’t see them, but they are loud this evening. Gerred [my husband] is still awake from the sound (he had a bad day today because he took the boys outside to play and swim and he said it felt like living next to an airport! Talk about Loss of Enjoyment of your property) . . . Anyway, I am feeling a vibration-like feeling just above my pelvic bone. It literally feels like when your cell phone vibrates but it is within my body. . . . I cannot describe it well, and even as I type I am having a hard time believing it myself. I wasn’t even thinking about the turbines, I was just watching the movie with the kids when it started but now it’s not stopping It feels very invasive . . . I don’t like it at all I remember one of the doctors saying that vibration can be conducted in gaps between bones, like at the jaw below the ear or something like that. . . . I wonder if this could be happening at the top of the pelvic bone? If anyone can provide me with any information, it would be greatly appreciated This is the most unnerving thing that has happened

so far . . . If anyone can let me know any possible cause it would be greatly appreciated I hope you don't all think I am crazy, I know it sounds strange, but it is definitely happening I just timed it out with the turbines and it seems to be following the same pattern I will definitely be seeking medical advice on this one.”

Nikki lives in Ontario, Canada. You can read her daily diary here, [My Next Door Neighbour Is a Wind Turbine](#). Ann Wirtz lives in Wisconsin. You can read about her hellish life, [here](#).

Ann's wild ride and Nikki's vibrating guts—the stories of two human guinea pigs—this is what Nina Pierpont's report is all about. Except that her report features 10 families, not just 2, from Europe and North America, analyzed in painstaking clinical detail. Ten families who have either abandoned their homes for good, or simply moved away to temporary lodging and hope someday to return. To this the wind developers and their acoustician & physicist hirelings respond, “Nonsense!”

“On Friday night Julian and I went to a meeting in a local village hall to give a presentation on our experiences of having turbines as neighbours. The developers were there also. To our horror and absolute amazement, one of the directors of the company proposing the development said that it couldn't be true that the noise from the turbines was

louder at our home 930m away from the turbines than it was 100m away or underneath them. *And she laughed at us [emphasis added]*.

“It is so worrying when someone purporting to be a chartered engineer with 15 years experience of building wind farms, has absolutely no understanding of how large, moving structures (330+ feet high) create sound waves, and how those waves propagate. As at the [Wind Turbine Noise 2009 Conference](#) [we attended] in Aalborg, Denmark, June 17-19, 2009, we found that many (not all) who spoke had no experience of wind turbine noise in the raw, real world. No experience of the swish, the whoomph, the roar, the ever present hum, the lash, the grinding—none at all—and yet they purport to be able to predict what “noise” the nearest receptors (that's “homes” to you and me) will suffer from.

“They do not understand and seemingly do not care, either!”

—Jane Davis, Lincolnshire, England, 7/5/09. (Listen to Jane's account, “We've Now Abandoned Our Home.”)

And your government, dear reader, lets the wind industry get away with all this. (Yes, Alice, you are now in Windfarmland.)



I am a physician and scientist; my expertise lies in clinical and environmental matters. Whether or not wind proves to be a viable source of power, it is absolutely essential that windmills not be sited any closer than 1.25 miles (2 km) from people's homes or anywhere else people regularly congregate. (Highways are also a problem for motorists with seizure and migraine disorders and motion sensitivity, from the huge spinning blades and landscape-sweeping shadow flicker.)

I consider a 1.25 mile set-back a minimum figure. In hilly or mountainous topographies, where valleys act as natural channels for noise, this 1.25 mile set-back should be extended anywhere from 2-3 miles from homes.

Let me be clear. There is nothing, absolutely nothing, in the wind energy proposition that says windmills must be sited next door to people's homes. Siting, after all, is the crux of the issue.

Irresponsible siting is what most of the uproar is about. Corporate economics favors building wind turbines in people's backyards; sound clinical medicine, however, does not.

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REFERENCES

1 Dr. Black's clinical resumé:

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Dr. Owen Black is the Director of Neurotology Research for Legacy. An internationally known neurotologist and human vestibular physiologist, he received his MD degree from the University of Missouri in 1963. After completing a residency in otolaryngology at the University of Colorado and an NIH-sponsored fellowship in otology, he served as a combat surgeon in Vietnam with the US Navy.

Dr. Black completed his research training in 1974 through the assistance of an NIH Research Career Development Award, and held appointments at the University of Florida and University of Pittsburgh before joining the Robert S. Dow Neurological Sciences Institute in Portland in 1982. He established his lab with Legacy in 1997. Dr. Black has received continuous funding from the NIH and NASA for his research for over twenty years. In addition to his research pursuits, Dr. Black has an active clinical practice at Balance and Hearing Northwest.

Research Interests

Dr. Black's research focuses on disorders of the human vestibular system and the effects of microgravity on human postural control, with a major emphasis on the role played by otolith function. His recent studies are centered on determining how trauma, disease and certain drugs adversely affect vestibular function, and in quantitatively assessing the consequences of vestibular placticity. A component of his work is investigating how visual cues the brain receives from the eyes work with the inner ear to help control balance.

His NASA-funded research involves the impact that the zero gravity of space has on astronaut balance control. Weightlessness adversely affects how the brain interprets information received from the inner ear, causing space motion sickness and difficulties in regaining a sense of balance once returning to Earth. He regularly travels to the JohnsonSpace Center in Houston and the Kennedy Space Center in Florida to meet with his NASA collaborators, and serves on the medical advisory team for the space shuttle program.

These studies are leading to a further understanding of the human vestibular system and its role in spatial orientation, equilibrium, balance, and debilitating disorders such as motion sickness that will lead to new diagnostic and therapeutic methods.

2 Part I, Article 1 of the **Convention against Torture and Other Cruel, Inhuman or Degrading Treatment or Punishment**: *“For the purposes of this Convention, torture means any act by which severe pain or suffering, whether physical or mental, is intentionally inflicted on a person ... for any reason based on discrimination of any kind, when such pain or suffering is inflicted by or at the instigation of or with the consent or acquiescence of a public official or other person acting in an official capacity.”* And Article 16: *“Each State Party shall undertake to prevent in any territory under its jurisdiction other acts of cruel, inhuman or degrading treatment or punishment which do not amount to torture as defined in Article 1, when such acts are committed by or at the instigation of or with the consent or acquiescence of a public official or other person acting in an official capacity. In particular, the obligations contained in articles 10, 11, 12 and 13 shall apply with the substitution for references to torture or references to other forms of cruel, inhuman or degrading treatment or punishment.”*

