

Human Health Effects of Biomass Incinerators: Dioxins Damage Children and Adults

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1. I'm going to talk about a matter of health for you and your family.
2. I'm Bill Blackley, Fellow AAFP, trained at Chapel Hill and Duke. I've spend the last 37 years studying the cause and effect of illness and treating problems I'm going to address today. I've never been paid to talk about this issue. Simply put, preventing illness is a natural extension of medical practice Biomass burning produces multiple toxic emissions that damage and kill humans in many different ways. I want tell you what dioxins are, where they come from, to alert you to the risks they pose to American Citizens and tell you why scientists and medical organizations representing over a hundred thousand physicians are concerned about and opposed to biomass burning.
3. I served two tours in III Corps Vietnam where Agent Orange was sprayed. Dioxins were in Agent Orange and the damage inflicted was unintended, sort of like "friendly fire" from errant artillery fire

In 2008 a biomass burning company wanted to come to my town and I heard from a fellow "veteran," also physician, that the company would create dioxins as a byproduct. I served in III Corps where most Agent Orange was sprayed. I didn't want my family exposed to dioxins because any toxin that causes damage or death 30 to 40 years later is very worrisome.

4. The company touted themselves as clean and green even though they burned poultry waste and wood. They denied any health risk and claimed health, environmental and other data showing that their process was safe. They claim they were in complete compliance with regulations and laws.
5. They claimed they actually cleaned up the air. They claimed to be a solar process based on the convoluted logic that the Sun made the food that chickens ate. These are the sort of claims and bogus science local citizens and commissioners are faced with all across the country. We found that their whole promotional package was laced with PR spin and deceit.
6. When we learned that they emitted millions of pounds of air pollution including particulate matter, nitrogen oxide, arsenic and . . . Dioxin. The majority of physicians, pharmacists, 92.5 % of businesses in the Chamber of Commerce, all five tourist agencies, the majority of county citizens polls and our Commissioners came to oppose the company.

7. When physicians, citizens and leaders confronted this company about the emissions and health risks the company quietly slipped out of town. We found that we were not alone in our opinion and concern that biomass burning emissions are unsafe for any community.
8. Multiple other medical professionals and organizations throughout the United States have expressed concern about toxic emissions released by biomass incineration. They voiced their . . . “Second Opinion” in this review The Medical Profession Diagnoses Biomass Incineration listed in my references. <http://www.bredl.org/pdf3SecondOpinion.pdf>
9. Among those concerned and opposed are the American Lung Association and American Academy of Family Practice with 94,700 members. Physicians agree that good health should come first.
10. There’s national and international concern about the documented toxic health effects of dioxins because . . . see next slide.
11. Increasing levels of dioxins increase health risks in humans. Even background levels increase health risks. The Environment Protection Agency began studying dioxins ~ 26 years ago. Research data proved the risk and the EPA produced a report. There was an effort by those who emit dioxins to suppress the government report but after thorough vetting . . .
12. By EPA Science Advisory Board, the EPA published the non-cancer dioxins report in February 2012. The release was prompted by the EPA research that found that after a 90% dioxins decrease in the past 20 years, yet during that time dioxins from wood burning increased 56% and studies showed an 18% increase in dioxins emissions from 2009 to 2010 . . .
13. This is the EPA Dioxins Reanalysis of Key Issues Related to Dioxins Toxicity that, along with other data, I’m going to address.
14. The EPA report addresses the key issues related to dioxins toxicity, defines the risk, was 27 years in the compiling, contains 334 pages of review and comments on 1,500 dioxins studies. You can read the report and the other references yourself but I’ll give a brief summary of risks today.
15. I reviewed most of my comments on this PowerPoint with this lead government scientist.
16. There are a host of other scientific studies concerning dioxins. I’ve included 42 pages of additional references on line and I recommend the first article on the list . . .
17. Second author is Linda Birnbaum, Ph.D., who is a lead scientist on the EPA review as well as Director of the National Institute of Environmental Health Service and of the National Toxicology Laboratory.
<http://www.researchgate.net/researcher/38645571> Arnold Schechter

This study makes it clear that dioxins did not exist prior to industrialization except in very small amounts due to natural combustions and geologic processes.

18. These are two sentinel points. It's the process of burning hydrocarbons and chlorine that creates dioxins and not simply industrialization. There are ways other than burning biomass to create energy and deal with waste without creating a whole new additional source of dioxins and set of health problems.
19. An effective way to reduce this whole new source of dioxins is to reduce biomass burning and create energy and deal with waste in alternate ways. This would have the added benefit of reducing multiple of toxic smokestack emissions including particulate matter, nanoparticles, other toxins and chemicals leading to ozone, smog, etc.
20. What are dioxins? They're Persistent Organic Pollutants(POPs) along side DDT in the list of the "Deadly Dozen" most toxic chemicals known to man. EPA once opined that they would be our next DDT. EPA calls them persistent Bio-accumulative toxicants.
21. They persist for decades in soil, water and animals after they are created because they are highly resistant to physical, chemical or biologic degradation. The primary way to reduce dioxins is to not create any more of them. That's the World Health Organization recommendation.
22. When hydrocarbons like trees, railroad ties, tires, poultry litter, grass trash, garbage, etc. are burned in the presence of chlorine dioxins are created. Almost all biomass contains chlorine. Creation is the operative word since dioxins do not exist in these fuels before burning.
23. Dioxins are an insidious risk. They're a necessary byproduct of biomass burning. The emissions are like secondhand cigarette smoke and nobody can leave the room. Smokestacks are like 300-foot cigarettes.
24. Damage by dioxins is almost impossible to avoid because dioxins are invisible and odorless, there are no warning signs of exposure, no initial symptoms, a single test costs ~\$1,200, there's no medical way to remove the dioxins even if you find them. It's the perfect slow poison as many US Veterans have learned.
25. How do dioxins get in humans? They are created during burning, leave the smokestack and settle on soil, in water & on leaves, etc. Trapped in fly or bottom ash they're spread as fertilizer, used as building materials or placed in landfills where they eventually leach to the soil and water

Minnesota Dept of Health has reported finding dioxins in waste derived fertilizer.
26. Dioxins bio-accumulate in the fat of chicken, birds, grazing animals and fish when they ingest their usual food that has been contaminated with dioxins.

27. Humans bio-accumulate dioxins without knowing it when they eat food contaminated with dioxins.

Whole dairies and egg operations have been shut down because of dioxins contamination.

28. Chart is from p37 of the review draft of U.S. Environmental Protection Agency's "Estimating Exposure to Dioxin-Like Compounds – Volume 1: Executive Summary" June 1994. It can be found on the Dioxin Homepage: <http://www.ejnet.org/dioxin/> Newer estimates can be found in Table 4-30 (p4-110) in Part 1, Volume 2, Chapter 4 of U.S. Environmental Protection Agency's "Exposure and Human Health Reassessment of 2,3,7,8-Tetrachlorodibenzo-p-Dioxin (TCDD) and Related Compounds National Academy Sciences (NAS) Review Draft." <http://www.epa.gov/ncea/pdfs/dioxin/nas-review/> The table is on p100 of: http://www.epa.gov/ncea/pdfs/dioxin/nas-review/pdfs/part1_vol2/dioxin_pt1_vol2_ch04_dec2003.pdf

29. The greater the exposure the higher the risk. They build up in humans for decades. Males are never able to eliminate dioxins. Females can eliminate dioxins through the placenta to the fetus and breast milk to the newborn at ~ 6 times the level of the pregnant or nursing mom.

30. The most toxic effect is on the developing fetus, newborn and child. How does that happen?

31. Dioxins derange development. Genes determine the functions of our body. Dioxins imitate normal (epigenetic) messenger chemicals and send a false signal to the genes turning them "off" or "on" abnormally. Dioxins cause profound biologic effects (abnormal developments) in parts per trillion.

32. A few parts per trillion of dioxins can be enough to cause abnormal development.

33. A little change make a big difference at the target. Be extremely skeptical about the claims that small doses of dioxins don't matter.

34. What are some of the target organs, abnormalities and outcomes?

35. Abnormal Outcome include premature delivery, reduced response to vaccinations, immune system suppression, increased respiratory and ear infections and allergy in children, alterations in fetal development, reduced head circumference in the fetus and reduced IQ.

36. Other abnormalities associated with dioxins exposure: Hyper-reflexivity in newborns, increased need for neurologic support, endometriosis, polycystic ovary disease, protein disorders in muscle, heart disease, hypertension and hardening of the arteries.

37. Other damaging disorders associate with dioxins exposure: Decreased sperm quality and quantity, reduced fertility, abnormal menses, Type II Diabetes Mellitus, Altered thyroid levels, auto-immune diseases and Parkinsonism.

38. Any level of dioxins increases the risk of squamous cell carcinoma, leukemia, multiple myeloma, prostate, respiratory cancer, Hodgkin's and non-Hodgkin's lymphoma and breast cancer.

US EPA reference dose 0.7 picogram per Kg bw . . . Average US levels are higher than background levels now but not much. For the developmental level much lower levels cause risk.

39. Hidden social and economic costs: Abnormalities can persist for a lifetime. They create a need for more costly medical and social care.

40. Biomass electricity is expensive especially when health care costs from resulting diseases are taken into consideration It is costly as well as dirty, In 2010, EPA estimated that the value of the benefits resulting from tightening restrictions on air toxics emissions from commercial and industrial boilers and process heaters - ranges from \$17 billion to \$41 billion for the year 2013, outweighing the costs by at least \$14 billion. Further those standards will avoid up to 8,100 premature deaths, 5,100 heart attacks, and 52,000 asthma attacks. EPA estimates that Americans would receive 12 to 30 dollars in health benefits for every dollar spent to meet the proposed standards.

41. The cost to society is enormous in term dollars and suffering. Used by permission of the Union of Concern Scientist cartoon, per Heather Tuttle, UCS Asst. Editor , Sept 6, 2012.

42. Studies prove that dioxins damage and kill humans. Even background levels of dioxins increase health risk and the US average dioxin level is above the EPA Reference dose now. Though there was an overall dramatic decrease in dioxins from 1987 to 2010 there was an 18% increase in dioxins emissions from 2009 to 2010 mostly from biomass burning.

43. Does it make sense to pay people to burn more biomass and create more dioxins? Incentivizing biomass burning is like encouraging businesses to set up and light 300 foot cigarette in American communities and to force everyone, including children, to breathe the secondhand smoke.

44. Elsewhere: The United Nations Environmental Program (UNEP) adopted a worldwide treaty to eliminate Persistent Organic Pollutants (POPs). Twelve organochlorine POPs, including dioxins, have been prioritized for eliminations

45. What can legislators do? Reduce dioxins. How?

46. Join the opposition to creating dioxins by opposing incentives for biomass burning that emits dioxins as well as particulate matter and emissions leading to dioxins

47.

48.

49. End