Cancer Connection to Mercury, Toxic Metals, and Dental Cavitations

Bernard Windham (Ed.)

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The President's Cancer Panel Report for 2008-2009 found that the true burden of environmentally induced cancers has been grossly underestimated (547). Other studies and documentation have similar findings (560). As seen here, in addition to cancers caused by radiation, pesticides, and other organic chemicals, toxic metals such as mercury have major effects on weakening the immune system and facilitating cancer.

Medical labs, medical studies, and government agencies have documented that dental amalgam is the largest source of mercury in most people who have several amalgam fillings (1, 500). Fish, vaccinations, and occupational exposure such as dental offices are other sources of significant mercury exposures. A nationwide survey found that over 22 percent of those tested for mercury levels in the hair had dangerous levels higher than the U.S. EPA mercury health reference level (2). Toxic metal levels were measured in 6-24 hours urinary samples of 100 randomly chosen patinets with chronic conditions at the Institute of Integrative Medicine following a combined EDTA/DMSA provocation challenge. Over 70% had levels of lead, arsenic, mercury, or cadmium outside the Laboratory Reference Level (571).

A large U.S. Centers for Disease Control epidemiological study, NHANES III, found that those with more amalgam fillings (more mercury exposure) have significantly higher levels of chronic health conditions (543). The conditions in which the number of dental amalgam surfaces were most highly correlated with disease incidence were MS, epilepsy, migraines, mental disorders, diseases of the nervous system, disorders of the thyroid gland, cancer, and infectious diseases (543, 500).

Mercury and other toxic metals such as copper and lead cause breaks in DNA (4, 38, 41, 42, 197, 272, 296, 500), and also have synergistic effects with x-rays (296) . Several toxic metals, including arsenic, cadmium, chromium, and nickel, have been documented to be carcinogenic (5). Some of the mechanisms by which toxic metals such as mercury cause cancer have been documented by many medical studies (5, 500). Low non-cytotoxic levels of mercury induce dose dependent binding of mercury to DNA and significantly increased cell mutations (142, 4, 500) and birth defects (197, 38, 105). In addition to effects on DNA, mercury also promotes cancer in other ways. Mercury by its effect of weakening the immune system contributes to increased chronic diseases and cancer (91, 180, 228a, 237, 239, 222, 234, 355, 369, 405, 500, 530, 543, 570, 35, 38, 40, etc).

Nobel Prize winner Dr. Otto Warburg determined that cancer has only one prime cause (581). It is the replacement of normal oxygen respiration of the body's cells by an anaerobic [i.e., oxygen-deficient] cell respiration. Porphyrins are precursors to heme, the oxygen carrying component of blood. Mercury inhibits the conversion of specific porphyrins to heme. (84, 35, 201, 539, 500) Mercury has been documented to bind to oxygen carrying sites in the blood, reducing a person's available oxygen supply. (232, 233, 570, 571, 500). Mercury binds with hemoglobin, which is located

inside the red blood cell and carries oxygen for transport to tissues. Mercury bound to hemoglobin results in less oxygen carrying capacity of the red blood cell and therefore less oxygen will reach the tissues. The body senses the need for more oxygen and may attempt to compensate for this by increasing the production of hemoglobin. A normal or increased hemoglobin level combined with symptoms of lack of oxygen (fatigue, weakness, appearing pale, rapid heart rate, shortness of breath, etc) could indicate mercury toxicity. But this can confuse some doctors since the patient seems like they are anemic but in fact the blood counts seem fine (233). A new well documented book has more information on causes of cancer and effective natural treatments for cancer (560), including the toxic teeth connection.

At the energetic-molecular level, the boundary between health and the state of absence of health is marked by oxidosis, acidosis, and dysoxygenosis (dysox). (571, 581) There is but one fundamental difference between a healthy cell and an unwell cell: a healthy cell has a well preserved oxygen homeostasis. A healthy cell utilizes oxygen well, without incremental oxidative stress (oxidosis) and without accumulating organic acids (acidosis). In contrast, an unwell cell cannot utilize oxygen well and gets clogged up with Krebs cycle metabolites and other organic acids. At the bioenergetic cellular level, all inflammatory, autoimmune, and neurodegenerative disorders are caused by the oxygen disorder (dysfunctional oxygen utilization) caused by cellular toxicity in the cells.

Mercury from dental amalgams appears to be one of the most, if not the most, potent disrupters of oxygen metabolism in the oral cavity (571, 233). Other such disrupters are thioethers related to root canal teeth or cavitations and other microbial toxins . Those factors also alter the local conditions that either inhibit or foster microbial growth, so facilitating biofilm formation. Such dynamics seem to play crucial roles in the pathogenesis of systemic disorders rooted in the oral cavity. The crucial importance of oral toxicity in triggering, amplifying, and perpetuating systemic inflammatory and infectious disorders has largely been ignored by most doctors and dentists. The presence of the cellular dysox state can be readily documented by the measurement of 24-hour urinary excretion of organic acids.

Mercury has been found to bind oxygen binding sites in hemoglobin, thus reducing access to oxygen carried by the blood. (232, 233, 35, 582) Oxyhemoglobin saturation levels in venous blood should be at least 60% for normal levels. The majority of a group of 27 patients with amalgam dental fillings suffering from chronic fatigue whose oxyhemoglobin was tested had lower than normal oxyhemoglobin saturation levels (232, 35). After amalgam replacement the majority of those with oxyhemoglobin levels equal to or less than 45% had significant increases in oxyhemoglobin saturation levels, on average about 15%. Heme is used for 2 main functions, in red blood cells and in production of energy by enzymatic processes in the ATP cytochrome oxidaze system. Mercury and other toxics have been documented to block these enzymatic processes, resulting in dumping porphyrin wastes into the urine rather than completing the proper heme functions. The level of these porphyrins in the urine can be measured by a standard urine test, the fractionated porphrin test, and indicate the level of toxic disruption of the basic enzymatic ATP production process. The majority of the patients in the study had high levels of porphyrins in the urine, which decreased significantly after amalgam replacement. This has also been confirmed by other studies (260, 233).

Mercury from amalgam binds to the -SH (*sulfhydryl*) groups, resulting in inactivation of sulfur and blocking of enzyme functions such as cysteine dioxygenase (CDO), gamma-glutamyltraspeptidase (GGC) and sulfite oxidase, producing sulfur metabolites with extreme toxicity that the body is unable to properly detoxify (33, 111, 114, 405), along with a deficiency in sulfates required for many body functions. Sulfur is essential in enzymes, hormones, nerve tissue, and red blood cells. These exist in almost every enzymatic process in the body Mercury also blocks the metabolic action of manganese and the entry of calcium ions into cytoplasm (333). Mercury from amalgam thus has the potential to disturb all metabolic processes (33, 35, 60, 111, 114, 180, 181, 194, 333, 405, 500). Mercury is transported throughout the body in blood and can affect cells in the body and organs in different ways causing numerous types of chronic health conditions including blood conditions and cancer.

Mercury has a high affinity for and readily binds to selenium and to the thiol or sulfhydryl (sulfur/hydrogen combination) sites in living tissues. The higher the attraction between chemicals or elements, the stronger they bond to each other, and the harder it is to separate them. The thiol combination is extremely common in the human body. It occurs as part of certain amino acids, which are building blocks of proteins. Since these amino acids are used to build cells, hormones, and enzymes, the occurrence of the thiol combination in the body is not only common but extremely important, as normal function is altered. There are several thiol sites in the hemoglobin molecule in the red blood cells used to transport oxygen throughout the body. Mercury accumulates in red blood cells in humans and other animals. When mercury attaches to the thiol sites, the hemoglobin can't carry as much oxygen as it could. This results in decreased availability of oxygen (*hypoxia*) that is needed by all body cells and explains one way that mercury toxicity can cause chronic fatigue symptoms and other effects of low oxygen levels in the cells.

Toxic metal exposure's adverse influence on thyrocytes can play a major role in thyroid cancer etiology (144, 500) . Among those with chronic immune system problems with related immune antibodies, the types showing the highest level of antibody reductions after amalgam removal include thyroglobulin and microsomal thyroid antigens (91, 369). Similar results regarding mercury have been found for treatment of other types of cancer. Studies have found conventional chemotherapy (alone) to be only a little more effective than no treatment and clinical cases have demonstrated that detoxification and nutritional support can be effective in treating multiple myeloma (550) and other cancers (486, 530, 572, 35, 228a).

Exposure to mercury vapor causes decreased zinc and methionine availability, depresses rates of methylation, and increased free radicals - all factors in increased susceptibility to cancer and other chronic conditions (14, 34, 38, 43, 143, 144, 180, 237, 239, 251, 256, 283, 530). Amalgam fillings have also been found to be positively associated with oral cancer (206, 251, 403). Mercury from amalgam fillings has also been found to cause increase in white blood cells and in some cases to result in leukemia (35, 180). There is evidence that some forms of leukemia are abnormal response to antigenic stimulation by mercury or other such toxics, and total dental revision including removal of amalgam has led to remission very rapidly in some cases (35, 38, 180, 239, 500). Among a group of patients testing positive as allergic to mercury, low level mercury exposure was found to cause adverse immune system response, including effects on vitro production of tumor necrosis factor TNF alfa and reductions in interleukin-1. (126, 131, 152)

Mercury has been found to cause decreased sperm volume and motility, increased sperm abnormalities and spontaneous abortions, increased uterine fibroids/endometritis, and decreased fertility in animals (4, 104, 105, 162) and in humans (9, 10, 23, 31, 37, 105, 146, 159, 395, 433, 27, 35, 38). In studies of women having miscarriages or birth defects, husbands were found to typically have low sperm counts and significantly more visually abnormal sperm (393). It's now estimated that up to 85 per cent of the sperm produced by a healthy male is DNA-damaged (433). Abnormal sperm is also being blamed for a global increase in testicular cancer, birth defects, and other reproductive conditions.

There are extensive documented cases (many thousands) where removal of amalgam fillings led to cure or significant improvement of serious health problems such as oral keratosis (pre cancer)(87, 251), cancer (breast, leukemia, etc.) (35, 38, 94, 180, 228a, 469, 486, 487, 500, 530).

Some studies have found increased risk of lung, kidney, brain, and CNS system cancers among dental workers (34, 99, 143, 283). Other studies reviewed found increased rates of brain cancer related to mercury exposure (193, 383, 328). Dr. Max Daunderer's serial biopsies on malignant tumors in-patients that had amalgam fillings found toxic metals contained in amalgam in the tumor. The concentration is highest in the center of the tumor (malignant melanoma, brain cancer, bladder, stomach, colon and tongue cancer). (570) An occupational study found that Occupations with likely exposure to mercury or arsenic such as dental nurses displayed increased risk of melanoma (14).

Some studies have also found persons with chronic exposure to electromagnetic fields (EMF) to have higher release of mercury from dental amalgam, higher levels of mercury exposure and excretion (28, 251c) and higher likelihood of getting chronic conditions like ALS (526) and Alzheimer's (251c) and cancer (546).

Mercury causes significant destruction of stomach and intestine epithelial cells, resulting in damage to stomach lining which along with mercury's ability to bind to SH hydroxyl radical in cell membranes alters permeability (338, 405, 35, 21c) and adversely alters bacterial populations in the intestines - causing leaky gut syndrome with toxic, incompletely digested complexes in the blood (222, 228b, 35) and accumulation of heliobacter pylori, a suspected major factor in stomach ulcers and stomach cancer (256) and candida albicans (404), as well as poor nutrient absorption.

From extensive clinical experience the spread of cancer has been commonly found to be related to fungal/Candida incidence, and treating Candida through blood alkalinity balance and reduction of toxic metals body level has been found to reduce the spread of cancer (233a). Such treatments also increase oxygen supply to the cells. (580). An anaerobic environment favors the development of yeast infections and cancer, since yeast is a fermenting spore and cancer is a fermenting cell rather than a normal respiratory (oxygen using) cell.

Mercury has a symbiotic relation to Candida in the body and promotes the proliferation of Candida. Mercury impairs the body's ability to kill Candida albicans by impairment of the lytic activity of neutrophils and myeloperoxidase in workers whose mercury excretion levels are within current safety limits (233, 285, 404). Immune Th1 cells inhibit Candida by cytokine related activation of macrophages and neutrophils. Development of Th2 type immune responses deactivate such defenses (404b, 181). Mercury inhibits macrophage and neutrophil defense against Candida by its affects on Th1 and Th2 cytokine effects (181, 285, 404b). Candida also methylates inorganic mercury to the highly toxic methyl mercury form which like mercury vapor readily crosses the blood-brain barrier, causes neurological damage, and weakens the immune system (225, 405) Candidiasis is often observed in immunocompromised individuals such as those with toxic metal exposures, especially those who are found by test to be immune reactive to mercury or other toxic metals (60, 235, 405). Amalgam replacement cures or significantly improves Candida (404, 222, 35, etc).

Nickel and beryllium are 2 other metals commonly used in dentistry that are very carcinogenic, toxic, and cause DNA malformations (35, 456, 560, 13). Nickel ceramic crowns, root canals and cavitations have also been found to be a factor in some breast cancer and other cancers and some have recovered after TDR, which includes amalgam replacement, replacement of metal crowns over amalgam, nickel crowns, extraction of root canaled teeth, and treatment of cavitations where necessary (35, 200, 228a, 486, 530, 560). Nickel depletes intracellular ascorbate, which leads to the inhibition of cellular hydroxylases, manifested by the loss of hypoxia-inducible factor (HIF)-1alpha and -2alpha hydroxylation and hypoxia-like stress (13). Proline hydroxylation is crucial for collagen and extracellular matrix assembly as well as for assembly of other protein molecules that have collagen-like domains, including surfactants and complement. Thus, the depletion of ascorbate by chronic exposure to nickel could be deleterious for lung cells and may lead to lung cancer.

Root canals and cavitations also facilitate cancer by effect on immune system. (570, 560) As more information is accumulated it is apparent that these areas (bone cavitations) of chronic infection in the craniofacial area are very real and the probable cause of multiple painful conditions in the head, neck and tooth area. (571) This is due in part to the progressive loss of vascularity in the jaw bones and associated structures. This allows the pathogenic anaerobic microbial population to exist and create a chronic infected, inflamed area. This area is effectively isolated from the circulatory system which is responsible for delivering any anti-microbial medications to the infected area. These types of bone cavities have also been shown to have accumulations of toxic heavy metals, as well as the pathogenic microbes. There have been considerable numbers of cases documented of recovery from cancer after dealing with oral infections such as root canals and cavitations. (571, 560, etc.)

Prostate cancer is the most commonly diagnosed cancer in men in the US. Over 300,000 new prostate cancer cases are diagnosed annually, constituting about 30% of all new male cancer cases, and more than 40,000 men die from the disease each year (490). Both breast cancer and prostate cancer are hormonally responsive, containing estrogen, androgen, and progesterone receptors. Genetic susceptibility and environmental factors that promote the sequence that results in clinical prostate cancer have been found to be factors in prostate cancer, with environmental factors being the larger with exposures in early life facilitating later effects. Low-level developmental exposures to substances that modulate endocrine activity can have life long impacts if the exposure occurs during window (s) of unique vulnerability.

Cadmium and arsenic are known human carcinogens and are linked to prostate & breast cancer in epidemiologic and laboratory animal studies (490-494). Cadmium and arsenic have also been found to be associated with lung cancer (491e, 494c, etc.) Food, cigarette smoke, and well water are 3 sources of cadmium exposure. Selenium (Se) in a large-scale human supplementation trial has been shown to significantly reduce the incidence of prostate cancer in elderly men. Because Se is known to interact with cadmium (Cd), it has been suggested that its cancer protective action could be attributable in part to its interaction with cadmium (11). The excessive accumulation of Cd in the prostates of smokers along with sub-optimal Se intakes could explain why smokers develop more aggressive and lethal forms of prostate cancer than nonsmokers. Toxic metals such as mercury, lead, cadmium, and nickel have been found to promote prostate cancer, and reducing toxic metal exposures and detoxification with nutritional support have been found to cure or result in significant improvement in the condition (490, 491, 486, 530, 531, 572, 11, 35).

Dietary factors such as consumption level of red meat, refined carbohydrates, and environmental exposures to estrogenic chemicals have been found to increase the incidence of both prostate and breast cancer (490, 560). Many occupational studies show an increased incidence of prostate cancer incidence and/or mortality among farmers and pesticide applicators. One in vitro study of human prostate cancer cells showed that several organochlorine pesticides, a pyrethroid, and a fungicide each caused proliferation of androgen-dependent cancer cells (490). Another "environmental estrogen", bisphenol A (BPA-a component of epoxy resins, polycarbonate plastic, and dental sealants to which the general population is *exposed at low levels*[1]), has been found to affect the prostate and be related to development of prostate cancer (490).

The toxic metals mercury, lead, cadmium, copper, cobalt, nickel, lead, aluminum, and tin have been found to have reproductive and endocrine system disrupting effects (10, 12), as well as *synergistic effects*[2]. The ability of metals to activate estrogen receptor-alpha (ERalpha) was measured in the human breast cancer cell line, MCF-7. Similar to estradiol, treatment of cells with the divalent metals copper, cobalt, nickel, lead, mercury, tin, and chromium or with the metal anion vanadate stimulated cell proliferation; by day 6, there was a 2- to 5-fold increase in cell number. The metals also decreased the concentration of ERalpha protein and mRNA by 40-60% and induced expression of the estrogen-regulated genes progesterone receptor and pS2 by1.6- to 4-fold. Furthermore, there was a 2- to 4-fold increase in chloramphenicol acetyltransferase activity after treatment with the metals in COS-1 cells transiently cotransfected with the wild-type receptor and an estrogen-responsive chloramphenicol acetyltransferase reporter gene. The ability of the metals to alter gene expression was blocked by an antiestrogen, suggesting that the activity of these compounds is mediated by ERalpha (10, 12). Aluminium in the form of aluminium chloride or aluminium chlorhydrate, which are used in antiperspirants, can interfere with the function of oestrogen receptors of MCF7 human breast cancer cells both in terms of ligand binding and in terms of oestrogen-regulated reporter gene expression (12).

[1]**Internet:** "http://www.protectingourhealth.org/newscience/infertility/2002/2002-1031ikezukietal.htm".
[2]**Internet:** "http://www.flcv.com/synergis.html".

1.1 Cancer treatments

As previously seen, there are several estrogenic or carcinogenic metals, and clinical experience has found metals detoxification to be beneficial in cancer case treatment. There are also diet measures and supplements that have been found to be beneficial in preventing or treating cancer. A comprehensive and well documented summary of natural cancer treatments clinically documented to be effective in treating cancer is Outsmarting Your Cancer (560). Many effective options are covered, with considerable detail and documentation.

Vit K2, Vit D, zinc, and green tea have all been found to be effective in preventing or treatment of prostate cancer and other types of cancer (501-503, 493a). Black tea theaflavins have been found to be effective at prevention of cigarette smoke-induced lung damage and cancer (504), and have demonstrated effectiveness in switching off the genes involved in many types of cancer (505). Studies have shown the aflavin supplementation significantly reduces levels of inflammatory cytokines such as TNF-alpha, Il-6, Il-8, and C-reactive protein; and lowered rates of production of inflammation-generating trasnscription factor NF-kB, cytokine generating COX-2, and the adhesion molecule ICAM-1(506). Vitamin K2 has been shown to induce apoptosis in leukemia cells in vitro and inhibitory effects against myeloma and lymphoma, as well as being effective at reducing liver cancer in patients with hepatitis B or C (known risk factors for liver cancer), and also to be effective at reducing rate of re-occurrence of liver cancer in liver cancer patients in remission (506). Apatone (Vit C & Vit K3) was demonstrated to significantly delay cancer progression in a group of end stage prostate cancer patients.

Patients with advanced cancer have been found to be vitamin K deficient and it is recommended to monitor levels and supplement where needed (506). Several studies found evidence of benefit of intravenous Vit C in treatment of cancer (15). A connection between cancer and fungus/candida has been demonstrated and many types of cancers have been successfully treated using sodium bicarbonate (551, 552). Magnesium and Iodine have also been found beneficial in treating cancer (552) and flax oil with cottage cheese which addresses common digestive problems that can be related to cancer (553). Supplementation with chlorella has been found to result in beneficial effects when used in cancer patients or for other chronic conditions such as ulcerative colitis, hypertention, or Fibromyalgia (572). Doctors such as D. Klinghardt have suggested that the mechanism by which chlorella improves treatment of such conditions is metals detoxification, which is the main mechanism of action of chlorella.

People who drink two or more high fructose syrup sweetened soft drinks a week have a much higher (87%) risk of pancreatic cancer. The high levels of sugar in soft drinks may be increasing the level of insulin in the body, which the authors think contributes to pancreatic cancer cell growth (495).

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Case #3: A 51 year-old male presented with stage four squamous cell carcinoma located in the right pharyngeal-tonsil space. EG underwent conventional therapy with little to no success. Clinical exam revealed cavitational osteonecrotic lesion in the area of the lower right third molar. Soft tissue exam revealed swollen and inflamed pharyngeal arches, bilateral tonsilar inflammation and enlargement. Extraoral palpation revealed minor swelling of lymphatic nodes on the right side. Treatment goal was not to treat the cancer but to eradicate the infective state in the head and neck. EG was placed on a 3 month head and neck oxygen/ozone protocol developed by Dr. Mollica. This protocol was inclusive of direct and indirect infusion of 21 micograms/cc of oxygen/ozone into the afflicted areas. The afflicted areas being the osteonecrotic lesions, soft tissues, and lymphatic tissue. In addition to the oxygen/ozone therapy nutritional and drainage support was provided. Within a month after the completion of the protocol EG was given an exam which included a PET scan. No trace of the cancer or any activity associated with the lesion was found. Attributed to spontaneous remission.

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