

# TerranearPMC Safety Share

## Week of February 23, 2015 – Tattoos

*Me and my brother were talkin' to each other  
'Bout what makes a man, a man  
Was it brain or brawn, or the month you were born  
We just couldn't understand*

*Our old man didn't like our appearance  
He said that only women wear long hair*

*So me and my brother borrowed money from mother  
We knew what we had to do  
We went downstairs, past the barber and gymnasium  
And got our arms tattooed*

These are the opening lyrics to the Who's song, *Tattoo*, from their album, "The Who Sell Out." The song ends with:

*Now I'm older, I'm tattooed all over  
My wife is tattooed too*

The song is about a young man's rite of passage and ends with what was then considered to be the funny and absurd. After all, nobody had tattoos all over their body and women back then didn't get tattoos!

Oh my, how times have changed! Tattoos are fast becoming a mark of the 21st century, with one quarter or more of those under the age of 30 adorning their skin with at least one. Whether driven by the urge for personal expression or just plain youthful impulsiveness, most people get tattooed without a clue about the health implications of this invasive skin-puncturing procedure.

The health effects from tattoo ink are nothing new. The inks, which are injected into skin with small needles, have caused allergic rashes, chronic skin reactions, infection and inflammation when exposed to the sun. Tattoos are designed to last forever, as the process involves delivering permanent ink under the epidermis. The skin reacts by protectively encapsulating the alien clumps of pigment in dense fibrous tissue while a few nearby lymph nodes collect what migrates out. For a long time, removal meant surgical excision or deep abrasion of the skin, invariably causing scarring and sometimes the need for skin grafting. Nowadays, laser treatments have become the preferred approach, whereby, based on a specific laser wavelength that is tailored to the pigments, the tattoo gradually fades away.

Chemists from several laboratories, including the government's National Center for Toxicological Research, have identified low levels of carcinogens as well as other substances that have been associated with adverse health effects. These include phthalates (used as plasticizers), and a variety of metals, and hydrocarbons. Such metals as chromium, cadmium and nickel have been linked to cancer in addition to being endocrine disruptors (materials that interfere with the hormone system).



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For phthalates, which can mimic estrogen or disrupt testosterone, exposure to fetuses and infants is the major concern. In infant boys, prenatal exposure to dibutyl phthalate has been linked to feminization of the reproductive tract. In men, phthalate exposure has been linked to sperm defects and altered thyroid hormones.

According to Shanna Swan, a reproductive epidemiologist at the Mount Sinai School of Medicine in New York who has studied the effects of phthalates on infant boys, "Phthalates are cleared from the body within hours, and unlike many phthalate exposures, those from tattooing will not be continuous." Nevertheless, Swan said pregnant and nursing women should minimize any exposure to phthalates.

Colored inks often contain such heavy metals as lead, cadmium, chromium, nickel, and titanium. These materials are known to trigger allergies and serious effects to the reproductive and nervous systems. According to *Fact Sheets*, published by the Food and Drug Administration (FDA), pigments used in tattoos are industrial grade colors that are suitable for printers' ink or automobile paint. Yet they are the same substances injected into humans for the visual esthetic value of tattoos. More concerning, these chemicals raise unanswered questions about more serious, long-term risks such as skin cancer. One of the chemicals found in black tattoo inks, often made of soot, is benzo(a)pyrene. This is a known human carcinogen, prevalent in tobacco smoke. Therefore, it should be no surprise that dermatologists have observed melanomas and other malignant tumors found in tattoos.

According to the Washington Institute of Dermatologic Laser Surgery in Washington, D.C., whenever a substance is injected into the skin, there is a risk of infection. In addition, other health risks include hepatitis, staph, and even warts.

But the laser removal process, which demolishes the pigment by scorching it with heat, triggers chemical reactions that generate carcinogenic and mutation-inducing breakdown products, which are then absorbed by the body. Recently, German scientists reported that concentrations of toxic molecules from red and yellow pigments increased up to 70-fold after laser irradiation. And the bigger the tattoo, the greater the toxic release. This can only make one wonder whether it's better to let the sleeping paint lie, walled off by the body's own protective devices. However, only time and a lot more study will tell the entire story.

The FDA, which has had a high focus on the cosmetics industry for the past decade, strangely enough, does not regulate the tattoo industry. While the FDA may regulate the inks in tattoos, the actual practice of tattooing is regulated by local jurisdictions, such as cities and counties. That means there is no standardized certification for those doing the tattooing or an overall governing body supervising the health and safety of tattoo parlors.

The fact is no one really knows *exactly* what's in the numerous commercial and homemade inks. But they do contain solvents and metals like lead and mercury and a range of impurities acceptable for computer printers or car paint—but not for human injection.

**We always strive after what is forbidden, and desire the things refused**

**us - Ovid (Roman Poet)**

