Webinar Questions & Answers

Tattoo Inks, Cancer and Other Chronic Diseases: Gaps in research and regulation
February 22, 2024

Co-hosted with the Cancer and Environment Network of Southwest PA & presented in partnership with Breast Cancer Prevention Partners

For the full webinar, see:
https://www.healthandenvironment.org/che-webinars/96733

The webinar participants posed a number of questions, some of which were addressed during the webinar. Dr. David Kriebel has prepared the following additional responses to questions posed by participants.

For many of the questions posed by participants, I am fairly confident that the answer is not known.

Please note that a number of the questions presume that there is some chronic health risk from tattoos; we do not know if this is true.

Some of these interesting and important questions without answers are:

- What do we know about natural non-synthetic inks?
- Is black the most "safe" color for tattoo?
- What do you think of the idea of mixing human cremated remains (cremains) with tattoo inks?
- Does the toxicity decrease with time, e.g. is a 10 year old tattoo less worrisome than one that is new?
- What is the latency period for a possible tattoo related cancer?
- How does the reaction to tattooed skin differ from a reaction to other traumatic skin damage, e.g. wounds or blunt trauma?
- Do you know if there are any preservatives or additives to traditional ink like carbon?
- Is it better to get a tattoo in Europe?
- Is there any evidence suggesting that our sedentary lifestyle has an impact on the detoxification of these exposures?
- Tattoos are used in breast reconstructive surgery. Should we be more cautious?

- Is it possible that the immune system is more prepared for other illnesses like COVID-19 after tattooing?
- Do tattoos that are consistently UV protected vs. not, have different rates of melanoma?

Participants also posed important questions about the prospects for policy action on tattoos within the US:

- What do you think would happen if evidence about risk (of cancer or autoimmune diseases) of tattoos is found?
- How do we demand the FDA start regulating tattoo inks?
- The FDA regulatory process is very onerous. Is there another approach that would be easier to implement to protect the safety of tattoo inks?

Here are a few questions for which I can provide an opinion, or point you to relevant information.

1. Are any cohort studies planned?

- Yes, there are at least two large prospective cohort studies in Europe for which tattoo information is being collected. For further information, contact Dr. Milena Foerster at the International Agency for Research on Cancer (foersterm@iarc.who.int).

2. Would you suggest that US tattoo artists who are concerned about this attempt to purchase inks containing ingredients that are approved in the EU?

- It seems like a reasonable precautionary approach to only use inks approved in the EU. This would allow a tattoo artist to ensure the absence of certain chemicals of high concern. Again, I stress that this does not guarantee that there will be no long-term health risks.

3. Is the "reactionary principle" you mentioned the official position of U.S. regulatory agencies and laws passed by Congress, or your professional perspective on this paradigm?

- The latter. For further discussion of the reactionary principle, see: *Kriebel D. The reactionary principle: inaction for public health. Occupational and Environmental Medicine, 2007. Sep;64(9):573-4.*

4. What is your advice for countries that have not started any work on the health hazards of tattooing?

- I think the EU approach to chemicals management is a good place to start. The Health and Environment Alliance (HEAL) is a European non-governmental organization that is a good resource. For example: https://t.co/kkEjKUIjN6

5. Can you elaborate on the evidence that the body mounts a continual immune response to the tattoo? And a related question: what is the evidence that continuous immune stimulation may lead to dysregulation and errors in immune cell replication?

- For a good non-technical discussion of this, please read the excellent article by Katherine J. Wu in *The Atlantic*, March 22, 2023: *Tattoos do odd things to the immune system.*

- Also see*: Ruocco E, Gambardella A, Langella GG, et al. Cutaneous sarcoidosis: an intriguing model of immune dysregulation. Int J Dermatol. 2015 Jan;54(1):1-12. doi: 10.1111/ijd.12566.*

- On the question of how continuous immune stimulation (from other causes) might lead to cancer*, see: Wang SS, Vajdic CM, Linet MS, et al. B-Cell NHL Subtype Risk Associated with Autoimmune Conditions and PRS. Cancer Epidemiol Biomarkers Prev. 2022 May 4;31(5):1103–1110. PMCID: PMC9081255*

- Three papers that lay out the hypothesis that tattooing might cause cancer are:
  Kluger N, Koljonen V. Tattoos, inks, and cancer. The Lancet Oncology. 2012 Apr;13(4):e161–e168. PMID: 22469126

  Sabbioni G, Hauri U. Carcinogenic Tattoos? Epidemiology, Biostatistics, and Public Health 2016;13(4). https://riviste.unimi.it/index.php/ebph/article/view/17631

  Foerster M, Schreiver I, Luch A, Schüz J. Tattoo inks and cancer. Cancer epidemiology. 2020;65:101655–101655. PMID: 31836426

6. Would the removal of a tattoo potentially decrease chemical risk?

- We don't know the answer to this, but there is some concern that the laser removal process could generate new and potentially toxic compounds. See:
  Vasold R, Naarmann N, Ulrich H, Fischer D, König B, Landthaler M, Bäumler W. Tattoo pigments are cleaved by laser light - the chemical analysis in vitro provide evidence for hazardous compounds. Photochem Photobiol. 2004;2004-05-17-RA-170. PMID: 15244509
  and
  Hering H, Sung AY, Röder N, Hutzler C, Berlien HP, Laux P, Luch A, Schreiver I. Laser Irradiation of Organic Tattoo Pigments Releases Carcinogens with 3,3'-Dichlorobenzidine Inducing DNA Strand Breaks in Human Skin Cells. Journal of Investigative Dermatology. 2018 Dec;138(12):2687–2690. PMID: 29935208

7. Is there any requirement for tattoo ink manufacturers to disclose the ingredients in their ink?

- Yes, under OSHA's Hazard Communication requirements, tattoo ink manufacturers are required to disclose ingredients in their products, with some exceptions. For more information on the requirements, see https://www.osha.gov/hazcom.