Still Monotonic After All These Years

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For just about everything we ingest in our daily lives, from aspirin to alcoholic beverages, small doses may be just fine for us. But too much of a good thing may be harmful. That common sense principle was first described by a Swiss physician named Paracelsus in the 16th century and is commonly stated today as “the dose makes the poison.”

In modern scientific terminology, Paracelsus’ principle is described as a “monotonic dose-response relationship”… the more we take in of something the greater the response. For some substances though, a counterintuitive principle described as a **non**-monotonic dose-response relationship (NMDR) has been suggested by some in the scientific community, meaning that a lower dose could be more harmful than a higher dose. To date though, NMDR are best described as a hypothesis, a sort of scientific speculation, and have not been proven with reliable scientific evidence.

A group of scientists have repeatedly claimed that exposure to bisphenol A (BPA) exemplifies this phenomenon, which may in part account for why BPA has been a controversial topic in the media for 20 years or more. This is not just an academic debate since it is well-known that we are exposed to miniscule amounts of BPA through our diet. Could it be that those very low levels are causing us harm?

To resolve remaining uncertainties about the safety of BPA, U.S. government scientists have been conducting an in-depth research program on BPA over the last decade. Most recently, the results of the CLARITY Core Studywere released in a final report at the completion of a nearly 5-year study conducted by senior scientists at the U.S. Food and Drug Administration

(FDA).

The scope and magnitude of the study are unprecedented for BPA, and the resulting dataset is ideal for assessing whether BPA does or does not cause NMDR. Until recently though, scientific methodology to evaluate the evidence for NMDR has not been available, which is at least part of the reason why the controversy about NMDR has simmered for so long.

Last year a set of objective scientific criteria to evaluate NMDR were published by a panel of scientists from four European government agencies and scientific institutes. Their work was sponsored by the European Food Safety Authority (EFSA).

Those objective criteria have now been applied to the large dataset from the CLARITY Core Study and the results are now published in the scientific literature.* The conclusion presented in this paper pretty much says it all:

Overall, our analysis found little evidence for NMDR in the endpoints evaluated in the CLARITY-BPA Core Study. The results of this analysis are consistent with and support the conclusions reached in the CLARITY-BPA Core Study report. Thus, the results of this large U.S. government-sponsored guideline-compliant study and the present analysis should provide some resolution of the controversy related to the toxicology of BPA.

As to FDA's conclusions on the CLARITY study, Dr. Stephen Ostroff, Deputy Commissioner for Foods and Veterinary Medicine noted in a statement released in conjunction with the report: "*our initial review supports our determination that currently authorized uses of BPA continue to be safe for consumers.*" And now, after 20 years of controversy, we know that BPA is still monotonic.

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