

Early exposure to BPA alters cardiac rhythm and may influence adverse cardiovascular outcomes

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Nikki Gillum Posnack, Ph.D., is a study author and an assistant professor at Children's National Heart Institute and at George Washington University. Credit: Children's National Health System

More than 8 million pounds of bisphenol A (BPA) is produced each year and reaches 90 percent of the population through consumer and medical products. Epidemiological studies find BPA exposure in adults correlate with adverse cardiovascular events, ranging from abnormal heart beats, or arrhythmias, and angina, chest pain, to coronary artery disease, the narrowing of the arteries, commonly referred to atherosclerosis—the leading cause of death in the United States. Now, based on a study using neonatal rat heart cells, researchers find that the immature heart may respond to BPA in a similar fashion—with slower heart rates, irregular heart rhythms and calcium instabilities. The study appears as an online advance in *Scientific Reports*.

The authors note that while additional research is

needed to determine the impact prolonged BPA exposure has on a child's developing heart, this study documents the elevated risk short-term BPA exposure, for a period of 15 minutes, may have in pediatric intensive care settings. The authors highlight the importance of incentivizing the development, manufacturing and clinical adoption of alternative biomaterials to potentially improve patient safety outcomes, based on the preliminary data.

"Current research explores the impact endocrine disruptors, specifically BPA, have on adults and their cardiovascular and kidney function," notes Nikki Gillum Posnack, Ph.D., a study author and assistant professor at Children's National Heart Institute and the George Washington University. "We know that once this chemical enters the body, it can be bioactive and therefore can influence how [heart cells](#) function. This is the first study to look at the impact BPA exposure can have on heart cells that are still developing."

The significance of this research is that plastics have revolutionized the way doctors and surgeons treat young patients, especially patients with compromised immune or [cardiac function](#).

"We're exploring the potential—and inadvertent risk of plastic medical devices, which have revolutionized the medical field," notes Dr. Posnack. "We're investigating whether these hospital-based exposures may cause unintended effects on cardiac function and looking at ways to mitigate chemical exposure. We hope this preliminary research incentivizes the development of alternative products by medical device manufacturers and encourages the research community to study the impact of plastics on sensitive patient populations."

Dr. Posnack's ongoing research examines the impact environmental influences—including BPA and other endocrine disruptors—have on cardiac function. Her next studies are aimed at measuring chemical exposures in patients and translating her results to human models.

More information: Manelle Ramadan et al, Disruption of neonatal cardiomyocyte physiology following exposure to bisphenol-a, *Scientific Reports* (2018). [DOI: 10.1038/s41598-018-25719-8](https://doi.org/10.1038/s41598-018-25719-8)

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