

SAMANTHA O'BRIEN, Dept of Chemistry, Fairmont State University, Fairmont, WV, 26554, and DR. MATTHEW SCANLON, Dept of Chemistry, Fairmont State University, Fairmont, WV, 26554. Analysis of stomach acid extraction of lead from children's jewelry.

Research shows that children in the U.S are being seen in emergency departments for swallowing small objects at an increasing rate, with 7.0% of visits attributed to swallowing jewelry.<sup>1</sup> Treatment for lead poisoning occurs when the concentration of lead in blood is 45 µg/dL (450 ppb), however, no level of lead is considered safe<sup>2</sup> and the CDC uses 3.5 µg/dL (35 ppb) as a reference as to when a pediatrician should consider "follow-up services" to reduce possible long-term effects.<sup>3</sup> This experiment measures the concentration of lead extracted by stomach acid from various samples of children's jewelry

Simulated stomach acid solution heated to body temperature was used to attempt extraction of lead from children's jewelry samples that had previously been determined to contain lead in their metal alloy composition. The simulated stomach acid samples were analyzed for lead content using AA spectrophotometry. Preliminary results indicate that while stomach acid does not dissolve jewelry, it is capable of extracting lead, which could lead to lead poisoning depending on the amount of lead extracted and absorbed into a child's bloodstream should they swallow a piece of jewelry.

#### Citations

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2. Mayo Clinic Staff. Lead Poisoning, 2022. Mayo Clinic Web site. <https://www.mayoclinic.org/diseases-conditions/lead-poisoning/diagnosis-treatment/drc-20354723#:~:text=There%20is%20no%20safe%20blood,or%20higher%20%E2%80%94%20should%20be%20treated.> (Accessed Feb 3, 2022).
3. Centers for Disease Control and Prevention. Childhood Lead Poisoning Prevention: Blood Lead Levels in Children, 2022. CDC Web site. <https://www.cdc.gov/nceh/lead/prevention/blood-lead-levels.htm> (accessed Feb 3, 2022).