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Risks Associated with Strategies to Reduce Waterborne Lead Exposures: Prevailing Flush Guidelines and Partial Lead Service Line Replacements

Adrienne Katner, D.Env., M.S

In 2012, the CDC acknowledged that no safe threshold for blood lead level exposures has been found. Officials now acknowledge that waterborne lead may be a more significant source of total lead to young children than originally calculated; and may be the primary route of lead exposure for formula-fed infants. This information, along with recent events in Flint, Michigan, have brought renewed attention to the risks from low dose lead sources like drinking water.

The EPA's Lead and Copper Rule (LCR) states that when cities are out of compliance, utilities must promote flushing of water to reduce waterborne lead exposures: "Run the water for 15-30 seconds or one minute if the home has a lead service line (LSL)." A related regulation, the Consumer Confidence Report rule (CCR), requires similar flush messaging (30 seconds to two minutes) on all annual reports to consumers, by even utilities meeting regulatory requirements.

However, there is widespread acknowledgement among water quality engineers that flushing protocols must



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Ed Trapido, ScD
Associate Dean
Research
etrapi@lsuhsc.edu

Donna L. Williams, DrPH
Associate Dean
Public Health Practice and
Community Engagement
Dwilli3@lsuhsc.edu

LSU Health
NEW ORLEANS

School of Public Health

2020 Gravier, 3rd Floor
New Orleans, LA 70112

be tailored for specific plumbing configurations and type of lead release. In 2009, the US EPA revised the LCR and CCR to allow water utilities to modify the original flush time recommendations if the utility determines longer flush times are needed- this revision was targeted to all utilities, but especially those with LSLs, the primary source of lead in drinking waters.

NOLA is not alone- one proposed modification to the LCR would require all water utilities to inventory and identify the number of LSLs in their system and eventually remove them. Replacing LSLs as a solution to mitigate lead sources can be problematic as ownership of this pipe is split between the homeowner and water utility. When homeowners do not replace their section of the service line, only part of the lead pipe is replaced (PLSLRs)- a practice that disproportionately impacts low-income residents. When the utility's portion of the lead pipe is replaced with copper pipe or a brass connector fitting is installed, galvanic corrosion of the lead pipe can also increase rates of lead leaching into water.

IMPLICATIONS FOR PRACTICE: While flushing is an effective short-term approach to remediate high waterborne lead contamination after disturbances like PLSLRs, it should be remembered that flushing should be conducted frequently over a long period of time, and should be conducted in a very methodical way. But even this is no guarantee that WLLs will remain low. More cost-effective solutions for reducing waterborne lead exposures, like point-of-use (POU) filters, should be promoted. Information about how to select, install and maintain the most effective filters is needed; and should be targeted to women of child-bearing age, especially those in rural, low-income, minority, and low English proficiency communities.

EDITOR'S NOTE: The EPA's Lead and Copper Rule (LCR) provides a good foundation standard for flushing. In order to reduce lead exposure, practitioners and public health professionals should introduce cost effective solutions to low-income families. For more information on certified filters, visit <http://www.nsf.org/certified-products-systems>.



Adrienne Katner, D.Env., M.S.

Dr. Adrienne Katner is an Assistant Professor in Environmental and Occupational Health at LSUHSC School of Public Health. Prior to that, she worked for 7 years at the Louisiana Office of Public Health, and 2 years at the National Cancer Institute's Occupational and Environmental Epidemiology Branch in Rockville MD. Her research focuses on heavy metals and water quality. In 2015, she spear-headed an effort to evaluate lead in New Orleans' drinking water based on concerns which first began while she was at the state Office of Public Health.