

# DECLINE OF PERFLUOROOCCTANOIC ACID IN HUMAN SERUM OVER TWO YEARS BEFORE AND AFTER GRANULAR ACTIVATED CARBON FILTRATION IN TWO PUBLIC WATER SUPPLIES, AND IMPLICATIONS FOR HALF-LIFE ESTIMATION

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## Introduction

Perfluorooctanoic acid has been detected in public water supplies in several water districts near the DuPont Washington Works facility in West Virginia. Two of these water districts, Little Hocking Water Association and Lubeck Public Service District, began granular activated carbon filtration during 2007 in order to remove the contaminant.

## Materials and Methods

Up to 7 blood samples were collected from each of 200 participants, from May 2007 until June 2009. Primary drinking water source varied over time for some participants; our analyses were grouped according to water source at baseline (149 participants served by Lubeck and 51 participants served by Little Hocking). Serum perfluorooctanoic acid concentrations were measured by Antonia Calafat and colleagues at the Centers for Disease Control and Prevention. Log concentration random effects models were used to estimate serum half-lives.

## Results and Discussion

Median serum concentrations in May-June 2007 were 89 ng/mL for Lubeck participants and 325 ng/mL for Little Hocking participants. During the first year of the study, average decreases in serum concentrations were 26% for Lubeck and 24% for Little Hocking, yielding a median half-life estimate of 2.3 years.<sup>1</sup> During the second year of follow-up, average decreases in serum concentrations were 9% for Lubeck and 15% for Little Hocking. Serum perfluorooctanoic acid concentrations did not fall as rapidly in the second year as they did during the first year. Possible explanations include ongoing exposures from sources other than the two public water supplies and/or pharmacokinetics that are not well described by a one-compartment model with first-order elimination.

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## References

1. Bartell SM, Calafat AM, Lyu C, Kato K, Ryan PB, Steenland K (2010) *Environ Health Perspect* 118(2): 222-228.