

The exposure of Veterans to contaminated water at Camp Lejeune 1953 -1987 and today's role of the Nurse Practitioner

GAPNA
VA SIG

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Background

Recent attention has been given to Veterans, their families and civilians who were stationed at the United States Marines Corps Base at Camp Lejeune, North Carolina, from 1953 to 1987 for at least 30 days.¹ These individuals were exposed to water contamination with high levels of carcinogenic and neurotoxic agents. The water-quality testing in some wells in early 1980's detected **volatile organic compounds (VOC)** including trichloroethylene (TCE), tetrachloroethylene (PCE), vinyl chloride, and benzene.¹ Exposures to those contaminants are associated with the development of multiple health-related conditions. More than 300,000 people may have been affected by drinking contaminated water.¹

In March 2017, final regulations establishing a presumption of service connection for eight health conditions associated with contaminated water exposure at Camp Lejeune became effective.²

Rationale

- To increase awareness of environmental exposures in Veterans who stationed at Camp Lejeune
- To provide Nurse Practitioners (NPs) with knowledge and skills to start identifying potential environmental exposures using the VA **environmental exposure pocket card**³
- To encouraged NPs to apply that knowledge and skills in discussing disease prevention with Veterans

Methods

A thorough review of the primary sources related to water contamination at Camp Lejeune and environmental exposures was conducted to expand knowledge and skills of NPs.¹⁻⁴

Results

The Agency for Toxic Substances and Disease Registry (ATSDR) reported in 2018 that based on the 76,058 survey results confirmed by medical records, past exposure to drinking water contaminants at Camp Lejeune contributed to multiple health conditions including several cancers.¹ The study evaluated risk for developing 16 conditions potentially related to VOCs. Due to some limitations of the study, its results might be overestimated. However, the study of possible impacts of water contamination at Camp Lejeune is still ongoing and its results contribute to understanding higher prevalence of cancer among Veterans. There is a unique role for NPs in caring for Veterans and their family members potentially exposed to those water contaminants.

15 Camp Lejeune-related conditions²

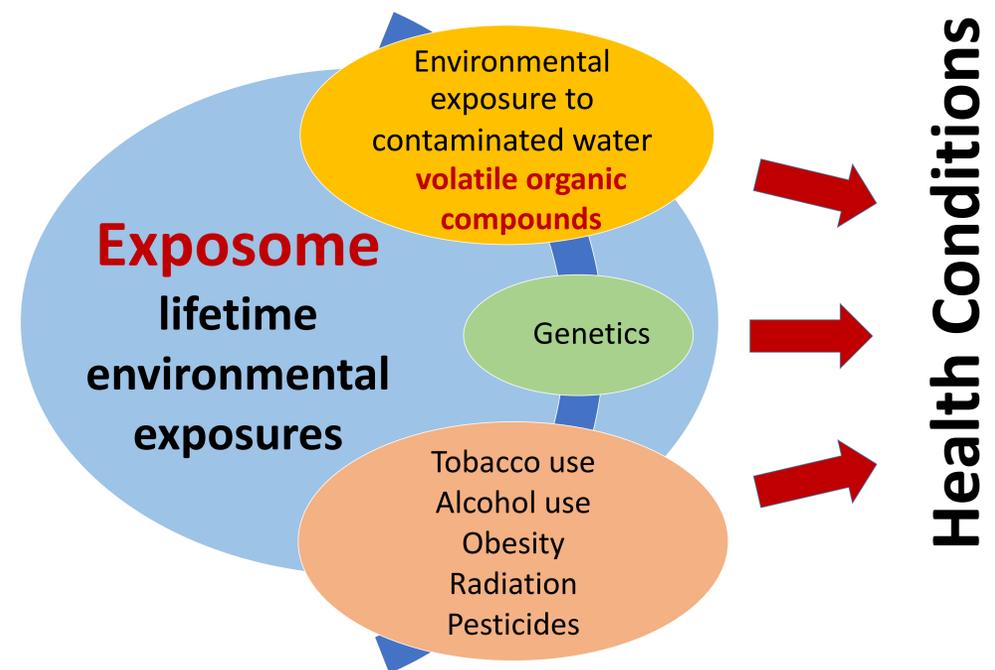
Bladder cancer
Breast cancer
Esophageal cancer
Female infertility
Hepatic steatosis
Kidney cancer
Leukemia
Lung cancer
Miscarriage
Multiple myeloma
Myelodysplastic syndromes
Neurobehavioral effects
Non-Hodgkin's lymphoma
Renal toxicity
Scleroderma

8 Presumptive disability conditions²

Bladder cancer
Kidney cancer
Liver cancer
Multiple myeloma
Adult leukemia
Aplastic anemia & other myelodysplastic syndromes
Non-Hodgkin's lymphoma
Parkinson's disease

Theoretical Framework

The exposome is a theoretical framework providing a greater understanding of how environmental exposures such as contaminated water at Camp Lejeune impacted the health of those who lived and/or worked in that area. The exposome can be defined as "the measure of all the exposures of an individual in a lifetime and how those exposures relate to health."⁴



Application to Practice

- Identify VA and CDC resources related to Camp Lejeune
- Gain a broader understanding of environmental exposures in Veterans who served at Camp Lejeune
- Consider the concept of the exposome in practice for the purpose of health promotion and disease prevention

References/Resources

1. Agency for Toxic Substances and Disease Registry (ATSDR). CDC. Morbidity study of former Marines, employees, and dependents potentially exposed to contaminated drinking water at U.S. Marines Corps Base Camp Lejeune. https://www.atsdr.cdc.gov/sites/lejeune/morbiditystudy_factsheet.html. Published April 2018. Accessed 8/22/2019.
2. U.S. Department of Veterans Affairs. VA's Final Rule to consider certain diseases associated with exposure to contaminants in the water supply at Camp Lejeune for service connection. <https://www.publichealth.va.gov/docs/exposures/CLFactsheet.pdf#>. Published Jan 13, 2017. Accessed 8/22/2019.
3. U.S. Department of Veterans Affairs. VHA Office of Public Health. Post-Deployment Health Strategic Healthcare Group. U.S. Department of Veterans Affairs environmental exposure pocket card. <https://www.publichealth.va.gov/docs/exposures/environmental-exposure-pocket-card.pdf#>. Published Oct 2012 (Version 5). Accessed August 28, 2019.
4. National Institute for Occupational Safety and Health (NIOSH). CDC. Exposome and exposomics. <https://www.cdc.gov/niosh/topics/exposome/>. Last reviewed April 21, 2014. Accessed 8/22/2019.