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

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

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
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.

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. 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.

Exposome
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

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

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