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Cancer Prevention is Necessary at Every Stage of Human Development, Beginning at Conception

University of Maryland School of Medicine Pediatrician among Elite Group of Experts to Address Opportunities for Cancer Prevention in Early Life

Baltimore, November 1, 2016— Cancer prevention is necessary and possible at every stage of life, beginning at conception through age 7, according to an elite group of experts who authored a special supplemental issue of *Pediatrics*, published today. Authored by the nation's leading pediatricians, oncologists and epidemiologists, among them Cynthia F. Bearer, MD, PhD, the Mary Gray Cobey Professor of Neonatology at the University of Maryland School of Medicine and Chief of Neonatology at the University of Maryland Children's Hospital, these insights underscore the need for early cancer prevention strategies.

"Prevention is always superior to cancer treatment," says Dr. Bearer, author of the concluding commentary. "Treatment is arduous, expensive and can even lead to secondary cancers later in life. But the development of cancer is complex. Multiple factors contribute to its occurrence over the entire lifespan. Because of this, a focus on primary prevention beginning at conception is of utmost importance."

Modifiable risk factors for cancer include individual behaviors (such as smoking) and exposure to environmental hazards. Genetics, on the other hand, is a risk factor that cannot be modified. Access to quality health services and certain health policies can also affect a person's risk of developing cancer. The 12 papers published today are therefore categorized into these five determinants of health.

Key findings include:

- The long-term effects of treatment on adult survivors of childhood cancer have a significant influence on educational attainment, potential earnings and future career development. Surviving a childhood cancer is associated with a substantial economic burden equaling an annual productivity loss of $6,701 per adult survivor of childhood cancer compared to $3,083 per adult without a history of cancer. These losses could be avoided if childhood cancer is prevented.

- Preventive measures to reduce exposure to environmental hazards like pesticides, tobacco, paints and solvents can and should be implemented to reduce the incidence of childhood leukemia even in the absence of prospective studies to determine causation. The impact of intervention is best studied only after widespread adoption. Then an evaluation of changes in incidence rates can be conducted.
- Understanding why one person gets cancer and another doesn't is required to truly personalize medicine. For example, exposure in utero to diethylstilbesterol elevates a woman's risk of clear cell adenocarcinoma of the vagina. But only some women exposed to the hormone develop cancer meaning something else must be contributing to its occurrence (perhaps, a second exposure later in life). Further study to identify which individuals should avoid exposure and which exposed individuals merit close watching is needed.
- Adverse childhood experiences increase a person's cancer risk. Health policies to address disparities and provide safe, stable, and nurturing environments for all children can help prevent these adverse experiences before they occur.

"Timing, in every sense of the word, is critical," says Dr. Bearer. "Because cancer is so often influenced by what came before, an individual may be more susceptible or more resilient to a carcinogen at every stage of development. It may be that every day is a critical window of susceptibility for yet another molecular event. Therefore, the health of fetuses and the pre-conception health of parents should be included in all cancer prevention policies."

"Cancer is one of our most urgent contemporary public health issues," said University of Maryland School of Medicine Dean E. Albert Reece, MD, PhD, MBA, who is also vice president for medical affairs at the University of Maryland and the John Z. and Akiko K. Bowers Distinguished Professor. "Dr. Bearer's points on this subject are extremely timely and important. As important as it is to seek treatments, it is equally important to focus on taking actions that will reduce the risk of developing cancer in the first place."

The *Pediatrics* supplement is the third in a series from the Cancer Prevention Across the Lifespan (CPAL) workgroup, which was organized by the Centers for Disease Control and Prevention's Division of Cancer Prevention and Control. Culling from the nation's foremost experts, the workgroup published their first series on cancer prevention for preadolescents and adolescents in 2011 and the second series for adults ages 45 through 64 in 2012. Opportunities for cancer prevention among adults ages 19 through 44 and those over age 65 are forthcoming.

For more information about CPAL, please visit:
http://www.cdc.gov/cancer/dcpc/prevention/lifetime.htm

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