News from CDC: applying a life course approach to primary cancer prevention

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Abstract

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Each year, over 1.5 million people in the USA are told that they have cancer [1], a major challenge for everyone facing a cancer diagnosis, as well as for the Centers for Disease Control and Prevention (CDC), the nation's prevention agency. Cancer is more easily prevented than cured [2], yet many avoidable risk factors remain prevalent. We now understand that cancer is actually many diseases, caused by different factors operating, sometimes synergistically, over many years. A transdisciplinary approach can be used to synthesize and disseminate the disparate knowledge needed to develop and implement effective cancer prevention programs [3, 4]. As we learn more about the multitude of individual, societal, and environmental factors that influence cancer development, we can build on this growing body of scientific knowledge to

adopt and implement multifaceted approaches for cancer prevention [5]. CDC uses a comprehensive framework for chronic disease prevention that encompasses four cross-cutting strategies: epidemiology and surveillance, environmental approaches, health systems interventions, and community-clinical linkages [6]. While the activities of CDC's Division of Cancer Prevention and Control (DCPC) historically have focused primarily on health system interventions related to cancer screening and surveillance through cancer registries, we are exploring new opportunities to apply all four strategies to primary cancer prevention.

The Cancer Prevention Across the Lifespan (CPAL) workgroup was organized within DCPC as a division-wide effort to foster innovative public health approaches to primary cancer prevention, adapted as appropriate for different stages of life (Fig. 1). Grounded in a socio-ecological framework [7], the workgroup reviews the scientific literature and engages scientific experts both within and outside CDC. It works to understand and disseminate information about ways to translate science into public health practice for cancer prevention. The workgroup uses several overarching questions to identify opportunities to reduce cancer risk and promote health at every age (Box 1).

Box 1. The CPAL workgroup's overarching questions

- How do risk and protective factors contribute to cancer development at different stages of life?
- Which of these risk and protective factors could be modified through policy, systems, or environmental changes or other social or public health interventions?
- Where is the evidence strongest to justify taking public health action and what role might public health agencies play?
- What additional data in the short-term could create tipping points for action?
- What specific public health activities have been demonstrated to be effective or show promise at the community level to address these factors?
- How do we best coordinate health promotion and disease prevention efforts to work toward broadly shared goals, such as improving quality of life, preventing premature death and reducing health care costs?
- What barriers might we face in trying to put scientific findings into public health policy and practice?
- How do we communicate certainty or uncertainty regarding cancer risk and prevention to the public, to policymakers and to the media?

In 2011, the CPAL workgroup held a transdisciplinary expert meeting on opportunities for cancer prevention during preadolescence and adolescence, a

period of unique susceptibility [8]. Health behaviors associated with cancer risk, such as tobacco and alcohol use and indoor tanning, tend to emerge during this

The CPAL Workgroup's Lifespan Approach

Fig 1 | The CPAL workgroup's lifespan approach

phase of life [9] and can influence cancer risk later in life [10]. This meeting highlighted several key topics relevant to cancer prevention in this age group. Examples included reducing exposure to radiation from medical imaging, harmful endocrine-disrupting chemicals, and pro-tobacco advertisements, avoiding indoor tanning, and promoting healthy, protective behaviors such as use of the human papillomavirus (HPV) vaccine, physical activity, and healthy eating [11]. A special issue of the *Journal of Adolescent Health* included articles that elaborate further on strategies to prevent cancer, with a focus on youth, available at <http://www.sciencedirect.com/science/journal/1054139X/52/5/supp/S>. In addition to the journal supplement, the workgroup conducted a systematic review of the scientific literature on barriers to HPV vaccine use. Although CDC recommends the HPV vaccine for preteen boys and girls aged 11 or 12 years to protect against HPV infection and prevent cervical cancer in women, too few boys and girls receive the HPV vaccine [12]. The review identified multiple points of intervention for increasing vaccine uptake [13].

In 2012, the CPAL workgroup held a transdisciplinary expert meeting on opportunities for cancer prevention during midlife, another critical period for cancer prevention [14]. During midlife, the effects of harmful exposures and health behaviors often start to appear along with the onset of chronic diseases or other health problems. While cancer risk generally increases with age, this relationship potentially could be modified by avoiding harmful exposures, preventing and managing chronic conditions, and modifying health behaviors at midlife [15]. Many evidence-based approaches exist to reduce cancer risk and support health during midlife and beyond, and factors such as diet, physical activity, sleep, environmental carcinogens, medical radiation, and alcohol are particularly important [16]. A supplemental issue of the *American Journal of Preventive Medicine* elaborates on cancer risk during midlife and strategies to take public health action [17], available at <http://www.sciencedirect.com/science/journal/07493797/46/3/supp/S1>. One risk factor highlighted at the expert meeting and

in the supplemental issue was alcohol use. Alcohol use is an important risk factor to address within the context of cancer prevention given its high prevalence among US adults (56 % were current drinkers 2011) [18]. Unfortunately, it is often overlooked in US cancer control plans [18]. Also highlighted was the workplace, a promising setting for cancer prevention interventions due to its strong influence on health among adults at midlife. Numerous resources are available from CDC to help employers incorporate cancer prevention into workplace health promotion [19]. These resources emphasize workplace exposures, physical activity, and nutrition as well as organizational policies that influence cancer risk in the workplace.

Skin cancer is the most common cancer in the US, and most cases are preventable by avoiding overexposure to the sun or indoor tanning. DCPC and members of the CPAL workgroup contributed to *The Surgeon General's Call to Action to Prevent Skin Cancer*, which raises awareness about skin cancer prevention and calls on partners to take action against skin cancer risk [20]. This report, available at <http://www.surgeongeneral.gov/library/calls/prevent-skin-cancer/index.html>, summarizes recent data from CDC and others and presents strategic goals to support skin cancer prevention in the USA.

DCPC and the CPAL workgroup are developing a series of briefs for CDC's Comprehensive Cancer Control (CCC) grantees on best policies and practices for cancer prevention [21]. DCPC has initiated this series with two briefs: one on reducing radon in homes and another on reducing indoor tanning among minors. Both are evidence-based guides to help states and CCC programs reduce harmful exposures and subsequent cancer risk.

DCPC will continue to promote partnership development, research translation, and dissemination of effective public health strategies to support cancer prevention across the lifespan. To maximize success, public health efforts need to be transdisciplinary and involve all four of the cross-cutting strategies for chronic disease prevention. As we consider the different stages of life, we look forward to new opportunities

to put science into public health action for primary cancer prevention.

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