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Cancer Risk Among Older Adults: Time for Cancer Prevention to Go Silver

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Abstract

Over two-thirds of all new cancers are diagnosed among adults aged ≥60 years. As the number of adults living to older ages continues to increase, so too will the number of new cancer cases. Can we do more as a society to reduce cancer risk and preserve health as adults enter their 60s, 70s, and beyond? Cancer development is a multi-step process involving a combination of factors. Each cancer risk factor represents a component of cancer causation, and opportunities to prevent cancer may exist at any time up to the final component, even years after the first. The characteristics of the community in which one lives often shape cancer risk-related behaviors and exposures over time, making communities an ideal setting for efforts to reduce cancer risk at a population level. A comprehensive approach to cancer prevention at older ages would lower exposures to known causes of cancer, promote healthy social and physical environments, expand the appropriate use of clinical preventive services, and engage older adults in these efforts. The collection of articles in this supplement provide innovative insights for exciting new directions in research and practice to expand cancer prevention efforts for older adults. This brief commentary sets the stage for the papers that follow.

Keywords

Cancer causes; Cancer incidence; Community health; Preventive healthcare

More than 70 years ago, the World Health Organization defined health as not merely the absence of disease, but rather as “a state of complete physical, mental and social well-being” (International Health Conference, 1948). In that same spirit, this supplement to The Gerontologist has defined cancer prevention at older ages as more than merely the avoidance of deaths from cancer. Cancer prevention aims to delay or prevent the onset of new cancer cases and increase health spans as well as life spans. The goal is more cancer-free years for

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Conflict of Interest
None declared.
as many people as possible, including the increasing number of older adults in the United States and other countries.

Older adults represent a growing population at special risk of cancer. Over two-thirds of all new cancers are diagnosed among adults aged ≥60 years (Figure 1). As the number of adults living to older ages continues to increase, so too will the number of new cancer cases (Berger et al., 2006; Muss, 2009; Weir, Thompson, Soman, Møller, & Leadbetter, 2015). The average 65-year-old can expect to live another two decades, and many will live even longer (Murphy, Xu, Kochanek, & Arias, 2018; Office of the Chief Actuary, 2015). This increased longevity presents time, opportunities, and public health imperatives to shift the cancer risk trajectory toward better health at older ages.

Cancer prevention efforts, however, rarely focus on the distinct needs and circumstances of older adults. Can we do more as a society to reduce cancer risk and preserve health as adults enter their 60s, 70s, and beyond? In April 2017, the National Association of Chronic Disease Directors and the Division of Cancer Prevention and Control at CDC convened a meeting of multidisciplinary experts to explore this question. The collection of papers in this supplement grew out of those discussions (Cancer Prevention during Older Adulthood Writing Group, 2019; Holman, Ding, Freeman, & Shoemaker, 2019; Hooker, Mejia, Phibbs, Tan, & Stevens, 2019; Kietzman, Toy, Bravo, Duru, & Wallace, 2019; Martin, et.al., 2019; Prohaska & Peters, 2019; Rudd, 2019; Schoenborn, Boyd, Lee, Cayea, & Pollack, 2019; Tucker-Seeley & Thorpe, 2019; Warner et al., 2019). Each paper addresses this question from a unique perspective. This commentary seeks to promote a comprehensive approach to cancer prevention in the older adult population and sets the stage for the papers that follow.

### Cancer Incidence at Older Ages

The United States benefits from an extensive surveillance system of cancer registries that collects and maintains high-quality data on cancer incidence for the entire population (U.S. Cancer Statistics Working Group, 2018). These data show that the risk of receiving a cancer diagnosis of any kind climbs steeply with age (Table 1).

Because cancer represents a heterogeneous set of conditions rather than one disease, counts of all cancers combined include many cancer types affecting different sites. The three most common cancers in men (prostate, lung and colorectal) and women (breast, lung and colorectal) account for about half of all new cancers among adults aged ≥60 years (Table 2). In addition, about 1 in 5 new cancers occur among cancer survivors, adults with a personal cancer history, (Weir, Johnson, Ward, & Coleman, 2016), most of whom are aged ≥65 years (Bluethmann, Mariotto, & Rowland, 2016).

Although age is an important risk factor for cancer, most adults will never receive a cancer diagnosis, regardless of how long they live. The National Cancer Institute estimates that at age 60, a person’s remaining lifetime risk of being diagnosed with invasive cancer of any kind is 35%, and that figure drops to 29% at age 70 and 19% at age 80 (Noone et al., 2018).

Cancer development is a multi-step process that can occur over many years from a combination of causes (Hanahan & Weinberg, 2011). Much of our understanding of cancer
causation and prevention derives from formal epidemiologic studies that measured associations between population cancer risk and exposures to specific agents or risk factors (International Agency for Research on Cancer, 2018; Stewart & Wild, 2014). Confirmed or causative agents can contribute to cancer development through many different mechanistic pathways (Smith et al., 2016). In the model of cancer causation that includes contributions from multiple risk factors over a lifetime, most individual factors are neither necessary nor sufficient to produce cancer (Rothman & Greenland, 2005). Each cancer risk factor represents a component of cancer causation, and opportunities to prevent cancer may exist at any time up to the final component, even years after the first (Rothman & Greenland, 2005). A life course perspective is useful for cancer prevention, just as it is for successful aging (Stowe & Cooney, 2015).

Opportunities for Cancer Prevention During Older Adulthood

Despite the substantial age-related increase in cancer risks within the expanding cohort of older adults, efforts to prevent cancer face challenges that do not exist for other age groups, such as the high prevalence of multi-morbidity (Goodman et al., 2016). In the older adult population, multi-morbidity is the rule rather than exception. For example, in 2015, among the total Medicare beneficiary population, at least 65% had more than two chronic conditions, and among persons with a diagnosis of cancer, an estimated 67% had more than three other chronic conditions (Centers for Medicare & Medicaid Services, 2015). These epidemiologic realities highlight the dual roles for individual- and population-level preventive strategies. Such strategies not only ameliorate the many comorbidities but also may prevent the development of many chronic conditions, including several cancers. The articles in this supplement highlight a broad-reaching agenda to reduce cancer risk, promote health, and increase the number of cancer-free years in older adults.

Healthy Communities and Cancer Prevention

Opportunities exist to reduce the cumulative risk from exposure to harmful agents and unhealthy behaviors throughout life, including at older ages (Cancer Prevention during Older Adulthood Writing Group, 2019). For example, sunburn at any age increases the risk of melanoma (Dennis et al., 2008), and the adequate use of sun protection by older adults could reduce this risk (Holman et al., 2019).

The characteristics of the community in which one lives often shape cancer risk-related behaviors and exposures over time, making communities an ideal focus for public health efforts to reduce cancer risk at a population level (National Prevention Council, 2011; President’s Cancer Panel, 2010; Pruchno, Wilson-Genderson, & Gupta, 2014). For many well-recognized cancer risk factors, such as tobacco use, excessive alcohol consumption, obesity, and physical activity, The Guide to Community Preventive Services (Guide to Community Preventive Services, 2018) provides evidence-based recommendations for community-based strategies that are ready for implementation.

In addition to the physical environment, the social environment also can have profound influence on cancer risk (Freeman, 2004). Age stereotypes have become more negative over time, despite improvement in health at older ages (Levy, 2017). Strategies to address age-
discrimination and attitudes toward aging have the potential to enhance efforts to promote healthy behaviors and thereby reduce cancer risk for older adults (Hooker et al., 2019; Martin et al., 2019). The psychosocial dimension of aging, such as social connectedness and psychological stress resilience, also may affect biological pathways involved in cell aging and cancer development such as telomere length (Cancer Prevention during Older Adulthood Writing Group, 2019).

Natural disasters such as hurricanes, floods and wildfires can disrupt communities, and older adults may be particularly vulnerable (Wilson-Genderson, Pruchno, & Heid, 2017). In addition to acute injury and death, exposures to carcinogens from such events and the disruption of cancer-related services could negatively impact cancer risk and the care of cancer patients and cancer survivors (Prohaska & Peters, 2019).

The Role of Clinical Preventive Services

Framing prevention efforts in terms of a disease-specific outcome, such as cancer prevention, naturally puts the focus on clinical services. The detection and intervention in the early stages of disease, as occurs with the use of cancer screening tests, is regarded as secondary prevention (Song, Vogelstein, Giovannucci, Willett, & Tomasetti, 2018). The U.S. Preventive Services Task Force recommends routine screening for only a few of the cancers listed in Table 2, with upper age limits and other caveats (U.S. Preventive Services Task Force, 2018). Other recommended clinical preventive services, such as counseling to prevent tobacco use and excessive alcohol consumption, can lower cancer risk by reducing exposure to agents known to cause cancer.

Many older adults do not receive the recommended screening tests for cancer and other clinical preventive services (Jensen, Salloum, Hu, Ferdows, & Tarraf, 2015; White et al., 2017). Linkages between communities and health care providers can reduce barriers to accessing such services (Kietzman, et al., 2019). Socioeconomic factors may influence the receipt of health services and cancer risk behaviors through pathways that have not been fully explored (Tucker-Seeley & Thorpe, 2019).

To be engaged in accessing recommended health services and adopting recommended behaviors, older adults need to be able to comprehend and use health information. Efforts to address problems with literacy and numeracy can increase the accessibility of health information and improve the effectiveness of cancer prevention initiatives aimed at older adults (Rudd, 2019).

For some older adults with limited life expectancy or serious comorbidities, cancer screening may offer more harm than benefits. New research offers insights to improve conversations between providers and older patients about the need for cancer screening under such challenging circumstances (Schoenborn, et al., 2019; Warner, et al., 2019).

Conclusions

In a viewpoint published in this journal over half a century ago, a sitting U.S. senator described the need for “preventive geriatrics” (Williams, 1965). He called for “a more
comprehensive effort to identify and control” the chronic conditions common in later life, including cancer. Given the rapid growth in the population of older adults in the United States, the need for cancer prevention is even greater today than it was 50 years ago. Primary cancer prevention has long been regarded as an elusive goal, particularly for older adults (Keintz, Rimer, Fleisher, & Engstrom, 1988). This may no longer be the case. Past successes in public health point to opportunities to increase healthy life expectancy (Frieden, 2015). A comprehensive approach to cancer prevention at older ages would lower exposures to known causes of cancer, promote healthy social, and physical environments, expand the appropriate use of clinical preventive services, and engage older adults in these efforts. The collection of papers in this supplement call for a comprehensive approach to prevention, coupled with an intensified application of evidence-based measures and best practices to reduce cancer risk in the growing population of older adults, and provide innovative insights for exciting new directions in research and practice.

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Disclaimer

The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.

References


Gerontology. Series A, Biological Sciences and Medical Sciences, 71, 215–220. doi:10.1093/gerona/glv199


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Gerontologist. Author manuscript; available in PMC 2019 September 11.
Figure 1.
Table 1.

Rate of Invasive Cancer Incidence and Number of New Cancer Cases, by Sex and Age Group, United States, 2015

<table>
<thead>
<tr>
<th>Age</th>
<th>Rate b</th>
<th>95% CI</th>
<th>Number</th>
<th>Rate</th>
<th>95% CI</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;20</td>
<td>19.8</td>
<td>19.4–20.3</td>
<td>8,351</td>
<td>18.4</td>
<td>18.0–18.8</td>
<td>7,401</td>
</tr>
<tr>
<td>20–39</td>
<td>63.6</td>
<td>62.8–64.3</td>
<td>26,631</td>
<td>112.3</td>
<td>111.2–113.3</td>
<td>45,336</td>
</tr>
<tr>
<td>40–49</td>
<td>201.7</td>
<td>199.8–203.7</td>
<td>41,872</td>
<td>372.1</td>
<td>369.5–374.7</td>
<td>77,966</td>
</tr>
<tr>
<td>50–59</td>
<td>668.1</td>
<td>664.7–671.6</td>
<td>147,921</td>
<td>693.2</td>
<td>689.8–696.6</td>
<td>158,721</td>
</tr>
<tr>
<td>60–69</td>
<td>1,553.6</td>
<td>1,547.6–1,559.6</td>
<td>257,952</td>
<td>1,174.1</td>
<td>1,169.2–1,179.1</td>
<td>215,543</td>
</tr>
<tr>
<td>70–79</td>
<td>2,386.7</td>
<td>2,376.5–2,397.0</td>
<td>210,921</td>
<td>1,690.7</td>
<td>1,682.9–1,698.5</td>
<td>180,129</td>
</tr>
<tr>
<td>≥80</td>
<td>2,689.3</td>
<td>2,674.3–2,704.4</td>
<td>123,289</td>
<td>1,765.7</td>
<td>1,756.0–1,775.4</td>
<td>131,357</td>
</tr>
<tr>
<td>Total</td>
<td>816,937</td>
<td>816,453</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Notes:** CI = confidence interval.


b Rates are per 100,000 persons and age-adjusted to the 2000 U.S. standard population.
Table 2.

Most Commonly Diagnosed Invasive Cancers Among Adults Aged ≥60 Years by Sex, United States, 2015

<table>
<thead>
<tr>
<th>Site</th>
<th>Number</th>
<th>Site</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prostate</td>
<td>143,850</td>
<td>Breast</td>
<td>144,123</td>
</tr>
<tr>
<td>Lung and bronchus</td>
<td>93,960</td>
<td>Lung and bronchus</td>
<td>85,577</td>
</tr>
<tr>
<td>Colon and rectum</td>
<td>49,499</td>
<td>Colon and rectum</td>
<td>46,875</td>
</tr>
<tr>
<td>Urinary bladder</td>
<td>47,461</td>
<td>Corpus uteri</td>
<td>32,759</td>
</tr>
<tr>
<td>Melanoma of the skin</td>
<td>33,039</td>
<td>Non-Hodgkin lymphoma</td>
<td>21,921</td>
</tr>
<tr>
<td>Non-Hodgkin lymphoma</td>
<td>25,371</td>
<td>Pancreas</td>
<td>19,062</td>
</tr>
<tr>
<td>Kidney and renal pelvis</td>
<td>24,694</td>
<td>Melanoma of the skin</td>
<td>17,393</td>
</tr>
<tr>
<td>Pancreas</td>
<td>19,407</td>
<td>Kidney and renal pelvis</td>
<td>14,808</td>
</tr>
<tr>
<td>Oral cavity and pharynx</td>
<td>19,312</td>
<td>Urinary bladder</td>
<td>14,666</td>
</tr>
<tr>
<td>Leukemias</td>
<td>18,498</td>
<td>Leukemias</td>
<td>12,997</td>
</tr>
<tr>
<td>Liver</td>
<td>14,438</td>
<td>Ovary</td>
<td>12,825</td>
</tr>
<tr>
<td>Stomach</td>
<td>10,830</td>
<td>Thyroid</td>
<td>10,167</td>
</tr>
<tr>
<td>Myeloma</td>
<td>10,358</td>
<td>Myeloma</td>
<td>8,302</td>
</tr>
<tr>
<td>Esophagus</td>
<td>10,258</td>
<td>Oral cavity and pharynx</td>
<td>8,138</td>
</tr>
<tr>
<td>All other sites</td>
<td>71,187</td>
<td>All other sites</td>
<td>77,416</td>
</tr>
<tr>
<td>Total</td>
<td>592,162</td>
<td>Total</td>
<td>527,029</td>
</tr>
</tbody>
</table>