## Research Priorities, Measures, and Recommendations for Assessment of Tobacco Use in Clinical Cancer Research

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**ABSTRACT:** There is strong evidence that cigarette smoking causes adverse outcomes in people with cancer. However, more research is needed regarding those effects and the effects of alternative tobacco products and of secondhand smoke, the effects of cessation (before diagnosis, during treatment, or during survivorship), the biologic mechanisms, and optimal strategies for tobacco dependence treatment in oncology. Fundamentally, tobacco is an important source of variation in clinical treatment trials. Nevertheless, tobacco use assessment has not been uniform in clinical trials. Progress has been impeded by a lack of consensus regarding tobacco use assessment suitable for cancer patients. The NCI-AACR Cancer Patient Tobacco Use Assessment Task Force identified priority research areas and developed recommendations for assessment items and timing of assessment in cancer research. A cognitive interview study was conducted with 30 cancer patients at the NIH Clinical Center to evaluate and improve the measurement items. The resulting Cancer Patient Tobacco Use Questionnaire (C-TUQ) includes "Core" items for minimal assessment of tobacco use at initial and follow-up time points, and an "Extension" set. Domains include the following: cigarette and other tobacco use status, intensity, and past use; use relative to cancer diagnosis and treatment; cessation approaches and history; and secondhand smoke exposure. The Task Force recommends that assessment occur at study entry and, at a minimum, at the end of protocol therapy in clinical trials. Broad adoption of the recommended measures and timing protocol, and pursuit of the recommended research priorities, will help us to achieve a clearer understanding of the significance of tobacco use and cessation for cancer patients. *Clin Cancer Res;* 22(8); 1–7. © 2016 AACR.

## Cognitive Testing of Tobacco Use Items for Administration to Patients with Cancer and Cancer Survivors in Clinical Research

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**BACKGROUND:** To the authors' knowledge, there are currently no standardized measures of tobacco use and secondhand smoke exposure in patients diagnosed with cancer, and this gap hinders the conduct of studies examining the impact of tobacco on cancer treatment outcomes. The objective of the current study was to evaluate and refine questionnaire items proposed by an expert task force to assess tobacco use.

**METHODS:** Trained interviewers conducted cognitive testing with cancer patients aged 21 years with a history of tobacco use and a cancer diagnosis of any stage and organ site who were recruited at the National Institutes of Health Clinical Center in Bethesda, Maryland. Iterative rounds of testing and item modification were conducted to identify and resolve cognitive issues (comprehension, memory retrieval, decision/judgment, and response mapping) and instrument navigation issues until no items warranted further significant modification.

**RESULTS:** Thirty participants (6 current cigarette smokers, 1 current cigar smoker, and 23 former cigarette smokers) were enrolled from September 2014 to February 2015. The majority of items functioned well. However, qualitative testing identified wording ambiguities related to cancer diagnosis and treatment trajectory, such as "treatment" and "surgery"; difficulties with lifetime recall; errors in estimating quantities; and difficulties with instrument navigation. Revisions to item wording, format, order, response options, and instructions resulted in a questionnaire that demonstrated navigational ease as well as good question comprehension and response accuracy.

**CONCLUSIONS:** The Cancer Patient Tobacco Use Questionnaire (C-TUQ) can be used as a standardized item set to accelerate the investigation of tobacco use in the cancer setting. *Cancer* 2016;000:000–000. © 2016 American Cancer Society.

## Research Priorities Related to Tobacco Use by Cancer Patients

1. Determine the effects of tobacco and other forms of nicotine use or exposure on cancer patients as well as the effects of tobacco cessation (before diagnosis, during treatment, or during survivorship); research in this area could address the effects of tobacco/nicotine use/exposure and cessation on the following:
    a. Tumor response, disease progression or recurrence, second primary cancer, survival, and mortality
    b. Cancer treatment efficacy
    c. Adverse effects and complications of cancer treatment, recovery from cancer treatment, and post-treatment comorbid disease (such as heart disease)
    d. Needed dose, duration, and other characteristics of cancer treatment delivery
    e. Symptoms, psychosocial outcomes, and behavioral factors, including quality of life, mental health, and adherence to cancer treatment and post-treatment procedures

2. Determine the effects of exposure or use of tobacco and its constituents in all products (tobacco, nicotine replacement therapy, e-cigarettes and other electronic nicotine delivery systems) on cancer biology including the following:
    a. Carcinogenesis
    b. Tumor proliferation
    c. Angiogenesis
    d. Migration/invasion and metastasis
    e. Inflammation
    f. Immune modulation
    g. Tumor microenvironment
    h. Viral carcinogenesis and effects of viruses on cancer therapy (such as HPV)
    i. Metabolism of cytotoxic cancer agents
    j. Response to surgery, chemotherapy, radiotherapy, and targeted systemic therapy

3. Determine optimal strategies for implementing tobacco dependence treatment and prevention within the cancer setting, including the following:
    a. Evaluate the most effective platforms to promote system-wide identification of users of tobacco (and other forms of nicotine intake, such as e-cigarettes) and recent quitters using electronic health records and meaningful use criteria
    b. Evaluate the most effective means of delivering tobacco dependence treatment to all such individuals, including motivational approaches for the ambivalent tobacco user and telemedicine for patients who live at a distance
    c. Evaluate the effects of potential cessation treatment moderators, such as psychiatric comorbidities or genetic factors; develop focused approaches to ameliorate those effects
    d. Assess the role of biochemical verification
    e. Evaluate cost-effectiveness
    f. Determine the optimal cancer and cessation treatment timing
    g. Consider and inform provider behavior