

# State of the Science: Hot Flashes and Cancer, Part 1: Definition, Scope, Impact, Physiology, and Measurement

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**Purpose/Objectives:** To critically evaluate and synthesize multidisciplinary research related to hot flashes in the context of cancer. Topics include the definition, scope, and impact of hot flashes; physiologic mechanisms; and measurement issues.

**Data Sources:** Published, peer-reviewed articles and textbooks; editorials; unpublished data; and computerized databases.

**Data Synthesis:** Hot flashes can affect a diverse group of men and women diagnosed with or at high risk for certain cancers with a resulting negative impact on quality of life. Although the exact physiologic mechanisms underlying hot flashes remain unclear, a complex interplay of thermoregulatory, gluconeuroendocrine, genetic, and behavioral factors appears to be involved. Measurement of hot flashes should be considered carefully because they can be operationalized objectively and subjectively.

**Conclusions:** The large and diverse evidence base and current national attention on measurement of hot flashes highlight the importance of the symptom to healthcare professionals, including oncology nurses.

**Implications for Nursing:** Careful attention to assessment and measurement of hot flashes in patients with cancer is needed.

## Key Points . . .

- Several factors place women and men with cancer at risk for hot flashes, including agents used in the prevention of cancer, tumor characteristics, and cancer treatments.
- A complex interplay of factors appears to be involved in the physiologic mechanisms of hot flashes.
- Hot flashes tend to be underreported when subjective reports are compared to objective measurements.

and men with cancer are identified. The prevalence and negative impact of hot flashes also are presented. The question of whether hot flashes are identical in all groups is raised.

## Definition

A hot flash is defined as a sudden rush of heat and is considered to be a discrete physiologic event and a subjective phenomenon. When hot flashes were studied as discrete physiologic events, the following were noted to occur in healthy women. An inspiratory sigh precedes most menopausal hot flashes (Woodward, Greville, & Freedman, 1995). During a hot flash, sweat gland activity increases (Freedman, 1989), heart rate increases (Kronenberg, 1990; Kronenberg, Cote, Linkie, Dyrenfurth, & Downey, 1984), respiratory quotient (an indicator of metabolic rate) increases (Freedman, 1998), and blood pH falls slightly (e.g., acidosis) (Aktan, Kaleli, & Sungurtekin, 1998). Although one case study reported a profound drop in systolic blood pressure of 40 mmHg during a hot flash in a hypertensive African American woman (Nelesen, Krohn, & Dimsdale, 2004), another study of 20 nonhypertensive women

Part one of this state-of-the-science review relates to hot flashes in the context of cancer and focuses on three broad topics. First, the definition, scope, and impact of hot flashes in the context of cancer are discussed. Second, physiologic mechanisms of hot flashes are presented. Third, measurement issues are identified. Although much of the information presented is specific to cancer, where information is missing or currently unknown, data from healthy populations of men and women are used.

Throughout the review, the phrase hot flash is used. However, hot flashes also are known as hot flushes, night sweats, and vasomotor symptoms. The phrase hot flash is used commonly in the United States, whereas hot flush is used more commonly in Great Britain. The term night sweats often is used to refer specifically to hot flashes that occur while sleeping, although night sweats can result from other conditions, such as fever. The phrase vasomotor symptoms was coined in reference to the flushing and vasodilation that occur with hot flashes. Each of the terms refers to a single phenomenon.

## Definition, Scope, and Impact

In this section, hot flashes are defined and risk factors relevant to cancer prevention, diagnosis, and treatment are discussed. Differences and similarities in risk factors for women

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