



RoC Review of Shift Work at Night, Light at Night, and Circadian Disruption



Substance Overview

Listing Status: [Topic selected for evaluation](#)

PRIMARY USES OR EXPOSURES

- People who, by virtue of the nature of their work, lifestyle choices, or residence, are subjected to interruptions in the natural light-dark cycles and have the potential for circadian disruption.
- Over 10 million adults (7% of the U.S. population) frequently work night shifts (defined as working any amount of time between 1:00 a.m. and 5:00 a.m. for 6 to 30 days over the previous 30-day period).
- People are exposed to aberrant lighting conditions resulting from exposure to electrical light at night (LAN) from outdoor lights, indoor lights at home and at work, and using self-luminous electronic devices.

2011
Evaluation Commenced

2018 - August
Draft Report based on 650
research studies

2018 - October
Scientific Peer review completed

2019
Expected Publication

2020-22
Expected Regulations



National Toxicology Program

U.S. Department of Health and Human Services

Certain lighting conditions — i.e., excessive LAN exposure combined with insufficient daylight exposure — that cause circadian disruption are *reasonably anticipated to be a human carcinogen*.

- This conclusion is based on strong evidence that LAN acts through mechanisms that are likely to cause cancer in humans and limited evidence of the carcinogenicity of LAN from studies in humans.
- Toxicological and mechanistic data indicate that exposure to LAN causes melatonin suppression and other types of circadian disruption, which lead to the proliferation and growth of breast or mammary-gland cancer in experimental animals.
- LAN causes biological effects that are characteristics of recognized carcinogens.
- Studies in humans show that LAN causes melatonin suppression and may increase breast cancer risk.
- The characteristics of electric light that are most likely to cause circadian disruption include a combination of short wavelengths (e.g., blue light), longer duration, exposure to electric light during the biological night, and higher light intensity or levels. The exact conditions (e.g., duration) depends on the combination of these metrics. In addition to exposure to electric LAN, total light exposure (e.g., insufficient exposure to daylight) is also important in circadian regulation and thus is part of certain lighting conditions.

Pathway towards Regulation

