

## Training Workshop 1 Glossary of Terms

**Body Mass Index (BMI):** used in the clinic and research studies as a measure of overweight or obesity. Calculated by dividing body weight by height. A person with a BMI of 25-29.9 is considered overweight, while a person with a BMI of 30 or more is considered obese. Normal weight is defined by a BMI of 20-24.9.

**Cancer:** a term for any one of a group of diseases that occur when cells in the body become abnormal and divide without control, i.e., cells go from orderly cells to a mass of unorganized cells. Cancer cells can invade nearby tissues and can spread throughout the blood stream and lymphatic system to other parts of the body.

**Carcinogen:** A carcinogen is any cancer-producing substance or organism, such as polycyclic aromatic hydrocarbons (PAHs), or agents such as in certain types of irradiation. Most carcinogens are toxic because they affect the genetic material (DNA) of a cell.

**Case-Control Study:** An epidemiological study that enrolls subjects after they have a disease (cases) and compares aspects of their lives with individuals who are disease free (controls).

**Cell:** the structural and functional unit of all living organisms, and is sometimes called the "building block of life." Humans have an estimated 100 trillion normal cells which make up the tissues of the human body.

**Combustion products:** potentially toxic materials that are released when matter (i.e. fuel, wood, plastic) burn. Can enter the air, soil, or accumulate in the food supply, leading to human exposure.

**Endocrine disrupting chemical (EDC):** a diverse group of synthetic chemicals that when absorbed into the body either mimics or blocks hormones and disrupts the body's normal functions.

**Epidemiology:** the study of disease distribution and risk factors for disease in human populations.

**Estrogen:** Estrogens are a group of female steroid sex hormones. Estrogen is secreted by the ovaries and is responsible for the development and maintenance of female sex characteristics including mammary tissue. Estrogen is largely responsible for stimulating the uterine lining to thicken during the first half of the menstrual cycle in preparation for ovulation and possible pregnancy.

**Estrogen receptor:** a protein found inside the cells of mammary tissue, female reproductive tissue, and some cancer cells. Estrogen binds to estrogen receptor and stimulates proliferation during normal mammary gland development. Some synthetic chemicals have been shown to bind to estrogen receptor and cause breast cancer cells to multiply.

***in vitro*:** Literally means "in glass". In science, *in vitro* describes the biological processes that are made to occur outside the living body in a laboratory apparatus, such as a cell culture dish or test tube.

***in vivo*:** literally means "in life". In science, *in vivo* describes the biological processes as they are observed to occur in the natural environment, i.e., within a living organism. Animal testing and clinical trials are forms of *in vivo* research.

**Ionizing Radiation:** A known breast cancer risk factor. Radiation with enough energy so that during an interaction with an atom, it can remove tightly bound electrons from the orbit of an atom, causing the atom to become charged or ionized. Everyone is exposed to low levels of ionizing radiation from natural sources, however medical procedures such as X-rays, CT scans, and radiation therapies increase an individual's level of exposure.

**Latency:** Latency is the time between the first exposure to a cancer-causing agent and clinical diagnosis of the disease. Breast cancer latency can be decades long, making it difficult to study risk factors in humans.

**Precautionary Principle:** Suggests avoiding an exposure when risk of harm is suspected but existing scientific evidence cannot prove cause and effect.

**Proliferation:** the process by which a cell divides and replicates itself.

**Prospective Cohort:** An epidemiological study that enrolls subjects when they are disease-free and follows them over time to see if they develop the disease of interest. Exposures can be measured in real time and likelihood of developing a disease is assessed in the exposed population relative to the unexposed population. Expensive to conduct and can be difficult to keep subjects enrolled over long periods.

**Recall bias:** Occurs in epidemiological studies when subjects are asked to remember habits or exposures from years prior. Sick subjects are more likely to recall negative exposures than healthy subjects, making it look like there is an association when there isn't one.

**Relative Risk:** The probability of getting a disease in the exposed group relative to the probability of getting a disease in the non-exposed group. Calculated from data collected in cohort studies.

**Retrospective Cohort:** Also known as an historical cohort, an epidemiological study that enrolls subjects who may or may not have disease at enrollment and assesses exposures that occurred in the past through patient recall or medical records.

**Reverse causality:** A phenomenon that occurs in epidemiological studies when what is assumed that A causes B in fact B may actually be the cause of A. For example, some studies have shown higher levels of BPA in the urine of obese subjects. This finding may be interpreted as BPA increasing risk for obesity, OR in the reverse: that being obese increases the amount of BPA that a person is exposed to or excretes.

**Thelarche:** the beginning of breast development in females.

**Tumor:** A tumor is an abnormal mass of tissue that has lost its usual architecture as a result of abnormal cell division. Strictly, a tumor refers to any abnormal swelling. Tumors perform no useful body function. They may be benign (non-cancerous) or malignant (cancerous)

**Windows of Susceptibility:** Life stages when breast tissue is most sensitive to exposure to environmental toxins because breast tissue is developing or remodeling.