Circadian Rhythm Disruption and the Modern Diseases

In 1997 a study of workers in Japan drew attention to the adverse effects of night shift work. The epidemiological studies on the night shift workers, showed that long-term disruption of the Sleep-Wake and Fasting-Feeding cycles cause metabolic diseases such as obesity, type 2 diabetes, heart disease, and cancers. These diseases are fast becoming epidemics among young urban adults who have work and social life schedule similar to that of a night shift worker. The following groups of people are susceptible to circadian disruption metabolic diseases:

- Night shift workers
- Jetlagged / long-term frequent fliers crossing time zones
- Social and digital jetlag—The young adults who eat late, sleep late, and are perpetually indoors in the midst of artificial light, digital blue light, and noise.

The night shift workers, who make up almost 20% of the workforce in the urban population globally, were the first group of individuals who got studied for circadian rhythm diseases. These individuals were found to have a high incidence of several metabolic disorders, such as:

1. Abdominal obesity
2. High blood pressure
3. High blood sugar
4. Type 2 diabetes
5. Heart disease
6. Gastrointestinal disorders
7. Depression and mood disorders
8. High risk of developing cancers

Many epidemiological studies have shown an increased incidence of breast, colorectal, and prostate cancer in night shift workers. A 1996 report suggested a higher rate of breast cancer in Norwegian radio and telegraph operators. The World Health Organization (WHO) recommended a set of health risks, as outlined above, linked to night shift work.

The hypothesis of “Light at Night” (LAN) suggests that the lack of the sleep hormone melatonin is at the root of the cancer disease process. The sleep hormone melatonin is a powerful antioxidant which removes cancer-producing free oxygen radicals from the body tissues during the sleep. The epidemiological support for the LAN hypothesis and breast cancer connection is robust.

Habitual late-night social life, commonly called social jet lag is universal in the young city dwellers. Social jet lag carries the risk of the same diseases as the night shift worker and additionally, the risk of addictive behaviors such as alcohol and nicotine use.