



# FACT SHEET

## Community Development

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### The Invisible Environment Fact Sheet Series

# Seasonal Affective Disorder

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The source of energy and life for the Earth is the Sun. Historically, humans lived in agrarian or fishing-based societies, which required that people spend much of their lives out-of-doors. The change to a society where people spend as much as 90 percent or more of their lives indoors is relatively recent. The impacts of removing ourselves from natural light exposure are only now being seen. One such impact is that of Seasonal Affective Disorder (S.A.D.).

### What Is Seasonal Affective Disorder?

Seasonal Affective Disorder is recognized as a disease that affects nearly 6 percent of the population in temperate zones. Other estimates suggest that another 14 percent of the population experiences a low-level, self-clinical, or non-diagnosable form of the disorder. Women account for 75 percent of diagnosed cases. Some of the possible symptoms include depressed mood, irritability, reduced visual acuity, tendency to overeat (craving carbohydrates), and physical lethargy (some thought and motor retardation). Classic symptoms also include hypersomnia (sleeping a great deal) and a tendency to withdraw from elective social activities. S.A.D. is a specific type of clinical depression, and diagnosis is made by a physician, psychologist, or psychiatrist based on patient symptoms and a history of recurring “winter blues” that disappears in the spring. This pattern, and the severity of the symptoms, are important components in identifying S.A.D.

### How Does Sunlight Affect Humans?

It is accepted that bright light can affect sleeping patterns, have an impact on the internal biological clock,

and that the relative light during summer and winter can affect human energy levels. Exactly how this is so is a focus of study throughout the United States, Canada, and Great Britain. It is known that exposure to daylight helps the human body process food better and encourages the production of vitamin D3, which is important for efficient use of calcium and phosphorus in the body. Sunlight also activates an enzyme in the skin that produces a polymer of dopa (an amino acid) called melanin.

Melanin is the pigmentation in the skin that both produces the darkness and protects the skin from damage by sunlight. Initial exposure of skin to sunlight generates a rapid production of small quantities of melanin. Subsequent exposures produce slower generation of larger quantities of melanin (melanogenesis) which is the effect of tanning or darkening of the skin.

Sunlight also has an effect on the body through the eyes by stimulating the pineal gland to release a neurotransmitter called serotonin which helps regulate blood vessel constriction and a hormone called melatonin. An excess of melatonin in the body induces sleep, drowsiness, and lethargy. One hypothesis is that the dimmed natural light of winter signals the body to increase the production of melatonin. For most of us who already spend most of the time indoors, the increase of this chemical is intensified and, in some people, can create a psychological reaction. Furthermore, unlike subsistence farming or fishing societies, most people maintain their work, school, and social lives at a more consistent pace throughout the year, rather than reducing activity in the winter.

## What About Sunlight?

There are three aspects of sunlight exposure that are relevant to S.A.D.—intensity, wavelengths, and timing. The first aspect is that of intensity. Indoor lighting has a “brightness” between 200 and 1000 lux. Even through clouds, the midday sun has a brightness of at least 10 times greater than indoor lighting; the minimum intensity of brightness during midday is around 2500 lux and is normally around 10,000 lux.

The chief factor in S.A.D. is the brightness of light. Most people work during the day and, in the winter, tend to stay indoors even more of the time. Even twilight exposure, which is comparable to a well-lit room, is missed by many who leave for school or work in the dark and return after twilight.

The second factor in sunlight exposure has to do with wavelengths. Most artificial lighting has wavelengths in what is known as the visible light spectrum. Visible light, measured in wavelengths of radiation (meters) of energy noted as nm, ranges from 400 nm to 700 nm. Incandescent bulbs have a wavelength ranging from 300 nm to over 600 nm with high relative photon energy use. Fluorescent tubes range from 300 nm to nearly 700 nm with a low photon energy use at the upper end. Natural light, on the other hand, has both lower and higher wavelengths. This “unseen” light is on the high end infrared and on the low end ultraviolet (UV). This is the same UV that promotes the actuation of the melanin, and through the eye, the pineal gland stimulation for the production of serotonin and melatonin. This is also the wavelength that can cause sunburn. Visible with invisible light is called “full spectrum.”

The third aspect is that of timing. In temperate zones, UVA (an especially important UV ray) is most present between April and October. Research has been, to date, inconclusive, but several studies suggest that morning light is perhaps the most important related to exposure.

Depending upon the individual, the amount of exposure varies, but the consistency of when the body receives its “boost” appears to help the body set its biological rhythms of normal sleep patterns.

## What Can Someone Do?

As with most environmental health issues, all people are affected to some degree with light deprivation. Many people notice their moods turning “gray” to match the skies during extended overcast, winter days or the resurgence of energy they feel on sunny winter days. S.A.D. is diagnosed when symptoms are recurrent, persistent, and severe.

For many individuals, prevention is better than treatment. From spring through autumn, spend time outdoors and, when appropriate and possible, without sunglasses. During winter, try to be outside and be exposed to morning light.

Most people would benefit from changing cool white fluorescent lights to full spectrum bulbs indoors. Such bulbs can be found in some hardware and lighting fixture stores. Most people can feel a difference if the brightness of the lighting in a room is increased (usually 5 to 20 times higher than is standard). For individuals diagnosed with S.A.D., brightness is of greater importance than the spectrum exposure for treatment. When clinically diagnosed, there are treatments for S.A.D. The predominant method is the use of a very bright, full-spectrum light box. The therapy involves regular exposure of between 2,500 and 10,000 lux while the person is awake and reading or watching television. For individuals who believe S.A.D. may be a factor in their lives, a psychiatrist, physician, or psychologist may be able to confirm diagnosis and recommend appropriate treatment. The three aspects of brightness, wavelength, and timing are key to addressing light deficit and S.A.D. They are also keys to helping cope with the indoor creatures we have become.

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