Health Technology Advisory Committee
- Home
- Publications
- Links
- Search

Light Therapy for Seasonal Affective Disorder (SAD)

February 2001

Executive Summary

Seasonal affective disorder (SAD), is a mood disorder subtype characterized by recurrent depressive episodes that occur and remit with changes of season. Although recurrent spring-summer depressions have been documented and may be classified as SAD, the most common form of the disorder involves onset of depression in the late fall or early winter with remission in the spring or summer. Thus, winter pattern SAD is the focus of the majority of the light therapy studies presented in this report.

Since it is believed that SAD is associated with decreases in light exposure during the fall and winter seasons, light therapy has been recommended as the first-line treatment for SAD. For more than 15 years, patients have used light therapy for the treatment of SAD either individually or under the direction of a medical practitioner. The most commonly used and studied form of light therapy involves the use of a light box that administers bright light during a particular time of day, usually in the morning but sometimes in the evening. More recently developed but less studied forms of light therapy include dawn light simulation and the use of light visors.

Findings
Design problems, including small sample size, inadequate placebo controls, lack of blinding, and inconsistencies in timing, intensity, and duration of exposure and length of treatment, have hampered a definitive determination of efficacy since the introduction of light therapy as a treatment for SAD. However, several recent studies (e.g., Terman, 1998, and Eastman, 1998) have attempted to overcome some of these design limitations and have presented evidence that light therapy appears to be an effective treatment for SAD. Combinations of the three components of light therapy, that is, "timing, intensity, and duration" can affect the outcome of treatment. None of the studies have compared light therapy with other potentially active treatments, such as antidepressant medication and/or psychotherapy. Furthermore, long-term efficacy has not been established, and the intensity-response relationship, the optimal treatment schedule, and the long-term safety of light therapy have also not been clarified.

Conclusions
Light therapy continues to be an investigational treatment. The Food and Drug Administration (FDA) has not yet given clearance to market light boxes in the U.S. for the treatment of SAD nor does the Health Care Financing Administration (HCFA) cover the costs associated with using light therapy. Although, the Agency for Health Care Policy and Research (AHCPR), in guidelines published during 1993, provided light therapy a qualified recommendation under specific conditions.[1]

Both the FDA and the AHCPR (see recommendations) state that light therapy should be administered to properly diagnosed patients (who have no psychotic disorder and who are not suicidal) under the guidance of an experienced and trained medical professional.

Studies available to date support reasonable beneficial effect of light therapy as a treatment of SAD, where light deprivation is believed to be the causal agent.

Recommendations
Patients, who use a light box device at home, should only do so under physician supervision and they should be fully informed regarding possible adverse effects.

Further well-designed, randomized controlled studies are needed to establish the long-term efficacy, intensity-response relationship, the optimal treatment schedule and the long-term safety of light therapy treatment.

Physicians should follow the AHCPR principles when utilizing light therapy as a treatment for SAD.

AHCPR principles:

- Light therapy is a logical consideration only for well-documented seasonal, non-psychotic, winter depressive episodes in patients with recurrent major depressive or bipolar II disorders or milder seasonal episodes.
- It should be administered by a health care professional with experience and training in its use who deems it suitable for the particular patient.
- It may be a first-line treatment for these patients if they are not suicidal, and if there are medical reasons to avoid antidepressants, if the patient has a history of a positive response to light therapy and no specific negative effects, if the patient requires it, or if an experienced practitioner deems it indicated.
- It may be a second-line treatment option after the patient has failed to respond to an adequate medication trial.

Introduction

In simplest terms, SAD is defined as recurring depression with seasonal onset and remission. Recent studies estimate that SAD

is more prevalent in northern states, because SAD may be related to the occurrence of shorter periods of daylight in winter. In Florida, less than 1% of the general population may have SAD, while in Alaska as many as 10% of people may suffer from fall-onset SAD.2 In Minnesota, approximately 5% of the general public, or 240,000 people, are thought to be affected by SAD. Light boxes, devices that deliver light therapy, are sometimes utilized in the treatment of SAD.

Background

Seasonal Affective Disorder (SAD)
Seasonal Affective Disorder, defined by Rosenthal et al. in 1984, was depression with onset during the autumn or winter and remission in the spring or summer for at least 2 successive years.[3] SAD is now included in the latest version of the American Psychiatric Associations (APA) Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV) where it is listed, not as a separate mood disorder, but as a specifier of either bipolar or recurrent major depressive disorder, with a seasonal pattern of major depressive episodes.[4] (See Table 1)

The pathogenesis of SAD is not well understood. It is believed that the decreasing daylight period in the autumn and winter triggers a depressive episode in people predisposed to winter SAD. However, causality between winter SAD and the shortage of light or cooler temperatures has not been established. Initially, SAD was thought to be related to abnormal melatonin metabolism; however, later findings did not support this hypothesis. Other investigators proposed the phase-shifting hypothesis, based on studies of circadian rhythms. Circadian rhythms are biological rhythms with an intrinsic period of approximately 24 hours that are driven by an endogenous pacemaker in the suprachiasmatic nuclei (SCN) of the hypothalamus; the SCN is responsive to photic information from the retina via neural pathways and sends circadian signals to the pineal gland. Supposedly, the therapeutic effect of light is to phase-shift the dysregulated endogenous circadian rhythms in patients with SAD and resynchronize these rhythms, i.e., light presented in the morning phase advances the rhythm and light presented in the evening delays it. Nevertheless, research findings are contradictory and the status of this hypothesis is uncertain. The hypothesis currently in favor involves serotonin, a neurotransmitter thought to regulate mood. Some clinical studies suggest that serotonergic activity in the brains of people with winter SAD is abnormal. In addition, researchers have observed that the short-allele polymorphism for the serotonin transporter seems to be more common in patients with SAD compared with healthy people. Another hypothesis gaining support is the photon-count, or a too few photons hypothesis. A recent editorial by Wirz-Justice (1998) suggested that some of these hypotheses are not incompatible. While the exact mechanisms underlying SAD remain unclear, the available evidence suggests that the disorder is mediated by biological changes.[5,6-9]

Table 1 Criteria for Seasonal Pattern Specifier[4]

A. Regular temporal relationship between the onset of major depressive episodes and a particular time of the year (unrelated to obvious season-related psychosocial stressors).
B. Full remissions (or a change from depression to mania or hypomania) also occur at a characteristic time of the year.
C. Two major depressive episodes meeting criteria A and B in last two years and no non-seasonal episodes in the same period.
D. Seasonal major depressive episodes substantially outnumber the non-seasonal episodes over the individual's lifetime.

Patient Selection Criteria
To meet the DSM-IV criteria for SAD diagnosis, there must be a regular temporal relationship between the onset of major depressive disorder in Bipolar I or II disorders or recurrent major depressive disorder and a particular time of the year (unrelated to obvious season-related psychosocial stressors); full remissions (or a change from depression to mania or hypomania) also occur at characteristic times of the year (e.g., depression disappearing in the spring); two major depressive episodes with seasonal onset and remission in the last two years and no non-seasonal major depressive episodes have occurred during that same period; seasonal major depressive episodes substantially outnumber the non-seasonal major depressive episodes that may have occurred over the individual's lifetime. (See Table 2) Two seasonal disorder patterns types have been identified. The most common type of SAD is the fall-onset type and is often referred to as "winter SAD." These episodes typically begin in the late fall or early winter and subside in the spring. The less common type of SAD, referred to as "summer SAD," typically begins in the late spring or early summer.[4]

The World Health Organization's (WHO) International Classification of Mental and Behavioral Disorders (ICD-10) gives only provisional diagnostic criteria for SAD due to uncertainty of the condition's clinical and scientific status. The ICD-10 criteria are: at least 3 episodes of mood (affective) disorder, with onset within the same 90-day period of the year, for 3 or more consecutive years; remissions within a particular 90-day period of the year; and seasonal episodes substantially outnumber any non-seasonal episodes that may occur.[8,10,11] (See Table 2)

Prevalence of winter-type seasonal pattern appears to vary with latitude, age and sex. Prevalence increases with higher latitudes and age is a strong predictor of seasonality, with younger people at a higher risk for winter depression episodes. Furthermore, SAD seems to be more common in young adult women. Women comprise 60-90% of people with SAD.[4,8,11]

It is important that the clinician consider a variety of conditions in the differential diagnosis of SAD. For example, seasonally recurrent psychosocial stressors, such as fall/winter unemployment, may produce some of the symptoms of depression. In addition, there are conditions other than major mood disorders that may be influenced by changes in season, including eating disorders, premenstrual syndromes, and anxiety disorders such as panic disorder and obsessive-compulsive disorder.[12]

Diagnostic Criteria for a Major Depressive Episode[4]

A. At least five of the following symptoms have been present during the same two-week period, nearly every day, and represent a change from previous functioning. At least one of the symptoms is either (1) depressed mood or (2) loss of interest or pleasure. NOTE: Do not include symptoms that are clearly due to a general medical condition, or mood-incongruent delusions or hallucinations.

1. Depressed mood (or alternatively can be irritable mood in children and adolescents).
2. Markedly diminished interest or pleasure in all, or almost all, activities.
3. Significant weight loss when not dieting or weight gain or decrease or increase in appetite.
4. Insomnia or hypersomnia.
5. Psychomotor agitation or retardation.
6. fatigue or loss of energy
7. Feelings of worthlessness or excessive or inappropriate guilt.
8. Diminished ability to think or concentrate, or indecisiveness.
9. Recurrent thoughts of death (not just fear of dying), recurrent suicidal ideation without a specific plan, or a suicide attempt or a specific plan for committing suicide.

B.The symptoms are not better accounted for by a mood disorder due to a general medical condition, a substance-induced mood disorder, or bereavement (normal reaction to the death of a loved one).

C. The symptoms are not better accounted for by a psychotic disorder like schizoaffective disorder.

Symptoms of SAD
Typically, classic major depression involves decreased appetite, decreased sleep, and often poor appetite and weight loss. However, those with fall-onset SAD will exhibit atypical signs of depression such as prominent anergy, or lack of energy, increase in appetite and food intake, especially carbohydrate cravings, and increased sleep. In addition, symptoms include a marked increase in weight, irritability, interpersonal difficulties and leaden paralysis (a heavy feeling in the arms or legs). The typical signs and symptoms of depression characterize summer-onset SAD.[4-8,11,13-14] (See Table 3)

Table 3 Common Symptoms of SAD

Fall-onset Type

- change in appetite, especially a craving for sweet or starchy foods (i.e., carbohydrates)
- weight gain
- laden paralysis (heavy feeling in the arms or legs)
- decreased energy level
- fatigue
- hypersomnia
- difficulty concentrating
- irritability
- increased fear of social rejection and/or avoidance of social situations

Spring-onset Type

1. decreased/poor appetite
2. weight loss
3. insomnia

Treatment of SAD

Light therapy, also called phototherapy and bright light therapy, was introduced as a treatment for SAD in the early 1980s.[15] Currently, light therapy is recommended as the first-line treatment, or treatment of choice, for SAD if; the patient is not severely suicidal, there are medical reasons to avoid the use of antidepressants, the patient has a history of favorable response to light therapy, the patient requests light therapy, and an experienced physician deems light therapy is indicated. In addition, light therapy may be considered a second line treatment option in patients who fail to respond to drug therapy.

Light treatment involves exposure to visible light that produces a minimum of 2500 lux at eye level. Typically the amount of light used in studies was 2500 lux for 1-2 hours. However, recent studies using higher intensities of light (up to 10,000 lux) for approximately 30 minutes had showed equally good response rates.[8,11,14,16-17] Currently, 10,000 lux has become the clinical standard. During light therapy, the patient's eyes should remain open with light directed toward the patient at a downward slant. Staring directly into the light source is not necessary for treatment and is contraindicated because doing so may cause adverse effects such as photophobia, headache and possible retinal damage (although there is no evidence to date).[18]

Dosage
Length of treatment and intensity of light source can vary depending on the patient's response to treatment. Typically, treatment is initiated beginning with 2500 - 10,000 lux light intensity in a single 10-15 minute session per day, gradually increasing the duration to 30-45 minutes with adjustment of the dosage level to suit individual requirements after a week long assessment period.[5,8,11]

The intensity of the light source varies and can be as high as 10,000 lux. Most commercial light boxes used in standard treatment emit a range of light from 2500 to 10,000 lux. Usually a full-spectrum fluorescent light is used;[5] however, cool white fluorescent light may be just as effective as full spectrum.13 Light sources that are recommended do not emit ultraviolet radiation or filter out that band of the spectrum. A plastic diffuser in front of the lamps and an electronic ballast may make the light source more convenient to use. Investigators recently developed a dawn simulator that raises light levels in the morning while the patient is asleep and battery-powered, head-mounted light visors to decrease the time spent in light therapy and to permit the patient to maintain activities during the treatment.[8,11] The intensity of the light source in which light therapy is performed is in contrast to the typical 100 lux or less in a house and 300 to 500 lux in the workplace. Illumination outdoors varies with latitude, season, time of day, and local weather, but typically it is approximately 2000 lux or less on a rainy winter day to 10,000 lux or more on a sunny day.[8,11]

Length of Treatment
Although some patients show an immediate benefit from daily light therapy sessions, most take 2 to 4 days to experience a sustained response. However, a lack of response within the first week should not be interpreted as treatment failure since evidence suggests that longer treatment duration can improve response and that the initial response usually takes 1 to 2 weeks, or longer, to appear. After the initial period, effects can be maintained by undergoing light therapy five times a week throughout the winter.[8,11]

The Hamilton Depression Rating Scale (HDRS) was often used in studies as a measure of change of severity of depression in studies of light therapy and SAD. HDRS is a rater scored instrument, which measures the severity of depression.[5] A revised version that merges the HDRS with a supplementary eight-item scale for atypical symptoms, including prominent symptoms of hypersomnia, hyperphagia, carbohydrate craving, and afternoon or evening slump, is known as the Structured Interview Guide for the HDRS, SAD Version (SIGH-SAD).[19] There are also several self-report measures specific to SAD which include the Seasonal Pattern Assessment Questionnaire (SPAQ) and the Seasonal Screening Questionnaire (SSQ). The former is a two-page instrument assessing seasonal variation in mood, appetite, weight, energy, sleep, and socializing; a sum of the ratings provides a global seasonality score. The latter is a nine-page self-report questionnaire with items regarding symptoms and course of seasonal mood.[5]

Findings

The available evidence, in particular the most recent studies reviewed in this assessment, suggests that bright-light therapy is an effective treatment for winter SAD. Since the introduction of light therapy, design problems, including small sample size in many studies, inadequate placebo controls, lack of blinding, other than that of raters, and inconsistencies in timing, intensity, and duration of exposure and length of treatment, have made it difficult to clearly determine its efficacy. However, according to an accompanying editorial,[9] three articles published in the October 1998 issue of the Archives of General Psychiatry[16,20,21] present the best evidence to date that light is an effective treatment for SAD. Eastman et al. (1998) used a deactivated negative ion generator as the placebo condition, giving it an enthusiastic endorsement to increase patients' expectations for the generator treatment to be more similar to those for the light treatment. Terman et al. (1998) used high- and low-dose negative ion generators as comparison conditions. Both of these studies showed that bright light therapy using a light box is superior to these non-light control conditions. According to Avery (1998), in another accompanying editorial, the studies of Eastman et al. and Terman et al. provided good controls and adequate sample sizes, and supported the conclusion of many previous studies that morning light is superior to evening light. The study by Lewy et al. did not use a placebo control but directly compared morning and evening light, using a crossover design with a withdrawal week between treatment periods to eliminate a carryover effect. Although sample size was smaller than the other two studies published simultaneously and response rates were lower, this study also demonstrated morning light superiority. Long-term efficacy, however, has not been established.

Evaluation of Evidence

Patient Selection
For most of the studies, recruitment of subjects was through mass media advertising in addition to referrals from health professionals. Patients admitted to the studies either had to satisfy the criteria for SAD, to fulfill the DSM-III criteria for major depressive disorder or bipolar disorder with a winter-type seasonal pattern, or both, which usually was the case. Only one study used the DSM-IV criteria, since most studies were initiated before the establishment of these criteria. In addition, many of the studies required a minimum total depression score, usually 20, on the SIGH-SAD. Exclusions often specified were: psychotic disorder, recent drug or alcohol use, serious suicidal intent, significant somatic illness, psychotropic or antidepressant medications ranging from a period of greater than 2 weeks to 1 year, psychotherapy for 1 year, and cataracts, glaucoma, or retinal disease.

In one study that compared dawn simulation with light box treatment, however, 18% to 19% of the patients in both groups were on current antidepressant drug treatment. Some studies also excluded patients with previous light therapy. Although most of the research evaluated adult patients, one study evaluated light therapy for pediatric SAD.[22]

Study Design
Two controversial and interrelated methodologic issues in light therapy studies concern the use of a placebo control and blinding. Both are important factors in a well-designed study. In assessing the efficacy of a study, it is necessary to show that the treatment, in this case light therapy, has a benefit that is greater than the placebo response. However, it is difficult to design a light study with a suitable placebo control that would not also have a real or potential effect on outcome. Many studies, especially those prior to 1995, used dim light as a control condition. However, there is the possibility that dim light itself is an active treatment, that is, while the effect of dim light may be less than that of bright light, it may have an effect that is greater than no treatment at all. There are similar problems with the use of negative air ionization as a placebo control; negative ion generators also may produce a response. One solution has been to use a deactivated or sham negative ion generator as a

placebo control.[13] A recent study included two groups receiving negative air ionization as non-photic controls; however, only low ion density was considered a placebo, while high ion density was considered an active treatment. Results of the study were that the groups receiving light therapy or high-ion-density negative air ionization showed a significant response compared with the low-ion-density placebo group.[16] It is just as difficult to incorporate blinding in the design of a light therapy study since patients are aware of their exposure to bright light. Moreover, they often have expectations regarding light intensity that could influence their response.[13] Thus, many of the studies rated patients' expectations in order to examine and eliminate potential bias. In some studies, patients were led to believe that alternate treatments would have an effect when, in fact, the researchers hypothesized otherwise.

Outcome Measures
The majority of studies used the SIGH-SAD or the HDRS and atypical scales to assess response to therapy, comparing depression score before (baseline) and after treatment. Generally, a decrease in the score of at least 50% of baseline and a score of less then 8, considered strict response criteria, identified those patients with complete or nearly complete remissions. Some studies evaluated the HDRS and atypical scales separately. Researchers in Norway[23,24] used the Montgomery Åsberg Depression Rating Scale (MADRS) extended with four items increased sleep, increased appetite, carbohydrate craving, and fatigability to assess response. They defined non-responders as those having a pre- to post-treatment extended MADRS score reduction of less than 30% and responders as having a greater than 50% score reduction. The relative improvement criteria using the SIGH-SAD, HDRS plus atypical scale, and MADRS are considered analogous. Some studies made a distinction between response rates and remission rates, while other studies used these terms interchangeably. One study used the Clinical Global Impression, in conjunction with SIGH-SAD, to measure response, with ratings of very much improved, much improved, minimal improvement, unchanged, or worsened.19 One study used measures of salivary melatonin and cortisol at dusk and dawn to relate clinical response, using HDRS, to putative alterations of circadian rhythm phase.[25] A recent study used dim-light melatonin onset to assess circadian phase position.21

Timing of Exposure
Timing of light exposure is a very controversial issue. While many proponents believe that light therapy works best in the morning, study results have been inconsistent. There have been no studies showing that evening light is more effective than morning light; however, prior to 1998, studies were divided between those that showed morning light to be superior and those that showed no difference.[21] Many of the studies that demonstrated morning superiority used crossover designs, whereas parallel-group studies found no affect associated with time of day. In the crossover studies, there may have been a sequencing effect, e.g., morning light therapy may have had carryover effects that lessened the effects of evening light.[13,16,21] One study that investigated the influence of short-term rank ordering of morning and evening light on response rates found no difference in outcome whether patients received 2 days of morning light followed by 2 days of evening light or vice-versa.26 Three recent, well-designed studies by Eastman et al. (1998), Terman et al. (1998), and Lewy et al. (1998), one using a crossover design and the other two using both crossover and parallel-group designs, showed a higher response rate for morning light than for evening light.

Duration of Exposure
In most studies using 2500 lux light boxes, duration of exposure was 1 to 2 hours a day. It is unclear whether there is a dose-response relationship with respect to duration of light exposure. Some researchers found that longer exposures were superior to shorter exposures, while others suggested a therapeutic plateau for exposure time. Also, intensity and duration may be reciprocally related since some studies showed that remission rates with 10,000 lux for 30 minutes were similar to those with 2500 lux for 2 hours.[13]

Intensity of Exposure
While most of the early studies used light boxes providing 2500 lux of light, some of the later studies used a higher intensity, up to 10,000 lux. The higher intensities were administered for shorter periods of time based on the assumption that duration of light exposure worked in interaction with light intensity.

A recent meta-analysis of 39 studies conducted prior to 1995 evaluated the dose-response relationship of phototherapy for SAD with respect to light intensity.[27] Studies were clustered into three groups of light intensity: dim light (< 600 lux), medium light (1700-3500 lux), and strong light (> 6000 lux). While timing of exposure, i.e., morning, midday, evening, and morning-evening, was a consideration in the analysis, duration of exposure was not, since the latter tended to be fairly constant for different treatment regimens in most studies. Results of the meta-analysis indicated that increased light intensity produced a greater reduction in the typical symptoms as measured by the HDRS. However, there were no significant differences between the varying light intensities in reducing the atypical symptoms. The authors concluded that light intensity varied positively for typical, but not for atypical, symptoms of SAD.

Length of Treatment
Optimal length of treatment was not addressed in most controlled studies; however, most of the effect was seen within 1 to 2 weeks of therapy. The recent study by Eastman et al. (1998) treated patients for a 4-week period and only found a significant difference between active treatment and control groups at 3 weeks. Since discontinuation of therapy results in relapse of SAD symptoms within days, it is recommended that treatment continue throughout the winter season.[13] Researchers in the United States, in particular, have found that most patients suffer a relapse soon after terminating light treatment, whereas the finding from Oslo, Norway is that most patients retain their improvement for the rest of the season.[24]

Safety

When properly administered, light therapy is well tolerated with few adverse events. Common side effects of light therapy include photophobia, headache, fatigue, and irritability occur in approximately 19% of patients. An ophthalmologist or other

appropriate specialist should follow those individuals at risk of photochemical damage, such as those with progressive retinal disorders.[8,11] If side effects occur, they typically respond to a reduction in treatment time duration or a distance from light source, or periodic breaks during longer sessions. The initial effects of light therapy should be monitored, usually in an outpatient setting. Once the clinician has assessed the benefits of the treatment, the patient may purchase a light therapy device for home use. Patients, who use a device at home, without supervision, should be informed about health hazards and encouraged to be in contact with their physician.[8,11] Light therapy may be used in conjunction with pharmacologic treatment for depression without risks or harmful drug/light interactions.[8,11]

Several case reports have suggested that some patients with winter depression may become suicidal after treatment with light therapy. To examine the emergence of suicidal ideation during a standard protocol for light therapy, morning light therapy using cool-white fluorescent light boxes of 2500 lux for 2 hours per day or 10,000 lux for 30 minutes per day for 2 weeks. Investigators retrospectively analyzed a large case series of 191 SAD patients who had been rated before and after treatment with the SIGH-SAD. The SIGH-SAD includes an item for suicidal ideation, scored from 0 to 4 for absent, feels life is not worth living, wishes he were dead or any thoughts of possible death to self, suicidal ideas or gesture, and attempts at suicide. The study found a significant improvement in the SIGH-SAD suicide item score, with 45% of patients showing a reduction in score. The 6 patients whose suicide scores were worse following light therapy also had lower responses to treatment, indicating that they were still clinically depressed. The investigators concluded that light therapy relieves suicidal ideation in patients with SAD consistent with overall clinical improvement and that emergence of suicidal ideas or behaviors is not a very common occurrence with light therapy. However, while suicidality resulting from SAD is extremely rare, it is still important to carefully monitor for it when depressed patients are beginning to respond. The authors suggested that the findings of at least one of the previous reports could have resulted from using evening rather than morning light therapy, a less effective timing for light therapy.[28]

Instances of mania or hypomania in SAD patients during or after light therapy also have been reported, including one case in a patient with bipolar disorder I and one case in a unipolar patient. Nevertheless, light-induced mania in SAD has been observed only rarely.[17] This emphasizes the importance of well-defined patient selection criteria and monitoring of patients during treatment.

Alternative treatments studied include drug therapies, using one of several antidepressants that are known selective serotonin-reuptake inhibitors (SSRI), such as sertraline and fluoxetine, or a reversible inhibitor of monamine oxidase A (RIMA), such as moclobemide (moclobemide is not available in the U.S.). While there have been no reported trials of psychological therapies, proposed psychological interventions include cognitive-behavioral and interpersonal therapies.[8,11,29]

FDA Regulations
The FDA considers light boxes Class III medical devices, the most stringent regulatory category for devices, due to the lack of clinical trials on light therapy for treatment of SAD.[30] Therefore, the FDA has not given final approval to market light boxes for the treatment of SAD (under either 510(k) or PMA authority).

In 1993, the FDA entered into a "consent decree" which permits light box manufacturers to market light boxes in the U.S. provided no significant therapeutic claims are made (i.e., "light boxes are curative or are a sole primary treatment"). According to the FDA, as long as no therapeutic claims are being made by light box manufacturers, they are considered an "alternative medicine" (as deemed by the NIH) and therefore, allowed to be dispensed in the U.S. without a prescription and sold without FDA clearance.

Since 1997, the FDA has issued at least one warning letter to remove therapeutic claims from labeling. Since this time, we have found no additional warning letters issued.

In 1998, the FDA convened a small "informal" group to discuss healthcare policy. During this meeting, it was determined that light boxes, and their relationship to SAD, did not pose a "significant danger" to the public. In addition, the FDA is "not aware of any adverse events as a result of light box therapy".

Cost and Cost-effectiveness

There is no information in the literature on the cost of light therapy. There are a multitude of companies that manufacture light boxes, including Hughes Lighting Technologies (Lake Hopatcong, NJ), Daylight Technologies, Inc. (Halifax, Nova Scotia), Discovery Bay Lighting (Seattle, WA), Apollo Light Systems (Orem, UT), The Sun-Box Co. (Gaithersburg, MD), PhotoTherapeutics (Boise, ID), Northern Lights Technology (Montreal, Canada), Smifa Trading (Solrød Straud, Denmark), Scan-Med a/s (Drammen, Norway), and others. Discovery Bay Lighting advertises two models on their Web site that range in price from $275 to $344.31 Apollo Light System's standard model costs $299.32 A search of various manufacturers' Web sites revealed prices ranging from $195 to over $500, depending on model features.

The conditions under which medical plans cover light therapy vary. Check with each individual health plan's coverage policies.

Future of Procedure

Future research should clarify the mechanisms and sites of action of bright light exposure.[8,11] Long-term studies would be useful for determining whether the clinical effects are sustained over time. In addition, further studies are needed to clarify the intensity-response relationship, the optimal treatment schedule, and the long-term safety of light therapy.[13]

Conclusions

Light therapy continues to be an investigational treatment. The Food and Drug Administration (FDA) has not yet given clearance to market light boxes in the U.S. for the treatment of SAD nor does the Health Care Financing Administration (HCFA) cover the costs associated with using light therapy. Although, the Agency for Health Care Policy and Research (AHCPR), in guidelines published during 1993, provided light therapy a qualified recommendation under specific conditions.

Both the FDA and the AHCPR (see recommendations) state that light therapy should be administered to properly diagnosed patients (who have no psychotic disorder and who are not suicidal) under the guidance of an experienced and trained medical professional.

Studies available to date support reasonable beneficial effect of light therapy as a treatment of SAD, where light deprivation is believed to be the causal agent.

Recommendations

Patients, who use a light box device at home, should only do so under physician supervision and they should be fully informed regarding possible adverse effects.

Further well-designed, randomized controlled studies are needed to establish the long-term efficacy, intensity-response relationship, the optimal treatment schedule and the long-term safety of light therapy treatment.

Physicians should follow the AHCPR principles when utilizing light therapy as a treatment for SAD.

AHCPR principles:

- Light therapy is a logical consideration only for well-documented seasonal, non-psychotic, winter depressive episodes in patients with recurrent major depressive or bipolar II disorders or milder seasonal episodes.
- It should be administered by a health care professional with experience and training in its use who deems it suitable for the particular patient.
- It may be a first-line treatment for these patients if they are not suicidal, and if there are medical reasons to avoid antidepressant drugs, if the patient has a history of a positive response to light therapy and no specific negative effects, if the patient requires it, or if an experienced practitioner deems it indicated.
- It may be a second-line treatment option after the patient has failed to respond to an adequate medication trial.

Appendix I: Methodology

Search Strategy
Evidence for this technology assessment was obtained from a search in the MEDLINE and HealthSTAR databases, spanning the years 1995 through October 2000 and limited to human subjects and English language articles. Search terms included seasonal affective disorder, seasonal affective depressive disorder, SAD, or SADD, combined with light therapy or phototherapy as subject words.

Literature Review
Although this assessment will only formally evaluate light therapy studies published in 1995 or later, some of the prior research will be mentioned briefly. The more recent studies conducted since 1995 are reviewed below and summarized in Table 1.

Terman et al. (1989) used a pooled clustering technique to analyze individual subject data from 14 research centers.[33] The analysis included 332 patients in studies conducted over a 5-year period to 1988. Overall, there were significantly more remissions for bright-light exposure, 2500 lux for at least 2 hours daily for 1 week, when administered in the early morning (53%) than in the evening (38%) or at midday (32%). All 3 times were significantly more effective than dim light controls (11%). While results were promising, these data were limited by the fact that depression scores were measured using the HDRS without the supplementary 8-item scale for atypical symptoms seen in winter depression.

Tam et al. (1995) conducted a review of treatment studies of SAD published between 1989 and 1995 that included studies of light therapy. The criteria for inclusion in this review were those studies that used clear diagnostic criteria for selection of subjects, a comparison group, and replicable outcome measures with blinded ratings. Many of the studies examined supported the efficacy of bright-light therapy using a fluorescent light box, with response rates of 36% to 75%. While the best studied protocol was 2500 lux white light for 2 hours, newer protocols developed during this time period used 10,000 lux for 30 minutes and appeared to have comparable response rates. A small number of studies investigated head-mounted devices and reported similar response rates but failed to show that the brighter light conditions were superior to putative dim light controls. Methodologic limitations of many of the studies included brief treatment periods, small sample sizes, and lack of replication.

At least 11 studies of light therapy have been published since 1995. Most of these studies were randomized controlled trials using a crossover and/or parallel-group study design. Three studies were uncontrolled cases series and one was a non-randomized controlled study.

In addition to addressing the main question of whether, in patients with winter SAD, bright-light therapy is an effective treatment, with benefit beyond its placebo effect, other questions addressed included:

- Timing of treatment, i.e., are there differences in response rates for light exposure at different times of the day, and what is the influence of short-term rank ordering of morning and evening light on response rates?
- Can the treatment be used as a prophylactic measure prior to the emergence of symptoms?

- What clinical factors predict response to treatment?
- Is the treatment effective for pediatric SAD?
- What is the effectiveness of dawn simulation compared with bright-light treatment?

The studies used different placebos, including low-dose artificial light, brief, low-intensity dawn simulation, clear goggles, sham deactivated negative ion generator, and low-density negative air ionization. In most studies, active treatment was bright artificial light using a light box, with intensities ranging from 2500 lux for 1 to 2 hours daily to 10,000 lux for 30 minutes per day. Treatm periods usually were 1 to 2 weeks, but ranged from a low of 4 days to a high of 4 weeks. In the Wirz-Justice study, natural light therapy, an early morning walk outdoors, was the active treatment. In another, Swedo et al., the active treatment included dawn simulation in addition to bright-light therapy later in the day.

Appendix II: Summary of Clinical Studies of Light Therapy for SAD

Key: ADHD, attention-deficit hyperactivity disorder; AL, afternoon light; AMS, Adjective Mood Scale; BDI, Beck Depression Inventory; CGI, Clinical Global Impression;

DLMO, dim-light melatonin onset; EL, evening light; HDRS, Hamilton Depression Rating Scale; MADRS, Montgomery Åsberg Depression Rating Scale; ML, morning light;

MP, morning placebo; NIMH, National Institute of Mental Health; SAD, seasonal affective disorder; SIGH-SAD, Structured Interview Guide for the Hamilton Depression

Rating Scale, SAD Version; TPQTridimensional Personality Questionnaire; tx, treatment; VAS or VAS-DEP, Visual Analogue Scale.

Authors	Study Design, Population, and Objective	Light Intensity, Apparatus, Outcome Measure, Response Criterion	Results	Comments /Conclusions
Meesters et al. (1995) Academic Hospital, Groningen, The Netherlands	Randomized crossover and parallel-group study to investigate effects of timing of light tx (differences in response rates for light exposure at different times of day; influence of short-term rank ordering of morning and evening light on response rates). 68 patients with winter SAD who were drug-free for ≥3 wks. 5 tx groups: 4 days of ML (I, n=14); 4 days of AL (II, n=15); 4 days of EL (III, n=12); 2 days of ML, 2 days of EL (IV, n=13); 2 days of EL, 2 days of ML (V, n=14).	10,000 lux for 30 min. Depressed mood assessed 3 x/day by AMS and VAS-DEP and by BDI on days 2, 5, 12, 19; severity of depression assessed using HDRS. Response criterion: Final HDRS score <8, w/ maximum of 50% of baseline score.	Response rates: I, 69%; II, 57%; III, 80% with no significant differences; IV, 67%; V, 50% with no significant differences (also no differences between these rates and I and III). Final.	Timing of light tx does not appear to be critical; short-term rank ordering of ML and EL does not influence x/day outcome.
Wirz-Justice et al. (1996) Psychiatric University Clinic, Basel, Switzerland	Nonrandomized controlled trial to compare effects of natural light with low-dose artificial light (placebo) and to relate clinical response to putative alterations of circadian rhythm phase. 34 volunteer patients (28 evaluable) with winter SAD. 2 tx groups: Morning natural light (n=20), morning low-dose artificial light (placebo) (n=8).	Natural light tx: Daily 1-hr early morning walk outdoors in sunlight, if present, for 1 wk. Artificial light tx: 2800 lux for 30 min/day for 1 wk. HDRS used to assess response: Decrease of ≥50% defined response, with score of <8 indicating remission of symptoms. Salivary melatonin and cortisol measured at dusk (onset of melatonin secretion) and dawn (offset).	Natural light tx significantly reduced depressive symptomatology; 65% responded and 50% showed remission of symptoms. Artificial light tx produced response in 50% of patients and remission in 25%. Morning walk phase-advanced onset and/or offset of salivary melatonin secretion and decreased morning cortisol. Low-dose artificial light did not modify melatonin or cortisol patterns.	Outdoor natural morning light exposure for 1 hr appears to be as effective an antidepressant as high-dose artificial morning light seen in a previous trial.
Terman et al. (1996) Columbia University and NYS Psychiatric Institute, New York, NY	Uncontrolled cases series to determine whether pattern and severity of depressive symptoms predict response to light tx. 103 volunteer patients with winter depression with seasonal pattern. Normal physical exam, lab results and ECG; no cataracts, glaucoma or retinal disease; free of antidepressant medications, no previous light tx .	First 2 yrs: 2500 lux fluorescent light for 2 hr daily for 7-10 days in morning, evening, or both. After 2 yrs: 10,000 lux for 30 min daily in morning or evening for 10-14 days with crossover. SIGH-SAD and CGI used to assess response: Responders had ≥50% reduction in SIGH-	71 (~69%) responders; 15 (~15%) nonresponders; 17 (~17% partial responders). Responders characterized by atypical symptoms, especially hypersomnia, afternoon or evening slump, reverse diurnal variation (evenings worse), and carbohydrate craving (effect size positive for these symptoms). Nonresponders characterized	Responders and nonresponders showed different clinical profiles when depressed. Light-responsive SAD distinguished by dominant atypical symptom profile associated with depressed mood, with nonresponders forming clinically distinct group with melancholic features.

		SAD score with score of ≤7 and CGI rating of 1 (very much improved) or 2 (much improved); partial responders had SIGH-SAD score reductions between 30% and 50% and CGI ratings of 3 (minimal improvement); nonresponders had SIGH-SAD score reduction <25% (or score increased) and CGI ratings of 4 (unchanged) or higher (worsened).	by melancholic symptoms, such as retardation, suicidality, depersonalization, typical diurnal variation (mornings worse), anxiety, early and late insomnia, appetite loss, and guilt (effect size negative). Ratio of atypical to classical symptoms of depression, not severity per se, best predicted tx outcome.	Authors question whether nonresponders should be diagnosed as having SAD. Thus, necessary to consider patient=s symptom profile in diagnosis and selecting tx for SAD.
Reichborn-Kjennerud and Lingjærde (1996) Gaustad Hospital, Oslo, Norway	Uncontrolled case series to examine personality disorders and temperament as possible predictors of response to light therapy for SAD. 42 volunteer patients with winter SAD (33 included in part of study concerning personality disorders and temperament). No psychotic symptoms, severe suicidal ideation, current alcohol or drug abuse, or significant somatic illness; no fluoxetine, no antidepressants for ≥2 wks prior.	Full-spectrum white light of 1500 lux for 2 hr each morning for 6 consecutive days (4 patients received 1 hr of tx); tx administered in specially equipped hospital room; ≤10 patients treated simultaneously. Extended version MADRS*: nonresponders had pre-tx to post-tx score reduction <30%; responders showed ≥50% reduction.	22 (52%) responders, 8 (19%) nonresponders; responders had significantly fewer previous episodes of SAD than nonresponders. Patients with any Axis II personality disorder were significantly less likely to respond to light therapy than those without Axis II pathology. Poor tx outcome also significantly associated with one or more personality disorders in cluster C, avoidant personality disorder, high number of positive criteria for self-defeating personality disorder, and high score on harm avoidance scale of TPQ.	Results suggest that personality disorder and temperament factors that predict poorer response to antidepressant medication in patients with non-seasonal major depressive disorder found in other studies also predict poorer response to light tx in SAD patients.
Swedo et al. (1997) McLean Hospital, Belmont, MA and NIMH, Bethesda, MD	Randomized, double-blind, placebo-controlled crossover trial to evaluate the efficacy of light therapy for tx of pediatric SAD. 28 volunteer children (age, 7-17 yr) with winter SAD. 2 tx groups: Active tx (1 hr bright-light therapy plus 2 hrs dawn simulation), and placebo tx (1 hr clear goggles plus 5 min low-intensity dawn simulation).	Active tx: Dawn simulation to maximum of 250 lux, bright-light (2500 lux for <9 yrs and 10,000 lux for ≥9 yrs) between 4 and 8 pm. Placebo tx: Dawn simulation to maximum of 2 lux, clear goggles between 4 and 8 pm. 1 wk baseline period (dark glasses) followed by 1 wk tx phase (active or placebo) followed by 1-2 wks washout period (dark glasses) followed by 1 wk alternate tx. SIGH-SAD-P^ (n=28) and SIGH-SAD-C^ (n=16) used to measure symptom severity.	SIGH-SAD-P depression scores significantly decreased from baseline during active tx compared with placebo, with no difference between placebo and control (washout) phases. Similar, but nonsignificant, trend for SIGH-SAD-C scores. 20 (71%) children had ≥50% decrease of symptoms during active tx compared with 7 (25%) during placebo tx. Post-tx survey: 78% of parents and 80% of children rated active tx as the one in which the child felt best.	Comorbid psychiatric diagnoses in 10 children (36%), including ADHD, learning disorder, separation anxiety disorder, and post-traumatic stress disorder may confound results. Preliminary results suggest bright-light therapy may be effective tx for pediatric SAD; however, future studies need to determine differential efficacy of dawn simulation and light box tx. Active tx was not associated with higher frequency of side effects and was well tolerated.
Lingjærde et al. (1998) Gaustad Hospital, Oslo, Norway	Randomized controlled study to compare dawn simulation with bright-light tx. 61 volunteer patients (age, 20-70 yrs) with winter SAD. 2 tx groups: Light box tx on an outpatient basis (n=34), dawn simulation tx in homes (n=27). No current psychiatric comorbidity, abuse of alcohol or drugs during previous year, significant eye disease, or suicidal risk.	Light box tx: 1500-2500 lux full-spectrum white light for 2 hrs in morning for 6 days; given simultaneously to ≤7 patients in same room. Dawn simulation tx: 60 or 90 min light augmentation time to 100-300 lux for 2 wks. Extended MADRS used to rate severity of symptoms; VAS used to measure patient=s ratings of improvement (main outcome measure). Responders reported ≥50% improvement.	Immediate response showed significant difference in improvement at end of tx period on VAS (dawn simulation group, 40%; light box group, 57%) and significant difference in number of responders (dawn simulation group, 9 [33%]; light box group, 22 [65%]). Most patients in light box group maintained immediate improvement throughout 9-wk follow-up period; however, maintenance of improvement more variable in dawn simulation group, with many showing gradual improvement, eventually reaching same improvement level as light box group.	19% of patients in dawn simulation group and 18% of patients in light box group were on current antidepressant tx. Losses to follow-up during 10-wk follow-up period: included 9 in dawn simulation group (33%) and 6 in light box group (18%). Results confirm authors= previous finding of marked and lasting effect of 1 wk of moderate light box tx in winter depression; 2 wks of dawn simulation appears to have a less marked but persistent effect.
Postolache et al. (1998) NIMH, Bethesda, MD	Uncontrolled case series to compare degree of improvement after light tx with mood improvement in the subsequent summer in patients with SAD. 15 patients with winter SAD. No comorbid Axis I psychiatric conditions, medical problems, psychotrophic medications.	10,000 lux cool-white fluorescent light for 45 min 2 x daily for 2 wks, then tx individually customized and gradually tapered in spring. SIGH-SAD used to rate mood: Response to light defined as ≥50% decrease in baseline score and total post-tx ≤7.	Patients' scores on depression scale significantly higher after 2 wks of light therapy in winter than during following summer.	Preliminary results suggest that 2 wks of light tx in winter is only partially effective when compared with summer; however, further studies are needed to determine whether summer's light or other factors are the main contributors to this difference.
Eastman et al. (1998)		~6000 lux; light box with 6 horizontally mounted cool-	No differences in expectation ratings; no differences in	

Rush-Presbyterian-St. Luke's Medical Center, Chicago, IL	Randomized placebo-controlled trial using a parallel design to determine whether light tx has a benefit beyond its placebo effect. 96 volunteer patients with SAD (usual criteria plus atypical symptoms of increased appetite or weight and increased sleep). 3 tx groups: ML (n=33), EL (n=32), MP (n=31). No complicating medical conditions, no psychotropic medications, no previous bright light or negative-ion tx; not permitted to drink alcohol or to drink caffeine within 6 hrs of earliest bedtime.	white fluorescent lamps. Placebo: Sham negative ion generator. Both groups treated 1.5 hrs/day, 6 days/wk for 4 wks. Depression ratings using SIGH-SAD performed weekly: Decrease in SIGH-SAD score to 50% of baseline and score of ≤8 (strict response criteria) identified those with complete or nearly complete remissions.	mean depression scores after 4 wks (patients improved over time regardless of tx group). Responders: ML 55%;, EL 56%, MP 52% after 3 wks tx; ML 67%; EL 75%, MP 48% after 4 wks tx. Statistically significant differences when strict response criteria used. % responders increased as weeks progressed, and ML produced best response rates; after 4 wks, ML 61%, EL 50%, MP 32%.	71 patients were evaluable. Bright-light tx was a better antidepressant for SAD than placebo, producing more full remissions, but difference only reached statistical significance at 3 wks.
Terman et al. (1998) Columbia University and NYS Psychiatric Institute, New York, NY	Randomized controlled trial using crossover design (morning/evening) balanced by parallel-group controls and nonphotic controls given negative air ionization to compare response to morning and evening light with response to negative air ions and to detect potential sequence effects 158 volunteer. patients with SAD (age, 18-65 yr) given 2 consecutive tx of 10-14 days each. 6 tx groups (2 crossover, 2 parallel, 2 nonphotic controls): ML-EL (n=27); EL-ML (n=20); ML-ML (n=19); EL-EL (n=19); high ion density both periods (H-H) (n=20); low ion density both periods (L-L) (n=19). Normal medical status, no other Axis I disorder, no suicide attempt within 3 yrs, no habitual sleep onset later than 1 am or awakening later than 9 am; required to abstain from psychotropic medications, alcohol, recreational drugs.	10,000 lux for 30 min/day; SPX-30 triphosphor fluorescent lamps encased in a metal box with a translucent plastic diffusing screen. Nonphotic controls treated for 30 min/day in the morning: High ion density, 2.7 x 10^6 ions/cm^3; low ion density, 1.0 x 10^4 ions/cm^3 Depression ratings using SIGH-SAD: Decrease in SIGH-SAD score to 50% of baseline and score of ≤8 (strict response criteria) identified those with complete or nearly complete remissions.	No differences in expectation ratings; no significant differences in depression scale % change scores of 5 active tx groups, but placebo control group (L-L) had significantly less improvement than other groups. Only sequence effect was response to EL reduced when preceded by tx with ML. Significantly higher response to ML than EL sequence using strict remission criteria, regardless of tx; remission rates during first tx period were ML 54%, EL 33% (*P*=0.04), H 20%, L 10.5%.	145 patients completed study; 124 patients were evaluable. Both bright light and high-density negative air ionization act as specific antidepressants in patients with SAD; since EL produced a higher response than low-density placebo, cannot conclude that EL is inactive.
Lewy et al. (1998) Oregon Health Sciences University, Portland, OR	Controlled trial with crossover and parallel-group comparisons to assess the antidepressant effects of morning vs evening light. 51 volunteer patients with SAD exposed to bright light for 2 hrs/day, and 49 matched controls. 2 tx groups: ML-EV and EL-ML. Good physical health, not suicidal, no psychotropic medications or other needs that interfere with endogenous melatonin production, no psychiatric or medical illnesses.	2500 lux for 2 hrs/day for 2 wks followed by 1 wk withdrawal and then crossed over to other schedule; 2 40-watt cool-white fluorescent tubes. DLMO used as a marker of circadian phase position. Behavioral SIGH-SAD ratings: Remission criteria were ≥50% decrease in rating and post-tx score of ≤14.	Parallel-group comparison during first tx period showed significant difference in % change scores from baseline (ML, 36%; EL, 8%) and significant difference in number of responders (ML, 8/27 [30%]; EL, 1/24 [4%]). Crossover group comparison combining both tx periods showed significant difference in % change scores from baseline (ML, 37%; EL, 17%) and significant difference in number of responders (ML, 19/51 [37%]; EL, 3/51 [6%]). DLMO: Patients delayed compared with controls at all weeks of study, mainly due to ML first patient group; morning light phase-advanced DLMO and EL delayed it.	ML more antidepressant than EL for each tx period (parallel-group comparisons) and for both periods combined (crossover comparison); antidepressant superiority of ML over EL greater in second tx period than in first; lack of carryover effect may be due to withdrawal week between tx periods. EL=s modest antidepressant effect may be due to placebo effect; however, since study lacked placebo control, this cannot be shown. Results are consistent with phase-shift hypothesis.

***** Extended with 4 items: increased sleep, increased appetite, carbohydrate craving, and fatigability. H Modified parent and child versions of

^ SIGH-SAD; similar to adult version but contain additional items to measure symptoms that are unique to children.

NOTE: All studies used light boxes to provide artificial light. In addition, the Wirz-Justice et al. (1996) study used natural light

for the active tx group and the Lingjærde et al. (1998) study used dawn simulation as one of the active tx group

Appendix III: Public Comment

The following statements were submitted to HTAC during the public comment period on this assessment. The workgroup and full Committee reviewed each statement and incorporated them into the report as the Committee deemed appropriate.

UNIVERSITY OF MINNESOTA

Twin Cities Campus | *Department of Psychiatry, Medical School* | *F283/2A West Building, 2450 Riverside Avenue, Minneapolis, MN 55454-1495*

November 29, 2000

Tania L. Hughes
Evaluation Facilitator
HTAC
121 East Seventh Place
Suite 450
St. Paul, Minnesota 55101

RE: Light Therapy for Seasonal Affective Disorder

Dear Ms. Hughes:

Thanks very much for allowing me the opportunity to review and comment on a technology evaluation for phototherapy for seasonal affective disorder. Overall I am most impressed by the thoroughness and quality of the summary and have only a few comments.

First, on page three in the executive summary it states that seasonal affective disorder is also called "seasonal affective depressive disorder". I was interested to see this because in all the years that I have had some interest (both clinical and from a research perspective) in SAD, I have never come across the term "seasonal affective depressive disorder", nor "SADD". I would strongly suggest that that be deleted from the summary if possible because if this term is used it is used only very, very rarely and it's presence is probably misleading.

Second, and most important by far, the summary and the body of the evaluation refer to light therapy as "an investigational treatment". This is an extremely unfortunate and I believe quite inaccurate designation. It may be true that it is still under study and it may that you are required by the FDA to refer to it as "an investigational treatment" but this is extremely misleading and seems to suggest that its efficacy is in doubt, or perhaps its safety or the most appropriate way to utilize it. In fact, its efficacy really have become very clear in the past few years and I think it is very fair to say that the level of evidence supporting phototherapy for seasonal affective disorder greatly exceeds that seen in other areas of medicine for a number of widely accepted devices and procedures.

The next suggestion that I would have is that the AHCPR principles of diagnosis unfortunately do not correctly handle the issue of seasonality. It is critical in assessing for the presence of SAD to look not only for a consistent seasonal recurrence of depressive symptoms but also to ensure that there are not significant depressive symptoms present at other times of the year, for example in the summer. If symptoms are present throughout the year it is probably much more prudent to take the approach of treating it as a more typical major depression. The recommendations also state "it may be a second line treatment option after the patient has failed to respond to an adequate medication trial". This is an area, in contrast to the use of phototherapy for SAD, that is not at all well worked out. Whether photo therapy is a useful adjunct in the treatment of nonseasonal major depression is at best questionable. Clinically I believe that there are some individuals who have depressive symptoms throughout the year but have a marked seasonal worsening in the fall and early winter and those individuals do seem to benefit from light but this has not been clearly proven.

Next, on page seven and at subsequent points throughout the document there is reference made to using light therapy at a 2500 lux level. At this point the standard is 10,000 lux. Most commercially available units provide this intensity, and experts in this field do not recommend lower intensity treatment. To the extent that this document is to serve as a guide for either patients or clinicians it does a disservice to speak of treatments below 10,000 lux, in my opinion.

Next, on page eight reference is made to the Hamilton Depression Rating Scale as a questionnaire but it is actually a rater scored instrument. The Beck Depression Inventory or the Montgomery Asberg Depression Rating Scale (which you do reference) would be examples of questionnaires to be filled out by individual patients. You do make the excellent point that these don't necessarily deal well with the somewhat atypical depressive symptoms seen in SAD; but the reality is that most people, even most mental health practitioners, are not appropriately trained in the administration of the Hamilton Depression Rating Scale. My guess is that there are not more than a couple of dozen individuals in the state of Minnesota who have actually formally been trained in its use and, in the absence of formal training, widely variable and unreliable scores are obtained.

On page 11, at the bottom, the evaluation comments on the issue of the emergence of suicidal thinking in the midst of phototherapy and concludes

that it is rare. It may be worth noting that it appears to be similarly a rare, but not unheard of, phenomenon in pharmacotherapy for depression.

On page 12 reference is made to treatment with Moclobemide; again, to the extent that this is a guide for clinicians, it is probably worth noting that Moclobemide is not available and to my knowledge will not become available in the States.

Finally, at looking at the HCPR recommendations, they do seem to imply that it is necessary to have a medical reason to avoid antidepressant drugs in order to employ pharmacotherapy; clearly, this is not an appropriate requirement for the employment of phototherapy.

Again, I am very impressed by the thoroughness of this review. It generally at least meets, if not exceeds, the quality of published reviews in this area. Thank you very much for affording me the opportunity to comment on it. If you have any further questions or if there is any way I could be helpful, please don't hesitate to contact me at 612-273-9807.

Sincerely yours,

Scott Crow, M.D.
Associate Professor of Psychiatry
University of Minnesota
President-Elect, Minnesota Psychiatric Society

gw

References

1. Agency for Health Care Policy and Research (AHCPR). Depression in Primary Care-Treatment-Clinical Practice Guidelines Online. Available at: Available at: http://www.AHCPR.gov/clinic/ Accessed on: 07-20-1999.
2. University of British Columbia/Vancouver Hospital and Health Services Center. Information about Seasonal Affective Disorder. Available at: hhtp://www.psychiatry.ubc.ca/mood/md_sad.html Accessed on: 04-13-2000.
3. Rosenthal NE, Sach DA, Gillin JC, et al. Seasonal affective disorder: a description of the syndrome and preliminary findings with light therapy. Arch Gen Psychiatry. 1984;41:72-80.
4. American Psychiatric Association (APA). Diagnostic and Statistical Manual of Mental Disorders: DSM-IV. 4th ed. Washington, D.C., American Psychiatric Press. 1994;pg.390.
5. Dalgleish T, Rosen K, Marks M. Rhythm and blues: the theory and treatment of seasonal affective disorder. Br J Clin Psychol. 1996;35:163-182.
6. Karel R. Light found to affect levels of serotonin. Available at: http://www.psych.org/psych/htdocs/pnews/97-02-07/light.html Accessed on: 04-14-1999.
7. Lee TMC, Blashko CA, Janzen HL, et al. Pathophysiological mechanism of seasonal affective disorder. Journal of Affective Disorders. 1997;46:25-38.
8. Partonen T, Lonnqvist J. Seasonal Affective Disorder. Lancet. 1998;352:1369-1374.
9. Wirz-Justice A. Beginning to see the light. Arch Gen Psychiatry . 10-1998;55:861-862.
10. World Health Organization (WHO). The ICD-10 Classification of Mental and Behavioral Disorders: Diagnostic Criteria for Research. Geneva, Switzerland, World Health Organization. 1993.
11. Partonen T, Lonnqvist J. Prevention of winter seasonal affective disorder by bright-light

treatment. Phsychol Med. 1996;26:1075-1080.
12. Depression and Anxiety Information Resources & Education Center. Canadian Consensus Guidelines for the Treatment of Seasonal Affective Disorder: A Summary of the Report of the Canadian Consensus Group on SAD. Available at: http://www.fhs.mcmaster.ca/direct/sad.html Accessed on: 03-31-2000.
13. Tam EM, Lam RW, Levitt AJ. Treatment of seasonal affective disorder: a review. Can J Psychiatry. 1995;40:457-466.
14. Saeed AA, Bruce TJ. Seasonal Affective Disorders. Am Fam Physician. 1998;57:1340-1346.
15. Avery DH. A turning point for seasonal affective disorder and light therapy research? Arch Gen Psychiatry. 1998;55:863-864.
16. Terman M, Terman JS, Ross DC. A controlled trial of timed bright light and negative air ionization for treatment of winter depression. Arch Gen Psychiatry. 1998; 55:875-882.
17. Terman M, Terman JS. Bright light therapy: side effects and benefits across the symptom spectrum. J Clin Psychiatry. 1999;60:799-808.
18. Levitt AJ, Joffert, Moul DE ea. Side effects of light therapy in seasonal affective disorder. Am J Psychiatry. 1995;152:1197-1202.
19. Terman M, Amira L, Terman JS, et al. Predictors of response and nonresponse to light therapy treatment for winter depression. Am J Psychiatry. 1996;153:1423-1429.
20. Eastman CI, Young MA, Fogg LF. Bright light treatment of winter depression. A placebo-controlled trial. Arch Gen Psychiatry. 1998;55:883-889.
21. Lewy AJ, Bauer VK, Cutler NL, et al. Morning vs evening light treatment of patients with winter depression. Arch Gen Psychiatry. 1998;55:890-896.
22. Swedo SE, Allen AJ, Glod CA, et al. A controlled trial of light therapy for the treatment of pediatric seasonal affective disorder. J Am Acad Child Adolesc Psychiatry. 06-01-997;36:6:816-821.
23. Reichborn-Kjennerud T, Lingjaerde O. Response to light therapy in seasonal affective disorder; personality disorders and temperament as predictors of outcome. J Affect Disord. 1996;41:101-110.
24. Lingjaerde O, Foreland AR, Dankersten J. Dawn simulation vs lightbox treatment in winter depression: a comparative study. Acta Psychiatr Scand. 1998;98:78-80.
25. Wirz-Justice A, Graw P, Krauchi K. 'Natural' light treatment of seasonal affective disorder. J Affect Disord. 1996;37:109-120.
26. Weeters Y, Jansen JHC, Beersma DGM, et al. Light therapy for seasonal affective disorder-The effects of timing. B J Psychiatry. 1995;166:607-612.
27. Lee TMC, Chan CCH. Dose-response relationship of phototherapy for seasonal affective disorder: a meta analysis. Acta Psychiatr Scand. 1999;99:315-323.
28. Lam RW, Tam EM, Shiah IS, et al. Effects of light therapy on suicidal ideation in patients with winter depression. J Clin Psychiatry. 01-2000;61:30-32.
29. MSN Health Channel, Sebastian L. 04-25-2000;(Overcoming Depression and Anxiety).
30. Lamberg L. Dawn's early light to twilight's last gleaming. JAMA. 1998;280:1556-1558.
31. Discovery Bay Lighting. Bright Light Therapy for seasonal depression, winter blues. Available at: http://www.dblighting.com/ Accessed on: 03-31-2000.
32. Apollo Light Systems. Brite Lite IV. Available at: http://www.apollolight.com/ Accessed on: 03-21-2000.
33. Terman M, Terman JS, Quitkin FM. Light therapy for seasonal affective disorder. A review of efficacy [abstract]. Neuropsychopharmacology. 1989;2:1-22.

For questions about this page, please contact our Health Policy, Information and Compliance Monitoring Division: hpsc@health.state.mn.us

See also > Health Policy, Information and Compliance Monitoring Division Home