

The Carlat Child Psychiatry Report

A CME publication

VOLUME 2, NUMBER 2

WWW.THECARLATCHILDREPORT.COM

MARCH 1, 2011

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The Pharmacological Treatment of Sleep Disorders in Children: An Overview

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Childhood sleep problems are common, and most practitioners wind up prescribing or recommending something for sleep for a significant portion of their patients. Impaired or insufficient sleep can account for many of the symptoms of childhood depression (low mood, irritability, low energy), as well as many of the symptoms of ADHD (inability to focus, daydreaming, hyperactivity, impulsivity), and even aggression and anxiety (O'Brien LM, *Child Adolesc Psychiatr Clin N Am* 2009;18(4):813-823). In this issue of CCPR, Dr. Adhami gives us lots to think about in terms of what might be impairing sleep, and Dr. Wright makes some excellent points about what may not be impairing sleep, as well as some interesting suggestions on how to treat sleep problems, real or imagined, without medication.

A large meta-analysis of psychological treatments for insomnia in adults found an average effect size over 0.8 (a large effect) for sleep onset latency and total sleep time and nocturnal awakenings, with the greatest improvement seen in patients using relaxation techniques

(Murtagh DRR and Greenwood KM, *J Consult Clin Psychol* 1995;63(1):79-89). Psychological treatments don't always translate well to children, though, particularly hyperactive ones, and some families are not able to follow through with practice.

In a survey of child psychiatrists, 90% had recommended some pharmacological intervention in the past month for sleep (Owens JA et al, *Sleep Med* 2010;11(7):692-700). In the accompanying table are several things commonly used for sleep, as well as my own thoughts about them and the research behind them, if any.

In many cases, however, treatment of the underlying disorder may be the treatment of choice for the sleep disorder as well. For example, in a study by Kallepalli et al in adolescent inpatients, trazodone was found to regularize sleep only three days faster, on average, than fluoxetine (Kallepalli BR et al, *J Child Adolesc Psychopharm* 1997;7(2):97-107). However, the converse can also be true: adults given prazosin for nightmares in the context of PTSD improved in overall symptomatology when their sleep improved (Gehrmann PR and Harb GC, *J Clin Psychol* 2010;66(11):1185-1194). For those kids who need a sleeper, the table on page 2 has a number of possibilities. Imipramine, desipramine, and zolpidem have been left off the table as there are studies showing a lack of efficacy for sleep in children.

Learning objectives for this issue: 1. Describe the medications used to treat insomnia in children and the evidence to support each. 2. Explain the association between insomnia and mood disorders in adolescents. 3. Define a circadian rhythm disorder and other sleep disorders common among children and adolescents. 4. Understand some of the current findings in the literature regarding psychiatric treatment. This CME/CE activity is intended for psychiatrists, psychiatric nurses, psychologists and other health care professionals with an interest in the diagnosis and treatment of psychiatric disorders.

Medications Used to Treat Insomnia in Children

Medication	Dose	Side Effects	Evidence (see code descriptions in footnote)	Notes
ALPHA 2 AGONISTS				
Clonidine (Catapres)	For sedation: 0.05 mg qhs initially, may increase every 3 to 7 days by 0.05 mg to 0.2 mg maximum	May cause grogginess in younger kids, as well as hypotension, arrhythmia, syncope	Found to decrease sleep latency (Code B). Found effective and safe for ADHD, with drowsiness abating after about six weeks (Code A) (Daviss WB et al, <i>J Am Acad Child Adolesc Psychiatry</i> 2008;47(2):189-198)	Children are often fast metabolizers of this medication, requiring frequent dosing if used for anything but sleep onset. Rebound tachycardia can be an issue, so taper medication when discontinuing, after long use
ALPHA 1 ANTAGONISTS				
Prazosin (Minipress)	For sedation: 2 mg qhs, or 0.05 mg/kg/day	May cause priapism (rare), palpitations, syncope, headache, rash, urinary frequency	Improves sleep in adults with PTSD (Code B) but few studies in other contexts	Helps with flashbacks and nightmares in adults with PTSD; may be useful for children who sleep poorly secondary to trauma or nightmares
ANTIDEPRESSANTS				
Mirtazapine (Remeron)	For sedation: 7.5 mg qhs	Increases appetite and causes sedation at low doses; effect disappears at higher doses. May prolong QTc interval	Improved sleep (and effective treatment of depression) in adolescents at day 85 on mean dose of 32 mg (Code C) (Haapasalo-Pesu KM et al, <i>J Child Adolesc Psychopharm</i> 2004;14(2):175-184)	Useful for those children with ADHD who also have anxiety or poor appetite
Trazodone (Desyrel, Oleptro)	For sedation, use 25 mg qhs	Risk of priapism, hypotension, QT prolongation	Some effectiveness as sleep aid (Code B) (Ware JC and Pittard JT, <i>J Clin Psychiatry</i> 1990;51:Suppl:18-22)	Requires you to discuss priapism with teenagers, but a rare side effect in this age group
Doxepin (Sinequan)	For sedation: 25 mg to 50 mg is standard but low dose therapy (1 mg to 6 mg) is being evaluated favorably in the elderly	Anticholinergic effects, orthostatic hypotension, rare bone marrow suppression, and photosensitization	Significantly increased sleep efficiency over placebo (Code A) (Hajak G et al, <i>J Clin Psychiatry</i> 2001;62(6):453-63)	May worsen REM sleep disorders. May increase risk of sudden cardiac death
ANTIHISTIMINES				
Cyproheptadine (Periactin)	For sedation, start at 2 mg qhs	Increase appetite: Average weight gain 5.5 pounds. May cause bronchospasm rarely, and thickening of bronchial secretions	Some effectiveness as a sleep aid (Code C) (Daviss WD and Scott J, <i>J Child Adolesc Psychopharm</i> 2004;14(1):65-73)	Not as sedating as diphenhydramine, but enough for many kids. Another approach to the weight loss and poor sleep that can be associated with stimulant use
Diphenhydramine (Benadryl)	For sedation, 12.5 to 50 mg qhs	Increases appetite and causes sedation at low doses; effect disappears at higher doses. May prolong QTc interval	Some effectiveness as sleep aid (Code A) (Russo RM et al, <i>J Clin Pharmacol</i> 1976;16(5-6):284-288)	Available over the counter, but common side effect of dry mouth may lead to cavities with frequent use. Did not help with restless or nightmares
Hydroxyzine (Vistaril)	For sedation, 0.6 mg/kg or 50 mg for children under 6, and 100 mg for children over 6	Dry mouth, nose, and throat; upset stomach; drowsiness; dizziness; chest congestion; headache; reddening of skin	Effective as a sleep aid and as an anxiolytic (Code B), safe for children (Code A)	Can intensify the effects of other meds, including benzos and TCAs. Use with caution in patients with asthma
HYPNOTICS & SEDATIVES				
Benzodiazepines	Varies by agent	Dependence, withdrawal seizures, impaired memory and coordination	Surprisingly little evidence given their ubiquity (for a review see, Witek MW et al, <i>Psychiatric Quarterly</i> 2005;76(3):283-296)	May improve night terrors. Sedation may wane over time. Effective half life hard to accurately predict. May impair learning and school performance secondary to the effect on memory
DIETARY SUPPLEMENTS AND HERBAL TREATMENTS				
Melatonin	3 mg to 15 mg qhs	Headache, vivid dreams, rare tachycardia	Of anything listed here, this has the most data showing safety and efficacy (Code A) (Smits MG, <i>J Child Neurol</i> 2001;16(2):86-92; Hoebert M et al, <i>J Pineal Res</i> 2009;47:1-7)	Available over the counter
Valerian root	500 mg valerian extract (with 120 mg hops extract)	Headache, excitability, arrhythmia	No evidence of effectiveness alone, although some when in combination with hops (Code B) (Koetter U et al, <i>Phytotherapy Res</i> 2007;21:847-851)	Available over the counter
Evidence Code Key: A=well-designed studies in children; B=some RCTs, but primarily in adults; C=open label studies in children; D=open label studies in adults				

Insomnia and Mood Disorders in Adolescents

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Dr. Wright has disclosed that he has no relevant relationships or financial interests in any commercial company pertaining to this educational activity.

Insomnia and sleep disturbance are common symptoms of depression in adults, but this is not always the case in adolescents. In fact, a group of researchers at the University of Pittsburgh who studied insomnia in depressed teens found that, compared to adults, insomnia in adolescents is different—very different.

A 2005 study examined sleep differences between 51 depressed teens and 42 of their non-depressed peers. All of the depressed teens reported insomnia, many complaining that they hardly slept at all most nights. Subjects were interviewed before and after spending three nights in the lab where their sleep was recorded with polysomnogram and video recorder. Participants completed standard measures of depressive symptoms and rated their sleep according to onset, total sleep time, number of awakenings, and ease of waking up the next day. The main finding of the study was that none of the depressed teens who complained of poor sleep actually slept poorly. As a group and as individuals, their sleep records were entirely normal (Bertocci MA et al, *J Am Acad Child Adolesc Psychiatry* 2005;44(11):1158–1166).

This finding was not unexpected. Indeed members of this group (see Dahl R et al, *Psychiatr Res* 1991; Vol 38(2):201–214) and others (Armitage R et al, *J Affect Dis* 2001;63(1–3):139–148; Emslie et al, *Arch Gen Psychiatry* 1990;47(2):119–124) have previously found an absence of EEG correlation with subjective sleep complaints in teens. Yet perhaps a separate analysis of the most depressed adolescents might find a weak correlation? What they found instead was the opposite: the teens who rated their depression the highest—and their sleep the worst—actually had the most normal polysomnograms.

In 2008, the group followed up this

study with the addition of a comparison group of anxious teens. Again they found that the depressed adolescents complained of insomnia but slept normally. However, the anxiety group reported better sleep than they actually had. Anxious adolescents apparently underreport sleep difficulties almost as much as depressed teens overreport them. This finding was unexpected. As the authors note, “Sleep problems and anxiety disorders have been linked at many points in the life span.” The anxious kids actually had more awakenings and more minutes awake than either the MDD sample or the controls, but they reported fewer. They did report slightly longer sleep latencies that were verified by the EEGs. But interestingly, their estimations of how long it took for them to fall asleep were less accurate than the other two groups (Forbes EE et al, *J Am Acad Child Adolesc Psychiatry* 2008;47(2):148–155).

Taken together, what do these studies tell us about insomnia in teen depression? First, they suggest that in this group reduced sleep is fundamentally a misperception similar to other somatic complaints. More severe depression is related to more *complaints* of sleep problems (and other depressive symptoms), but not to measurably impaired sleep. Like physical symptoms in somatization disorder, they are distressing but not real. The second implication of this work is trickier. How do we approach such a universally distressing symptom, knowing that it is actually a false perception?

Two researchers at Oxford University have shown that distorted sleep perceptions can be changed. Drs. Nicole Tang and Allison Harvey studied 40 adults, all of whom presented with a complaint of primary insomnia. Each subject kept a sleep log and wore an actigraph (an activity monitor) for three nights. They were asked to estimate their sleep onset latency and their total sleep time. Then half the subjects were shown the discrepancy between their perceptions and their actual sleep, while the other half were not. Both groups were tested for another three nights. The subjects who were shown evidence of their misperception did much better at follow up. Their pre-

dictions of their sleep onset latency and total sleep time improved, as did their anxiety around sleeping. And interestingly, their true sleep latency got shorter—consistent with less worry (Tang NKY and Harvey AG, *Behav Res Ther* 2004;42(1):27–39).

So maybe what our depressed teens need is not a medication but an actigraph. It just so happens there’s an app for that. For 99 cents, your tech savvy teens can download Sleep Cycle, a smartphone app that uses the accelerometer in the phone to measure and graph the user’s sleep cycle. They have to sleep with the phone, though, which can lead to texting all night with friends.

Finally, let’s give an assist to Mozart in the struggle to improve our kids’ sleep. A study from Taiwan showed that fifth graders given a 45 minute music CD to listen to at naptime and bedtime had improved sleep at the end of six weeks (Tan LP, *J Music Ther* 2004;41(2):128–150). One word of caution: we are not sure that fifth graders in America have “naptime,” so your results may vary. An even more impressive study of 94 youth (ages 19 to 28) from Hungary demonstrated a specific benefit on sleep quality and mood from listening to classical music (Harmat L et al, *J Adv Nurs* 2008;62(3):327–335). No follow up on whether it improved their dancing.

CCPR’s Verdict: We think these studies are important in furthering our understanding that “insomnia” in teens must be distinguished from distorted sleep perception. It is routine for many of us to at least consider prescribing a sleeping medication for insomnia coexisting with depression. We tend to focus simply on the risk versus benefit of adding a sedative/hypnotic because we assume that the sleep complaint is both accurate and biologically based. But is any medication indicated if neither is true? And finally, we might want to give special attention to a sleep history with our anxious young patients, even if they offer no complaints. They might benefit from sleep hygiene education or CBT interventions for a problem they don’t even know they have. Or maybe they just need a new cell phone.

Q&A
With
the Expert

Expert Interview

Normal and Disordered Sleep in Kids
Seema Adhami, MD

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Dr. Adhami has disclosed that she has no relevant relationships or financial interests in any commercial company pertaining to this educational activity.

CCPR: Dr. Adhami, let's begin by having you tell us who you are and what you do.

Dr. Adhami: I'm a pediatric neurologist by training, and I have a keen interest in sleep medicine. At present, I am one of the two physicians, the other being a pediatric pulmonologist, involved in running a pediatric sleep clinic at UMass Medical Center.

CCPR: Sleep is so important, especially for children. What types of services are offered at a sleep clinic?

Dr. Adhami: Sleep is something that really affects all walks of life and all stages of a child's development. It encompasses many disciplines, but the two main ones that are involved in the evaluation and management of sleep disorders and sleep related problems are pulmonology and neurology. Sleep clinics provide evaluation of sleep related problems and sleep disorders, sleep studies when indicated, and treatment for specific sleep disorders, as well as information and advice regarding ways to instill good sleep habits and optimize sleep.

CCPR: At what age do you start to see most sleep disorders?

Dr. Adhami: Sleep problems can occur at any age—and are often different depending on age. Little kids can have problems with sleep onset association, that is, the set of circumstances that they associate with falling asleep, which can lead to problems sleeping through the night. Teenagers are particularly prone to sleep related problems and erratic sleep patterns that may develop into disorders.

CCPR: Teenagers are notorious for having irregular sleep patterns, right?

Dr. Adhami: That is correct. Very few teenagers get enough sleep. Teens should be getting between 9 and 9.25 hours of sleep at night (Mindell JA, Owens, JA. *A clinical guide to pediatric sleep: diagnosis and management of sleep problems*. 2nd ed. Wolters Kluwer, Lippincott Williams & Wilkins; 2010. 12–27). However, most high school kids actually get 7 to 7.5 hours of sleep (National Sleep Foundation. Sleep in America poll, 2006). It is important to know the average sleep needs of a teenager as a starting point in assessing problems.

CCPR: As child psychiatrists, what kinds of things should we be looking for to alert us that there might be a sleep issue?

Dr. Adhami: At any age, not just for teens, one should watch for symptoms related to daytime functioning. Is the child irritable? Is he or she moody? In adults, sleep problems are more likely to cause daytime sleepiness, but less so in children. In children, the manifestations are more likely to be moodiness, irritability, or hyperactivity. Most parents know that when their children are overtired they become irritable and little things set them off.

CCPR: So hyperactivity is a symptom of poor sleep?

Dr. Adhami: Yes, absolutely—in children, hyperactivity and moodiness may be symptoms of poor sleep. Sometimes it can be hard to differentiate the cause of these symptoms, but considering sleep as a possible factor is important. For instance, if you have a child who was doing well and is going through a period of inattention, hyperactivity, moodiness, and irritability, it is worth finding out if anything has changed in regard to sleep.

CCPR: What sort of questions should we ask to find this out? Just, "How is Susie sleeping?" or are there more specific details we should be looking for?

Dr. Adhami: Some of the screening questions we might use for "Susie" are: Does your child maintain a regular sleep schedule on school days and non-school days? Does she have any problems at bedtime? These could be problems falling asleep or bedtime resistance. Does your child sleep through the night or does she wake up multiple times a night and then cannot go back to sleep on her own? Does she snore? Have you noticed any problems with her breathing while asleep? Are there any unusual behaviors during the night? Is she excessively restless in sleep? How easy or difficult is it to awaken your child in the morning? When she wakes up, is she alert and ready to start the day or really sleepy and groggy? Is she sleepy or overtired during the day? How is her daytime energy level?

CCPR: One of the common complaints we hear from parents about the sleep habits of teenagers is, "Junior sleeps all weekend." What do you make of that?

Dr. Adhami: In reality, most teenagers are not getting the optimal 9 to 9.25 hours of sleep each night. There is a concept of "sleep debt." If kids are getting an hour less of sleep than they need each night, by the end of the week they have a five hour sleep deficit. This impacts how much they sleep over the weekend. When they can, teenagers will make up for the sleep debt that accumulates during the week on weekends.

CCPR: And is this okay?

Dr. Adhami: Not really. They end up with irregular sleep habits. In general, bedtime should not vary for any child, including teenagers, by more than half-an-hour to an hour between week nights and weekends. What happens with teens is that they wake up at noon or later on a Saturday afternoon, go to bed really late Saturday night, and sleep even later Sunday. Come Sunday night, they are unable to go to sleep at a reasonable time, even if they want to. The net result is that they will have to wake up early for school on Monday morning very groggy and having had inadequate sleep, and will not be able to catch up during the week.

CCRP: And is there also a theory that teens are just night owls by nature?

Dr. Adhami: In adolescence, there is a natural “phase delay” or a shift toward later sleep onset and wake times. An inconsistent sleep schedule makes this worse. The combination of these two things: the natural shift in the sleep phase, and a tendency to have an inconsistent sleep schedule due to staying up late, can be very detrimental and may precipitate a circadian rhythm disorder, which teenagers are vulnerable to.

CCRP: What is a circadian rhythm disorder?

Dr. Adhami: “Delayed sleep phase disorder” is a circadian rhythm disorder. Our natural sleep-wake cycle, or the human circadian rhythm, does not follow an exact 24-hour clock. It is a little longer than that. Our bodies want to follow this intrinsic clock, but are synchronized, or “entrained,” to the 24-hour-day cycle by environmental and behavioral cues, such as exposure to light, timing of meals, and even alarm clocks. Sleep-wake schedules that are not consistent, especially in teenagers with physiological phase delays, can get desynchronized. Ideally, teens would go to bed whenever they wanted and get up when they had had enough sleep, but that’s not how the world works. Teenagers with circadian rhythm disorders have no difficulty falling asleep when they go to bed at a later time, usually after midnight, and they have no difficulty maintaining sleep. So these kids won’t have a history of difficulty falling asleep when they are able to go to bed when they feel sleepy late at night or in the early hours of the morning, and they won’t have a history of difficulty staying asleep. Left to sleep, they will get their required amount of sleep and wake up feeling refreshed. However, when they need to wake up early for school, they will be severely sleep deprived. Then, although they might feel tired during the day, they won’t go to sleep until their circadian rhythm kicks in again. Gradually, due to the desynchronization of the natural circadian rhythm and the 24-hour-clock, their whole pattern of sleep may be reversed. So if they could, they would sleep during the day and stay up at night. That, as you can imagine, plays havoc with their lives.

CCRP: So how is a circadian rhythm disorder diagnosed?

Dr. Adhami: The presenting symptom is usually inability to wake up at a reasonable time or excessive daytime sleepiness. A sleep physician will take a detailed history about sleep habits and sleep-wake patterns in the previous several months and exclude the presence of sleep disruptors, such as snoring or excessive restlessness while sleeping, which may be causing these symptoms. Asking the youngster to maintain a sleep diary, showing sleep and wake-up times, can be a useful tool. Sleep studies are not indicated for these disorders. The diagnosis is clinical, based on the typical pattern. In some ways, it is a free running biological clock that has taken over and is uncoupled from the 24-hour clock.

CCRP: And how is this treated?

Dr. Adhami: It usually doesn’t work to just say, “Go to bed earlier.” Even if a teenager is willing to try this, his or her body won’t be ready to sleep at an earlier time, as the difference between actual sleep time and desired sleep time is usually several hours. It is much easier to move the sleep time even later. So if Junior goes to bed at 3 am most nights, you start by delaying bedtime by two to three hours daily. The first day he goes to bed at 5 am, then at 7 am, and so on until the desired bedtime, say 10 pm, is reached over a period of seven to 10 days. No naps are allowed once awake after seven to eight hours of sleep. This requires motivation on the part of the adolescent and help from a family member to make sure that the youngster does not nap or go to sleep before the appropriate time each day. This is obviously best done during time off from school. Once the bedtime has gone all the way through the day to a reasonable time at night, the challenge is to maintain consistent sleep and wake times. This process is easier said than done. Motivation is key.

CCRP: What are some of the other common sleep disorders?

Dr. Adhami: Sleep apnea or sleep disordered breathing is one. Snoring is the most common symptom. Children snore for all kinds of reasons, like colds and allergies, but if a child habitually snores, it is worth considering sleep disordered breathing, particularly if there are also concerns regarding behavior, irritability, tiredness during the day, or difficulty waking up in the morning. Sometimes, in more severe cases, parents observe that the child appears to stop breathing or seems to be choking while asleep, then snorts and starts breathing again. Sleep disordered breathing or sleep apnea is suspected clinically and is diagnosed by an overnight sleep study.

CCRP: How is this treated?

Dr. Adhami: Children have relatively small airways. If a child is having sleeping problems related to an airway issue, we try to treat it medically or surgically, rather than hooking him or her up to a continuous positive airway pressure device (CPAP) like we do for adults. Treatment might be as simple as decongestants like saline nasal washes, steroid nasal sprays, and treatment

Normal Sleep Requirements for Healthy Kids

Age	Naps	Nighttime Sleep	Total Sleep (per 24 hours)
Birth to 2 months	Irregular sleep pattern spaced throughout day and night		10 to 19 hours
2 months to 12 months	2 to 4 hours	9 to 10 hours	12 to 14 hours
1 year to 3 years	1 to 3.5 hours	9.5 to 10.5 hours	11 to 13 hours
3 years to 5 years	Variable	Variable	9 to 10 hours
6 years to 12 years	none	9 to 10 hours	9 to 10 hours
13 years to 18 years	none	9 to 9.25 hours	9 to 9.25 hours

Continued on Page 8

Research Updates IN PSYCHIATRY

DEPRESSION

Girls More Likely to Have Recurrent Depression

The Treatment for Adolescents With Depression Study (TADS) taught us that fluoxetine (Prozac) plus cognitive behavioral therapy was superior to medication alone or placebo for short-term recovery from major depressive disorder (MDD). But TADS didn't tell us anything about long-term recovery. Researchers recently conducted a naturalistic follow-up study of participants in TADS to determine the incidence of long-term recovery from MDD, and predictive factors for recurrence.

For this study, 196 participants in TADS were followed for up to five years after the start of that study to monitor recovery and recurrence of MDD. Recovery was defined as the absence of clinically significant symptoms of depression for eight weeks or longer, and recurrence was defined as a new episode of depression after a period of recovery.

Almost all of the adolescents who were followed recovered from depression (96.4%) at some point. Of those who recovered, 91.5% did so by two years after enrollment in the trial. Recovery was not associated with having been in the most efficacious treatment group (Prozac plus CBT) in TADS, but rather was most strongly associated with having been a responder to short-term (12 week) treatment (as opposed to being a partial responder or a nonresponder, regardless of which treatment the participant responded to).

However, by the end of the five-year follow-up period, 46.6% of participants had a recurrence. The other 53.4% stayed well through the end of the follow-up period. The mean time from recovery to recurrence was 22.3 months.

Sex was the strongest predictor

of recurrence, with 57% of females experiencing recurrence of MDD vs 32.9% of males (Curry J et al, *Arch Gen Psychiatry*; Nov 1, 2010;online ahead of print).

CCPR's Take: The good news is that most of the adolescents recovered; however, as seen elsewhere, earlier onset of symptoms predict a worse lifetime course: in this case, more frequent recurrence than later onset (adult) depression. This study also reminds us that there are gender differences in depression. Adolescent females are more likely to become depressed, and this study shows that they are also significantly more likely to experience more than one episode of depression.

PSYCHOTHERAPY

Single Therapy Session Works to Reduce Violence and Alcohol Misuse

Often, adolescents most at risk of problems with violence and alcohol abuse are the hardest to reach through traditional means. Because many at-risk youths may not have primary care or attend school regularly, a group of researchers recently studied the effectiveness of a brief intervention in decreasing violence and alcohol misuse among adolescents in a Flint, Mich, hospital emergency department.

Over the course of three years, more than 3,000 patients between the ages of 14 and 18 presenting to Level I ER between noon and 11 pm, 7 days a week, completed a computerized survey to assess for aggression and alcohol use. Based on positive reports of alcohol consumption and violence, 726 patients were randomized to one of three conditions: a 35-minute interactive computer intervention (n=237), a 35-minute intervention with a therapist (n=254), or the control group, which

was given a brochure (n=235). The interventions involved motivational interviewing techniques, personalized feedback, and training and role play aimed at reducing alcohol misuse and aggression. Computerized follow-up assessments took place at three and six months.

At six months, participants in the therapist intervention had the greatest reports of reductions in severe peer aggression (-37.7% vs -26.2% computer group and -28.4% control group), negative consequences related to violence (-28.9% vs -27.4% computer group and -24.3% control group), binge drinking (-20.3% vs -15.5% computer group and -19.9% control group), and consequences related to alcohol use (-32.2% vs -29.1% computer group and -17.7% control group). Participants from the computer intervention group showed the greatest reduction in reports of any experience of peer violence (-18.6% vs -12.7% therapist group and -7.1% control group) (Walton MA et al, *JAMA* 2010;304(5):527-535).

CCPR's Take: The best computer program in the world can't provide the nuanced, personal responses one gets from a human being, so it comes as no surprise that in most cases the therapist intervention was more successful than the computer intervention. In some cases, in fact, even the control group performed better than the computer intervention. However, a single, brief, 35-minute session with a therapist did show positive results for kids with histories of alcohol use and aggression, particularly in regard to instances of severe peer aggression and consequences related to alcohol consumption. This is good news for at-risk kids who are not very likely to have the means or the desire to show up for weekly therapy appointments.



CME Post-Test

As a subscriber to CCPR, you already have a username and password to log on www.TheCarlatChildReport.com. To obtain your username and password, please email CME@thecarlatreport.com or call 978-499-0583.

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Below are the questions for this issue's CME post-test. This page is intended as a study guide. Please complete the test online at www.TheCarlatChildReport.com. Note: Learning objectives are listed on page 1.

1. In a 2010 survey of child psychiatrists, how many had recommended some pharmacological intervention in the past month for sleep (Learning Objective #1)?
 a. 5%
 b. 15%
 c. 50%
 d. 90%
2. Of the following treatments for insomnia in children, which has the most data supporting its safety and efficacy (LO #1)?
 a. benzodiazepines
 b. melatonin
 c. prazosin
 d. valerian root
3. Bertocci et al found that among teens who rated their depression highest and the quality of their sleep the worst, what was actually true (LO #2)?
 a. they had the most normal polysomnographs of the group studied
 b. they had the most abnormal polysomnographs of the group studied
 c. they had comparable polysomnographs to a group of anxious teens
 d. they had significant and severe insomnia when compared to their non-depressed peers
4. Which of the following is a circadian rhythm disorder, according to Dr. Seema Adhami (LO #3)?
 a. sleep apnea
 b. sleep disordered breathing
 c. delayed sleep phase disorder
 d. periodic limb movement disorder
5. In the Curry et al study, what percentage of girls had a recurrence of MDD by the end of the five year study period (LO #4)?
 a. 21%
 b. 32%
 c. 57%
 d. 85%

To earn CME or CE credit, you must read the articles and log on to www.TheCarlatChildReport.com to take the post-test. Please see the pre-test listed below to prepare for this month's post-test. Learning objectives are noted on page 1. You must answer at least four questions correctly to earn credit. You will be given two attempts to pass the test. Tests must be taken by March 15, 2012.

PLEASE NOTE: WE CAN AWARD CME CREDIT ONLY TO PAID SUBSCRIBERS

Your evaluation of this CME/CE activity (ie, this issue) will help guide future planning. Please respond to the following questions:

1. Did the content of this activity meet the stated learning objectives? LO.#1: Yes No LO.#2: Yes No LO.#3: Yes No LO.#4: Yes No
2. On a scale of 1 to 5, with 5 being the highest, how do you rank the overall quality of this educational activity? 5 4 3 2 1
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5. How long did it take you to complete this CME/CE activity? ___ hour(s) ___ minutes

6. **Important for our planning:** Please state one or two topics that you would like to see addressed in future issues.

Expert Interview ————— *Continued from Page 5*

of allergies for kids with chronic allergies, or the removal of tonsils and adenoids to increase the size of the airway.

CCPR: Any other disorders we should know about?

Dr. Adhami: One that's not as common, but quite disruptive to sleep, is periodic limb movement disorder. This condition is a cousin of restless legs syndrome, but unlike restless legs syndrome which is bothersome when the patient is awake, periodic limb movement disorder occurs while a child is sleeping. The child is excessively restless in sleep. Parents may find blankets, sheets, and pillows on the floor in the morning and the child may be at the wrong end of the bed. Excessive movement, usually of the legs, causes frequent small arousals or disruption to sleep. The effect is similar to sleep deprivation even though the child is apparently sleeping through the night. Periodic limb movement disorder is diagnosed on sleep studies and usually responds to treatment with supplemental iron.

CCPR: And how do we know to look for this?

Dr. Adhami: The symptoms are those of not getting enough sleep—irritability, hyperactivity, moodiness, daytime sleepiness. A sleep study confirms sleep disruption and shows excessive periodic leg movements.

CCPR: Thank you, Dr. Adhami.



March 2011

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