

The Bipolar Child Newsletter

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The Morning Battleground: Why Bipolar Kids Can't Get Up and Get Going

Does this sound familiar?

Yesterday morning it took an hour-and-a-half attempting to get him up. We kept shaking him, beseeching, threatening, beseeching anxiously.... We even called his cell phone thinking he might pick it up for a friend's call. He simply growled, muttered something we would have preferred not to hear, and turned over and went back to sleep.

We finally did see him rise from the bed and we ran the shower thinking that might wake him up. Ten minutes later we found him in the bathroom curled up on the bath mat, sound asleep.

A father detailed his family's three-stage morning routine with their six-year-old daughter:

I carry her downstairs to the living room sofa. I leave the room and my wife pulls off her pajamas and dresses her while she's still asleep (that's stage one). Stage two: We help her into the kitchen, although she's still very groggy, sit her in a chair, and give her an "injection of breakfast" by shooting a GoGurt (yogurt in a squeezable tube) in her mouth. Stage 3: We carry her to the bathroom and help her brush her teeth, etc. Then we put on her coat and go outside and wait for the bus (or shall we say, the bus waits for us). Sometimes.

Every morning, in America and abroad, many parents of bipolar children wake up and experience dread as they prepare to get their children up for school. Contrary to cheery television commercials where families gather around quaffing fresh-squeezed orange juice, these parents often forgo that fantasy and mount a siege simply to get their children out of bed.

It's a tall order. While it may seem as if the child or adolescent is behaving in an oppositional manner, a great many of these youngsters actually suffer from something called *sleep inertia*.

What Is Sleep Inertia?

Sleep inertia is a transitional state of lowered arousal occurring immediately after awakening from sleep and producing a temporary decrement in any subsequent performance. Studies show that sleep inertia can last from a few minutes to four hours. Youngsters with bipolar disorder are far closer to the latter than the former. One 17-year-old girl described her attempts to get up in the morning this way:

I feel as though my *insides* are whining. I will do anything not to get up. Sleep is more important than anything in the world. I could sleep until 4:00 in the afternoon.

I never think about it from my mother's point-of-view. I don't think *anything*. When I do get to school (after much yelling by my mother and me back at her), I have my head on the desk until somewhere around 11:00 in the morning. Right before lunch I seem to truly get up.

Several factors are involved in sleep inertia. A child may be depressed and chronically tired, or the thought of facing the school day may produce waves of anxiety or panic, forcing the child to choose sleep or somatic complaints over the trial of going into the school environment. In many cases, the medications may be

causing an early-morning sleepiness.

We do know that children with bipolar disorder have disturbances in the architecture of their sleep—they have sleep/wake reversals and are activated at night and slowed-down in the morning. There is considerable evidence in the adult literature to suggest that several elements of the sleep/wake cycle are altered in people suffering with mood disorders.

The Typical Architecture Of Sleep

Normally throughout the night a person experiences two kinds of sleep that alternate rhythmically. One is called rapid eye movement (REM) sleep, during which most dreaming takes place; the other (not surprisingly) is called non-REM.

Non-REM sleep has a four-stage development plan as revealed by electroencephalogram (EEG) sleep studies. Sleep typically begins the night with a light stage 1 sleep where the brain waves are small and fast. After approximately 30 minutes, the sleeper slips deeper into sleep as Stages 2, 3, and 4 of non-REM sleep progress. EEGs of Stage 3 reveal larger and slower brain waves. Stage 4 brain waves are large, slow, and regular and this is the deepest period of sleep.

After approximately 90 minutes, a brief period of REM sleep appears. This is the dreaming state and the eyeballs can be observed moving rapidly beneath the eyelids. A 90-minute oscillating pattern develops with REM sleep asserting itself for longer periods of time. The first 90-minute cycle might consist of 85 minutes of non-REM sleep and 5 minutes of REM, but by the time the fourth cycle rolls around, it might consist of 60 minutes of non-REM and 30 minutes of REM.

But all is not so regular. As Drs. Mark W. Mahowald and Carlos H. Schenck of the Minnesota Regional Sleep Disorders Center at the University of Minnesota Medical School have written:

The rapid oscillation of states or the inappropriate intrusion of elements of one state into another may result in the appearance of parasomnias (night terrors, restless leg syndrome, teeth grinding, sleep walking, and confused arousals). Given the large number of neural networks, neurotransmitters, and other state-determining substances that must be recruited synchronously, and given the frequent transition among the three states of being, it is surprising that parasomnias do not occur more often.

A significant number of children with bipolar disorder do seem to be suffering several of these parasomnias, especially night terrors and confused arousals.

It may be that children and adolescents are being asked to get up and go to school when they are in the deepest, slow-wave pattern of sleep. Sleep research has shown that abrupt awakenings during a slow wave sleep episode produce more sleep inertia than awakening in stage 1 or 2 when the brain waves are small and fast. Awakenings during a REM episode produces some sleep inertia, but not as much as awakenings during slow-wave sleep.

Research is also revealing that sleep inertia is more intense when awakening occurs near the trough—the low point—of the core body temperature as compared to its peak. Sleep/wake irregularities, as well as irregularities of the thermoregulatory system, contribute to sleep inertia.

Thermoregulatory Disturbances

Children with bipolar disorder often have irregularities in their thermoregulatory systems. They are hot all the time—even when the ambient temperature feels cold (often very cold) to everyone else. Parents struggle

constantly to get them to wear jackets in winter. In addition, it is not uncommon to see their ears turn beet red.

Scientists have found that the rapid onset of sleep occurs when the blood vessels in the skin of the hands and feet dilate and cause heat loss at the extremities. This causes the core body temperature to lower. A group of researchers, Drs. Kurt Krauchi, Christian Cajochen, and Anna Wirz-Justice, noted this functional relationship between core body temperature and sleepiness, and hypothesized that the opposite would also be true: the *constriction* of blood vessels would raise the core body temperature and the human being would come to a state of wakefulness. (Think colder at night and the onset of sleepiness; and warmer in the morning and the onset of wakefulness.)

The authors write:

The circadian clock prepares the thermoregulatory system for vasodilation to begin in the early evening as sleepiness increases, followed by a drop in core body temperature. Even lying down increases sleepiness by redistributing heat in the body from the core to the periphery. Turning out the light is a complex cognitive and physiological signal that also leads to vasodilation. There is a tight correlation between the timing of the endogenous *increase in melatonin in the evening and vasodilation*, an effect that is mimicked by pharmacological doses of melatonin. Before bedtime, then, many overlapping events orchestrate the thermoregulatory overture.

Could irregularities in the timing of melatonin release—a peptide known to reduce core body temperature and induce sleep—be a factor in the increased activity level seen at night and the marked sleep inertia seen in the morning? Melatonin, produced in the pineal gland, is secreted into the cerebral spinal fluid at dusk and diminishes its effect at dawn.

The pineal gland is a small reddish-gray structure that sits near the center of the brain. Its name is derived from the Latin word for "pine cone" because early viewers glimpsed a resemblance. The pineal gland has a story of its own.

The Pineal Gland

All vertebrates possess a pineal gland, and in certain reptiles and birds the gland is situated close enough to the top of the skull to monitor the intensity of sunlight. This "third eye" appears to help animals adjust to changes in the day-light cycles of the yearly seasons. Seventeenth-century philosopher Rene Descartes, thought the human pineal to be the seat of the rational soul; early 20th-century scientists felt that the buried-down-under human pineal had been abandoned by the roadside of human evolution.

Not so. In the mid-sixties, researchers discovered that the pineal gland secretes an important hormone called melatonin. As we mentioned above, it is a sleep-inducing hormone thought to have a part in the synchronization of circadian (daily) rhythms. In animals, melatonin influences seasonal breeding patterns. Its secretion is at the highest levels in winter.

Today scientists accept that a kind of biological clock in the human organism establishes a fundamental daily rhythm for bodily functions such as temperature, the release of cortisol, rest/activity cycles, and the secretion of melatonin. But nature has built some flexibility into a human being so that the body can adjust to the ever-changing environmental rhythms—such as longer and shorter days in the summer and winter.

Apparently some people do not adjust so easily. Dr. Alfred Lewy, director of the Sleep and Mood Disorders Laboratory at Oregon Health and Science University, hypothesized that certain depressed people have a desynchronization in their 24-hour internal clock rhythms. For instance, their sleep, temperature, and cortisol cycles may be in synchrony with each other, but be out of step with other 24-hour rhythms, thus causing their internal rhythms to run a few hours behind or ahead of schedule. They either start and stop releasing

melatonin earlier than usual (leading to evening sleepiness and early-morning awakening), or start and stop releasing melatonin later than usual (leading to difficulty sleeping at night as well as difficulty getting up in the morning). Exactly what is seen so often in children with bipolar disorder.

What Can Be Done About Sleep Inertia?

A good plan of attack would be to discuss the timing of medications with the treating physician. If one or more of the meds is contributing to morning grogginess, than it might help to administer the drug at an earlier time the day before. If anxiety is causing school refusal, the doctor or therapist may ease the fears of the child by helping him or her deal with the anxiety. Cognitive therapy may be particularly helpful.

It is important that parents and teachers recognize that many children with bipolar disorder have co-occurring learning disabilities and executive function deficits, and that these deficits make school embarrassing and dispiriting. Rather than get up and go to school and fail, the youngster may prefer to sleep. Neuropsychological testing will reveal these problems, and the IEP of the student can accommodate these disabilities and make the child or adolescent less anxious.

Phototherapy, or light treatment, may entrain the rhythms and phase shift the dysregulation many of these children have. Some parents have reported that a dawn simulator is helpful in getting their children out of bed.

If the prescribing doctor thinks a trial of melatonin is a good idea, he or she will discuss the timing and dosage. In a pilot study, one of the authors of this newsletter (D.F.P.), found that 3-6 mg of melatonin given approximately 20 minutes before bedtime, not only enhanced the earlier onset of sleep, but in a number of cases abolished sleep-arousal disorders such as night terrors. A more restorative sleep ensued. Since melatonin is known to lower core body temperature, this may explain one of its effects on the regulation of the sleep/wake cycle.

Remember the parents who had to squirt GoGurt in their daughter's mouth each morning? They told us that they began to give her melatonin each night and she can now get up, get dressed, and eat without the aid of her parents (and Gogurt is no longer the only staple of her morning menu).

Melatonin requires more study, and no one is certain of its long-term effects, nor will it work for everyone. Naturally, much depends on the causes of the sleep inertia.

Until the sleep/wake cycle is regulated (and your child may always be more of an owl than a lark), an accommodation in the school day may have to be made. It might help if the student is allowed a later start, and it would be wise to schedule all academics later in the morning and in the afternoon when he or she would be more cognitively available for learning.

During the writing of this newsletter, a mother emailed us her philosophy and mantra. She speaks of her "during the school-year child" and her "summer vacation child." Because her son has learning disabilities, as well as sleep inertia, he feels anxiety, and even has small panic attacks upon arriving at school. She wrote:

Each school morning for me, as a mother, is an adventure. I try not to worry in advance because I never know what each morning will bring me from my son. Is it a good morning for him, or a bad morning? I only find out when HE finds out.

I try not to get anxious or too pushy, but of course sometimes I lose control, especially if there's a meeting I absolutely can't miss, or if I have a doctor's appointment.

I need to be aware of myself, my attitude, my temper, even my breathing. I do my best to slow

down, speak reasonably, and gently, and offer whatever alternatives work. I have even been known to offer bribes because I know that once he gets to school, his anxiety usually evaporates and I receive reports later about "what a good day he had." *I need to look at a bad morning as not necessarily a permanent all-day condition.*

She concluded by saying:

So my Mom mantra for a school day morning is: (1) Greet each day as a new day. (2) Prepare for different contingencies. (3) Maintain my calm, no matter what. (4) The more agitated my son gets, the calmer, slower, and gentler I get. (5) Take my time: it is more important for him to get to school, than it is important that he get to school on time. (6) Learn to cut my losses, and give up on the day if necessary. (If my son gets too agitated, I have to learn that it's not the end of the world if he doesn't get to school that day.)

In my opinion, it's hard to give consequences for behavior that is brain-induced or slowed down by meds. We just try to impress upon him what we expect from him, what the school expects from him. It can be a moment-to-moment experience.

In Conclusion

From all of the above, it is easy to surmise that morning alertness is dependent upon a complex set of factors: side effects of medications; chemical cascades that affect sleep architecture, thermoregulation, and mood; as well as the subjective feelings of the child when that morning alarm rings—*anxiety, depression, or stress*. No one can predict any one factor, several may be contributing, and all must be examined in order to find a solution for the child. The school administration and IEP team must understand the biological and psychological factors at play and accommodate the morning difficulties which, after all, are not volitional or oppositional on the part of the child.

We hope the above discussion helps parents who dread the split-second timing of a school morning, realize that they are not alone, and that they are not inadequate if the morning is tumultuous. For a while, at least, it is going to have to be okay if the child goes to school without breakfast, or leaves looking like he or she has just rolled out of bed (which he or she probably has).

Hopefully one of the suggestions above, and an understanding of what may be happening for the child at reveille, will result in a less gut-wrenching start to the day.

We'll write again soon. Meantime, let us hear from you. We both wish you and your children more gentle mornings.

All best,

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Bibliography

Krauchi, K., Cajochen, C., and Wirz-Justice, A. "Waking up properly: is there a role of thermoregulation in sleep inertia?" *Journal of Sleep Research* 2004; 13: 21-127.

Krauchi, K., Cajochen, C., and Wirz-Justice A. "Warm feet promote the rapid onset of sleep." *Nature* 1999; 401: 38-39.

"Light" (Talk of the Town). *New Yorker*, January 14, 1985.

Papolos, D. and J. *Overcoming Depression, Third Edition*. New York: HarperCollins, 1997.

Papolos, D. and J. *The Bipolar Child, Revised Edition* (Chapter 11). New York: Broadway Books, 2002.

Papolos, J. and D. "Night Terrors." *The Bipolar Child Newsletter*, July 2000, Vol. 4 (www.bipolarchild.com).

Reiter, R. "The Pineal Gland: An intermediary between the environment and the endocrine system." *Psychoneuroendocrinology* 1983; 8: 31-41.

Tassi, P. and Muzat, A., "Sleep Inertia." *Physiological Behavior* 1999; 68: 55-61.

Wehr, T., Goodwin, F., and Wirz-Justice, A. et al. "48-hour sleep-wake cycles and manic-depressive illness." *Archives of General Psychiatry* 1982; 39: 559-565.

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ADDITIONAL NEWS: (New on the JBRF Web site)

The Child Bipolar Questionnaire (CBQ) is a concise behavior-and-symptom inventory developed by the Juvenile Bipolar Research Foundation's director of research, Demetri Papolos, M.D. Alone, or in combination with other psychiatric rating scales, the CBQ may prove to be an effective screening tool for early-onset bipolar disorder. A parent can complete the questionnaire online and print it out for the diagnosing physician. [Click here](#) for printer-friendly downloadable copy.

The Juvenile Bipolar Research Foundation (JBRF) has been seeking families throughout the nation who have two or more children diagnosed with early-onset bipolar disorder for an affected sib pair genetic study. Since August of 2003, over 400 such sibling pairs have been identified and the researchers are very grateful to all of the parents who have responded. If you are a new subscriber to this newsletter, have two or more children diagnosed with the disorder, and would like to know more about this study, please contact Janice Papolos at jpapolos@jbrf.org for more information. To read an FAQ about this study, please visit JBRF's Web site at <http://www.jbrf.org>.