

Dim the lights on teen night owls

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Dim lights, board games and no bedside electronics: an old-fashioned sleepover? Not exactly. This overnight takes place at the University of California, Berkeley, and involves dozens of undergraduate research assistants, some in white lab coats and goggles, who collect saliva samples to gauge the hormone levels of teenage night owls.

UC Berkeley's Teen Sleep Study is a unique four-year experiment to reset the biological clocks of adolescents who have trouble going to sleep and waking up. It's specifically aimed at 10- to 18-year-olds whose bedtimes range between 10:40 p.m. and midnight. Most participants are between ages 14 and 16 and some have reported bedtimes later than 2 a.m. To qualify, sleep-deprived teens must also suffer from one or more emotional, social, behavioral or academic problem.

A sleep-deprived generation

"Huge numbers of kids want to come here to get this treatment," said Allison Harvey, a UC Berkeley [psychology professor](#) and principle investigator of the Teen Sleep Study, which is conducted at the Golden Bear Sleep and Mood Research Clinic. "They're using electronics or doing homework until late at night, and so we're looking at ways to help them wind down earlier. Some of them are stuck in vicious cycles and they need help."

With easy access to Facebook, Twitter, tablets and smartphones, not to mention later curfews and bedtimes, the need for sustained quality slumber among youth is reaching a critical mass. Earlier this month, U.S.

Education Secretary Arne Duncan put in a plug for later school start times, arguing that the teenage brain has trouble rallying in the early mornings.

"One of the common things we hear from the teenagers is that they try to get to bed earlier, but can't get to sleep, or they have trouble getting their day started. It's stressful for everyone in the family," said Kerrie Hein, director of the Golden Bear Sleep and Mood Research Clinic and the study's chief logistics czar.

The semester's first overnighiter

Last Friday (Sept. 20) marked the semester's first overnighiter for 27 new recruits. After eating dinner, they arrived at the campus's Tolman Hall with pajamas, toothbrush, books and homework in hand. There to get them settled in for the night were their "sleep buddies," undergraduate research assistants whose job it is to support study participants and keep them engaged and on task.

"You have to keep them entertained—else they might get bored—while still maintaining professionalism in that we're here to run a study and collect data," said Ben Greenberg, a junior majoring in psychology and the sleep buddies team leader.

The Teen Sleep Study piloted in fall 2012 with a half-dozen teenagers and began in earnest this spring with eight participants. At least two dozen teens are expected to complete the study this fall, and at least 170 by the time the study ends in 2016, at which time the results will be reported. Advertised on fliers and in school newsletters and online communities such as the Berkeley Parents Network, among other venues, it's generating a lot of interest among sleep-deprived San Francisco Bay Area families.

The strategies used in the study include motivational interventions and chronotherapy (controlling light and the timing of sleep cycles), as well as "wind-downs such as meditation, yoga or soaking up nature," Harvey said.

"If we are able to shift bedtimes successfully, melatonin onset will shift along with the new behavioral habits of the new bed and wake times," she added. As a result, participants should begin to benefit from improved sleep patterns.

Each six-week study session begins and ends with a sleepover at the clinic, and includes six sessions with a sleep coach, five interviews, and the use of an Actiwatch, a special watch which records activity levels throughout the day and night. At their first overnight, participants keep their regular bedtimes, no matter how late. Over the course of the program, Harvey expects the teens will have adjusted to an earlier bedtime schedule.

Manipulating the circadian rhythm

While the human circadian rhythm or sleep-wake cycle typically tips toward less sleep at the onset of puberty, the bright lights associated with electronic gadgetry, in addition to social pressures and other distractions, are setting adolescents' biological clocks even later than previous generations. Researchers have found that the bright light conditions created by electronics can suppress melatonin, a hormone that helps regulate the cycle.

"Younger kids are really enjoying that beautiful slow-wave sleep, and may not be as impacted by light," Harvey said. "But in adolescence, that deep slow-wave sleep starts to diminish and darkness is really needed for the melatonin to kick in."

To manipulate the sleep environment to naturally regulate melatonin production, Harvey and fellow researchers bring the teens into the clinic to play quiet games in a dimly lit room and then go to sleep in a dark room with no distractions.

Undergraduate research assistants drive the study

Undergraduate research assistants who recruit, screen, track, monitor, process lab samples and provide moral support, are what makes the Teen Sleep Study run. Overall, the teen study participants seem more comfortable hanging out with and confiding in young college students than with graduate students and faculty researchers.

"We play Monopoly and poker, and teens bring stuff to work on, like homework," said Greenberg, a Marin County native who did his first sleep coaching stint in the spring. "They're excited to get on a good sleep schedule, and they trust us that everything will go smoothly."

Not surprisingly, many sleep buddies tend to be night owls themselves, which makes it easier for them to work overnight shifts and grab a few hours of shut-eye in the clinic lounge.

Take Grace Wang, a triple major in psychology, molecular and cell biology and nutritional science who began her first sleep buddy volunteer stint on Friday. She says she gets, on average, two or three hours of sleep a night due to studying, volunteering, student club responsibilities and checking in with her friends and family members in Taiwan, which is 15 hours ahead of the San Francisco Bay Area.

Another first-time sleep buddy is Rachel Kang, a senior in psychology. She says working multiple jobs while studying has put a major dent in her sleep schedule, but she's hoping to turn that around. "I'm trying to get off caffeine and get more sleep, and I'm starting to feel better," she said.

A San Jose native, Kang has been pleasantly surprised by the phone conversations she has had with potential study participants. "They're surprisingly together," she said.

Still, she noted that the teens she has contacted are "under a lot of pressure" and technology plays a big part in their lives: "When I was growing up, not everyone had a cell phone. Now everyone does, and that's huge," she said.

Wang concurs: "When I was their age, I had an electronics curfew. I didn't have a cell phone until my senior year," she said. "Now they're on their smartphones and computers before they go to [sleep](#), and they're all on Facebook. It's a different world."

That said, she was reassured to see their excitement at Friday's overnight. "The teens grew slightly nervous after their parents left, but we ended up spending quality time together, playing board games, watching movies, listening to music, and chatting. Best sleepover ever."

Provided by University of California - Berkeley

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