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Host: We're talking today with Dr. David Trujillo about sleep. Welcome Dr. Trujillo.

Sleep expert Dr. David Trujillo: Thank you. Thank you for inviting me.

Host: First, let me ask about people who don't get enough sleep at night. What's the cause of this?

Dr. Trujillo: Well, some people have health issues that cause their sleep problems. They have trouble breathing while they sleep, or they may have some pain. These are medical problems.

Host: OK, so some sleep problems are medical. But not all of them?

Dr. Trujillo: Right. Other sleep problems are caused by lifestyle habits.

Host: Such as?

Dr. Trujillo: Well, habits related to technology. Before we had electricity in our houses, we all went to sleep when it got dark. There was no choice! There wasn't any light! But now, especially with technology going 24 hours a day, the computers and televisions and mobile phones ...

Host: ... Now we can find reasons to stay awake all night!

Dr. Trujillo: Exactly. And some of this technology actually causes sleep problems. So we can't fall asleep easily.

Host: Really?

Dr. Trujillo: Yes, the problem is the light from screens—the electronic screens on our phones and computers and televisions.

Host: That prevents us from sleeping well?

Dr. Trujillo: Well, the light from screens has more blue light than regular sunlight. And that blue light actually makes our body feel more awake. In fact it takes about an hour or two to start feeling sleepy again after watching a screen.

Host: Wow. So this is a problem for all of us!

Dr. Trujillo: I'm afraid so. Unless, somehow, you can exist without your device ...

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Speaker: First, let's start with the sleep habits of children. Children need much more sleep than adults. For instance, newborn babies—babies just one to three months old—need up to 16 hours of sleep each day. They need sleep to grow, and for their brains to develop. So it's clear that sleep is very important for young babies. OK, the next thing ...

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Professor Ruth Brooks-Hall: E01 How many of you got enough sleep last night? Huh, not so many. OK. Well, that's what we're going to cover today—the issue of sleep deprivation, not getting enough sleep. Now, you might say, "Sleep deprivation? Why is this a public health problem?" In fact, there are many serious consequences of not getting enough sleep. So we'll first look at the immediate impact—problems that it causes in your daily life. And then we'll look at the long-term effects—problems that grow over many months or years—especially concerning our health. **(COACHING TIP 1) E02** Let's start with a definition of sleep deprivation. Most adults need seven to nine hours of sleep every night. So, if you get less than seven hours of sleep on most nights, you'll start suffering from sleep deprivation. Lack of sleep has serious effects on the brain—on our ability to think and to function properly. Without a sufficient amount of sleep, we think more slowly. We have trouble making decisions. We make more mistakes and have trouble remembering things. So basically, anything to do with memory, making decisions, thinking—all of these are affected by the lack of sleep. And this is happening to many people. Recent studies show that 40 percent of adults get less than seven hours of sleep each night. So that means four out of ten adults are suffering from sleep deprivation. **E03** So let's talk about the immediate effect of not getting enough sleep, and how it can affect us in every aspect of our lives. **(COACHING TIP 2)** For instance, at school. How many of you have stayed up all night to study for a big test? Uh-huh. Well, research shows that in order for us to remember new information, we first need to sleep. It's interesting, right? Sleep assists our memory. So when we sleep, we consolidate and we strengthen our long-term memory. So if you don't sleep enough, learning is harder. In fact, some studies have shown a connection between the amount of sleep students get and their grades in school. Students who get less sleep get lower grades! **E04** Now let's think about work. On the job, sleepy workers cause many workplace accidents. One example is in the medical field. Doctors in hospitals often have to put in long shifts and stay up all night. One recent study looked at doctors who stayed awake all night working 30-hour shifts. It showed that these tired doctors were seven times more likely to make mistakes on these long shifts than on regular shifts when they got enough sleep. Seven times! These mistakes injured people and even killed patients. **(COACHING TIP 3) E05** Another place where the immediate effects of sleep deprivation is illustrated is on the road, in car accidents. Did you know that

tired drivers cause 20 percent of car accidents in the US? That's about 1,500 deaths and more than 7,000 injuries each year. Many of these accidents occur when tired drivers fall into "micro-sleep," which is falling asleep for several seconds. These people may look awake—their eyes are open—but their brain is asleep. They can't hear anything around them or see anything. It may only happen for a few seconds, but that's long enough to go through a red light, to drive off the highway, or to hit another car. **E06** So, those are all immediate, day-to-day problems caused by when you're trying to function when you're too tired. But there are also long-term consequences of sleep deprivation—especially to our health. For example, there's a link between lack of sleep and weight gain. Studies show that people who get less sleep are more likely to be overweight. When people are tired, they actually get hungrier and eat more than when they're well rested. They also have more time to eat because they're awake. All this adds up to weight gain. In addition, people who get less sleep are more likely to get sick and to have serious health problems. One study concluded that women who sleep less than five hours a night are 40 percent more likely to have heart problems, compared with women who get eight hours of sleep every night. Forty percent— that's a much higher risk! **(COACHING TIP 4) E07** The scariest thing about sleep deprivation is that most people don't realize that there are dangers! They continue to go to work when they're tired or to drive a car when they're sleepy. And, over time, they may begin to suffer from serious health problems caused by their lack of sleep. But they don't realize the cause. **E08** It's clear we need stronger health education programs to teach people about this problem—to make them realize that they should get enough sleep each night. With more sleep, people will do better at school, be safer at work. And they won't have as many car accidents, and they'll be healthier in the long run. Everyone needs this information. **E09** And that's what I want to look at next, how to educate people about the problem of sleep deprivation. We'll look at one educational program that was recently started ...

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- 2 So basically, anything to do with memory, making decisions, thinking—all of these are affected by the lack of sleep.
- 3 For instance, at school. How many of you have stayed up all night to study for a big test?
- 4 In fact, some studies have shown a connection between the amount of sleep students get and their grades in school.
- 5 Now let's think about work.

- 6 But there are also long-term consequences of sleep deprivation—especially to our health.
- 7 For example, there's a link between lack of sleep and weight gain.
- 8 In addition, people who get less sleep are more likely to get sick and to have serious health problems.
- 9 But they don't realize the cause.
- 10 It's clear we need stronger health education programs to teach people about this problem.

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Molly: That lecture was really good, but I missed a few details. Could we compare notes on some things?

Rob: Sure.

Molly: So, how much sleep does a normal person need? Does anyone have that?

Alana: Uh-huh. She said seven to nine hours, so eight hours on average, right?

Ayman: Right. I had a question, too. I wrote down: "Sleep deprivation is a public health issue because it has daily and long-term effects." Is that right?

Rob: Uh-huh, I have that same thing, basically.

Ayman: So that means it affects the public's health, in other words.

Rob: Right. But I think it's also a public health issue because it affects so many people, directly and indirectly.

Ayman: Oh, good point.

Alana: I have a question, too. Can anyone explain the connection between sleep and memory?

Molly: Yeah, I have that in my notes. This is really interesting to me—that in order for people to remember new information, you have to get a full night's sleep. That sleep "consolidates and strengthens" our long-term memories.

Ayman: That means sleep makes our memories stronger.

Rob: Well, sleep doesn't seem to make my memory any stronger.

Ayman: That's because you're sleeping during class!

Rob: Oh ha ha ha.