A study published March 16, 2016 in the International Journal of Cardiology found that compared with people who slept between six and eight hours a night, the risk of dying of coronary heart disease was greater for people who slept less than four hours a night and more than eight hours a night, particularly for women and older adults.

It was reported March 8, 2016 in Medical Daily.

What was this study seeking to determine?
The study sought to determine if there was any association between how long people sleep each night and their risk of death from coronary heart disease.

Who were the subjects? Was the size of the study unique?
Health care providers followed 392,164 adults over the age of 20 in Taiwan who came for a health check between 1998 and 2011. The participants were asked how long they slept at night. During the follow-up period, 711 of the participants died of heart disease. This is the single largest study examining how sleep duration affects the risk of dying from cardiovascular disease.

When and for how long were the subjects followed? What did the researchers measure? How did the researchers measure the data?
The subjects were followed for an average of 9.7 years. At the outset, subjects reported how long they sleep as fitting into one of four categories: between zero and four hours, between four and six hours, between six and eight hours, or greater than eight hours.

Researchers determined death from coronary heart disease through a Taiwanese government database that tracks causes of death for the population.

The researchers estimated the association of sleep duration with death from coronary heart disease while controlling for various factors that affect the risk for coronary heart disease mortality. These factors included education, marital status, age, sex, body mass index, blood pressure, blood sugar levels, cholesterol levels, smoking, alcohol use, physical activity level, and previous cardiovascular disease or diabetes.

What were the results?
The authors found that too much or too little sleep is linked with an increased risk of certain types of heart problems. Sleeping less than four hours or more than eight hours a night is associated with coronary heart disease.
with an increase in the risk of dying from coronary heart disease, such as heart attacks and unstable angina. Women and the elderly who sleep too little or too much were particularly at risk. There was a 50 percent increase in death in participants who slept fewer than four hours compared with participants who slept between six and eight hours. After adjusting for other risk factors, the risk of heart-related death still increased by 36 percent. Individuals who slept more than eight hours a night had a 53 percent increased risk of dying from coronary heart disease compared with participants who slept between six and eight hours per night. After adjusting for other risk factors, the risk was still 28 percent higher for those sleeping more than eight hours. The increased risk was not explained by the use of sleep medications.

Did the study reveal any differences concerning women or other subgroups?

Yes. Women who slept less than four hours or more than eight hours per night had a higher risk of dying from coronary heart disease when compared with men who slept similarly. Compared to women sleeping six to eight hours a night, women sleeping less than four hours increased the risk of dying of coronary heart disease by 82 percent, and sleeping more than eight hours increased risk of dying from coronary heart disease by 95 percent. This trend was not seen in men.

In addition, people 65 and older who slept less than four hours or more than eight hours per night also had slightly higher risk of dying from coronary heart disease when compared to people younger than 65 who slept similarly. The impact of age was not as statistically strong, possibly because there were only two coronary heart disease-related deaths among those under 65.

Did the researchers offer an explanation for the results? What are the possible mechanisms behind the danger of getting too little or too much sleep? Could the lack of sleep or excess sleep be symptoms of an underlying problem rather than a cause?

The researchers controlled for various factors that could contribute to the risk of dying from cardiovascular disease and still found that sleep patterns predicted risk. According to the researchers, short sleep duration leads to activation of stress responses, which in return is accompanied by increased heart rate and blood pressure — all strong risk factors for coronary heart disease. Shorter sleep duration may also cause obesity and diabetes, which are other risk factors for heart disease.

In the study, people who slept more than eight hours a day had a higher likelihood of health conditions such as hypertension, diabetes, and heart disease. That may have been a possible explanation for this group of people to have a higher risk of dying of coronary heart disease.

The authors also acknowledge that part of the explanation could be due to factors for which researchers lacked information and that could potentially be associated with both increased cardiovascular risk and prolonged sleep. Such factors might include unemployment, low socioeconomic status, depression, or sleep apnea.

The authors conclude that the association of long sleep duration and cardiovascular disease remains unexplained.

Does this research fall in line with previous studies? Was anything surprising?

This study partly supported findings from previous studies. But prior large-scale prospective studies did not look at death specifically from coronary heart disease. A review and analysis...
of 15 prior studies found that short sleep (less than five or six hours) and long sleep (more than eight or nine hours) were associated with a higher risk of developing coronary heart disease or dying.

**Were there any shortcomings in the study design? More data that could have helped? Is there anything that could have been done better?**

Yes, the few shortcomings were as follows:

1. Sleep duration was not assessed in an objective manner with direct observation of the participant. Instead, a questionnaire was used. And the self-reported sleep duration data were only collected at the beginning of the study, not during the follow-up period when sleep patterns may have changed.

2. The coronary heart disease mortality was determined through linkage to the Taiwanese cause-of-death register, the accuracy of which could not be confirmed.

3. The mean age of the study participants was 40, and studies have shown that the prevalence of coronary heart disease in this age group is lower than in older populations. This reduced the researchers’ ability to detect small effects and generalize the results to older people.

4. The researchers had no information on the prevalence of sleep apnea or depression, both of which are established risk factors for cardiovascular disease.

5. The study was from a health checkup program run by a private company, and the participants came from an advantaged social and economic position compared to the general population.

**How should people apply the results of this study to their sleeping habits? Would you warn your patients against over-sleeping?**

This study was done in a population from an East Asian country, with the study participants averaging 40 years old. This may limit the ability to generalize the findings to other populations. However, the results reinforce the need for optimum sleep duration, which is likely seven to eight hours per night, especially for women and older adults. I would advise my patients that adequate sleep should be considered part of a healthy lifestyle that also includes exercise, weight management, and cardiac risk factor assessment and treatment.