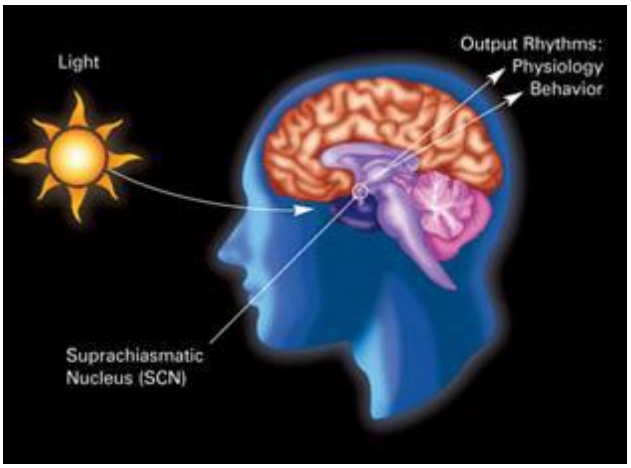
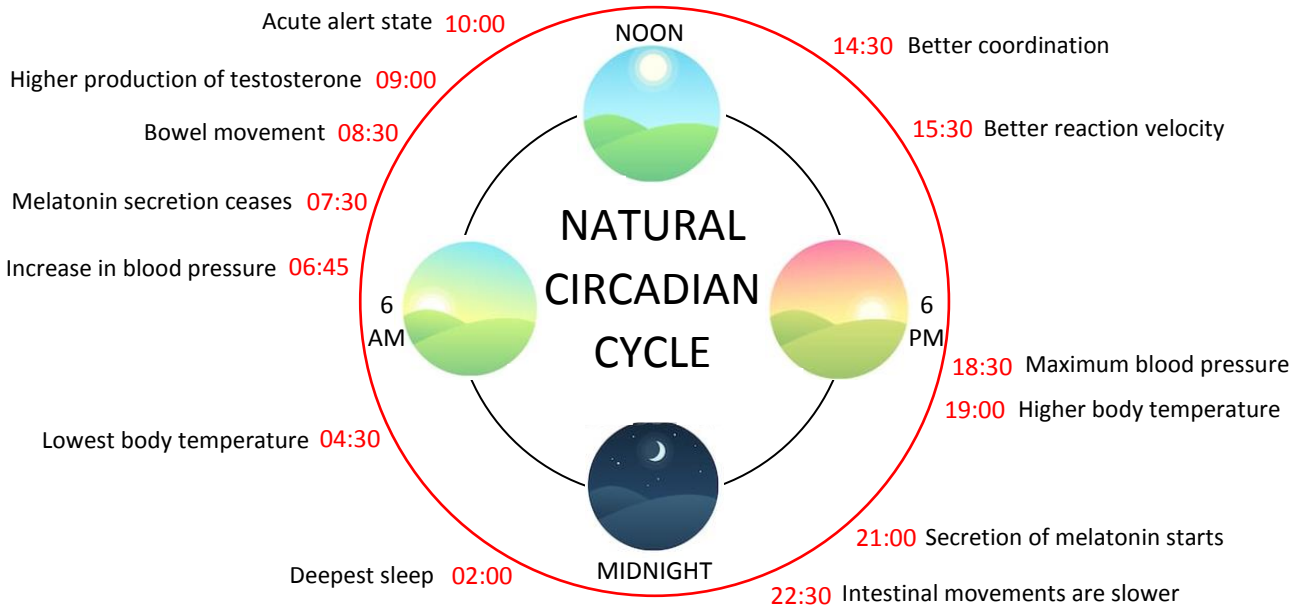
Guidelines: Balanced Lifestyle

The unique research into the body's biological clock system and its 24-hour rhythms called circadian rhythms earned a Nobel prize to three medical physiologists in 2017—Drs. Hall, Rosbash, and Young. The circadian rhythm science gave the world an insight into how natural biologic functions of the body follow precise timings. When humans lose harmony with the natural circadian rhythms, they fall victim to dysfunction and disease. The master clock of the body is in the brain, and it is stimulated or awakens with morning sun or daylight. The brain clock responds to 24-hour cues of light and dark and controls all body functions; digestion, metabolism, hormonal balance, sleep-Wake, and activity cycles. ***(Note: For details review the section of brain clock and healthy eating, sleep and activity behaviors on the website.)***



The Brain Clock—The Master Controller

(illustration credit: NIGMS.nih.gov)



Natural Daily Circadian Rhythms Controlled by the Brain Clock

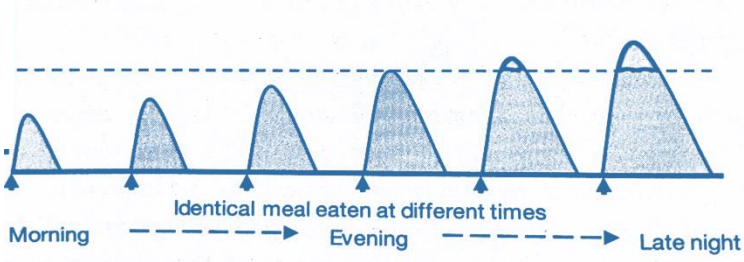
Keeping a lean disease-free body requires one to have a balanced lifestyle in addition to eating holistic plant-based food. The balanced lifestyle is about keeping a disciplined approach to the following four parameters:

1. When to Eat

Eating time influences the digestion of food, glucose utilization, and the quality of sleep.

- ***Digestion of food***. The absorption, digestion, and metabolism of the food are at best during the daylight hours. The intestinal movement and the digestive enzymes slow down after 10 PM (see the picture above on natural circadian cycle). The food consumed after 8 PM will not move along the digestive tract at the usual speed and will not get digested properly (see the risks of late-night eating below).

- ***Glucose utilization.*** During the daylight hours, the body requires more energy for physical activity. Glucose from the food is the primary fuel for energy and insulin is the hormone which helps the body in utilizing the glucose fuel for making energy. During the day, the demand for the energy is high, the body remains more sensitive to the insulin and uses up glucose more efficiently. At night, physical activity slows down, and the energy needs become minimal. The body shifts gears and uses glucose for making reserve energy such as fat for later use. Even if one were to eat similar meals at different times of the day, the blood glucose levels would be lowest during morning hours, and highest in the late evening and night hours (see picture below on glucose l el versus meal times). Late-night eating after 8 PM will invariably lead to higher blood gluco levels, abnormal fat storage, and obesity, even if one eats healthy meals.



Glucose Blood Levels vs, Meal Times
(from "The Circadian Code" by Satchin Panda, 2018)

- ***Sleep quality.*** Late-night eating is also disruptive to deep rejuvenating sleep. When food enters the digestive tract, it increases the blood flow, causing an increase in the body's core temperature (in Ayurveda called Jathar-Agni). For deep rejuvenating sleep to occur, the core

temperature must come down by a degree. After a meal, it takes the body almost two to three hours to cool down for good sleep. Late-night eating after 8 PM, therefore, is disruptive to sleep.

Risks of late-night eating (after 8 PM):

- ***Weight gain***. As outlined above, the body is less sensitive to insulin at night and cannot utilize glucose efficiently for energy. The unutilized glucose gets converted to reserve energy fat. Late-night eating invariably leads to weight gain, even if one is eating the healthiest meals.
- ***Acid reflux disease.*** By the natural circadian cycle (see picture above), the intestinal activity slows down at 10:30 PM. The food consumed after 8 PM does not get digested properly and does not move along at usual speed in the digestive tract. The food stasis and poor digestion causes acid reflux, indigestion, bloating, and constipation. Merely shifting dinner time before 8 PM and eating natural foods will take care of all these digestive problems.

- ***Excessive hunger***. Staying awake late at night increases the level of the hunger hormone ghrelin. Excessive ghrelin leads to food cravings and overeating. Late sleeping and excessive eating of sugary foods go together, and that makes two reasons which lead to overweight and obesity.

- ***Poor sleep***. Ideally, there should be a time difference of 2-3 hours between a night meal and sleep time. The late eating and poor sleep go together because of the reason for high core temperature (Jathar-Agni) as explained above.

2. How Often to Eat

Before 1970, the traditional number of meals in a day was 2-3 almost around the world. Diseases such as obesity and type 2 diabetes were rare. Eating frequency has currently multiplied globally amongst the urban population. Eating every 2-3 hours creates a vicious cycle of a consistent supply of glucose from the digestive tract. A meal of any size, small or large, provides glucose supply for energy lasting 2-3 hours. After this time the body falls back on its energy reserves of glycogen and fat. Glycogen is a short-term energy reserve which lasts 24-36 hours at best. Glycogen is stored in liver and muscle and breaks down to glucose rapidly when needed, such as during fasting hours of the night and sudden muscle activity. The glycogen reserve gets used up during extended fasting, after which the body falls on the fat reserve for its energy needs.

The habit of eating every 2-3 hours prevents the body from using its stored energy reserves of glycogen and fat. To get rid of unwanted fat reserves, one needs to follow a Time-Restricted Eating Plan (TRE) Plan. That requires keeping a separation of 12-16 hours between the dinner the previous evening and the next morning meal. Additionally, keep a separation of 6-7 hours between the day meals.

(Note: For details on TRE plan, review this section on the website.)

3. When to Wake Up and Sleep

Lack of exposure to sunlight or the bright daylight in the morning reduces the synthesis of the sleep hormone melatonin in the brain. Additionally, exposure to bright artificial light and blue light from digital devices, including mobile phones, reduces the release of melatonin in the brain. Both melatonin synthesis and release are critical to deep rejuvenating sleep. Melatonin and mood-elevating hormone serotonin get synthesized together in the brain. Lack of sleep or insomnia and depression, therefore, are interrelated.

4. Activity and Exercise

Muscles use up 80% of glucose energy produced in the body. Physical inactivity would mean an excess of leftover glucose, which gets converted to reserve energy fat. Intense exercise a few times a week typically does not work when it comes to keeping a lean body. For that, one needs to stay active the entire day. A good routine modified to individual capacity is as follows:

- Exercise and activity bring the best results when done first thing in the morning on an empty stomach to allow the body to use up stored reserves of glycogen and fat.
- Start with Pranayam (breathing exercises) and Yoga (stretching and balance).
- A brisk walk, climbing stairs, bike riding
- Stay active the entire day doing 7-10,000 steps per day (about 2-3 miles in a day).
- Young adults and children must engage in vigorous exercise and sports at least 2-3 times a week to build muscle mass and strength.
- The best time for active exercise is in the morning or late afternoon and early evening when the muscle coordination is at its best (see the circadian picture above). Intense activity after 7 PM interferes with deep sleep because it increases the level of excitatory hormone adrenalin.

References: Check the sections of Time -Restricted Eating (TRE) plan and Brain Clock on the website for references.