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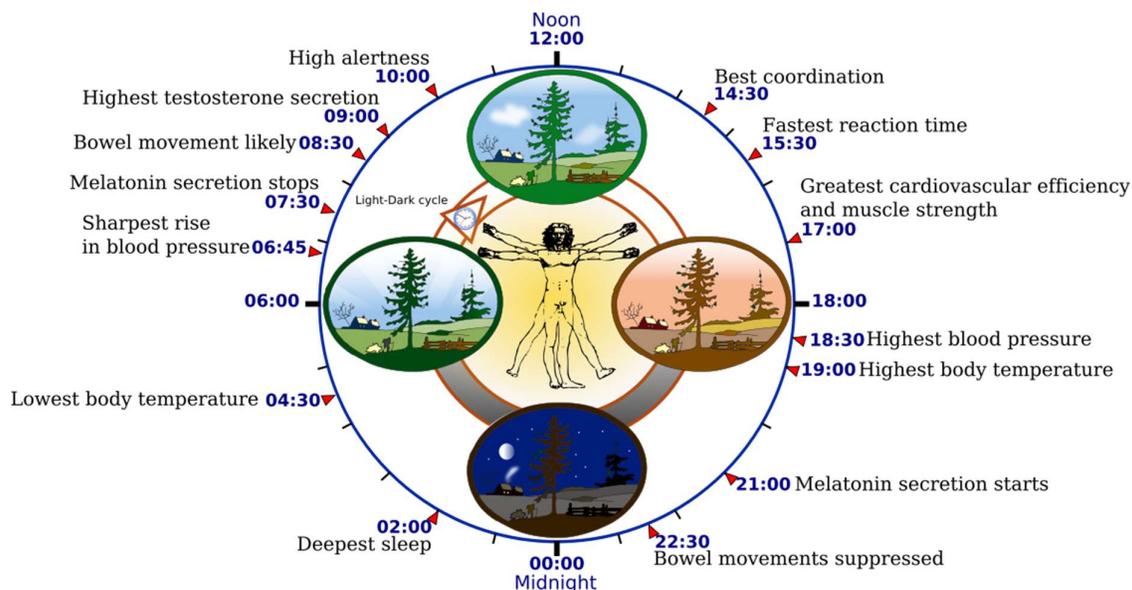
Human / Biological Clock = Circadian Rhythm

By - Dr. Ashutosh Pradhan

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The human body is accustomed to a 24 hours biological clock. Certain hormonal as well as body parameters occur as per the biological clock. The biological clock in medical terms is known as Circadian Rhythm.

The term *circadian* comes from the Latin *circa*, meaning "around" (or "approximately"), and *diēm*, meaning "day". Processes with 24-hour oscillations are more generally called **diurnal rhythms**; strictly speaking, they should not be called circadian rhythms unless their endogenous nature is confirmed. Although circadian rhythms are endogenous ("built-in", self-sustained), they are adjusted (entrained) to the local environment by external cues called zeitgebers (from German, "time giver"), which include light, temperature and redox cycles. Redox cycle is a chemical reaction stimulated by oxidation states of atoms. The above statements indicate that these changes in the rhythm are in the internal cells and tissues of the human body and commonly are triggered with the external light, temperature. Gross meaning thereby is certain hormones and bodily parameters vary from time to time. Let's enumerate these processes which change from time to time through out the 24 hours phase. Following image (courtesy Wikipedia) illustrates these changes in the Human Body within the 24 hours period.



Human Circadian Rhythm

| Time* | Endogenous / Within the Body Process | Significance / Your Lifestyle Proacting |
|--|--------------------------------------|--|
| 6 am | --- | --- |
| 6.45 am | Sharpest Rise in Blood Pressure | Ideally you should have been in pre-waking up stage |
| 7.30 am | Melatonin Secretion Stops | You should have been woken up and started your day |
| 8.30 am | Bowel Movement Likely | You should have had clean bowel movement. If not then one is expected to spend at least 15 minutes in the washroom to induce natural bowel movement. |
| 9 am | Highest Testosterone Secretion | Testosterone regulate sex drive (libido), bone mass, fat distribution, muscle mass and strength, and the production of red blood cells and sperm in males. During the peak one is likely to take high risk decisions quickly. |
| 10 am | High Alertness | You should be engrossed in a productive task |
| 12 noon | --- | --- |
| 2.30 pm | Best Coordination | Perform activities that need good coordination abilities |
| 3.30 pm | Fastest Reaction Time | Good time to carry out quick turnaround requiring tasks |
| 5 pm | Greatest Cardiovascular Efficiency | Ideal time to undertake strenuous activities such as swimming, badminton, squash etc. |
| 6 pm | --- | --- |
| 6.30 pm | Highest Blood Pressure | One should maintain good emotional balance and harmony during this time |
| 7 pm | Highest Body Temperature | Ideal time to take evening bath |
| 9 pm | Melatonin Secretion Starts | Melatonin is the hormone that is secreted to induce sleep. Quality sleep and amount of Melatonin secreted is in proportion to each other. Avoid screens, avoid strong lights which usually sends wrong signal to brain to avoid Melatonin secretion thus inducing sleeplessness. |
| 10.30 pm | Bowel Movements Suppressed | One should have gone to bed by 10 pm |
| 00 am | --- | --- |
| 2 am | Deepest Sleep | One should be sleeping comfortably in the bedroom where there is absolute dark, no sounds. |
| 4.30 am | Lowest Body Temperature | Usually time when we experience rapid eyeball moving sleep. (I will consider this at length in an article on sleep) |
| * time mentioned here is indicative and may vary from individual to individual | | |

I hope you are well convinced that the circadian rhythm plays a pivotal role in maintaining health. We often come across patients who boast themselves that we can stay awake for many consecutive nights with haphazard food intake. However, such individuals suffer from lifestyle disorders over period of time of messing up with the circadian rhythm.

We all are very much aware about the birds around; they follow the biological clock meticulously. I bet you offer fish or chicken to crows around after 6 pm and they will never touch the dish despite of the dish being their preferred one. If you offer them the same dish at 1 pm or around there will be hundreds and thousands of crows who will come flying to lavish upon the fish / chicken offered by you.

Considering the nature around and the circadian rhythm one must follow daily routine meticulously even during long vacations.

References:

1. Circadian Rhythm - Wikipedia - https://en.wikipedia.org/wiki/Circadian_rhythm (accessed on 28-Mar-2020)
2. Understanding How Testosterone Affects Men – National Institute of Health, US - <https://www.nih.gov/news-events/nih-research-matters/understanding-how-testosterone-affects-men> (accessed on 28-Mar-2020)

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