

Circadian Rhythm

This may be the most important thing you may read regarding your health during this isolation (except from Covid-19). Circadian rhythm (CR) is an internal clock consisting of 24-hour cycles, which regulate physiological functions. CR is driven by a circadian clock comprised of two components: the central clock located within the hypothalamus (brain), and the peripheral clocks, which are located in almost all tissues and organ systems. Cardiovascular disease (CVD) is the leading cause of mortality in developed nations, and recent evidence suggests that alterations in **CR may contribute to CVD risk**. Therefore, this needs to be addressed as right now people are doing one tiny bit of exercise a day, or nothing at all.

As mentioned one of the central clocks is located within the brain. Within the brain is a small organ, known as the pineal gland, which produces melatonin. This is the hormone that helps you fall asleep. This peaks at night as darkness triggers the pineal gland to produce melatonin. This process establishes the wake/sleep cycle that creates the CR. However, the internal body clock can be thrown off by light that inhibits the production of melatonin. So by identifying the triggers, you can reset the clock and stay on schedule that promotes health and not destroy it.

First of all is **Electronic light** via computers, phones and televisions. Artificial light tricks the brain into thinking it is time to remain awake rather than slow down. Therefore, this is where you may find you are having a second wind of energy and struggling to go sleep.

Next up is the **weekend partying**. Let's say you are a Monday to Friday, 10pm sleeper and 6:30am wake upper. Changing this routine at weekends to 1am to 11am confuses the body internal clock, which is why you really struggle to wake up on Monday morning.

Another factor is **shift work**, meaning your job requires you to work when normally you'd be sleeping. This where your body is protesting and making it hard to adjust.

Another point to think about is **travelling across time zones**. This process of adjusting to different time zones causes a load of symptoms known as jet lag. The symptoms include muscle aches, difficulty concentrating, sweating, upset stomachs and insomnia.

Other factors that can cause disruption are the **lunar cycle** and **Spring time** in March. The lunar cycle has 8 phases but the main one that seems to affect us is the full moon phase and people tend to not sleep as well on nights near full moon. Lastly, the clock change in March causes us to lose an hour of sleep causing drowsiness until you can adjust.

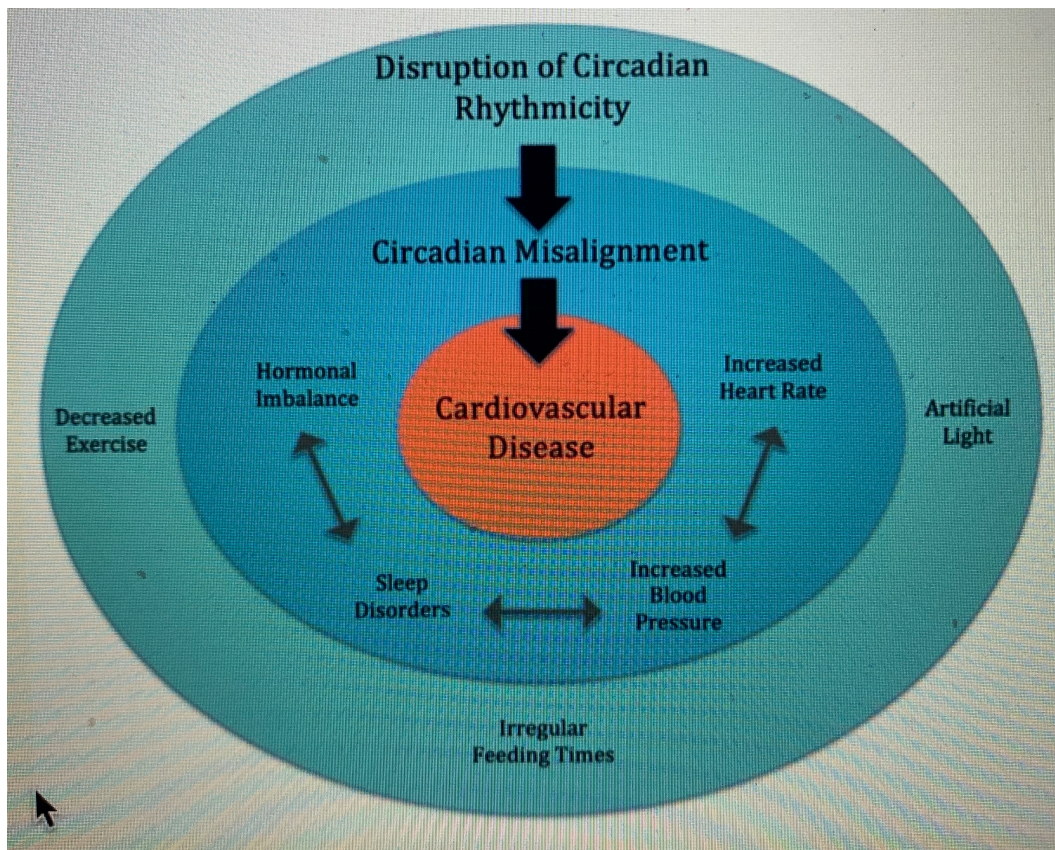
Good news is that you can help yourself when the circadian rhythm is disrupted. Here are some suggestions:

- Avoid using technology and hour and half before bed.
- Maintain the same sleep/wake schedule on days off and weekends. If this is hard, try getting a hefty dose of natural light in the morning.
- If you a shift worker, wear sunglasses from time you leave work until you home, consider taking melatonin supplement (speak to doctor) or put on an eye mask before bed.
- International Travellers should pack an eye mask, consider buying earphone pressure regulating earplugs, reserve window seat to control shade and sleep during normal hours on plane.
- When the calendar is about to change, prepare for sleep in advance, eliminate caffeine and alcohol, meditate or yoga before bed and try exposing to as much natural light outside in the day.

The last thing to mention is even though light is big daddy of affecting the CR. There is evidence that decreased **physical exercise plays a role** in causing stuff to happen as well. In general there are four types of exercise people should be focusing on to maintain a healthy functional body. These are strength aerobic, flexibility and balance. Working on these things help with decreasing the resting heart rate, decreasing blood pressure and balancing hormones out. Something I hope you are keeping up with while you are away from the gym.

Studies are saying that timed and regular/daily bouts of exercise is useful for the entrainment of CR. Training in the morning or afternoon have produced more proteins that help sync the rest of the body in accordance with the CR in comparison to the late evening. Results in the late evening have shown to develop significant disruptions in the CR.

Overall, if this was hard to understand have a look at the diagram below. After you have seen it, I want all my clients, past, present and potential ones in future to keep motivated with exercise and follow some of these tips to help prevent CVD. Right now in this moment in time, there is a lot of negativity and pressure. If you do the right things, you will come out of this pandemic better than you went in.



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