

Your Inner Clock

By James Bone

Nature's rhythm

Everything in the universe changes – cyclic changes, rhythmic changes, changes from good to bad and back again. As an ancient philosopher says - there is nothing more permanent than the cycle of change - Day to night, ebb and flow of the tides, changes of the seasons, from calm to storms, from a growing economy to a recession and back again.

Our bodies love to Dance

Even our bodies have an inner rhythm – with built in cycles of change:

- The pulse of the heart, the rhythm of our breath, electrical discharge of our nerves, movement of our muscles, etc.
- Research has begun to show that there are special brain cells involved in producing a brain rhythm called Gamma brain waves, which aid in the function and working of the brain – without such rhythm there is dysfunction.
- Research has also shown that our very DNA oscillates - oscillates in tune with nature and the cycles of the universe. All our genes oscillate – not necessarily in sync, but more like an orchestra of activity – if the light and dark cycle is disturbed then this rhythm can be disturbed, like an orchestra out of tune. This is regulated by a specific amino acid within us. We thus have an inner body clock, which aligns our physiology with the environment.

Ayurveda - ancient wisdom of Life

Ayurveda, the ancient science of living from India, identified these cycles, advocating the wisdom of living in tune with the cycles of the universe, and how important they were – and all of this 5000 years ago! Modern science is now catching on to this truth.

I've got Rhythm, I've got Music

For us the most important cycle is that of **light and dark**.

- Light enters your eyes and tells you to wake up.
- Darkness of night prepares you for sleep.
- *Interestingly our inner body clock appears to be regulated by **variations (change)** in the environment, not constancy of the environment - eg the **cycles** of day and nights . Consequently, constant light or constant dullness can be extremely unbalancing to our body clock.*

Our inner clock is also known as Circadian rhythms, which are biological rhythms that cycle over a 24 hour period and regulate most of our physiological and behavioural functions, including sleeping, eating and activity.

- *Light fluctuations seem to be a major factor in restoring circadian rhythm.*

Specificity

This Circadian Rhythm appears to have ramifications for everything – something can be good at one time, but not so good at another. Activity, specific medication use, diet, sleep, may all have specific times through our daily cycle where they are optimal, and other times where they can cause problems.

Busy, busy, busy....

Our inner body clock relates to 1000s' of different functions:

- Body temperature variations
- Hormonal variations
 - Cortisol – peaks early in the day – then reduces later in the day
 - Serotonin – ‘feel good’ hormone from GUT & brain – peaks during the day
 - Melatonin – ‘recovery’ hormone – peaks at night
- Pain is less, later in the day
- Strength for some improves through the day
- Medication effects can vary through the day – less anaesthetic is needed in the afternoon
- Metabolism varies
- Blood vessels cell lining varies and may explain why there are more heart attacks in the morning
- Brain function can vary – you may learn better in the evening
- Immunity variations – may be more active at night

Anatomical stuff

The major orchestration for the inner clock appears to come from an area of the brain called the Suprachiasmatic Nuclei, which is located below the hypothalamus at the base of the brain.

It has 2 parts - one linked to deep sleep, related to physical recovery and the day and night cycle, and one related to REM sleep, which is more related to the body's internal cycle (dreaming) – this is possibly one of the factors related to jet lag. Normally the parts are linked, but with jet lag, the part not related directly to the light cycle, can take longer to adjust and so your sleep cycle of deep sleep and REM sleep is disturbed.

Health, wellbeing and scary opposites

Our optimal Health & wellbeing are dependent upon a well running clock. When the clock dysfunctions, there have been links to obesity, heart disease, insomnia, depression, cancer, diabetes, mood, CFS, and many other problems. But do not be scared – we have ways and means of maintaining optimal health and wellbeing.

So what upsets our inner clock?

Living out of tune to nature's cycles (which is so easy now due to technology)

Changes in cycles of light and dark

Our daily habits

Our work – eg shift work

Our nature

Seasonal changes

Travel

The Keys to good inner body cycles and Health

The Circadian Circle is most influenced by light – the cycle of light and dark.

- **Light in the morning or on rising** is the first key: There appear to be special light sensory organs in your eyes *and also in other organs close to the skin*, which appear especially sensitive to the blue spectrum light. This type of light is especially helpful in the morning to aid mental alertness, memory and health. However, it can be detrimental in the evening.
- **Darkness at night or when sleeping** appears to be the second key – try to have your sleep environment as dark as possible – even watch out for clock radios or any devices like mobile phones, especially if they shine blue spectrum light.
- **Regularity** is probably the third key. Ayurveda recommends a concept called DINACHARYA, which relates to the process of establishing and maintaining regular lifestyle habits throughout the day, in tune with nature's cycles, and making variations according to season, your health imbalance, age and day cycle – for more information about this see Sanjoti & Radhika's

Ayurveda Course.

- **Correct Diet** is the fourth key. A Diet high in fat has been shown to not only increase calorie intake, but also alters body/brain chemicals responsible for the body clock, and leads to more eating of junk at the wrong time ie at a time when you should be sleeping. Research may identify other factors in the future.

Ayurveda recommends regular meals, and targeting your main meal during the *middle* of the day. Modern science related to metabolism is coming into accordance with this idea.

- **Healthy Lifestyle** and **Good Sleep** is probably the fifth Key (we have talked about this many times in the past).

Our individual daily cycles can also be different – Are you a morning person or a night owl?

There are differences in brain function between morning people (who get up early and feel energetic early) and night owls (who get up late and peak later). Morning people's brains are most excitable at 9 am, while night owls' brains are most excitable at 9 pm. Evening people *become* stronger through the day, while morning people *remain* stable with strength throughout the day. Ayurveda also recognises individual differences, and suggests daily variations accordingly.

Shift work can be damaging to your health

It is well recognised now that shift work can be damaging to your health, even if healthy. Our modern lifestyle functions with 24 hour per activity – so shift work is unavoidable for some.

So what can you do to help?

- Work towards some form of rhythm – establish your own Dinacharya
- Get assistance from health professionals
- Remember a Light and Dark Routine, and wake and sleep timing
- Try bright light exposure when waking up
- Sleep in a very dark room
- Medical aids – *you need to speak to your doctor about these things*
- Don't stay with a shift work cycle for the long term – have a break regularly
- If you cannot change shiftwork, then it's probably better to remain on the same shift (all nights for example), rather than be on a broken cycle with constant changes in shifts – for eg, morning, late night, afternoon, etc...

These constant shiftwork changes leave little room to establish a routine and get your circadian rhythm in balance.

NB – These are guidelines only. For your specific needs you should seek help from a Health professional.

Jet Lag can also cause problems – what can you do?

- Morning bright light exposure
- Gradual shift in sleep/wake cycle prior to travel
- Respect your body and don't expect too much for a few days after arrival, especially related to memory and learning.

- Go to the Ayurveda and Yoga Course in August to learn more about yourself, with simple and practical things to bring you and your family into balance.

Reading & Resources

- Circadian Rhythms Dominate all of Life's Functions - www.sciencedaily.com/releases/2007/06/070615075550.htm
- Morning and night owls show different brain function - www.sciencedaily.com/releases/2009/06/090623150621.htm
- Jet lag disturbs sleep by upsetting internal clock in 2 neural centres - www.sciencedaily.com/releases/2009/04/090416125157.htm
- High Fat Diet Disrupts Body Clock - www.sciencedaily.com/releases/2007/11/071106133111.htm
- Body Clock Regulates Metabolism - www.sciencedaily.com/releases/2009/03/090312140840.htm
- Brain Works Best when Cells Keep Rhythms Right - www.sciencedaily.com/releases/2009/04/090426175644.htm
- Shift Work Linked to Organ Disease - www.sciencedaily.com/releases/2008/04/080409205727.htm
- Unprecedented Data on Circadian Rhythms - www.sciencedaily.com/releases/2009/05/090507072824.htm
- The Wonders of Biological Rhythms – www.naturalnews.com/022210.html
- Ayurveda – Dr Robert Svoboda (many publications) is always a good read on natural cycles of Ayurveda.