

Could it be that sleep is the most important factor in our resilience? When we look at wellbeing, exercise and nutrition tend to get most attention. Steadily growing evidence finds sleep to be a key factor in preventable disease, distress, wellbeing, emotional competence and cognition. We review life through the lens of sleep as the lead factor in individual and social resilience.

Sleep is in the spotlight

In May 2014, BBC's Day of the Body Clock reported Oxford, Cambridge, Harvard, Manchester and Surrey scientists saying that we have become "supremely arrogant" in ignoring the importance of sleep. Studies are well reported in the media. The current expert text is 1766 pages. Sleep is a key action point for resilience.

Given the pandemic of diet books and the angst over physical exercise it is curious that sleep has received little attention. In fact, it has been a blind spot in our society. Culprits include:

1. The dominant paradigm of productivity is that "sleep = lazy"
2. The evening is a frenzy of alcohol, food, music, light and entertainments.
3. The online world surrounds us with stimulation from multiple devices 24/7.
4. Sleep deficit, unlike fat or sloth is neither visible nor explicitly experienced.

As an exercise, let's assume that optimal sleep might be the first, rather than the last, step in being a better person and creating a better society. Experts encourage approximately 30 minutes of exercise, 1.5 hours of eating and 10 minutes of relaxation, a total of 2 hours and 40 minutes.

Sleep experts tell us that we need 7 to 8 hours of well-structured sleep per night. Any less and the impact is quickly measurable. In terms of time, sleep

is three times more important than the rest of your wellbeing program.

Finding the right view

If we take just a sampling of sleep research and map it against our Resilience model we see that it is a key input to all levels.

Resilience Assets	Sleep Inputs
Spirit in Action	Critical to team performance Supports ethical behaviour Restores insight and self awareness Enables self control
Train Mind	Restores concentration Increases test performance Facilitates memory formation Removes toxins from brain
Engage Emotion	Allows facial recognition and empathy Increases facial expressiveness Improves mood Supports impulse control
Energise Body	Optimises hormones for growth and repair Prevents metabolic disease –craving, obesity, diabetes, heart disease. Immune system optimised
Master Stress	Enables optimal performance states Reduces anxiety (deep or slow wave sleep) Facilitates calm, focused attention Foundation of bounce back practices

In short, when compared to the many things we might do to improve our health, lives and society, sleep is low hanging fruit. We can abuse nutrition and exercise far more than we can afford to abuse sleep. Short-term sleep disruption has immediate effects on our daily performance. Long-term disruption can be fatal.

There are only three scientific concepts to understand: S, C and U or "SCU".

S - Sleep demand

Normal humans need somewhere between 6 and 8 hours sleep per night. Experts estimate that most are sleeping an hour less than we need and some sleep too much. Health and performance risk is clearly measurable when we sleep less than 6 hours on a regular basis. Health risk increases when we sleep more than 8 hours. Inadequate sleep disrupts human function at many levels.

As in all of nature we are distributed on a normal curve. A few get by with less than 6 hours or more than 8. Most of us must secure a regular 7 to 8

hours per night. We can absorb some sleep deficit with minimum risk but the debt must be repaid ASAP. Organise this into your life. If not you put yourself, your loved ones and your work at risk. No bravado. S is also for Simple!

Sleep in America poll, 2008 showed:

- Working adults need 7 hours and 18 minutes to function best
- 44% sleep less than 7 hours and 16% sleep less than 6 hours
- Cumulative sleep loss per week is a full night lost for most adults

Analysis of 12 months of our data at The Resilience Institute showed the following matches to sleep issues:

- Not exercising most days of the week
- Multitasking and high activity days
- Boredom, worry and overactive mind
- Difficulty with impulse control

C - Clocks rule biology

Equally important to your resilience (health and performance) is to sleep through the right period of the day. A handful of genes determine each person's biological clock. The clock genes run our biological rhythms – when you fall asleep, the phases of sleep, hormone production and release, immune regulation, digestion, repair, emotion, cognition and wisdom. The clock genes align with the daylight hours of your location. They adapt slowly to time zone change (our ancestors did not fly) hence jet lag.

Beginning with studies on shift-work and aircrew, we know that frequent disruption of your clock genes

leads to cancer, diabetes and heart disease. Even sleeping in a couple of hours through a weekend or a holiday causes massive biological disruption. Growth hormone, testosterone, melatonin, thyroid hormones, glucose, insulin, and appetite hormones desynchronise and those that don't (cortisol) spike at the wrong time. C also stands for complex.

We are “arrogant” in neglecting sleep. Human sleep evolved over millions of years and is embedded in our genes.

In short, when we disturb the timing of sleep we create profound and lasting effects. Starting with the trivial – hunger, craving, libido loss, weakness, memory loss, anxiety, infertility and illness – these progress to obesity, diabetes, heart disease and cancer. Is that late night and sleep in really worth it?

Stop for a moment and consider how many people – young and old – are going to bed too late and stimulated by screens, pressure and noise. We have an epidemic of “bedtime curtailment”. Put another way most of us are permanently jet lagged. Imagine the impact on productivity, learning, relationships, substance abuse, road accidents and violence.

Even two nights of going to bed late can increase ghrelin (greedy) by 28% and reduce leptin (loaded) by 18%. With a 70% disruption of appetite, you eat more the next day, crave sugar, and lose your ability to regulate sugar. Over 40 long-term studies show that short sleep is associated with weight gain and diabetes.

No country has been able to crack the obesity and diabetes pandemic with exercise or diet. Perhaps we are looking in the wrong place. Studies suggest that if we followed our clocks, we would reverse obesity, metabolic disease and diabetes. We must go to bed early and wake up early. Nature designed us thus. Sorting C will help us and our children desire the exercise and nutrition we need.

No compromise. Your clock rules your resilience.

U - Ultradian Architecture

We sleep in 90-110 minute cycles governed by the ultradian cycle. The first two cycles (10pm to 2am) are predominantly deep (slow wave) sleep and the next three are REM (dreaming sleep). When sleep deprived we repay deep sleep debt first suggesting that the hormonal, brain, immune and rest functions are primary. REM sleep is associated with memory and perhaps emotion regulation.

Both S and C are keys to U. We need enough (S) of the right sleep (U) at the right time (C). Those who go to bed late miss out on deep sleep and get too much REM sleep. When stimulated by blue light (screens) in the evening we deplete deep sleep and disrupt architecture (C).

Missing blue light in the morning causes the clock to shift west disrupting daytime function and the next night's sleep (C).

Sleep architecture (U) requires that we bring all these systems together. The two critical points are wake time and sleep time. We flip into wakefulness and flop into deep sleep through a precisely timed combination of factors.

Enough sleep of the right type at the right times, raised growth hormone, testosterone, cortisol, temperature increase, and the blue light of dawn all combine to flip us into an alert and functional state.

Exposure to daylight, work and exercise (adenosine increase), melatonin increase, temperature decrease, and fatigue all combine to flop us into deep sleep. If we check messages, worry about tomorrow, watch TV in bed, turn lights on at night, we break the flop mechanism.

Anxiety, worry, depression, obstructed breathing and medication can all disturb the ultradian architecture, hormonal function and resilience.

This may well be more effective than smoking, nutrition and exercise interventions. Leaders pay attention!

Sleep slows Ageing

Studies show that change in sleep quality disrupts brain and hormones in a way that may drive ageing. Deep sleep, growth hormone and testosterone in men and women drop

steadily from peak levels in young adulthood. Deep sleep is the time when we produce growth hormone and a good sleep time of 7.5 hours drives a clinically meaningful increase in testosterone.

REM sleep, waking and evening cortisol are maintained until midlife and then change rapidly. This combination of reduced REM, disturbed nights and raised cortisol at night combine to impair cognition, memory and metabolism.

Consider warming about 30 minutes before bedtime with a hot bath or warm clothing and then allowing the body to cool just as we head to sleep. This combination appears to combine with melatonin release to deepen and lengthen sleep. Many older adults now take 1 – 3 mg of melatonin before bed.

Sleep is the first step in anti-ageing medicine. Optimise your sleep as early as possible but this research encourages a special effort in middle age. Sleep may be a revolutionary approach to resilient ageing – no drugs required.

Sleep in society

We are “arrogant” in neglecting sleep. Human sleep evolved over millions of years and is embedded in our genes. We are scripted to run to strict rhythms (SCU) paced by natural light cycles. When we disrupt SCU biology collapses. Yet we furiously

pursue lives that flagrantly abuse our sleep biology.

Think of all those stuck behind screens late into the night. A recent study showed 69% of adults check their messages before going to sleep. What about our children? Consider shift work. How about the mass of drunken revelry that continues into the early morning – surrounded by adverts, fast food, stimulants and bright lights? We know that weekend sleep ins are strongly correlated with the peak of road accidents, suicides, heart attacks and strokes on Monday morning.

A wise society would take action immediately. This may well be more effective than smoking, nutrition and exercise interventions. Leaders pay attention.

Personal action

Prioritise your sleep. Aim for 7.5 hours with adequate cool down time and a strict wake-up time. Explore the optimal clock rhythm for your genes and location. Larks tend to need to be in bed before 10 while owls may be better at 11pm. Avoid all screens and technology for two hours before sleep. The science is unanimous on this. A cool, dark and quiet bedroom is helpful.

Use power naps to maintain afternoon productivity and go to bed 90 minutes early to repay sleep debt at least once per week. Exercise between 4 and 8 hours before bed increases the speed of falling asleep and deepens the structure (U). Eat smaller evening meals. Perhaps try the routine of warming the body about 30 minutes before bed and then encouraging cooling. A cool shower, cool room, feet and hands outside duvet, and no electric blankets might help.

Travel causes profound SCU disruption. Smart management of time zone change is complex and needs expert, individual fine-tuning. Some ideas:

1. Excessive travel will disrupt your biology – plan and prepare

2. Travel westwards if possible as the Clock (C) shifts this way
3. Adjustment to the new zone is slow – give yourself time
4. If your clock advances (NY to LA or London to NY) sleep early, get up early and exercise
5. If your clock retreats (LA to NY NY to London) avoid bright blue light in morning
6. Melatonin (1-3mg) before bed helps you adjust to the new cycle
7. If working or competing plan your travel very carefully
8. Avoid sleeping pills, alcohol and excessive food.

Responsible parenting

Sleep disruption in young people causes me more angst than any other resilience factor. The average family is in a sleep crisis – S, C, and U. The impact is global and tragic – anxiety, conflict, hormone disruption, metabolic disorders (obesity, high blood pressure), learning and memory failure, reduced impulse control, and reduced social skills. How many behavioural, lifestyle, schooling, relationship and health issues could we solve by guiding your children towards smart sleep? I suspect most of us know but are too cowardly to act.

The solutions as above are available and obvious. Parents and families must take on this challenge. In many homes this is the single most powerful act of love. Parents must step up to this challenge. Device and online addiction is a reality. Almost every teenager is glued to screens, messaging and various entertainments far too late. They will react emotionally to curtailment. Tough love is required.

Key steps include: make sure young people get exercise during the day, remove all devices from children two hours before bedtime, never allow screens in the bedroom, have a consistent family

wake up time, and help young people learn how to calm down and prepare for a good night's sleep.

A call for leadership

The hypothesis is that sleep disturbance has become a lead factor in our lives:

- Health: obesity, diabetes, heart disease, hormone function and immunity
- Productivity: social skills, empathy, concentration, memory and creativity
- Society: health care costs, accidents, violence, and antisocial behaviour

Research is steadily accumulating, followed by leading opinions that is proving the hypothesis. It is time to act. The action must start with leadership. Ideally, this begins with politicians and public sector leaders taking a firm, public stance and funding the necessary communication and action groups to drive change.

In business, leaders and human capital experts must factor sleep monitoring, education and promotion into their organisations. All educational institutions must understand sleep issues in their student population and set about established good habits from an early age. It is a foundation of education outcomes.

For a complementary view, The Centre for Creative Leadership has produced a White Paper on

Sleep Well, Lead Well.

For further information we have made one of our educational sessions on sleep available on our [website](#).



In conclusion, start with yourself and enjoy the benefits that rapidly accrue. Be curious about the sleep habits of those you love. Introduce them to the material and simple practices of improving sleep – S, C and U.

Improving the way we sleep will have profound impacts on our lives, our families, our society and our businesses. All that is required is common sense, a little planning and some firm self-discipline.

Sleep well!

References

Kryger et al (2010), Principles and Practices of Sleep Medicine