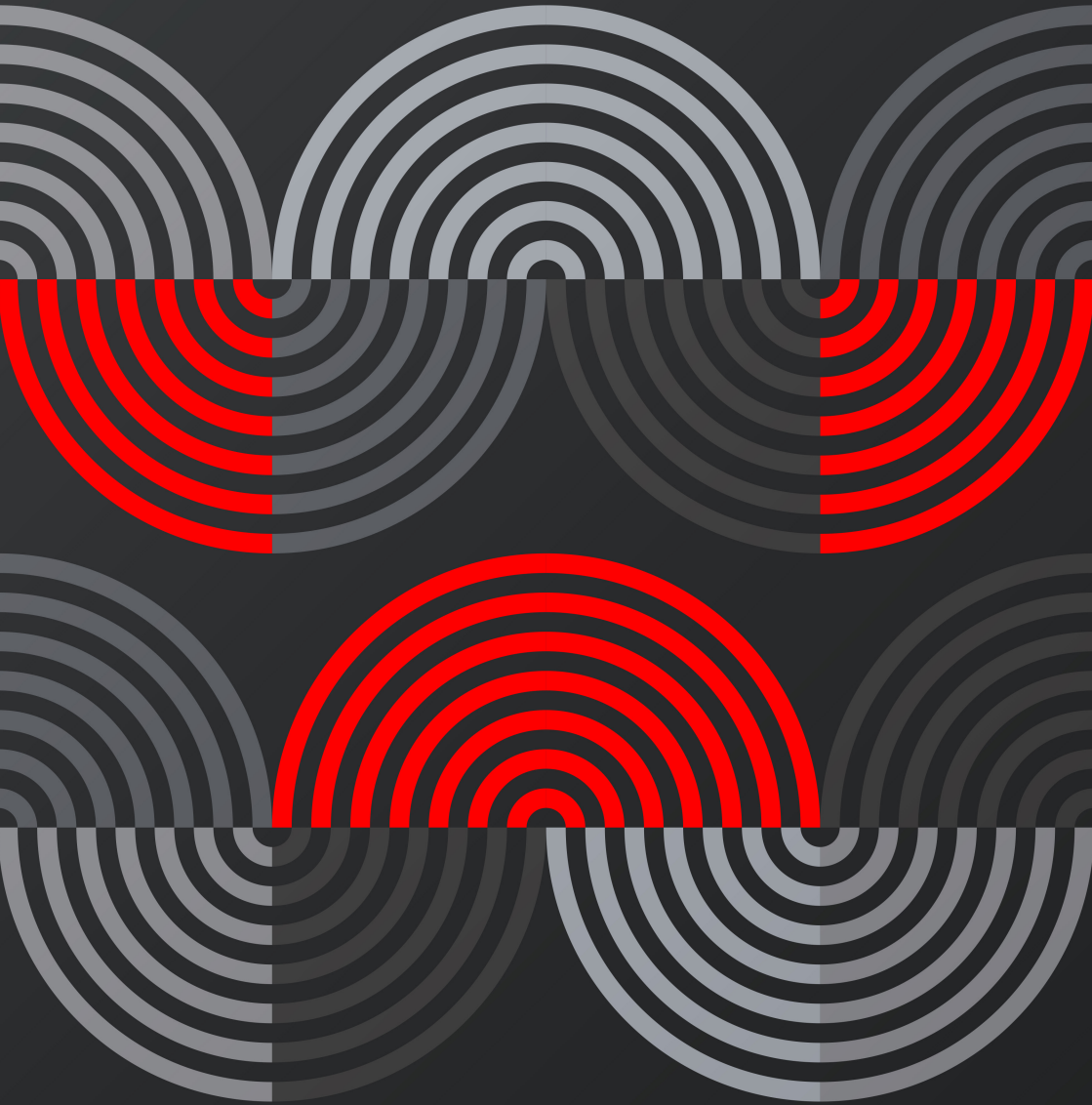




**APEX**  
ALLIED SCIENTIFIC AND TECHNICAL

# NIGHT SHIFT

YOUR HANDBOOK FOR WORKING NIGHT SHIFTS





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# 1

## WELCOME TO... THE NIGHT

Working night shifts is hard. It's tough on your body. It's difficult for your mind. It has an impact on your family and how you live.

For many of us who work the graveyard shift there is the awful combination of feeling tired when we are supposed to be starting work in the late evening, and not being able to get to sleep once we finish work after dawn.

Fatigue is the major and special issue night shift workers face. This unique hazard creates increased risks of physical and mental illness as well as increasing the risk you will be injured or make a mistake at work.

It is important when working night shifts you are well aware of the risks and dangers as well as the strategies you can use to mitigate the worst of the risks, improve your sleep and manage life during night shifts.

With this in mind, this handbook is a brief introduction to what the known risks of night shift work are, as well as providing you with some advice on how to keep yourself safe before, during and after night shifts.

A 2019 study of hospital workers found lower levels of job satisfaction, and greater adverse impacts on social life and family life on night shift workers than day shift workers. Around 71% of night shift workers reported having poor-quality sleep compared with 50% of day shift workers.

The science is continuing to develop on the risks of night shift work, and the possible underlying mechanisms which cause the physiological impact. In 2022 new research was published based on a study of French hospital night shift workers who wore portable activity and temperature sensors. The study found changes in the body temperatures and higher levels of resting needed by night shift and former night shift workers indicating that working night shifts significantly disrupts our circadian rhythms, even years after stopping working night shifts.

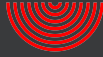
When everyone else seems to be sleeping, a night shift worker is on their feet, attending to the 24/7 needs of the public.

Just as it is important for you to take action at an individual level to stay safe when working night shifts, it is also important we work together as a union to ensure our contracts and our rosters support safety during nights.

Safeguarding and advancing protections for the health and safety of night shift workers is only going to become more important as the population grows,

and demand for 24/7 and emergency services grows.

It's important we keep working together to ensure health professionals receive adequate protections, rest and compensation for working the night shift.



## 2 THE WORKPLACE IN THE 24-HOUR SOCIETY

Access to healthcare for an increasingly sick and elderly population, the continued implementation of 24-hour shift rosters risks the health of the professionals themselves. As Philippa Gander wrote in *Sleep in the 24-Hour Society*.

*The usual motivation for moving to 24-hour operations (except in the emergency services) is economic – to increase productivity and profitability. The safety and health consequences of shiftwork are effectively hidden costs that are transferred to the individual, his or her family, and eventually to society as a whole. Few people would argue that these represent "costs", but putting a dollar value on them is exceedingly difficult. Nor does it capture their effect on quality of life, or in terms of human suffering.*

*I am still unresolved in my position with regard to the 24-hour society. The pragmatist in me says that it is here to stay, and that we must cooperate to maximise the good and minimise the harm that it can bring. But there is another voice that urges caution. I also strongly believe that we need to broaden the debate on the costs and benefits of the 24-hour society, and to*

*stop ignoring the moral and political implications.*

Workplace safety has often been led by workers, and union-won campaigns such as those for the 8-hour day, equal pay for women and a minimum wage have helped to significantly improve and extend workers' rights.

These victories have been written into history through new provisions in collective agreements won by workers taking strike action and by Parliament passing legislation like the Equal Pay Act and Health and Safety at Work Act.

As society learns more about the importance of sleep and the health risks caused by the lack of sleep or disruption of sleep, we need to start writing new protections into our collective agreements for night shift workers. For emergency services and hospital workers especially, the 24-hour working life is here to stay, and we need new protections to keep us safe.

An action plan to make life better and work safer for night shift workers needs to recognise the special risks to health that night shifts entail and the need for protection from fatigue and exhaustion. As a starting point, the following provisions should be mandatory:

1. Clean drinking water and nutritious meals provided for night workers.
2. Employees should not work for longer than 8 hours overnight.
3. There should not be more than 4 night shifts in a row.
4. Annual medical check-ups should

be reimbursed.

5. Fatigue should be monitored at least annually, and wrist-worn sleep trackers can be used to regularly assess the impact of rosters on sleep.
6. Employment agreements should set aside 11-hour rest periods every 24-hours.
7. Sleep facilities for napping during shifts or after work should be installed, especially where workers commute long distances to work.
8. Changes to rosters should be done with the agreement of those who work the roster.
9. All hours between 10pm and 7am should be paid at time-and-a-half.

## **The Night Work Convention**

The International Labour Organisation is a United Nations agency sets out international employment law and monitors workers' rights worldwide. States, employers and union organisations are all represented within the ILO. Through conferences, these parties agree the rules and standards for international employment law through adopting Conventions, which can then be ratified through for example implementation in domestic or national law.

In 1990 the ILO adopted Convention 171 – the Night Work Convention. It was the eighth convention the ILO has adopted on the rights of night shift workers. The first convention on night work, Convention 4, was adopted in 1919 and prohibited women working in

mining, construction and manufacturing at night. Subsequent conventions addressed the issue of children and minors working at night.

C171 defines night work as work of more than seven hours including the interval between midnight and 0500, and a night worker as someone "whose work requires performance of a substantial number of hours of night work".

- The right to undergo a confidential health assessment without charge and to receive advice on how to avoid health problems associated with their work (before employment, at regular intervals during, and if they experience a health problem);
- First aid facilities available in the workplace;
- The right to move to a similar job when certified unfit for night work;
- An alternative to night work be provided for pregnant women eight weeks before and after childbirth;
- Compensation in time, and pay of benefits that recognises the nature of night work;
- Appropriate social services for night workers;
- Regular consultation between employers and unions over the work schedules of night workers.

In June 2018 Uruguay became the seventeenth country to ratify C171. The Vice Minister of Labor and Social Security in Uruguay, Dr. Nelson Loustanaou, stated at ratification: "There is scientific evidence that night work has undesirable effects on the

physical and psychological health of those who perform it. For that reason, it is not recommendable to undertake night work. Nevertheless, the current conditions of production, in certain cases, make it necessary and even indispensable. It is for these reasons that our country is ratifying Convention No. 171 with a view to extending the list of instruments to protect those workers who have to work at such times."

## Lets Get Truckin'

Although New Zealand regulates the maximum working hours of transport and truck drivers, no other group of workers get the same protections despite having the same physiology. In any 24-hour period drivers can work a maximum of 13 hours and must have a 10 hour break, as well as their half breaks for each five-and-a-half-hour period. After 70 hours of working, drivers must take a full break of at least 24 hours. All of this is enforced by the police, who can inspect the logbooks which drivers are required to keep and show upon demand.

Yet there is no similar legal protection for any other worker. An OECD report found 13% of New Zealanders were working more than 50h a week, compared to an average 9% for other OECD countries.

Until we get serious as a country about ensuring adequate protections for shift workers, the negative effects of the 24-hour society will continue to be borne by those working the midnight shift.

We must keep working together to put stronger protections into our agreements to ensure we're as safe as possible on the midnight shift.

## European Working Time Directive

European Working Time Directive incorporates much of ILO C171 into European labour law, recognising that, "Research has shown that the human body is more sensitive at night to environmental disturbances and also to certain burdensome forms of work organisation and that long periods of night work can be detrimental to the health of workers."

The European Working Time Directive mandates a period of 11 consecutive hours' rest in every 24-hour period, a full 24-hour rest period every 7 days, and a maximum average working time (including overtime) of 48 hours. The Directive also requires European states to ensure night shifts are not longer than 8 hours, night workers get free health assessments and those who become ill can transfer to day shifts.

Some European countries established protections for shift workers. In Sweden, the Working Hours Act 1982 entitles all employees to a minimum rest period of 11 consecutive hours in any 20-hour period and prevents shifts for night workers from being any longer than 8 hours.

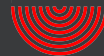
## NASA Nap

Have you heard of a NASA nap? In the

1990s, NASA conducted research into the effectiveness of napping to help sleep-deprived astronauts operate safely in space. NASA was concerned about the impact fatigue was having in an environment where an error could be catastrophic.

One study NASA conducted examined the effectiveness of short naps for commercial airline pilots. Pilots who napped for just 25 minutes during a 9-hour flight did not have reduced performance when flying at night, after multiple flights or at the end of a flight. Pilots who did nap had 16% faster reaction times than those who didn't nap, and 34% fewer lapses. Napping pilots had half as likely to report drowsiness.

Since the research was carried out, NASA naps have been adopted by many commercial airlines, not to mention by NASA themselves, to improve alertness and manage fatigue for pilots and astronauts.





# 3

## THE HEALTH & SAFETY AT WORK ACT 2015

Under the Health and Safety at Work Act 2015, employers have a responsibility to, as far as is reasonably practicable, ensure the health and safety of workers. That means eliminating risks to health and safety, or if you cannot reasonably eliminate risks – minimising those risks.

Worksafe New Zealand advises that employers should:

- Make sure your workers take regular rest breaks;
- Make sure working hours are not too long and carefully monitor a worker's ability to cope;
- During low attention times (0300-0500 and 1500-1700) adopt a conservative approach to safety and avoid critical jobs;
- Negotiate with workers if overtime is required, monitor and place limits around overtime and avoid incentives to work excessive hours;
- Monitor and place limits around shift swapping and on-call duties;
- Design rosters well to allow for good sleep opportunity, recovery time and avoid work starts before 6am where possible;
- Limit the number of night shifts in a row;
- Provide adequate facilities for rest

- breaks and drinking water;
- Make sure workloads are manageable;
- Be aware of employees' personal circumstances and provide support where possible;
- Provide good supervision;
- Develop a fatigue policy for all workers with information about maximum shift length and average weekly hours, work-related travel, and procedures for managing and reporting fatigue;
- Train new workers on fatigue management.

And workers have a reasonable responsibility to take care of their own health and safety including:

- Turning up fit for work, having done everything possible to get a good sleep;
- Informing their manager when a task is beyond their capability;
- Recognise the signs and symptoms of fatigue;
- Report fatigue-related incidents.



# 4

## KEEP YOURSELF SAFE

We're not always the best at looking after ourselves.

This section looks at ways you can safeguard your sleep by implementing some simple (though not necessarily easy) changes in your life.

### Alcohol

It can be tempting for shift workers to use alcohol as a sedative. However, although it may get you to sleep quicker, it can seriously impact the quality of your subsequent sleep by suppressing melatonin production and disrupting REM sleep.

Melatonin is a hormone produced in the pineal gland near the centre the brain. Melatonin regulates sleep-wake cycles. The body will synthesise melatonin in darkness, facilitating sleep. But drinking even a moderate amount of alcohol suppresses melatonin production by between 15 and 19%.<sup>7</sup>

A 2013 review of alcohol's impact on sleep showed that it reduced REM sleep. The best advice is to have a blood alcohol level of zero before going to sleep.

*"In sum, alcohol on the whole is not*

*useful for improving a whole night's sleep. Sleep may be deeper to start with, but then becomes disrupted. Additionally, that deeper sleep will probably promote snoring and poorer breathing. So, one shouldn't expect better sleep with alcohol." – Chris Idzikowski, Director of Edinburgh Sleep Centre.<sup>8</sup>*

### Caffeine

Many shift workers use coffee, tea and other caffeinated beverages to boost alertness and energy at the beginning of and during their shift.

Caffeine has an almost immediate effect and levels peak in the bloodstream between 15 and 45 minutes after your drink. However, caffeine has a half-life of between 5 and 6 hours in the human body. This means that half the caffeine is still pumping through your veins 5 hours after you drink your coffee.

One American study gave dosages of caffeine to people 0, 3 and 6 hours before bedtime. They measured sleep outcomes using a sleep diary and recordings of the electrical activity of the brain (via a headband worn during sleep). The study showed that all dosages of caffeine reduced total sleep time by more than an hour compared to a placebo.

People who took caffeine at bedtime and 3 hours prior self-reported sleep disturbance, but those who took it 6 hours prior to bedtime did not self-report disturbance. This may be because the

caffeine-associated awakenings caused relatively short sleep fragmentation. It's a good idea to stop drinking caffeine eight hours before you will be sleeping.

## How Much Sleep is Enough?

'The practical answer is as much as it takes for you to feel well rested and fully functional when you are awake.'

— Prof Philippa Gander, Sleep in the 24-Hour Society

## Blue Light

The body wants to be exposed to light in the morning and darkness at night. Blue light is part of the visible light spectrum and it's in the light we get from the sun. Blue light is at the short end of the light wave spectrum and there is more of it at midday. Blue wavelengths boost attention, reaction times, and mood. Blue light is emitted from lights and screens as well as the sun. Blue light suppresses melatonin more powerfully than other lights, so exposure to sunlight or a bright screen after shift work will make it harder to get to sleep.

"Specialised cells in the human eye have evolved over millions of years to respond to daylight, particularly blue wavelengths of light, in order to track time and regulate biological functions such as our circadian clock."<sup>9</sup>

— Royal Society Te Aparangi

"Blue light from lighting can be minimised by choosing LED or CFL bulbs with a 'warm-white' colour, rather than 'cool-white' or 'blue-white'. Some bulbs are labelled with a 'colour temperature' – choose them with a temperature of 2700 or 3000 K.

Computer and phone screens often have a night time setting, which changes the colour balance to reduce the amount of blue light. Don't forget that what you are looking at on the screen can also have an important effect on sleep.

If you finish your shift during daylight hours, consider wearing sunglasses on your way home to block out blue light. You can also buy special orange tinted glasses that block out just blue light.

## Put down your phone

### Sleep Masks & Earplugs

**Sleep masks** and **earplugs** can help improve the quality and quantity of the sleep you get, especially if daytime activities in your neighbourhood like construction, lawn mowing or your family or flatmates are moving around and making noise in the day.

A 2010 study found that when people had to sleep in an environment with some light and noise disruption, wearing earplugs and eye masks improved how well people rated their sleep, as well as increasing the amount of REM sleep and nocturnal melatonin levels.

A 2015 study that replicated the disruption of sleeping in a hospital ward found "use of earplugs and eye masks significantly improved the sleep quality, as seen in shorter sleep-onset latency, reduced number of arousals and awakenings, better perceived sleep quality and less anxiety."

## Annual Medical Checks

One of the primary ways to keep yourself safe is to get an annual medical check from your GP if you are a night shift workers. Because night shift workers are at greater risk of type 2 diabetes, cardiovascular disease, hypertension and cancer it is sensible that the employer reimburse the cost of seeing the GP, and the GP carry out any investigations including blood tests as appropriate to monitoring the risk.

## Meditation

It's difficult to sleep when your mind is racing and your body is tense. Relaxation techniques give us awareness of where we feel stress, and help us let it go.

Meditation focuses our attention on the calming sensation of our breathing.

When we use these techniques, they can be incredibly effective aids to relaxation and preparation for sleep.

A 2015 study compared the effectiveness of mindfulness meditation with that of sleep hygiene education. Both interventions improved participants' sleep quality, but the mindfulness

group experienced a more dramatic improvement in sleep quality. The researchers believe that mindfulness techniques improved people's ability to perceive thoughts and feelings without reacting to them, helping them relax – a necessary part of getting to sleep.

You can find meditation and relaxation guides and tutorials on the internet, including YouTube or through various mobile phone applications.

## Restructuring Rosters

One of the best ways to reduce the impacts of night shifts is to restructure rosters to incorporate adequate rest provisions, a maximum of four nights in a row, and a maximum frequency of night shifts per month. As part of a major cohort study in the Netherlands of over 167,000 people, research was published in 2022 which found night shift workers had an increased BMI, waist circumference and immune cell counts compared to non-shift workers. Particularly relevant was the study's findings that "associations with metabolic risk factors and higher immune cell counts were, in general, more pronounced in night shift workers working >3 consecutive night shifts. For example, BMI and waist circumference were particularly higher in >3 consecutive night shifts, as well as the level of leukocytes. To our knowledge, this is the first study demonstrating the association between  $\leq 3$  consecutive or >3 consecutive night shifts and elevated metabolic and immune parameters in night shift workers."

## Exercise

A 1988 experiment in Finland provided an exercise programme of running, swimming, walking and gymnastics to female nurses working shifts and "found a significant positive effect of physical exercise on sleep length and reduction of fatigue among nurses". The results suggest that moderate physical exercise can help reduce fatigue and improve quality and quantity of sleep.

## Chamomile Tea

Chamomile tea is made from the infusion of dried daisy flowers and hot water. Chamomile is one of the oldest medicinal plants in the world and one of the most popular herbal teas with about a million cups being drunk every day.<sup>17</sup> Chamomile tea has mild sleep-inducing effects for many people, which some speculate is because it contains apigenin, an organic compound that may have a mild tranquilising effect.

## Pregnancy & the Night Shift

The British Royal College of Physicians and NHS Health at Work advises that there are increased risks of preterm delivery and miscarriage for pregnant women working night shifts. In some cases these risk increases are slight; however, for those working fixed night-shift work the risk of miscarriage rose from 12% to 18.1%.<sup>11</sup> The US Centres for Disease Control advises pregnant women to avoid working during normal sleep time during pregnancy.<sup>12</sup>

Working at night, during your normal sleep hours, can change your circadian rhythms, which regulates your menstrual cycle and your pregnancy hormones.

Shift work and long working hours have been related to menstrual disorders, miscarriages, and preterm birth.

Women who work at night, or who work long hours, often do not get enough sleep.

A 2005 study of 1908 pregnant women in the United States found a 50% elevation in the risk of preterm delivery for women who reported working at night (10:00pm to 07:00am).<sup>13</sup>

We advise women to suspend night shift work from 28 weeks.

## Sleep Debt

"Recovery sleep may be slightly longer than usual, but the main difference is in the sleep quality. The first night includes an exceptional amount of slow-wave sleep (non-REM stages 3 and 4), and usually has less non-REM stage 1 and fewer arousals from sleep. If you sleep longer than usual, you will probably also catch up on some REM. However, the second recovery night typically includes an exceptional amount of REM. By night three, your sleep should have returned to normal."

## Healthy Eating

One small experiment showed that people exposed to night shift conditions

were more than twice as likely to choose high fat foods for breakfast than those who had slept through the night.<sup>14</sup>

The body is not designed for eating at night and sleeping during the day, and so night shift can cause significant disruption to the metabolism. Shift working has been shown to be associated with increased risk of diabetes, heart disease and obesity.

It's important for night shift workers to take extra care with what they eat and when they eat it. It is recommended that shift workers try to keep as close as possible to a regular and normal pattern of eating and nutrition.

**Workplace Health and Safety Queensland recommends the following meal pattern for night shift workers:**

**After your shift and before sleeping:**  
**Small breakfast to help you sleep and stop you from waking due to hunger.**

**After your sleep: Lunch meal to provide you with energy for your day.**

**Night time meal breaks:**  
**Early in your shift: small dinner meal or snack.**

**Late in your shift: a small snack every few hours to keep you alert and energised.**

One group of researchers, after reviewing the interaction between shift work, diet and metabolic disruption, offered some specific guidelines for shift work.<sup>15</sup> Their recommendation is to avoid over-reliance on (high-energy content) convenience foods and high-carbohydrate foods during night shifts. Instead choose vegetable soups, salads, fruit salads, yoghurt, wholegrain sandwiches, cheese or cottage cheese (topped with slices of fruits), boiled egg, nuts, and green tea (promoting antioxidant activity), although this may not be palatable to some. Avoid sugar-rich products such as soft drinks, bakery items, sweets, and non-fibre carbohydrate foods (high glycaemic load) like white bread.

## Get Home Safe

In 2016 fatigue was a factor in 28 fatal crashes, 199 serious injury crashes and 438 minor injury crashes in New Zealand. Common types of crashes caused by fatigue are head-on collisions and crashes where the vehicle loses control or goes off the road.

A US study tested the driving skills of night shift workers after a night shift versus a night of sleep at a closed driving track for 2-hour sessions. The study found that none of the drivers crashed when driving after a night of sleep. However, 37.5% had a near-crash event needing emergency braking. The study also found:

- 43.8% of post night-shift driving sessions were terminated early because the shift worker was unable to safely control the vehicle



# 5 RISKS

- Driving performance was evidently impaired in the first 15 minutes of driving but became much worse 45 minutes or more after the start of driving
- Post night-shift drivers frequently drove outside their lane and had numerous microsleep episodes.

It's important that night shift workers can get home safely, which may involve napping at work after your shift before driving home, especially if the drive home is greater than 20 minutes.

We can't avoid facts. Research shows that working nights is associated with an increased risk for a range of conditions. This doesn't mean that night shifts condemn you to poor health. However, you need to make informed decisions, so let's look at what the studies show.

## Extra Tips

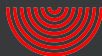
- Try to keep a regular sleep pattern: your body will find it easier to keep to a regular sleep schedule.
- Have a regular pre-sleep routine – you may find having a warm bath helps. Warm baths lower the core body temperature allowing sleep to come easier.
- Avoid eating or drinking too much before bed.
- If you don't fall asleep in 20 minutes get out of bed and do something relaxing.
- If you have a chronic sleep problem, talk to your doctor.

## Heart Attack Up 31%

A 2012 meta-analysis of 34 studies across 2,011,935 people found shift work was associated with a 23% increased risk of heart attack and 5% increased risk of stroke. The research published in the BMJ noted a 41% increase in risk of coronary events for night shift workers specifically. The study defined "coronary event" as the composite of heart attack, coronary mortality, and hospital admissions due to coronary artery disease.<sup>1</sup>

## 21% More Likely to Have Unhealthy Aging

A 2022 article published the findings of a 24 year study of 46,318 nurses in the United States and found , longer duration of rotating night shift work was associated with significantly decreased odds of healthy aging. The study found the longer the years working rotating night shifts the more likely it was the



nurse developed a chronic disease, lost good physical function, lost food mental function or lost good cognitive function. Those who worked more than 10 years of rotating night shifts had a 21% decreased chance of healthy aging.<sup>1</sup>

## Type 2 Diabetes

A 2018 study of 272,214 British people found those who worked more than 8 night shifts per month were 36% more likely to have type 2 diabetes than those who never worked night shifts. "Circadian misalignment causes adverse cardiometabolic outcomes, including glucose intolerance, even in long-time shift workers."<sup>3</sup>

## Cancer

A 2018 meta-analysis of 61 articles across 3,909,152 women found an average increased risk for women working long-term night shift work with a range of carcinogenic effects.<sup>2</sup>

## Breast Cancer Up 32%

## Skin Cancer Up 41%

## Digestive Cancer Up 18%

*"The underlying biological mechanisms of the association between night shift work and increased cancer risks are complex. One of the possible hypotheses is that exposure to light at night accompanying night shift work results in the disruption of circadian rhythm and the reduction of melatonin production. Melatonin is characterised with oncostatic effect*

*which works through antioxidant, antiangiogenesis, regulation of immunity, and metabolism."*<sup>2</sup>

## Depression Up 42%

A meta-analysis of 11 studies looking at the link between night shift work and depressive illness showed a 42% increase in the risk of depression among those working nights.

"The direct consequences of disruption to the chronobiological rhythm must be considered: reduced sleep time, reduced sensitivity of peripheral cortisol receptors and functional hypercortisolism, and reduced melatonin production."<sup>4</sup>

## Infection

Research conducted in 2016 by Cambridge University found virus replication of mice infected with the influenza or herpes virus was ten times greater when they were in the resting phase of their body clock versus the active phase of their body clock. Dr Rachel Edgar, lead researcher, said of the results, "this indicates that shift workers, who work some nights and rest some nights and so have a disrupted body clock, will be more susceptible to viral diseases. If so, then they could be prime candidates for receiving the annual flu vaccines."

## Shift Work Sleep Disorder

Shift work sleep disorder (SWSD)<sup>5</sup> occurs when a person's circadian rhythm is disrupted by working shifts.

The symptoms include:

- Difficulty sleeping





- Excessive sleepiness
- Problems concentrating
- Headaches
- Lack of energy.

It is estimated that up to a third of shift workers have SWSD. The Australasian Sleep Association provides information for health professionals on shift work sleep disorder that prompt questions of the patient such as, Does the patient sleep differently on days off or day shifts? and What strategies has the patient used to promote sleep?

## Sleep & Alzheimer's

The link between poor sleep and Alzheimer's disease is well established, although not well understood. Margaret Thatcher and Ronald Reagan both claimed to sleep only four or five hours per night, and both suffered from dementia. A US study published in 2017 showed an association between lack of REM sleep and increased risk of dementia. Other American studies of sleep-deprived mice have shown the importance of sleep in removing toxic build-ups of Alzheimer's causing chemicals in the brain. One of the prominent researchers in the area, neuroscientist Jeffrey Iliff, studied how cerebrospinal fluid is pumped through the brain during sleep to "clean out" the toxic build-ups.

*"Our own research suggests when the brain is awake and is at its most busy it puts off clearing away the waste from the spaces between its cells until later. When it goes to sleep and doesn't have to be as busy it shifts into a cleaning mode to clear away the waste in the*

*brain. A little bit like how you or I put off our household chores during the workweek and catch up on them all when the weekend rolls around."*

## Sleep & Learning

The text below is an excerpt from Matthew Walker's book *Why We Sleep*, published in the US by Penguin in 2017.

*"A long, finger-shaped structure tucked deep on either side of your brain, the hippocampus offers a short-term reservoir, or temporary information store, for accumulating new memories. Unfortunately, the hippocampus has a limited storage capacity, almost like a camera roll, or to use a more modern-day analogy, a USB memory stick. Exceed its capacity and you run the risk of not being able to add more information or, equally bad, overwriting one memory with another: a mishap called interference forgetting.*

*How, then, does the brain deal with this memory capacity challenge? Some years ago, my research team wondered if sleep helped solve this storage problem by way of a file-transfer mechanism. We examined whether sleep shifted recently acquired memories to a more permanent, long-term storage location in the brain, thereby freeing up our short-term memory stores so that we awake with a refreshed ability for new learning.*

*We began testing this theory using daytime naps. We recruited a group of healthy young adults and randomly divided them into a nap group and*

a no-nap group. At noon, all the participants underwent a rigorous session of learning (one hundred face-name pairs) intended to tax the hippocampus, their short-term memory storage site. As expected, both groups performed at comparable levels. Soon after, the nap group took a ninety-minute siesta in the sleep laboratory with electrodes placed on their heads to measure sleep. The no-nap group stayed awake in the laboratory and performed menial activities such as browsing the Internet or playing board games. Later that day, at six p.m. all participants performed another round of intensive learning where they tried to cram yet another set of new facts into their short-term storage reservoirs (another one hundred face-name pairs). Our question was simple: Does the learning capacity of the human brain decline with continued time awake across the day and, if so, can sleep reverse this saturation effect and thus restore learning ability?

Those who were awake throughout the day became progressively worse at learning, even though their ability to concentrate remained stable (determined by separate attention and response time tests). In contrast, those who napped did markedly better, and actually improved in their capacity to memorize facts. The difference between the two groups at six p.m. was not small: a 20 percent learning advantage for those who slept."

## 6 KEY POINTS

- Know the risks of shift work.
- Make sure you get the annual flu vaccine – shift work can compromise your immunity.
- Avoid alcohol before sleep.
- Stop taking caffeine at least 8 hours before you intend to sleep.
- Chamomile tea can help some people sleep.
- Avoid sources of blue light (sunlight, screens) in the period before sleep.
- Use a sleep mask.
- Use ear plugs to block out noise.
- Try meditation before sleep.
- Get regular exercise.
- If possible, avoid shift work during pregnancy.
- Take care of what, and when, you eat. Avoid convenience foods during night shifts.
- Keep your sleep patterns as regular and predictable as possible.
- Don't drive if you feel fatigued: consider a nap before driving home.
- If you don't fall asleep within 20 minutes of going to bed, get up and do something relaxing.
- Get regular medical check-ups: you're at increased risk for diabetes, cardiovascular disease, depression, infection and other illnesses.

And most importantly:  
Keep working with APEX to protect your rights and conditions of employment!

# 7

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