

Shift Workers – Nutritional Needs

Pharma Nord Webinar, 20th Jan 2026



1

Types and Prevalence
of shift work

2

Health Consequences
of shift work

3

Diet & lifestyle
interventions

4

Specific supportive
nutrients

Today's aims



Today's Speaker

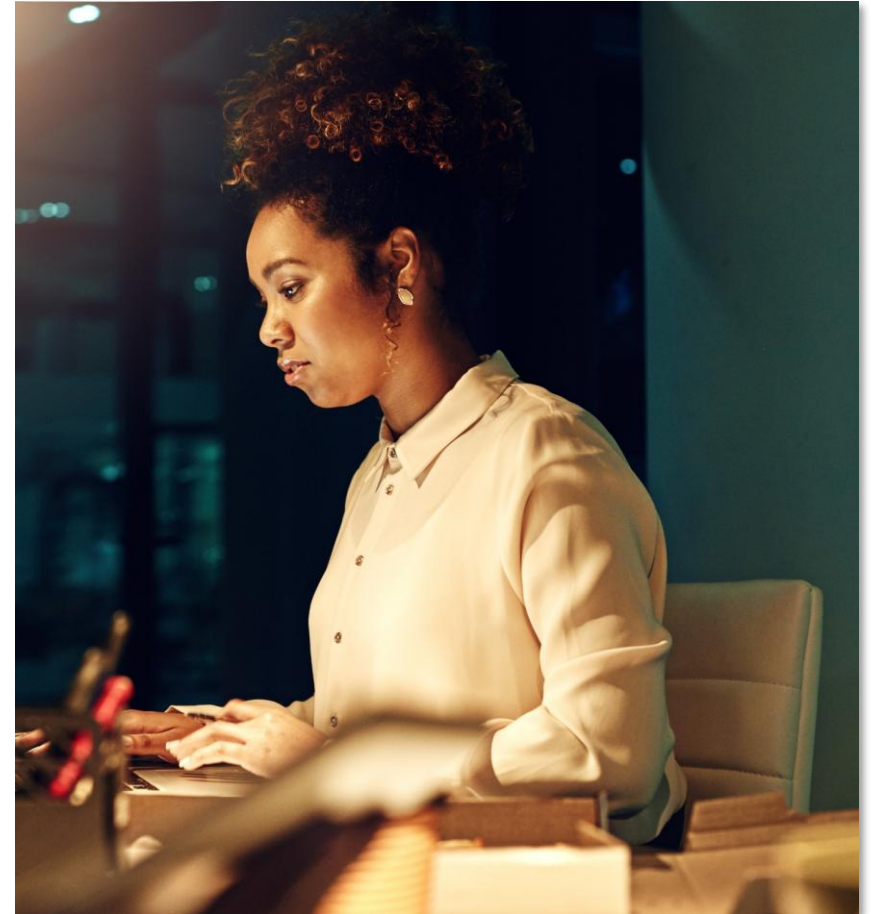
Helen Lynam

BANT Nutritional Therapist, educator and supervisor

- Former Airline Engineer
- Registered Nutritionist (MBANT)
- Registered Nutritional Therapist (CNHC)
- In clinical practice for 20 years
- Specialist in Chronic Fatigue and Long Covid
- Has contributed to the Functional Medicine series of books
- Performance Specialist for Corporate executives
- Accredited and clinical supervisor for nutritional practitioners

What is Shift Work

- Shift work refers to the specific period of time that someone is working, so 9am – 5pm is technically a shift, often referred to as a “Day shift”
- For the purposes of today we are talking about shifts outside of the 9am – 5pm period
 - Sometimes know as nontraditional shifts
- They tend to serve specific business needs whilst affecting the worker health



Main Types of Shifts

- Early Shift: working 8 hrs between 6am and 2pm
- Late Shift: working 2pm and 10pm
- Night Shift: normally 10pm – 6am
- Rotating shift: where there is a different shift each day or week
- Split Shift: working 2 different time periods in the same day with time off in the middle – eg in restaurants to allow early starts and late finishes with the same person.
- 12hr shifts: working typically 7am – 7pm and 7pm -7am often used in health care



Prevalence of Shift Work



Occurrence of Shift Work in the UK

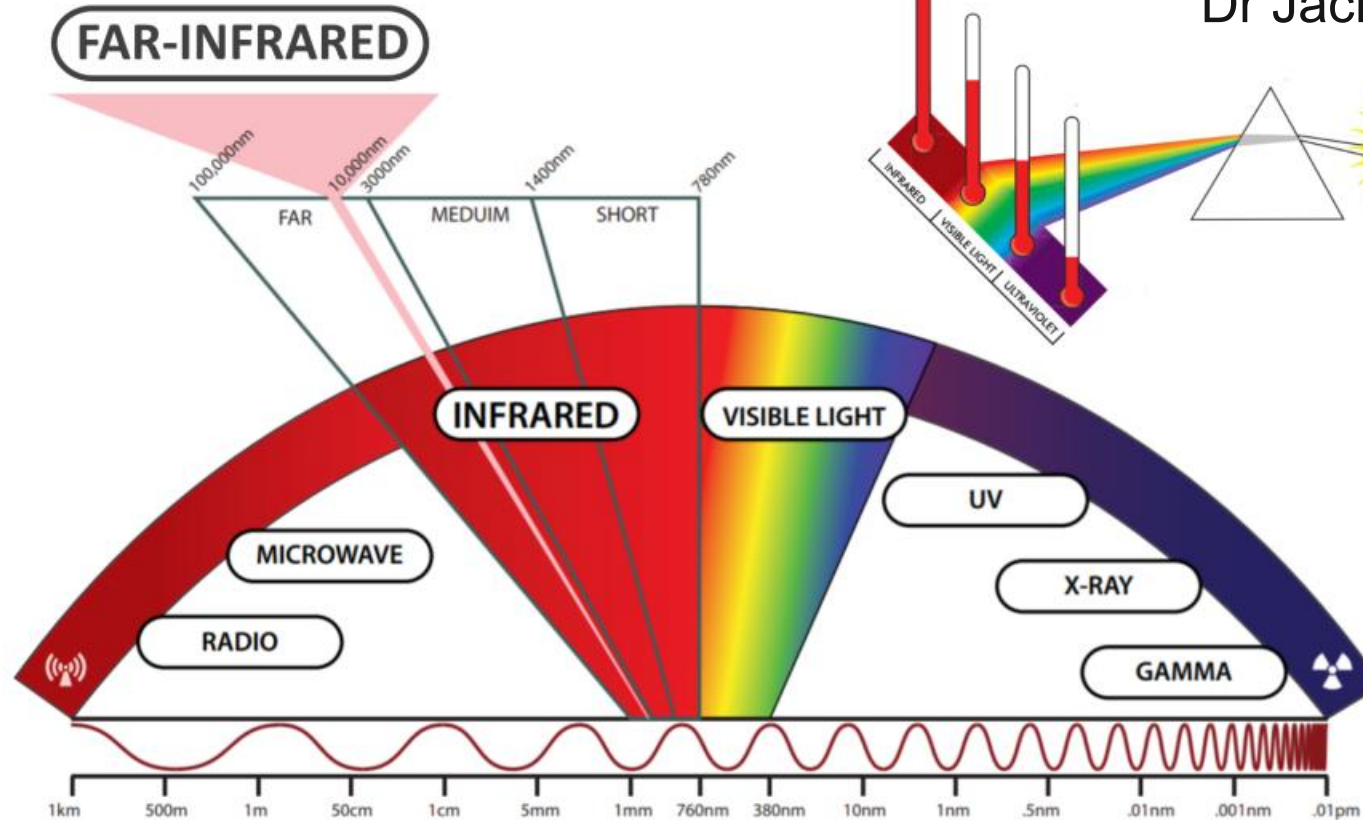
- Hospitality and food service has the highest occurrence of night and evening work
 - Also entertainment, transport and storage, health work, manufacturing
- In 2022 official figures reported 8.7million night-time workers (working evening or night shifts) (around 12% of workers)
 - This is down from 9.5million in 2016
- 15% of night-time workers are in low-paid roles
- 56% of night shift works are male, 44% are female (a shift towards females by 2% since 2012)

Behavioural Changes with Shift Work



Light Exposure

“Each separate frequency / colour of sunlight has nutritional value for cells”
Dr Jack Kruse



Changes in Light Exposure on shift

- For millions of years, light cycles have been constant
- Increasingly we are all exposed to artificial light at night indoors and outdoors
 - Early artificial light (fire, incandescent light bulbs and sodium streetlights a high degree of light in the infrared wavelength region)
 - Light emitting Diodes (LEDs) are increasing – light intensity is often brighter and have significant emissions at the blue wavelength and no Near Infrared light.
- On shift, LED light is often used in the evening/ all night / early morning shifts
- Reduction in natural light exposure in the day

Changes in Eating Habits on Shift

2023 Systematic Review of 31 studies (18,196 participants) of Shift work (rotating and night shift) vs Day work found:

- Average 24 hour energy intake higher
 - No difference between those on rotating shifts vs those on permanent nights
- Irregular and more frequent meals and snacking
- Fewer “core” foods
 - Higher intake of saturated fats and discretionary foods
 - Lower intake of protein and fibre
- Higher caffeine consumption
- Lower intake of vegetable and fruit
- Food intake skewed to later part of the day

Clark A, Coates A, Davidson Z, Bonham M. Dietary Patterns under the Influence of Rotational Shift Work Schedules: A Systematic Review and Meta-Analysis - ScienceDirect. Advances in Nutrition. 2023 Mar;14(2):285–316.

Rationale for Different Food intake

- There is a decrease in hunger during the night – some workers don't eat during the nightshift
- Care workers and emergency services may have to prioritise patient care / incidents over breaks to eat
- The type of work may influence the timing of breaks – ie Cabin crew so there is no regularity
- Home life also has an influence on meal types and timing
 - Some may prioritise family meals over sleep (and then eat another main meal on shift with colleagues)



Rationale for Different Food intake

- Some cultural differences may have interesting benefits
 - ie Muslims during Ramadan
 - Spanish traditionally having daytime “split shifts” around a long lunch
- Food supply may be a canteen (may be limited options), but more likely to be vending machines, food brought in from home or take-aways (and now possibly deliveries)
- Nursing staff often given gifts (biscuits and chocolates) from patients



Original Research(2023)

Macronutrient intake and alertness during night shifts – the time interval matters

Participants	128 nurses (92% female) from 3 hospitals in the Netherlands, aged 20 – 61, on night shifts for at least 6 months
Methods	Psychomotor vigilance tasks (PVT) during the night shift (between 2 and 5am) and a 24hr dietary recall after the night shift Repeated 3x always on the first night in a series
Measures	Macronutrients intake 0-1, 1-2, and 2-3 hrs before PVT PVT performance = reaction time, lapsed Perceived alertness BMI
Findings	Protein was not associated with objective alertness Fat and carbohydrate had opposite associations

Fatigue and Macronutrients

- 26 of these nurses reported to have fallen behind the wheel after a night shift had been involved in an accident after a night shift because of fatigue
- Protein eaten 1 – 2 hrs before the PVT appeared to aid reaction time but not lapses
 - this correlation disappeared after adjustments for BMI and caffeine intake
- Fat intake up to 1 hr before the PVT resulted in a longer reaction time
 - Fat intake 2 – 3 hrs before PVT resulted in shorter reaction time and fewer lapses

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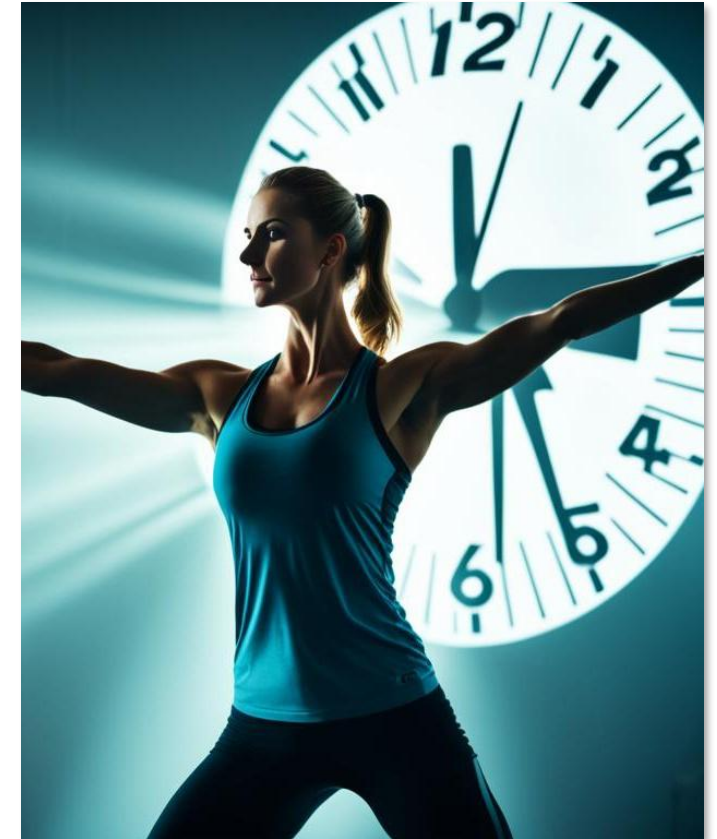
Fatigue and Macronutrients

- Carbohydrates
 - Carb intake up to 1 hr before PVT resulted in shorter reaction time, especially mono and disaccharides
 - 2-3 hrs before, there was a longer reaction time and more lapses

Summary : eat a meal balanced with macronutrients

Physical Activity

- A 2017 review of Dutch shift workers show they tend to spend more time walking than non-shift workers
 - No overall difference in physical activity to non-shift workers
- An Australian study in 2025 of 21 intern paramedics showed an increase in activity in leisure time (but still not achieving recommended guidelines)
- UK biobank analysis 2006-2010 found reduced physical activity at work and fewer steps walked by shift workers



Loef B, Hulsege G, Wendel-Vos W, Verschuren M, Vermeulen R, akker M, et al. Non-occupational physical activity levels of shift workers compared with non-shift workers | Occupational & Environmental Medicine. BMJ. 2017;74(5):328–35.
Crowther M, Ferguson S, Reynods A. Sleep, dietary intake and physical activity changes with onset of shift work in intern paramedics. Paramedicine. 2024 Oct;22(3):127–39.
Xu M, Yin xiaoxv, Gong Y. Lifestyle Factors in the Association of Shift Work and Depression and Anxiety | Lifestyle Behaviors | JAMA Network Open | JAMA Network. JAMA Network Open [Internet]. 2023 Aug [cited 2025 Dec 4];6(8). Available from: <https://jamanetwork.com/journals/jamanetworkopen/fullarticle/2808248>

Changes in Sleep for Shiftworkers

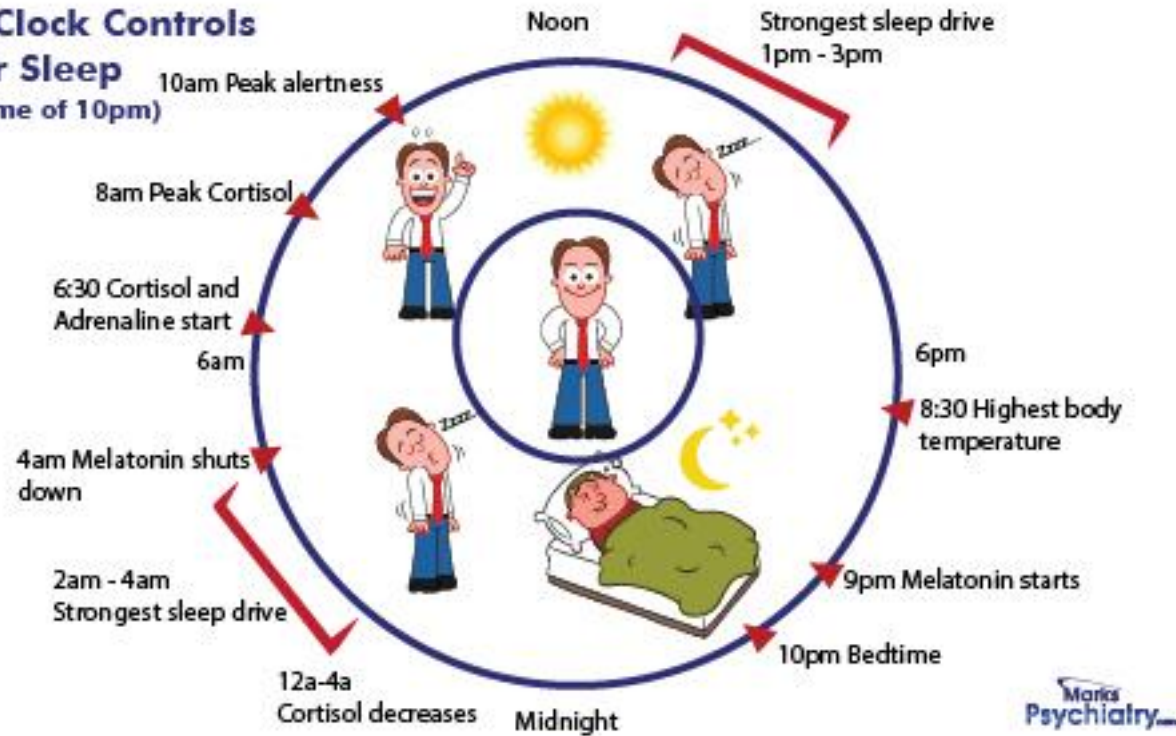
- Less sleep during shift work
 - 5 hrs 51mins after a night shift
 - 6hrs 37 before a morning shift (before 0600)
 - 8hrs 22 mins after an evening shift
- Normally reduced REM
 - Reduced slow wave (deep) sleep when early wakings are anticipated
- Sleep often extended above 8 hrs on first day off after shift work
 - So acute sleep loss vs chronic sleep loss?



Physiological Changes with Shift Work



Your Body Clock Controls Your Sleep (assumes a bedtime of 10pm)



- Shift work misaligns the body's internal biological clock with external environmental cues
- There is then a mismatched between physiological process and the natural day-night cycle

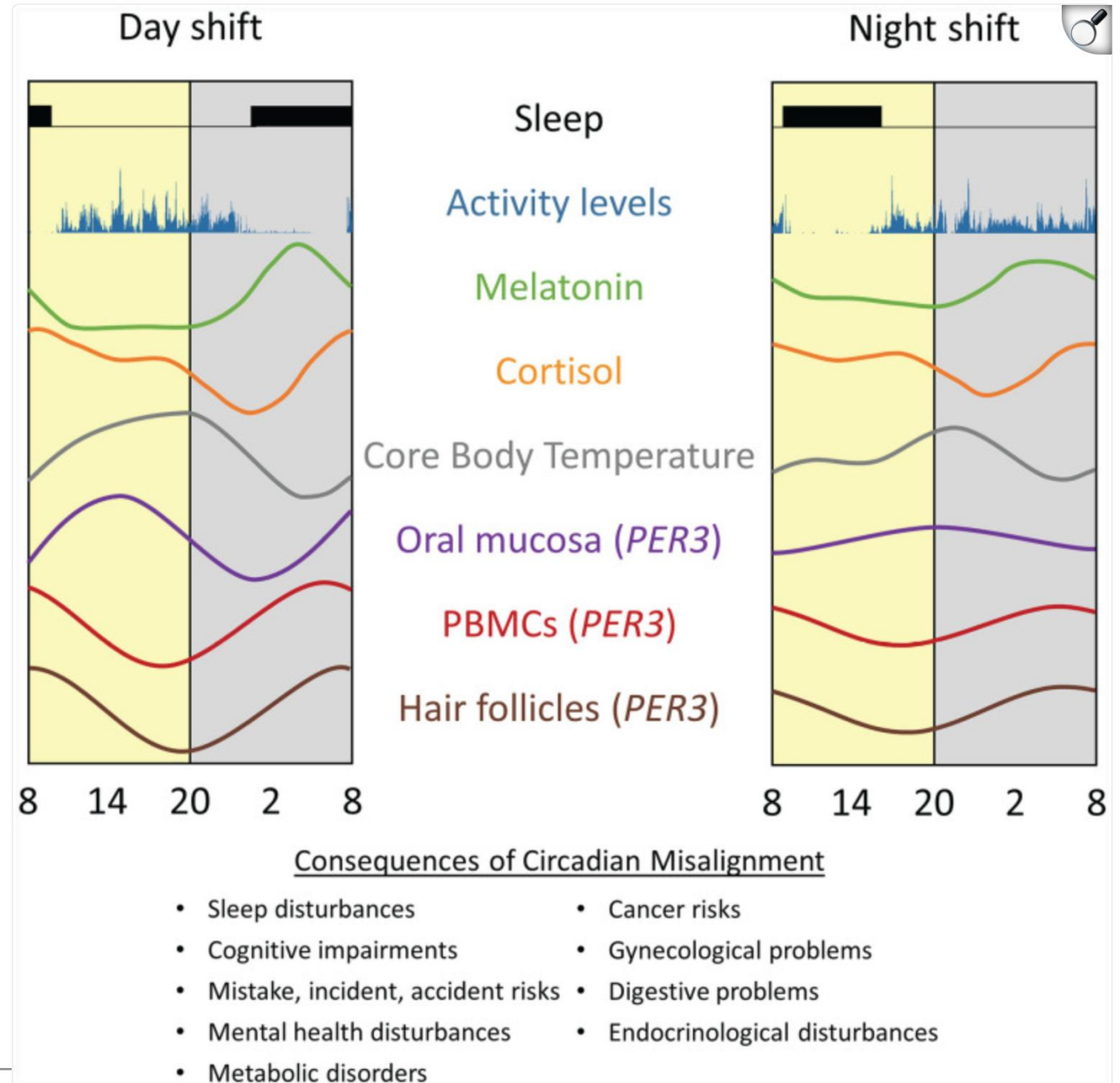
Circadian Disruption

- We have a central clock (located in the suprachiasmatic nucleus)
 - Controls metabolism through a 24hr clock
- Peripheral clocks in tissues through the body eg the gut, synchronised to the central clock when external factors follow diurnal patterns
- Circadian process at night promote sleep, and fasting through melatonin and insulin
- Daytime activity optimises for energy expenditure – insulin secretion, cholesterol and glycogen synthesis
- Estimated a total of 19% metabolites in the blood have strong circadian fluctuations

Clark A, Coates A, Davidson Z, Bonham M. Dietary Patterns under the Influence of Rotational Shift Work Schedules: A Systematic Review and Meta-Analysis - ScienceDirect. Advances in Nutrition. 2023 Mar;14(2):285–316.

Ang JE, Revell V, Mann A, Mantelle S, Otway DT, et al. Identification of Human Plasma Metabolites Exhibiting Time-of-Day Variation Using an Untargeted Liquid Chromatography–Mass Spectrometry Metabolomic Approach. The journal of Biological and Medical Rhythm Research. 2012 July;27(7):868–81.

Disruption of Central and Peripheral Rhythms by Nightshift Work



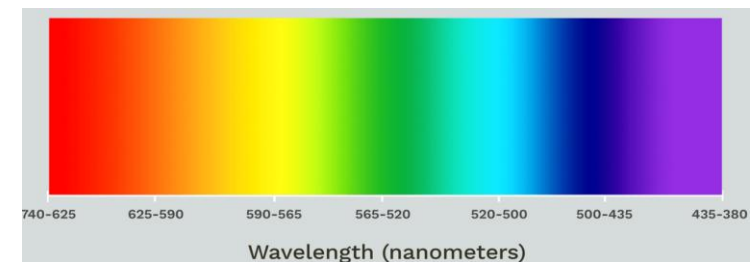
Boivin D, Boudreau P, Kosmadopoulos A. Disturbance of the Circadian System in shift Work and its Health Impact. Journal of Biological Rhythms. 2021 Dec;37(1).

Melatonin

Originally thought to be produced primarily in the cytosol in the pineal gland – this is still true

- AND, now it's found to be produced by the mitochondria inside many other cells in the body
- The GI mucosa is a significant secondary source, with neurons, glia, astrocytes, thymus, heart, kidney, spleen, lymphocytes, oocytes, testes, placenta, skin, gut etc
- It is a part of the body's sleep/wake cycle
 - Bright and particularly blue light (wavelength 480nm) suppresses melatonin release from the pineal gland

- It's a powerful antioxidant
 - Inhibits tumour cell proliferation
 - Reduces oxidative DNA damage
- Regulates oestrogen levels
- It inhibits leptin



Cortisol roles:

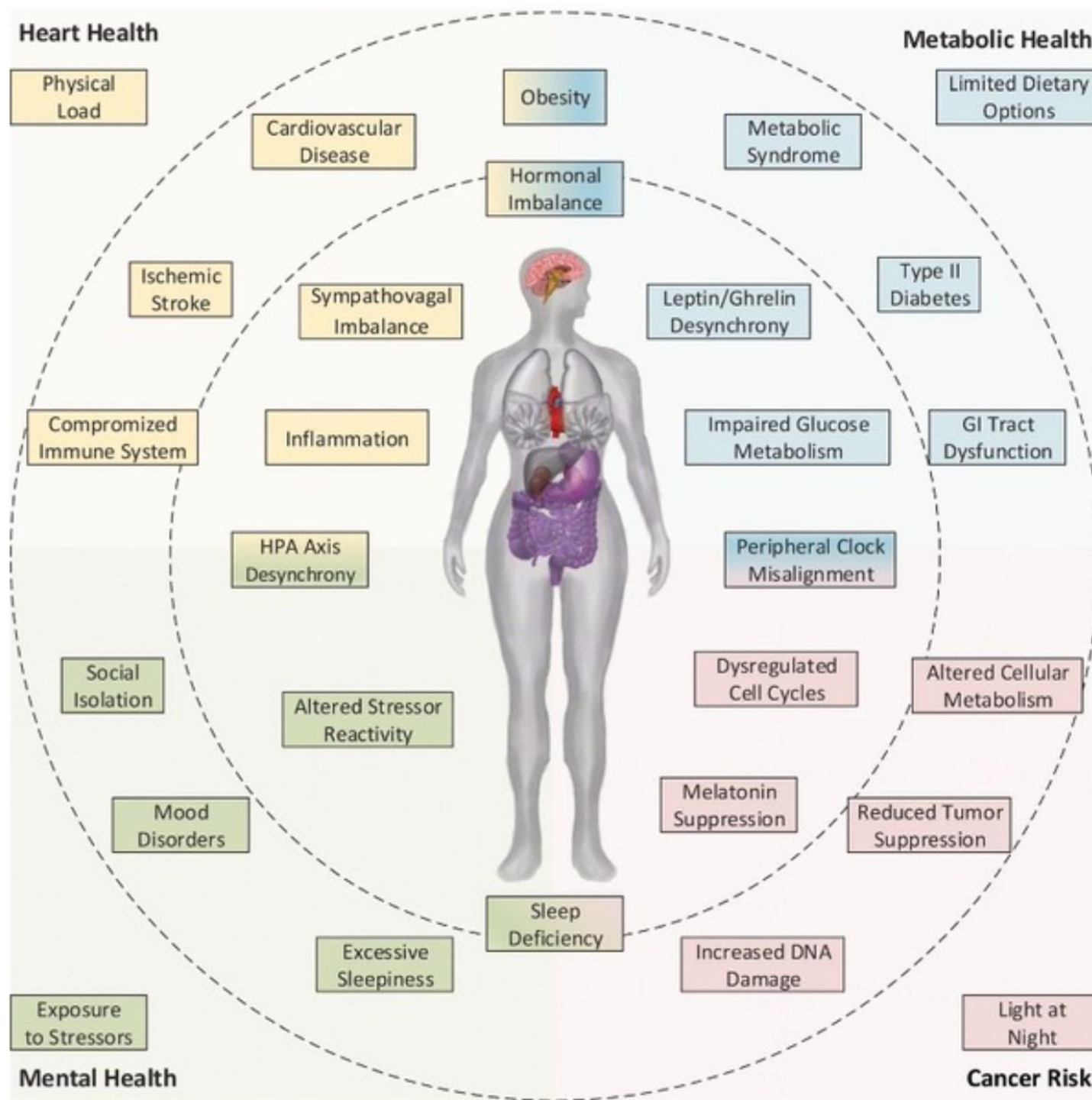
Cortisol binds to glucocorticoid receptors which are present in virtually all tissues in the body:

- **Energy mobilisation:** facilitates gluconeogenesis in the liver
 - Dysregulation can lead to hyperglycemia, insulin resistance and metabolic syndrome, T2DM (each adding stress in the body)
- **Immune function:** it exerts anti-inflammatory effects, helping to regulate immune activity and homeostasis.
 - Dysregulation can promote low grade chronic inflammation
 - Also the Cortisol awakening response (CAR) is suggested as playing a role in switching from cellular to humeral immune response as we wake
- Cortisol directly impacts **blood pressure regulation** through vascular tone and sodium retention
 - Night shift workers show a prevalence of hypertension

Grosser L, Knayfati S, Yates C, Dorrian J, Banks S. Cortisol and shiftwork: A scoping review. Sleep Medicine Reviews [Internet]. [cited 2025 Dec 18];64. Available from: <https://www.sciencedirect.com/science/article/abs/pii/S1087079221001660>

Health consequences of shift work

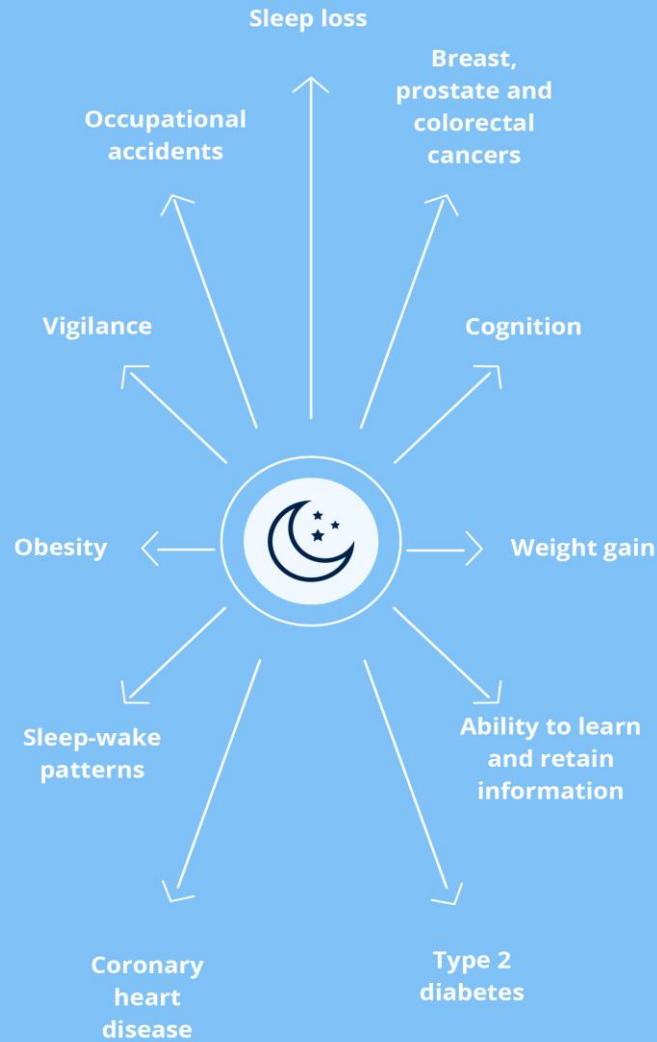




Pathophysiology due Shift Work

James tephen, Honn K, Gaddameedhi S, van Dongen H. Shift Work: Disrupted Circadian Rhythms and Sleep - Implications for Health and Well-Being | Request PDF. Current Sleep Medicine Reports [Internet]. [cited 2025 Dec 4]; Available from: https://www.researchgate.net/publication/315775543_Shift_Work_Disrupted_Circadian_Rhythms_and_Sleep_-_Implications_for_Health_and_Well-Being

Research suggests night shift work can influence:



Increased Health Risks due Shift Work

2016 review of 38 meta-analyses and 24 systematic reviews

- T2 diabetes -relative risk 1.09-1.4
- Coronary heart disease- relative risk 1.23
- Stroke -relative risk 1.05
- Cancer – relative risk 1.01-1.32
 - Breast cancer – possible increase of 3% for each 5year increment
 - Prostate cancer – possible increase of 2.8% for each 5year increment

Kecklund G, Aselsson J. Health consequences of shift work and insufficient sleep. *BMJ*. 2016 Nov;(355)
Zhong Y, Bai H, Zhang Y, Yang X, Zhang T, Li Z, et al. Association of rotating shift work with incident irritable bowel syndrome: a large population-based prospective cohort study. *Frontiers in Public Health* [Internet]. 2025 Mrch [cited 2025 Dec 4];13. Available from: <https://www.frontiersin.org/journals/public-health/articles/10.3389/fpubh.2025.1541122/full>

Increased health risks due shift work

Some risks mimic those of insufficient sleep:

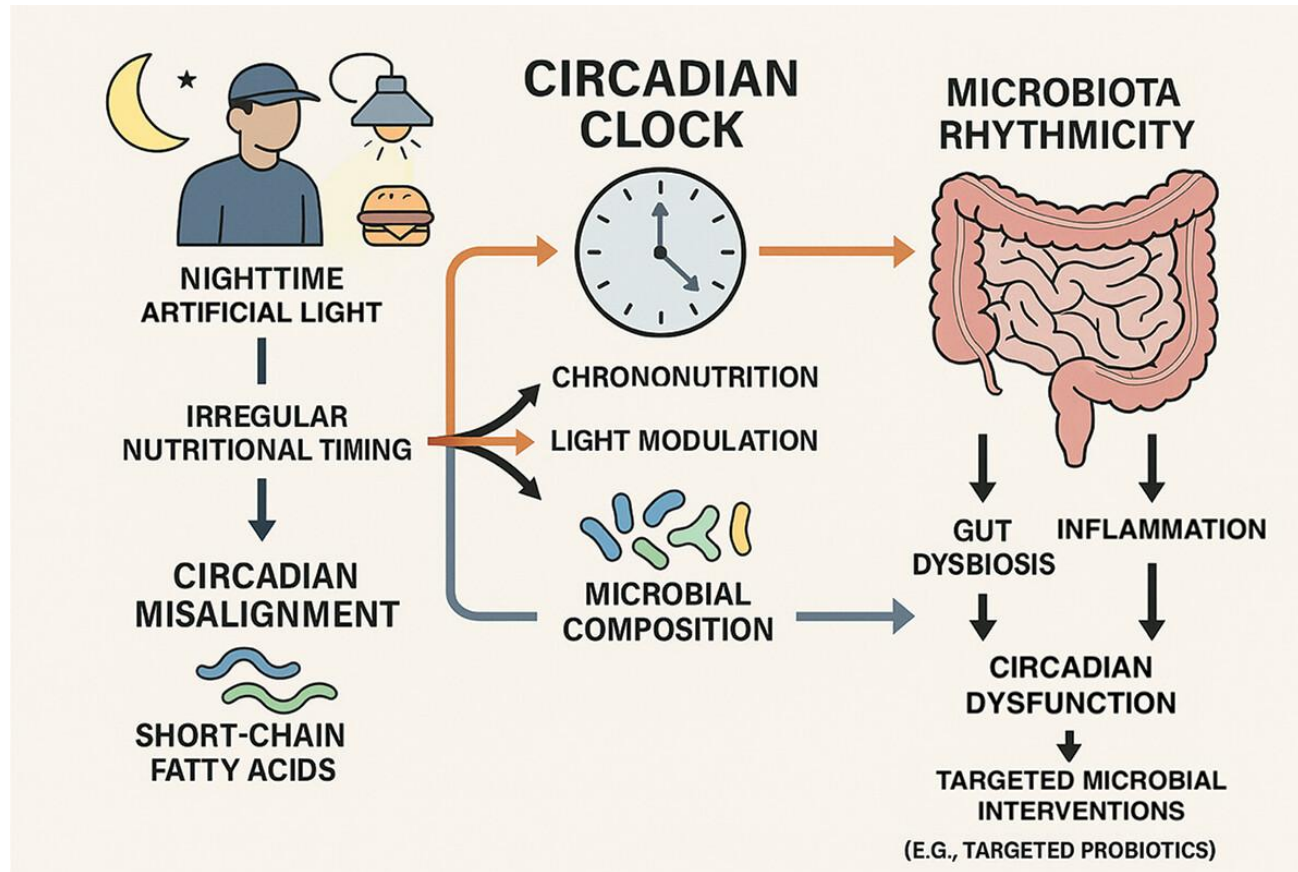
- Accident risk
- Cardiometabolic disease
 - Cardiometabolic stress (based on lab tests)
- Cognitive impairment (based on lab tests)



Gut health

Shift workers report IBS type symptoms, possible reasons:

- Higher carb / sugar diet
- More frequent grazing
- Sleep induced stress
- Increased inflammation
- Impact on peripheral clocks in the gut membrane



Zhong Y, Bai H, Zhang Y, Yang X, Zhang T, Li Z, et al. Association of rotating shift work with incident irritable bowel syndrome: a large population-based prospective cohort study. *Frontiers in Public Health* [Internet]. 2025 March [cited 2025 Dec 4];13.

Touitou Y, Perlemuter G, Touitou C. Shift work, gut dysbiosis, and circadian misalignment: The combined impact of nighttime light exposure, nutrients, and microbiota rhythmicity. *Chronobiology International*. 2025 Aug;42(10):1275–90.

28 Santamraia AL, Mondragon A del C, Cardelle A, Santos E. Effects of Unconventional Work and Shift Work on the Human Gut Microbiota and the Potential of Probiotics to Restore Dysbiosis. *Nutrients* [Internet]. 2023 July [cited 2026 Jan 1];15(13).

Cohort Study (2024)	
Lifestyle Factors in the Association of Shift work and Depression and Anxiety	
Participants	175,543 from UK Biobank (2006-2010)
Methods	Depression and anxiety based on health records, using hazard regression models to associate with mediating role of lifestyle factors
Measures	Shift status, smoking, physical activity, alcohol consumption, dietary characteristics, sleep duration, sedentary time, BMI
Findings	Shift work significantly associated with higher risk of depression and anxiety Lifestyle factors partially mediated the associations
Xu M, Yin xiaoxv, Gong Y. Lifestyle Factors in the Association of Shift Work and Depression and Anxiety Lifestyle Behaviors JAMA Network Open JAMA Network. JAMA Network Open [Internet]. 2023 Aug [cited 2025 Dec 4];6(8). Available from: https://jamanetwork.com/journals/jamanetworkopen/fullarticle/2808248	

Depression and Anxiety

- Ultimate conclusion “Shift work should be considered an occupational hazard”
- Occurs more in females
- Negative association with years worked
 - Proposed that there is a level of adjustment that occurs
- Fatigue tends to increase mental health issues
 - Also alleviated over time with adaptation
- May also be associated with low income, poor environment and subjective stress

Cross Sectional Study (2014)

Association between exposure to rotating night shift versus day shift using levels of 6-sulfatoxymelatonin and cortisol and other sex hormones in women

Participants	136 women 73 day shift workers, 63 rotating night shift workers
Methods	Blood and urine samples after 2 consecutive days
Measures	6-sulfatoxymelatonin(aMT6s),Cortisol, oestradiol, progesterone, DHEA, DHEAS, testosterone
Findings	Rotating night shift workers had lower excretion of aMT6s, lower fluctuation and a later acrophase (peak aMT6s) time, and higher oestradiol and progesterone levels especially in follicular phase

Gomez-Acebo I, Dierssen-Sotos T, Papantoniou K, Garcia-Unzueta M, Santos-Benito MF, Llorca J. Association between exposure to rotating night shift versus day shift using levels of 6-sulfatoxymelatonin and cortisol and other sex hormones in women. The Journal of Biological and Medical Rhythm Research. 2015;32(1).

Hormone impacts

- A 2025 systematic review and meta-analysis on male reproductive health:
 - Lower sperm count
 - Marginally higher serum testosterone
- A 2025 Systematic Review on impact of night shift, on fertility and pregnancy:
 - Increased risk for gestational diabetes and hypertensive disorders of pregnancy and pregnancy loss
 - Mildly increased risk of preterm birth

Viramgami A, Balachandar R, Sheth A. Study on the association between night shift work and reproductive functions among male workers: a systematic review and meta-analysis - PubMed. Endocrine. 2025 May;88(2):410–9.

Lee CY, Moawad K, Pien GW. Frontiers | Impact of night shift work on women's fertility, pregnancy and menopause. Front Sleep [Internet]. 2025 Apr [cited 2025 Dec 3];4. Available from: <https://www.frontiersin.org/journals/sleep/articles/10.3389/frsle.2025.1545258/full>

Shift Work Disorder

- This is a particular circadian rhythm sleep-wake disorder
- It occurs when a person who does shift work has:
 - Difficulty adjusting to different sleep/wake schedules before or after the shift
 - Has excessive sleepiness and fatigue during shifts

May increase the risk of:

- Chronic sleep disturbance, Cognitive impairment, Depression, Reduced performance, work-related errors and accidents, road traffic collisions, Cardiometabolic conditions, Cancer

It effects around
26.5% of people who
work non-traditional
shifts

More prevalent in
night shift rather than
evening

Lifestyle drivers and interventions



Daylight, NIR and the Mitochondria

- Near Infra Red therapy also referred to as photobiomodulation
- Used for retinitis pigmentosa, age related macular degeneration, soft tissue injuries, acceleration of wound healing even Alzheimer's disease is being researched
- Thought to be the NIR / mitochondrial interaction
 - NIR able to penetrate clothing, skin into underlying tissues
- NIR linked to melatonin synthesis
 - There is a similarity between melatonin and NIR interventions
- Is there are health benefits of daylight beyond its role in melatonin and sleep.

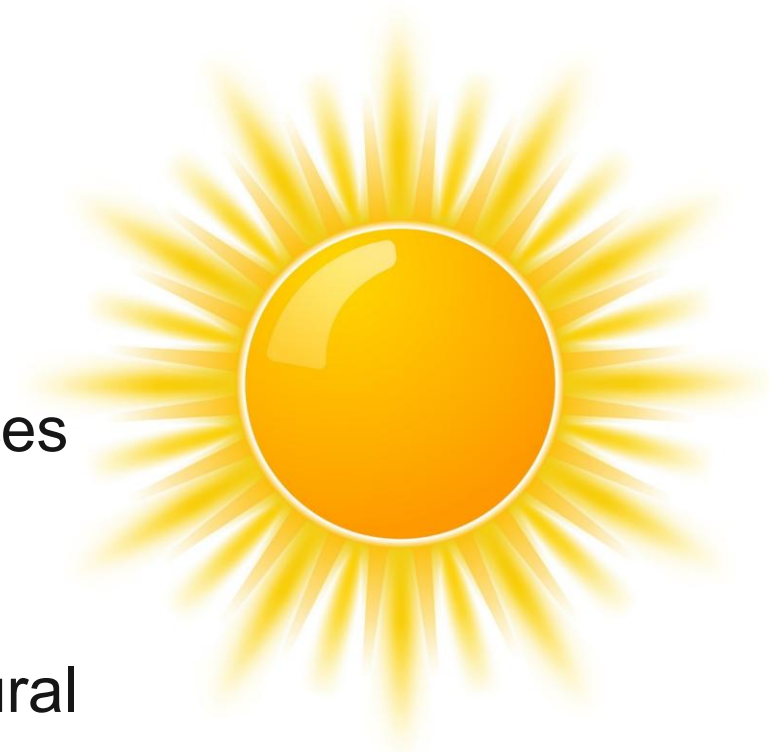
Light Exposure – Natural / Red / NIR Light

- Consistent research shows red light (peak wavelength of 630nm) exerts minimal influence on pineal melatonin levels and circadian system whilst maintaining alertness.
- 2024 study showed that exposure to red light (670nm) reduced blood glucose elevation after intake by 27.7% over 2 hrs, with max peak reduced by 7.5% (through increase in mito potential and increase in ATP production)
- Ideally lighting in a work / hospital setting should consider shift scheduling, ie, it needs to be different for morning, afternoon and evening shifts

Figueriro MG, Pedler D. Red light: A novel, non-pharmacological intervention to promote alertness in shift workers. Journal of Safety Research. 2020 Sept;74:169–77.
Powner M, Jeffery G. Light Stimulation of Mitochondria Reduces Blood Glucose Levels. Journal of Biophotonics. 2024 Feb;17(5).
Lowden A, Kecklund G. Considerations on how to light the night-shift. Society of Light and Lighting [Internet]. [cited 2025 Dec 22];53(5). Available from: <https://journals.sagepub.com/doi/10.1177/14771535211012251>

Individual action with light

- Get out into daylight whenever possible
- Consider using red light bulbs or halogen bulbs in places at home to use at the end of a night shift
- Use blue light blocking glasses later in a night shift
- If doing an early (indoor) shift aim to be outside in natural light afterwards
 - Again combine with exercise if possible
- If doing an evening or night shift, aim for daylight before the start of shift
 - Though not always possible before a night shift, then use strong lighting if possible at home.



Sleep

Prioritise sleep and regular sleep patterns

- If on permanent night shifts, aim to maintain a consistent pattern even on days off
 - Aim for a minimum of 7 hours – if necessary, taken in 2 blocks
- If on rotating or irregular night shifts, go to bed as soon as possible and sleep for as long as possible (nap before the next shift if possible)
- Create a good sleeping environment – dark, cool, quiet
 - Use eye mask, ear plugs, white noise and even “cold water bottle”



Sleep recommendations

from Sleep Council Canada

- Aim for 8 hours sleep
 - Between 10am and 6pm
 - Allows a 4 hr window (6am – 10am) for activities and “dinner” (as you would if you worked day shifts)
- Start wind-down routine 30mins before bed (i.e. 0930)
 - Such as light stretching, warm shower or meditation
- Keep bedroom dark and cool (between 18-20C)
- Between waking at 6pm til work
 - 6.00pm eat a light “breakfast”
 - 6.30pm-7.30pm opportunity for activity to boost alertness and fitness
 - Prepare a light lunch to take to work (to be eaten between 2am and 3am)
 - Eat something substantial at 10pm

Dietary Interventions



Single Blind, parallel-arm trial (2025)

Daytime Eating During Simulated Night Work Mitigates changes in Cardiovascular Risk Factors: Secondary Analyses of a Randomised Controlled Trial

Participants	20 healthy participants (non-shift workers) on simulated night work
Methods	First arm was eating “normally” (ie day and night) Second arm was only eating in the day-time
Measures	Percentage consecutive heartbeat intervals >50 Root mean square of successive heartbeat differences Low/high cardiac frequency Blood concentration of prothrombotic factor plasminogen activator inhibitor
Findings	Markers were positively modified “Daytime eating despite mistimed may mitigate changes in cardiovascular risk factors”

Chellappa S, GAO L, Qian J, Vujovic N, Li P, Hu K, et al. Daytime eating during simulated night work mitigates changes in cardiovascular risk factors: secondary analyses of a randomized controlled trial. *Nature Communications* [Internet]. 2025 Apr [cited 2025 Dec 23];16(3186). Available from: <https://www.nature.com/articles/s41467-025-57846-y>

- The meal timing intervention:
 - did not significantly modify cortisol levels
 - significantly (positively) modified the impact of simulated night shift on synaptic and diastolic blood pressure (by 6 – 8%)
 - Decreased cardiac vagal modulation
- BUT**
- It was only over 2 weeks
 - Was a simulated night shift – ie not long-term shift workers
 - What about alertness and fatigue?

Sample Night Shift Meal Plan

PRE-SHIFT DINNER: GRILLED SALMON BOWL

- 4 oz salmon fillet
- 1/2 cup cooked quinoa
- 1 cup steamed broccoli
- 1/4 avocado, sliced
- 1 tsp olive oil, lemon juice, garlic (for marinade)

MID-SHIFT SNACK: GREEK YOGURT PARFAIT

- 3/4 cup plain Greek yogurt
- 1 tbsp chia seeds
- 1/2 cup mixed berries
- 2 tbsp granola

LATE-SHIFT MEAL: TURKEY SPINACH WRAP

- 1 whole grain tortilla
- 3 oz sliced turkey breast
- 1 tbsp hummus
- 1/4 cup shredded carrots
- 1/2 cup baby spinach

POST-SHIFT LIGHT MEAL: OATMEAL BOWL

- 1/2 cup rolled oats
- 1/2 banana, sliced
- 1 tsp almond butter
- 1/2 cup unsweetened almond milk



Nurse.com [Internet]. 2025 [cited 2025 Dec 23]. 5-Day Night Shift Meal Plan for Nurses. Available from: <https://www.nurse.com/nursing-resources/new-nurses/5-day-night-shift-meal-plan-for-nurses/>

Strategic use of Caffeine

“note caffeine does not resolve fatigue but masks it”

- According to the FAA in the USA, used strategically, caffeine can offer:
 - fast acting, short term relief from symptoms of fatigue
 - temporarily improved alertness and performance
- BUT too much can lead to:
 - dependency and needing more
 - inability to fall asleep or disrupt sleep cycles impacting depth and quality of sleep



Use should be:

- timely and when you need it and not for several hours before sleep is due
- not because you are thirsty (check hydration levels)
- use as a “caffnap”, ie combine with a 15-20min nap

Dietary recommendations / thoughts

- Multiple studies show that nurses will eat what is available
- Canteens are often closed or have reduced offerings
 - Improve what is available
 - Or improve storage / fridges to enable home prepared food
- High fibre diets with balanced macros and consistent mealtimes
- An eating window of less than 12 hours was associated with reduced odds of anxiety in airline crew (study of >20,000)
- Low-glycemic foods (particularly at night) due reduced insulin sensitivity
- Consume tryptophan rich foods post shift / before sleep

Gupta C, Coates A, Dorrian J, Banks S. The factors influencing the eating behaviour of shift workers: what, when, where and why. *Industrial Health*. 2018 Nov;57(4):419–53.
Touitou Y, Perlemuter G, Touitou C. Shift work, gut dysbiosis, and circadian misalignment: The combined impact of nighttime light exposure, nutrients, and microbiota rhythmicity. *Chronobiology International*. 2025 Aug;42(10):1275–90.
Zhang E, Li H, Han H. Dietary Rhythmicity and Mental Health Among Airline Personnel. *JAMA Network Open* [Internet]. 2024 July [cited 2025 Dec 23];7(7). Available from: <https://jamanetwork.com/journals/jamanetworkopen/fullarticle/2821153>

Nutrients

For cognitive function



Vitamin D

for shift workers



Vitamin D and Shift Workers

- An Italian 2022 systematic review of 13 cross-sectional studies
 - Significantly lower levels of serum 25-OH-D in shift workers compared with non-shift workers
- A systematic review from 2018 found:
 - Indoor / shift workers are more likely to experience vitamin D3 insufficiency or deficiency
 - There were some who had a higher incidence than others
- Both reviews couldn't ascertain level of supplementation, genetics or level of outdoor exposure

Martelli M, Salvio G, Santarelli L, Bracci M. Shift Work and Serum Vitamin D Levels: A Systematic Review and Meta-Analysis. International journal of Environmental Research and Public Health. 2022 July;19(15):8919.

Coppeta L, Francesca P, Magrini A. Are Shiftwork and Indoor Work Related to D3 Vitamin Deficiency? A Systematic Review of Current Evidences. Environment and Public Health. 2018 Sept;

Who needs more vit D?

Vit D status & requirements depends on:

- Shift work / Indoor lifestyle > (prisons, nursing homes)
- Geographical location & season (you can use an app such as Dminder)
- Skin tone:
 - Lighter skin - prone to sunburn (pale skin)
 - Deeper skin tones - melanin naturally impedes UVB rays
- SPF use
- Obesity / Body fat %

.....*Ideally, best to test*



An estimated
1 billion
people
lack D3
globally

Pharma Nord Formulations

Vitamin D3

- Small, easy to swallow 'pearl' capsules
- Dissolved in cold pressed organic olive oil to enhance absorption
- Available in a range of strengths from 800IU – 20,000 IU
- Documented bioavailability, proven in clinical trials



Available in **UK**



Available in **ROI**

Probiotics and Shift Work

- A 2023 review of 8 studies on the use of probiotics with people with unconventional work and shift work and their health consequences found
 - *“Probiotic supplements may be effective in protecting and preserving the diversity and stability of the intestinal microbiota”*
- 2021 study of 87 (29 in each arm) female night shift workers, given *lactobacillus acidophilus* or *bifidobacteria animals* or placebo for 14 days
 - Aim was to measure impact on cortisol, immune and inflammatory markers before supplementation, before starting 1st night shift then 2nd night shift
 - *“Probiotics may moderate the effects of anticipatory stress on the immune system in the lead up to night shift”*

Santamraia AL, Mondragon A del C, Cardelle A, Santos E. Effects of Unconventional Work and Shift Work on the Human Gut Microbiota and the Potential of Probiotics to Restore Dysbiosis. *Nutrients* [Internet]. 2023 July [cited 2026 Jan 1];15(13).

Pharma Nord Formulations

Cultures

- Contains scientifically documented lactic acid bacteria
 - Lactobacillus acidophilus (La-5®)
 - Bifidobacterium lactis (BB-12®)
- Does not require refrigeration
- Small enteric-coated capsules that are easy to swallow
- A special delivery technique ensures the viability of the bacteria in the gut



Available in **UK**



Available in **ROI**

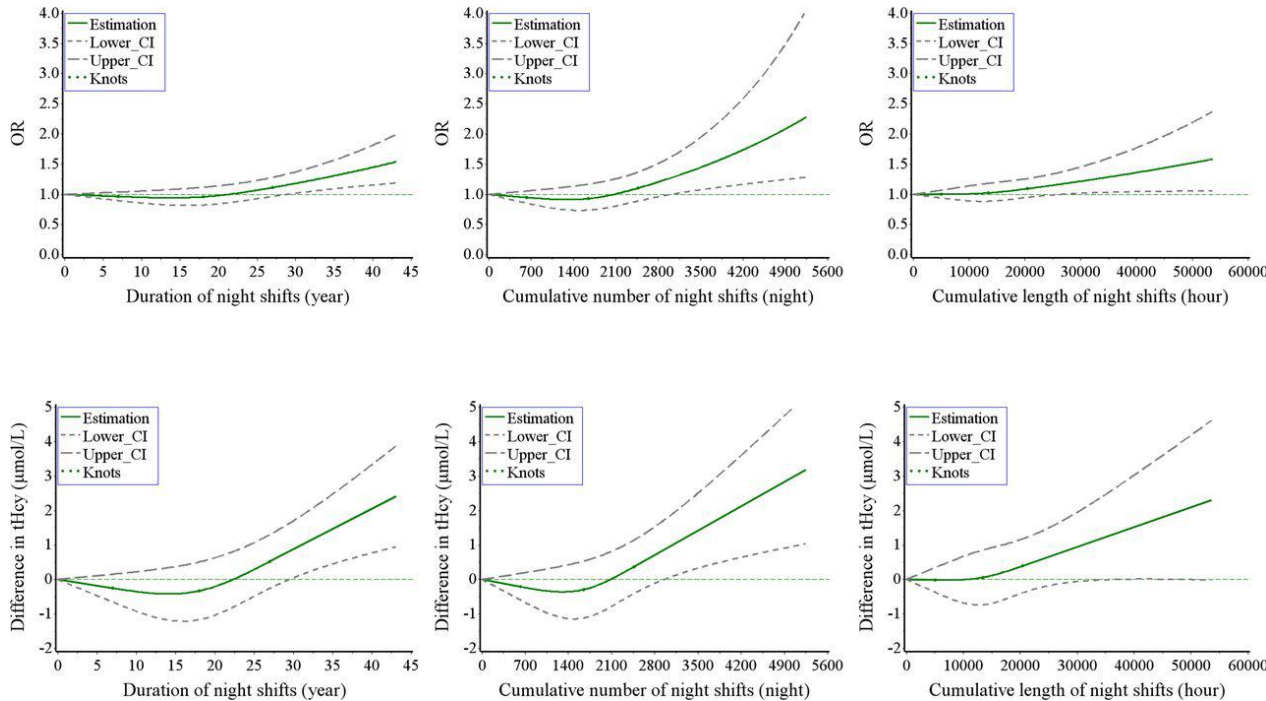
Fibre supplementation and Shift Work

- There is no research looking at the benefits of fibre supplementation on shift workers.
- BUT we know:
 - Shift workers tend to have an increase in gut symptoms AND
 - Shift workers tend to have a low intake of fibre



B Vitamins – Homocysteine considerations

Original cross-sectional study in 2020 Of 6846 Chinese steel workers on shift found:



- Current night shift workers have 23% higher odds of having higher homocysteine than those who have never worked a night shift
- If n/s for more than 28 years those odds are 35% higher
- If >7 night shifts per month odds are 35% higher
- If >30% of hrs worked are n/s then odds are >23%
- If worked n/s for >20 years, regardless of length, roughly 20-30% higher odds
- No differences for females were found

B Vitamins

B-Complex

A comprehensive B-Complex

- Supports energy-yielding metabolism
- One-a-day formula
- Suitable for vegetarians & vegans
- Manufactured to pharmaceutical standards



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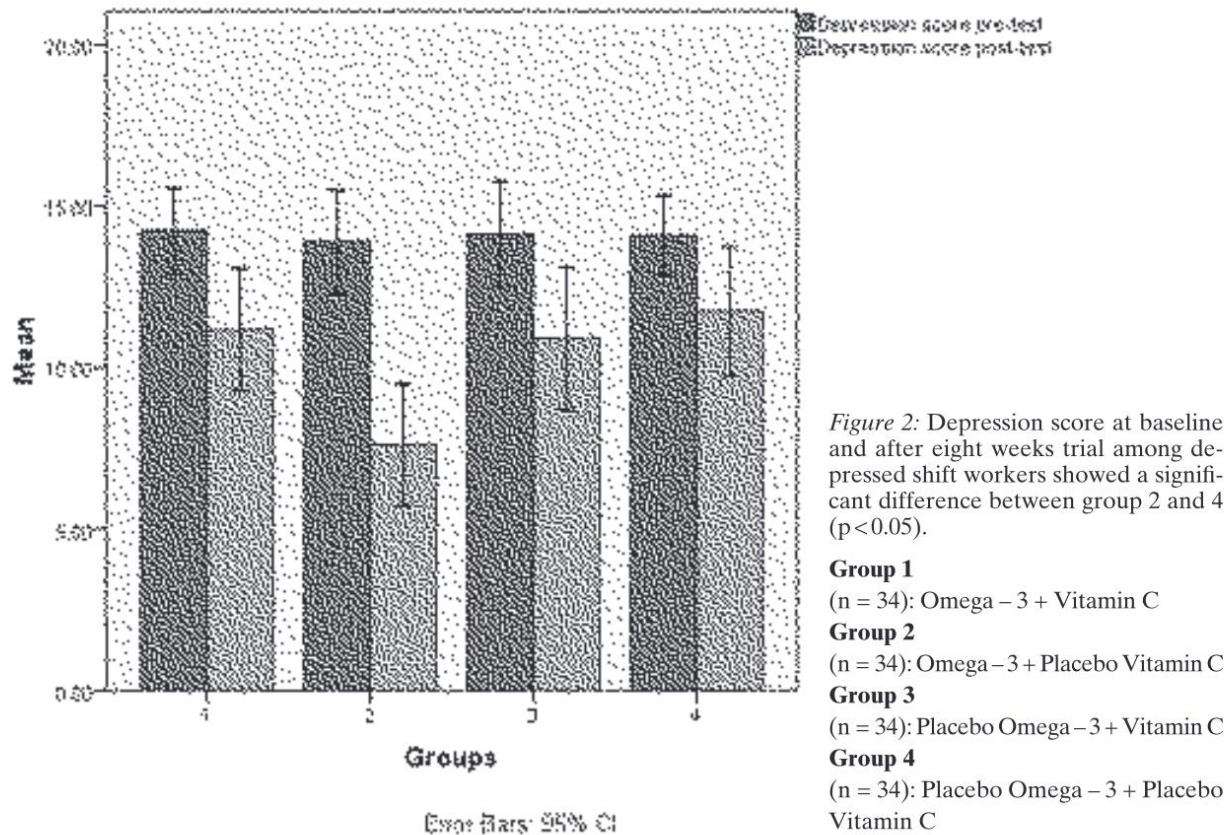
Omega 3 for sleep

- A systematic review in 2024 of 19 studies into the impact of omega 3 on sleep
 - Found that omega 3 improves sleep quality (in 74% of studies)
- End 2024 a phase III trial proposed, looking into using omega 3 supplementation for healthcare shift workers.
 - It's a randomised double blind trial in USA
 - Will have worked 2 – 4 night shifts a week for 6 months prior to taking part
 - Have symptoms of nightshift disorder
 - Supplementation is 3,300 mg (1 omega-3 capsule contains 675 mg of DHA and 975 mg of EPA)
 - Will also include sleep-hygiene practices

Bernandes C, Assad IM, Yonekura VY, Agular MR de A. The Impact of Omega-3 on Improving Sleep Quality: a Systematic Review of Current Clinical Research. Principles and Practice of Clinical Research Journal. 2024 Feb;9(4).

Sequeira ML, Ortiz MIB, Bernandes C, Yonekura VY. Efficacy of Omega-3 in Improving Sleep Quality of Healthcare Workers with Shiftwork Sleep Disorder: Phase III, Double-blind, Placebo-controlled Trial Study Protocol (SLEEP-O3 Trial). Principles and Practice of Clinical Research Journal. 2024 Aug;10(2).

Omega 3 and Vitamin C and Depression



A 2015 randomised, double blind trial with 136 Iranian depressed oil workers on rotating shifts

- Given 1000mg 2pd Omega 3 and/or 250mg ascorbic acid 2pd
- BDI (Beck Depression Score) reduced in all groups
- Reduced the most with omega 3 alone

Pharma Nord Formulations

Fish Oil

- **Free fatty acid form** x1.6 better absorption than triglyceride form
- Small and easy to swallow source of DHA & EPA
- Screened for heavy metal content
- Featured in human clinical trials
- Suitable for ages 11+

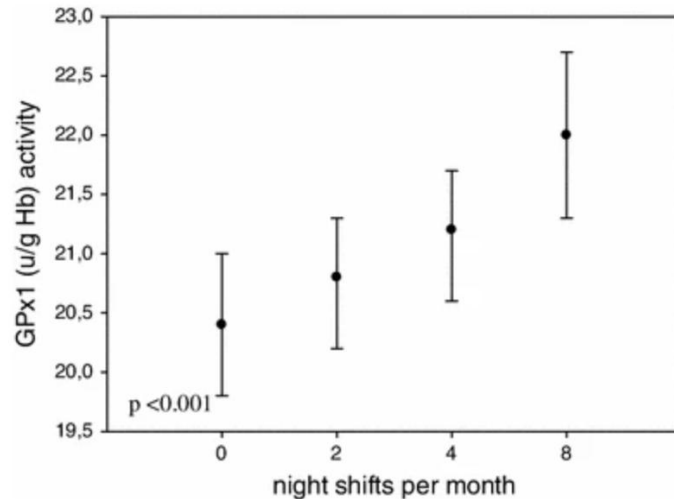


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Antioxidants



This 2012 study of antioxidant status of 359 "healthy" Polish nurses found:

- Statistically significantly higher red blood cell glutathione peroxidase (GSH-Px) in nurses working night shifts (After adjusting for age, alcohol, smoking, and oral contraceptive use)
 - Previous animal studies have found GSH-PX tends to increase at night and decrease in the day)
- Plasma Glutathione peroxidase activity in postmenopausal women appears to be reduced
- Statistically significant lower vitamin A and E level in premenopausal women

- *Consider if your client is pre or post menopausal*
- *Test and consider vitamin A / beta-carotene, vitamin E and Selenium supplementation*

Pharma Nord Formulations

Beta-carotene

- Pure beta-carotene - the natural precursor of vitamin A - in an easily digestible and stable form.
- Provitamin A for the maintenance of normal skin, vision, and mucous membranes
- Manufactured under Danish pharmaceutical control



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Pharma Nord Formulations

Vitamin E

- Protects against oxidative stress
- Manufactured under Danish pharmaceutical control
- Scientifically documented



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Selenium-yeast **SelenoPrecise in summary**

The selenium formulation with the highest documented absorption

- EFSA approved for bioavailability & safety
- Contains more than 30 organically bound selenium compounds
- Used in more than 40 published scientific trials
- Manufactured under pharmaceutical control



Selenium and CoQ10 may reduce CVD risk

The 'KiSel-10' trial:

- Double blind
- Randomized
- Controlled
- 443 participants, aged 70-88 years

- **Group 1** 200 mg Bio-Quinone Q10 & 200 µg selenium-yeast (SelenoPrecise) daily for 4 years

- **Group 2** Placebo

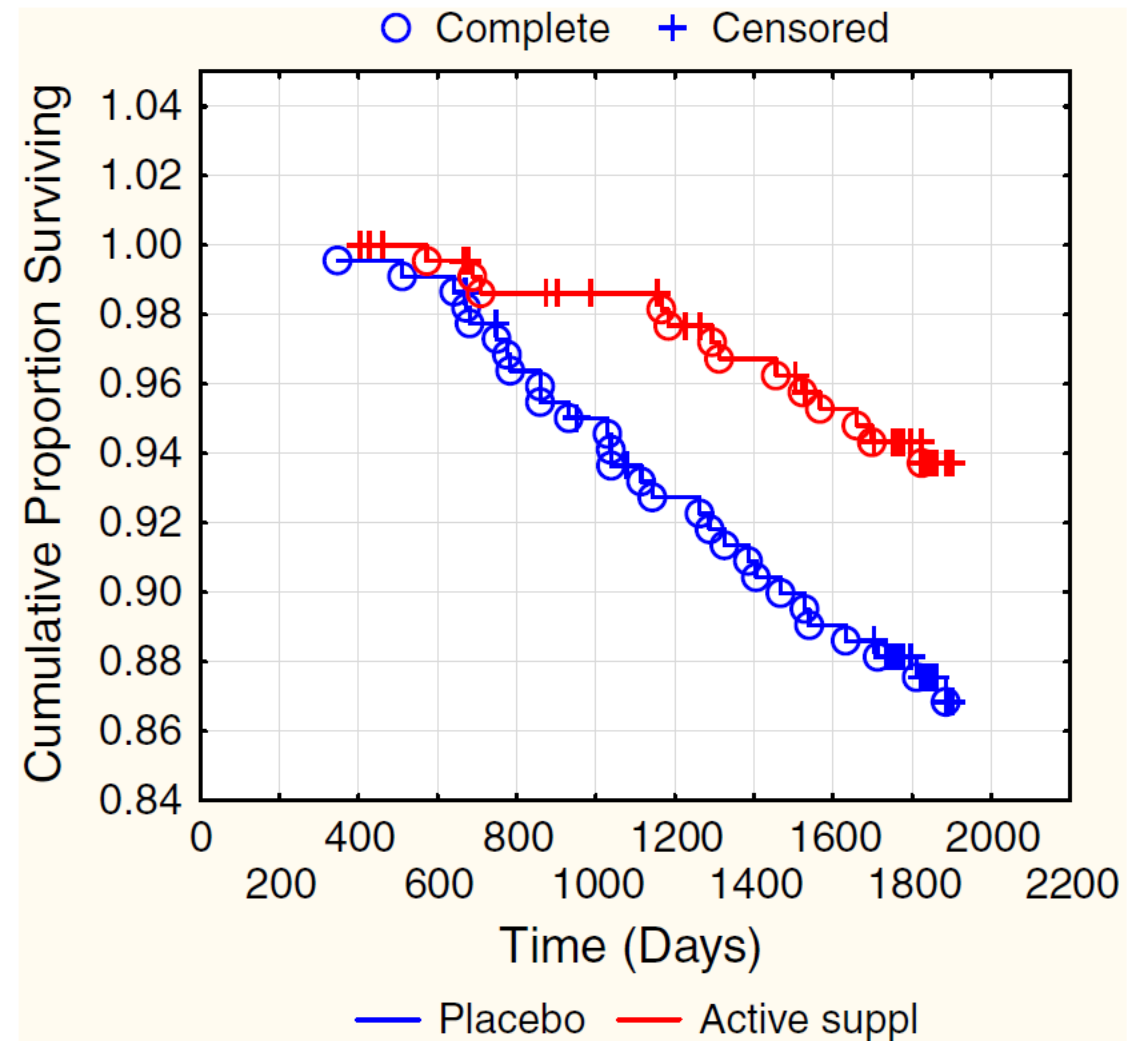
Monitored every 6 months (bloods and echocardiographic changes)

Results published in 2013

The KiSel-10 research group have published 23 sub-studies to identify the *key mechanisms* by which Q10 and Se are so powerful in cardiovascular ageing

54% reduction in cardiovascular mortality

A result worth considering given shift workers have a 23% increased risk of CVD



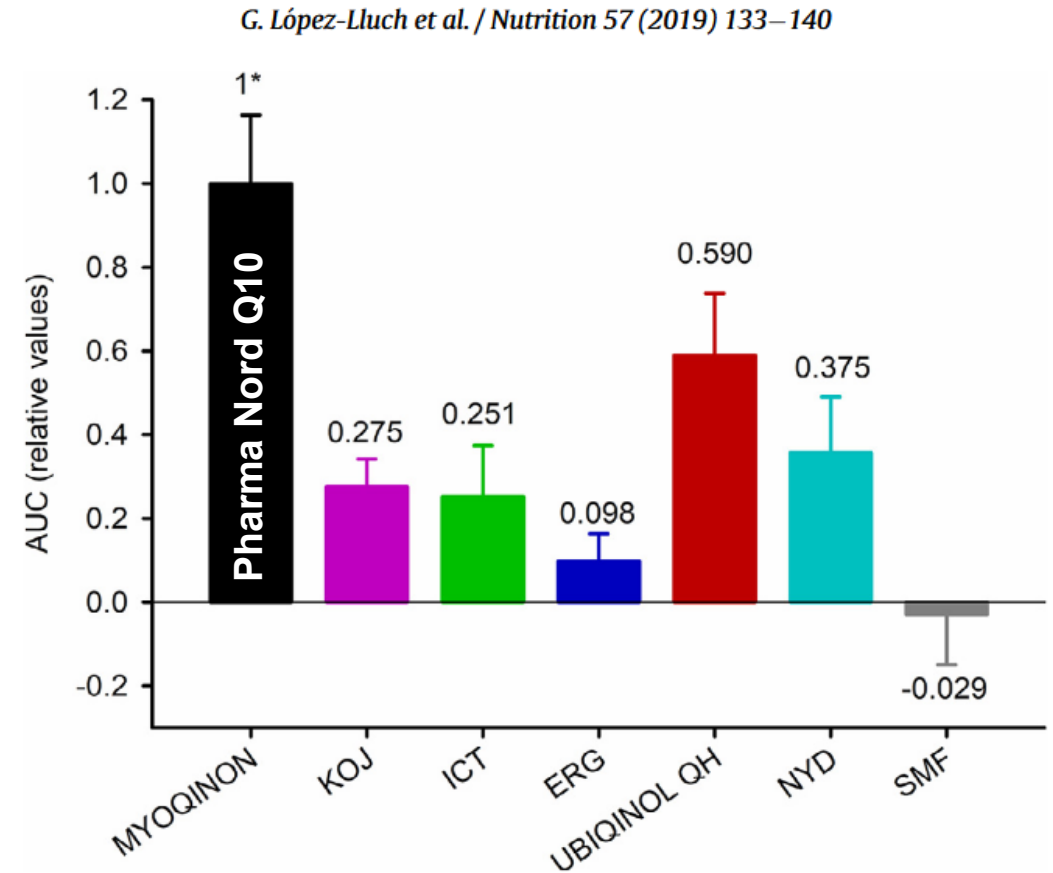
Q10 formulation considerations

1. Raw Q10 is difficult to absorb

- Well documented delivery form is needed
- Bio-Quinone increases Q10 surface area through crystalline structure

2. Q10 is a fat-soluble compound

- Oil containing capsules / dietary fats facilitate absorption
- **Doses:** if possible, no more than 100mg within 4 hours to maximise intestinal uptake



Pharma Nord Formulations

Coenzyme Q10

- Used in 100+ clinical trials, 30+ years
- Reference product of the International Coenzyme Q10 Association
- Documented bioavailability, proven in human clinical trials
- Manufactured under pharmaceutical control



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Magnesium

- Whilst there no research on the use of magnesium with shift workers.....
- There is a lot of research for magnesium and sleep disorders, this review in 2025 states that magnesium:
 - Reduces the excitability of the nervous system
 - Aids muscle relaxation
 - Regulates cellular biological clocks, energy balance and circadian rhythm
 - And deficiency shortens effective sleep and impairs sleep quality

Supplementation
is worth
considering for
those with
shiftwork disorder



Pharma Nord Formulations

Magnesium

- Contains a complex of three forms of Mg, offering high bioavailability
- Each tablet contains 200 mg of elemental Mg
- Dissolves in water
- Used in clinical research
- Manufactured to pharmaceutical standards



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1

There are a lot of actions you can take: make a personal plan

2

Prioritise natural and well-timed light exposure, plan your exercise with this if possible.

3

Find the best sleep times and aim for 1 sleep block and be consistent.

4

Eat proper meals, and no snacks finding the best timings that suit you within a 12 hour window.

5

Micronutrients: Vitamins B and D, fibre, probiotics, omega 3, antioxidants, CoQ10 and selenium, and magnesium.

Summary

Our next Webinar!

Nutritional Strategies for Infections

- Tuesday **10th February 2026**
- 10:00 am – 11:00 am GMT
- Free CPD certified webinar

Sign-up at pharmanord.co.uk/webinars



Katie Sheen

Dip.ION, PGCE, MA.Education

Registered Nutritional Therapist
(CNHC) & Breathworks accredited
Mindfulness Teacher

Thank you!

Please email
pro@pharmanord.com
For any queries!



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