NATIONAL CODE OF PRACTICE - HOURS OF WORK, SHIFTWORK AND ROSTERING FOR HOSPITAL DOCTORS

Summary

This is a voluntary Code that provides practical guidance on how to manage fatigue and eliminate or minimise the risks associated with shiftwork and extended working hours. It applies to all hospital employers and salaried hospital doctors and doctors in training.

“The AMA encourages all hospitals, doctors and doctors in training to become familiar with the Code, to review their rostering and working arrangements in the light of the risk assessment guidelines contained in it and to implement suitable changes to reduce their risk profiles.”

FOREWORD

The AMA's National Code of Practice - Hours of Work, Shiftwork and Rostering for Hospital Doctors was issued in 1999 after a consultation process with stakeholders including all Australian hospitals, State health administrations, medical and regulatory organisations, doctors and a range of other bodies and individuals. It is available on the AMA website at https://ama.com.au/article/national-code-practice-hours-work-shiftwork-and-rostering-hospital-doctors .

The Code does not contain absolute, enforceable limits on single elements such as the maximum length of a safe shift or the break required between episodes of work. The level of fatigue and the consequent effect on safety and work performance is complicated and is the product of a range of factors.

Those factors are identified in the Code, which contains a Risk Assessment Guide and a Risk Assessment Checklist to help assess the risk level of an individual's working hours. The Code provides the tools to identify unsafe working hours and reduce the associated risk levels. The Code now stands as the accepted standard for safe working hours for hospital doctors and doctors in training in Australia and is referenced by standards organisations such as the Australian Council for Safety and Quality in Health Care, the Australian Council on Healthcare Standards, Postgraduate Medical Education Councils and the Australian Medical Council.

Based on the risk factors listed in the Code, the AMA developed a risk assessment methodology which measures the risk level of each situation against a risk rating scale. The AMA has used this tool to audit the work patterns of hospital doctors and doctors in training every five years since 2001. The results of these audits are available on the AMA website at https://ama.com.au/article/2011-ama-safe-hours-audit-9 .

This tool is also available on line to help doctors better understand their work practices and to determine whether they are at risk of fatigue. The AMA Fatigue Risk Assessment Tool is available at http://safehours.ama.com.au/ . Doctors who use the tool will receive an on-line assessment of the fatigue risks of their roster. Doctors who are assessed as being at risk are encouraged to raise this with their hospital management and AMA members can also contact their local AMA branch for assistance.

Other useful AMA resources include the AMA guidance on clinical handover – Safe Handover: Safe Patients https://ama.com.au/sites/default/files/documents/Clinical_Handover_0.pdf – to assist doctors, hospitals and members of the healthcare team in their efforts to improve patient safety.

The AMA encourages all hospitals, doctors and doctors in training to become familiar with the Code, to review their rostering and working arrangements in the light of the risk assessment guidelines contained in it and to implement suitable changes to reduce their risk profiles.

FEEDBACK

Feedback is welcome and can be directed to:

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Further information on doctors' health and wellbeing and fatigue management can be found on the AMA website at https://ama.com.au/resources/doctors-health

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ABOUT THE CODE

The AMA's National Code of Practice - Hours of Work, Shiftwork and Rostering for Hospital Doctors (the Code) responds to ongoing concerns about working hours and safe practice. It acknowledges the special characteristics of the hospital sector as well as managing the risks associated with shiftwork and extended hours for hospital doctors and doctors in training.

Since the AMA embarked on its safe working hours campaign in the mid-1990s there has been a significant reduction in the number of doctors whose working hours expose them to higher risks of fatigue.[1] The trend towards reduced working hours for doctors is confirmed by the latest Australian Institute of Health and Welfare and Medicine in Australia: Balancing Employment and Lifestyle (MABEL) survey data.[2,3]

Along with changing attitudes to the ethic of safe hours, increasing numbers of prevocational and vocational trainees, and a growing emphasis on efficiency within the hospital sector, the Code has been instrumental in shifting workplace practice without the need for the rigid restrictions on working hours that have been introduced in Europe and the United States.[4] However extremes in hospital doctor working hours still persist and many hospital doctors continue to work rosters that place them in higher risk categories.

As the evidence regarding doctor fatigue and patient safety matures, achieving safe working hours will require intelligent solutions beyond a simple restriction in working hours. The Code is one part of a broader education and awareness program to improve understanding about the risks fatigue creates for individual health and safety and quality of patient care. It also promotes change in individual and organisational practice, beliefs and culture to support safer working hours and patterns for hospital doctors and doctors in training.

The Code has also been prepared in recognition of the responsibilities of employers and employees under Work Health and Safety (WHS) legislation. A list of Australian WHS legislation is at Appendix A. In this legislative framework a safe system of work needs to be provided to protect employees and others (including patients) affected by the employers' activities. This is in contrast to the individual liability model, more commonly associated with incidents involving patient treatment.

A detailed literature review outlining the background to the Code can be found at Appendix B.

1.1 PURPOSE

This Code provides practical guidance on how to manage fatigue and eliminate or minimise the risks associated with shiftwork and extended working hours.

1.2 SCOPE

This Code applies to all hospital employers and salaried hospital doctors and doctors in training.

The scope of the Code is limited to hazards related to shiftwork and extended working hours and the effect on the health and safety of individual doctors and impacts on patient care.

Other hazards present in a hospital environment are not covered in this code and reference should be made to other legislation, standards, codes and guidance material in relation to those hazards.

1.3 STATUS OF THE CODE

This Code is a voluntary code developed to be compatible and consistent with WHS legislation in Australian States and Territories.

A voluntary code does not have any specific legislative standing but provides recommendations for duty holders to consider in meeting their obligations. A distinction needs to be drawn between a Voluntary Code and an Approved Code of Practice that is made under relevant State and Territory legislation.

An Approved Code of Practice[5] supports either general duties in a WHS Act or specific duties in a regulation. To have legal effect in a jurisdiction, a model Code of Practice must be approved as a code of practice in that jurisdiction. Compliance with guidance provided in an approved code is not mandatory but duty holders should follow such a guide unless they have an alternative method that achieves the same safety outcome. An approved code has evidentiary status and may be used in a prosecution to demonstrate a failure to meet a duty.

A Voluntary Code, such as this national code, does not necessarily have evidentiary status but may have some legal status like all other guidance in that it contributes to "the state of knowledge" about a particular hazard or risk and the ways of mitigating that hazard or risk, particularly if its use is clearly encouraged in a workplace.

1.4 LEGISLATIVE FRAMEWORK

This Code operates in the context of WHS legislation that sets out a general duty of care for employers to provide and maintain a safe and healthy workplace. Legislation in most states and territories follows this formulation with the duty of care qualified by an expression such as "so far as is practicable".

"Practicable" means that the duty to provide and maintain a safe and healthy workplace is qualified by:

- The cost of removing or mitigating a hazard or risk.
- The state of knowledge about the hazard or risk.
- The state of knowledge about measures to control risks.
- The severity of the hazard or risk.

Consequently, this Code provides guidance on practicability in relationship to the hazards and risks associated with extended working hours.

Modern WHS law is described as performance based, highlighting the achievement of safety outcomes rather than defining in great detail the way in which the outcome is to be achieved. This code is drafted within this framework to enable flexibility and innovation in managing risks. Since 2012, WHS legislation in Australia has been harmonized by adoption in most jurisdictions of the model *Work Health and Safety Act*. This has not been adopted in all jurisdictions. (See Appendix A for legislative references).

Each state and territory is responsible for regulating and enforcing WHS laws. WHS legislation includes a model WHS Act, regulations, Codes of Practice and a national compliance and enforcement policy

1.5 GENERAL DUTIES IN MORE DETAIL

Primary duty

Under the WHS legislation adopted in most states and territories, the primary duty of a person conducting a business or undertaking is to ensure as far as is reasonably practicable:

a) the provision and maintenance of a work environment without risks to health and safety, and
b) the provision and maintenance of safe plant and structures, and
c) the provision and maintenance of safe systems of work, and
d) the safe use, handling, and storage of plant, structures and substances, and
e) the provision of adequate facilities for the welfare at work of workers in carrying out work for the business or undertaking, including ensuring access to those facilities, and
f) the provision of any information, training, instruction or supervision that is necessary to protect all persons from risks to their health and safety arising from work carried out as part of the conduct of the business or undertaking, and
g) that the health of workers and the conditions at the workplace are monitored for the purpose of preventing illness or injury of workers arising from the conduct of the business or undertaking.

A 'worker' includes:

- an employee, or
- a contractor or subcontractor, or
- an employee of a contractor or subcontractor, or
- an employee of a labour hire company
- an outworker, or
- an apprentice or trainee, or
- a student gaining work experience, or
- a volunteer.

A primary duty of care exists when you:

- direct or influence work carried out by a worker,
- engage (or cause to engage) a worker to carry out work (including through subcontracting),
- have management or control of a workplace.

WHS Duties of workers

While at work, a worker must:

a) take reasonable care for his or her own health and safety, and
b) take reasonable care that his or her acts or omissions do not adversely affect the health and safety of other persons, and
c) comply, so far as the worker is reasonably able, with any reasonable instruction that is given by the person conducting the business or undertaking to allow the person to comply with this Act, and
d) co-operate with any reasonable policy or procedure of the person conducting the business or undertaking relating to health or safety at the workplace that has been notified to workers.

Even more broadly, a person conducting a business or undertaking must ensure, so far as is reasonably practicable, that the health and safety of other persons is not put at risk from work carried out as part of the conduct of the business or undertaking. This could potentially extend to the safety of patients in a medical context.

1.6 RELATIONSHIP OF THE CODE TO AWARD AND AGREEMENT PROVISIONS

Much has changed in Australia since the National Code of Practice was first launched in 1999. In addition to specific industrial relations provisions regulating hours of work and rostering practices, industrial agreements in most jurisdictions increasingly acknowledge the importance of managing fatigue in the workplace.

While these changes are for the most part positive, a complex interplay between efficiency, personal choice, safety and quality, and the industrial rights of employers/employees in relation will continue to create professional and industrial questions for doctors and employers.

The minimum standards vary from jurisdiction to jurisdiction but nothing in the Code should be read as altering these minimums. Award and Industrial Agreement provisions primarily relate to pay and penalty rates, whereas the code provides guidance on how to manage the risks arising from shiftwork and extended hours.

HAZARD IDENTIFICATION, RISK ASSESSMENT AND RISK CONTROL

The primary WHS legislation requires risks to be controlled. A duty imposed on a person to ensure health and safety requires the person:

a) to eliminate risks to health and safety, so far as is reasonably practicable, and
b) if it is not reasonably practicable to eliminate risks to health and safety, to minimise those risks so far as is reasonably practicable.

What is 'reasonably practicable' in ensuring health and safety?

Under the model WHS legislation, 'reasonably practicable', in relation to a duty to ensure health and safety, means that which is, or was at a particular time, reasonably able to be done in relation to ensuring health and safety, taking into account and weighing up all relevant matters including:

a) the likelihood of the hazard or the risk concerned occurring, and
b) the degree of harm that might result from the hazard or the risk, and
c) what the person concerned knows, or ought reasonably to know, about:
    a. the hazard or the risk, and
    b. ways of eliminating or minimising the risk, and
d) the availability and suitability of ways to eliminate or minimise the risk, and
e) after assessing the extent of the risk and the available ways of eliminating or minimising the risk, the cost associated with available ways of eliminating or minimising the risk, including whether the cost is grossly disproportionate to the risk.

The method of assessing risks will vary according to the nature of hazards and the industry in which they are found. For example, in chemical processing industries complex quantitative risk assessment methods may be used because of the potential severity of failures and the high levels of interdependence of hazards. Conversely, a small domestic building site may use simple observational methods to identify hazards and assess risks.

Risk controls are normally seen in terms of a hierarchy of control ranging from "hardware" controls like engineering or design, through substitution and isolation, to "software" controls like training, administrative measures and personal protective equipment.

In order to be consistent with the philosophy and approach of current WHS law and Approved Codes of Practice, the hazard identification, risk assessment and risk control model is used in this code.

2.1 HAZARD IDENTIFICATION

The employer should ensure that all hazards associated with shiftwork and extended working hours in a hospital are identified. A hazardous agent or process is one which has the potential to cause harm. Hazard identification should be undertaken as part of the business planning process of the hospital and be regularly reviewed in light of changing circumstances.

Information on hazards can be collected from:

- Daily, weekly, monthly and annual working time records.
- Workers compensation, absence and sick leave records.
- Incident and injury records associated with extended working hours.
- Views of doctors collected through hospital surveys, complaints or disputes involving extended working hours.
- Health surveillance records.
- Reports or advice from specialists in work scheduling, shiftwork and fatigue.
- Research findings into the impact of extended hours on work performance and health and safety.

This hazard identification phase needs the active involvement of doctors through consultative arrangements like WHS Committees or other hospital based forums. It is also important to acknowledge that working hours, schedules and workloads will impact on individuals differently. For a given hazard some doctors will respond differently and some may be at greater risk of harm than others. Hospitals should interpret hazards in the context of the doctor and the situation concerned, and consultation and planning with individual doctors as to how to mitigate professional, personal and organisational risk is a key part of hazard identification and risk control.

2.2 TYPICAL HAZARDS ASSOCIATED WITH SHIFTWORK AND EXTENDED HOURS

Common hazards associated with extended hours revolve around work scheduling, the relationship to circadian rhythms and other scheduling and organisational factors that exacerbate these situations. [6]

2.2.1 Excessive Consecutive Hours Worked in Any One Period

The number of hours normally worked in shift or "ordinary" hours is set out in various industrial agreements, however, these ordinary hours may be extended through overtime and "call back" arrangements to deal with heavy workloads.

Working long hours in any one period (usually beyond 10 hours) may have a number of effects:

- Where extended hours are part of a rotating shift, further disruption to circadian rhythms may result.
- Lack of sleep and fatigue.
- Reduced work performance particularly in the early hours of the morning.

2.2.2 Lack of Rest Within and Between Work Periods

Within a period of extended hours, breaks should be taken where practicable, to enable recovery from intensive periods of concentration and physical work.

Lack of suitable rest periods between periods of work presents a significant hazard.

Lack of opportunity for undisturbed continuous sleep because of excessive hours worked including on call periods and the maintenance of the rostered work schedule may lead to chronic fatigue and sleepiness sometimes referred to as sleep debt. This is especially a concern for those working rotating shifts or permanent night shifts or for those whose extended hours take them into the night shift period.

2.2.3 Inappropriate Speed and Direction of Shift Rotations

The disruptions to sleep, personal and social life and the onset of fatigue are related to the difficulty the human body has adapting to changing work routines. Permanent night shift workers may get used to their work tasks but research suggests they never really adapt, as many return to a normal day schedule on their day off. This is to maintain their social life with family and friends. In this situation body rhythms never completely adapt to night work and cumulative sleep debt and fatigue can reach levels at which safe performance of duties is compromised.

In this sense there is less difference between permanent and rotating shifts than is normally assumed.

The direction of the shift rotation refers to the order of shift changes:

- A forward or clockwise rotation is for day (normally 8 am through to 5 pm) to evening (normally 4 pm through to 11 pm) to night (normally 11 pm through to 8 am).
- A backward or anti-clockwise rotation is from day to night to evening shift.

The rotation direction likely to optimise health and safety will vary according to body rhythms.

It is generally accepted that a forward rotation is more beneficial than a backward rotation. This is because it is easier to go to bed later and wake up later than to have to go to sleep earlier and earlier as required in a backward rotation. The speed of rotation is the number of days an individual spends on a particular shift before a change occurs to another shift or to time off periods.

A slowly rotating schedule, working for example 3 to 4 weeks on the same shift, appears to allow greater time for body rhythms to adjust and adapt. However, as the quality of day sleep is lower, such long cycles may create an accumulating sleep debt and fatigue problem. This can be exacerbated because workers usually return to a day schedule on their days off to fit in with family and social life.

A fast rotation, every two days for example, may enable the worker to maintain normal circadian rhythms, as body functions do not have time to start adjusting to night shifts.

Such rapid rotations also allow individuals to get through difficult shifts and not allow sleep debt to accumulate. The disadvantage is that while on night shifts individuals will be out of balance with natural body clock rhythms.

2.2.4 Irregular and Unpredictable Work Schedules

Whatever the individual experience of different shift speed and rotations, it is more favourable to have a regular and predictable work scheduling arrangement. One of the areas in which shifts and extended hours impacts most is on family and social life and predictability of scheduling minimises the potential social dislocation. Unpredictability of work scheduling also compromises the quality of rest time if there is the continual possibility of recall to duty.

Consequently, on-call arrangements both on-site and off-site also need to be structured in accordance with the issues considered under hazards already outlined.

Where rostering or on-call arrangements provide for doctors to remain on the hospital campus on-site facilities should maximise the opportunity for undisturbed rest and sleep. Where recall to duty is involved, particular attention should be given to the individual's current and recent work pattern in order to minimise hazards created by disruption of body rhythms and the potential for reduced work performance.

Hospitals should have mechanisms for compensating doctors who are not able to continue with their clinical duties due to an unexpectedly demanding or extended period of work. There should be flexibility within the hospital system to allow stressed and/or fatigued doctors to be relieved.[7]

2.2.5 Night Shift or Extended Hours that Lead into Night Shift

The combined effects of sleep deprivation and disruption to the body's internal clock come together after an individual works a night shift or where prolonged hours stretch into the night shift.

Circadian rhythms can cause performance levels to vary and many aspects of human performance are at their lowest level at night with 2am to 6am recognised as a low alertness period.

This is overlaid by lack of sleep caused by the reduced length of day sleep between consecutive night shifts.

Working on a night shift, whether it is one off or as part of an ongoing roster, represents a hazard for doctors working extended hours. Doctors who are rostered on regular night shifts are also less able to be involved in educational activities and continuing professional development from senior staff and hospital departments. In addition to the individual hazard from extended hours, there is also an institutional hazard from doctors being excluded from ongoing educational activities.

Hospitals should allow for periods of rest during night shifts to mitigate fatigue, especially during periods of low alertness. This could be achieved by providing on call rooms on site for doctors and other health professionals on night shift to rest if there is no requirement to be awake for clinical activities.

2.2.6 Type of Work and Additional Workloads

There is research that indicates particular types of tasks are performed better at particular times of the day than others. For example, tasks involving simple monitoring of activity improve over the day but are poorer at night.

Performance reductions with particular types of tasks can be modified by factors like the length of time involved doing them and the intrinsically interesting or satisfying nature of the work. For doctors this means that performance may be maintained over longer periods for complex tasks but simpler, routine medical or administrative tasks may not be completed to a satisfactory level.

Where this situation is compounded by the demands of education and training at peak periods in the working year, this hazard is greater. Study demands that eat into normal rest periods represent a particular concern for trainee doctors as the possibility of sleep deprivation and fatigue increases. Secondly, the effectiveness of the actual learning and education process is reduced.

2.2.7 Potential Exposure to Other Hazards

Exposure levels and thresholds for hazards like chemicals are usually calculated on a normal 8 hour working day basis. Extended hours of work and exposure need to be considered in assessing the risks associated with these kinds of hazards.

2.3 RISK ASSESSMENT

The employer should undertake a risk assessment to determine if there is any risk associated with the hazards identified.

A risk is the likelihood of injury or illness arising from any exposure to a hazard. Risk assessment is a process to determine the likelihood and impact of injury or illness for those exposed to the hazard. The risk assessment should consider any controls or methods already being used to control risk and assess the effectiveness of such current methods.

Risk assessment methods should be identified that are appropriate for the hazards identified and may include:

- Use of specialist expertise in scheduling and shiftwork.
- Use of techniques that enable calculation of potential sleep deprivation and fatigue risk factors.
- Consultation with staff on "best fit" schedules and on individual orientations to different work schedules.
- Use of available research on shiftwork, and extended hours and fatigue management.
- Consideration of alternative learning environments, including simulation techniques.

A risk assessment checklist and guide is set out below to assist in the assessment process and the recommended standards should form the basis of any work scheduling for doctors. Where these standards are not practicable, the employer should institute actions to minimise the impact of any individual hazard or the cumulative effect of related hazards.

2.3.1 Risk Assessment Checklist and Guide

The hazards associated with shiftwork and extended hours are complex and interrelated. In addition, individuals have different circadian rhythms that affect their performance at different times of the day.

Consequently, the risk assessment process needs to not only consider risks arising from schedules but also involve close consultation with doctors in order to achieve the best result.

The following checklist includes a number of defined operating standards and thresholds at which action should be triggered. Where these minimum standards are not being met a higher risk exposure is possible and consideration needs to be given to ways in which hazards can be eliminated or individual elements can be counter-balanced by other compensating aspects.

The checklist is in the form of questions to which an affirmative response would indicate risk controls need to be considered.

In using this checklist, administrators and staff should assess the risks associated with identified hazards.

The hazards and their associated risks are interrelated and in many cases cumulative. The traditional risk assessment model of frequency, severity and probability of occurrence is difficult to apply with

these hazards but the following guidelines drawn from the checklist illustrate a risk continuum from lower, to significant, to higher.

The Guide is not intended to be exhaustive but rather a tool in the assessment of risks. Other factors that need to be considered include:

- Lifecycle (e.g. age or family commitments).
- The intensity and nature of work (e.g. high concentration tasks, physically demanding tasks or decision making tasks).
- Work environment (e.g. appropriate light sources and ventilation).
- Incidence of sleep disorders, including shiftwork related insomnia.
- Capacity to meet training requirements.
- Service delivery and patient safety.

It should be noted in the Guide that hours worked refers to all hours whether rostered or not. Similarly overtime refers to all overtime worked whether rostered or unrostered.

The following risk assessment checklist and guide can be used to help determine the fatigue risks of a roster and can inform safe rostering practices.

RISK ASSESSMENT CHECKLIST

1	Are doctors regularly scheduled to work more than 10-hour shifts?
2	Do doctors work through a full shift cycle (i.e. 24 hours or more) at least once in a 7-day period?
3	Do doctors work more than 14 consecutive hours in any one period (including overtime and recalls) at least twice a week?
4	Is the minimum period of rest between scheduled work less than 10 hours?
5	Are the total hours worked • in a 7-day period more than 70 hours (including overtime and recalls)? • in a 14-day period more than 140 hours? • in a 28-day period more than 280 hours?
6	Is the minimum non-work time • in a 7-day period less than 88 hours? • in a 14-day period less than 176 hours? • in a 28-day period less than 352 hours?
7	Is there less than a 24-hour break free of work in a 7-day period?
8	Are there less than two 24-hour breaks free from work in a 14-day period?
9	Are there less than eight 24-hour periods free from work in a 28-day period?
10	Are doctors rostered for on-call duty more than once every three days?
11	Does the shift rotation move anti-clockwise?
12	Does the shift rotation change direction and speed over a 28-day period?
13	Have the actual hours worked and the times at which they have been worked in the last 28 days varied from the posted roster by more than 25%?
14	Is a doctor scheduled for more than three night shifts in a 7-day period?
15	Is a doctor rostered for on-call duty comprising more than 24 hours of the minimum 88 hours free from work in a 7-day period?
16	Is a doctor's work roster and schedule making it difficult for them to fulfil educational and training requirements?

RISK ASSESSMENT GUIDE (based on a 7 day period)

*Lower Risk (1 point)	* Significant Risk (2 points)	*Higher Risk (3 points)
Less than 50 hours worked	50 to 70 hours worked	More than 70 hours worked
No more than 10 consecutive hours in any one period	Up to 14 consecutive hours in any one period	14 or more consecutive hours worked at least twice
Scheduled shift hours worked	Scheduled shift plus part of next shift worked	A full shift cycle worked of at least 24 hours
Three or more short breaks taken during shift	One or two short breaks taken during shift	No short breaks taken during shift
Little or no overtime	More than 10 hours overtime	More than 20 hours overtime
Rostered for on-call less than 3 days in 7 days	Rostered for on-call duty 3 days or more in a 7-day period	Rostered on-call continuously for more than a 7-day period
No night shift or extended hours into night shift	At least 2 night shifts or extended hours into night shift	At least 3 night shifts or extended hours into night shift
Minimum 10 hour breaks between work periods and 2 days free of work	Minimum 10 hour breaks between work periods and 1 day free of work	Less than minimum 10 hour break on at least two work periods and no full day free of work
Forward shift rotation and predictable cycle	Forward shift rotation but changed cycle	No stable direction or speed of rotation
No changes to roster without notice	Changes to roster through overtime and recalls worked	Roster changed so much because of overtime and recalls so as to be unpredictable
Maximum opportunity for sleep to be taken at night including two full nights of sleep	About two-thirds of sleep able to be taken at night including one full night of sleep	Less than half of sleep able to be taken at night and no opportunity for one full night of sleep

*Each Lower Risk Element to be scored at 1

*Each Significant Risk Element to be scored at 2

*Each Higher Risk Element to be scored at 3

The Guide is based on a 7-day cycle but as the hazards of shiftwork and extended hours are cumulative this model should be applied to a 14-day period and a 28-day period as the items in the higher risk column create a greater risk the longer they are present. For example, if less than half of any sleep is able to be taken at night over a long period then the effects of sleep deprivation may be evident in work performance and on individual health.

A simple scoring system may assist in assessing risks for doctors. Lower Risk Elements are worth 1 point, Significant Risk 2 points and Higher Risk 3 points and when a Significant or Higher Risk Element is present for consecutive 7-day periods the points should be doubled on a rolling basis and then returned to normal points when the cycle is broken.

For example, a doctor who worked more than 70 hours a week for 4 weeks would be scored at 24 points in the final week. Conversely, if the 70-hour week was a one off then the score at the end of the 4-week period would be between 6-9 points.

Another example would be where at least two night shifts are worked in a week but breaks are taken within shifts, the minimum break between shifts is maintained and the shift cycle is predictable. In this case a potential high risk is balanced by other measures and the overall profile may be kept at the lower risk end of the scale.

The purpose of scoring is to provide a crude but simple way of highlighting risks to doctors, to the hospital and to those dependent on both. The profile can be adjusted to add specific risk factors relevant to the type of hospital and used to establish a preferred profile that meets patient and doctor needs as well as obligations to provide and maintain a safe and healthy workplace.

2.4 RISK CONTROL

Under WHS legislation an employers' duty is to control risk by either eliminating the hazard or by minimising the risk associated with the hazard.

As hours of work are an administrative or organisational matter the controls must be applied at a lower level of what is normally called the hierarchy of control. At the top of the hierarchy are controls that do not rely on human action (e.g. design, engineering), through to those that are dependent on individual and organisational measures (e.g. training, scheduling and personal protective equipment).

The effectiveness of controls at the level of individual and organisation is dependent on shared ownership of the protocols and arrangements to control risks.

Risk controls for shiftwork and extended hours cannot be set out as a series of stand alone solutions that will be effective in all cases. A series of strategies should be used including:

a) Design Principles for Schedules
b) Information, Supervision, Consultation & Training
c) Facilities and Services
d) Monitoring and Review

2.4.1 Design Principles for Schedules

Scheduling the work of doctors in hospitals to eliminate or minimise the risks to their health and safety and to those affected by their actions is the key control measure. The following performance based principles should underline the design of work schedules, which should be designed to:

- Minimise the occasions on which doctors are required to work more than 10 hours in a period.
- Ensure that minimum breaks between shifts enable doctors a minimum 8 hours continuous sleep before resuming duty. This should account for travel time from various rotations either to home (i.e. try to rotate doctors closer to home) or from the primary site (i.e. to which workers are more likely to live).
- Use a forward shift rotation to minimise individual adaptation problems.
- Avoid rapid shift changes such that at least a 24 hour break is provided before rotating to a new shift.
- Ensure doctors have regular time (a minimum of 24 hours) free of work in a 7-day period in which unrestricted sleep is possible.
- Minimise consecutive night shifts in order to limit reductions in performance levels caused by circadian rhythm imbalances.
- Ensure that longer breaks between and following night shift are provided.
- Account for 'covering' contingencies caused by sickness or absences by ensuring adequate staffing and support and using locums as required.

- Maximise the opportunity to take breaks within shifts.
    - Allocating sufficient time during the week to allow for:
    - Effective handover (refer to AMA guidance on clinical handover – Safe Handover: Safe Patients https://ama.com.au/sites/default/files/documents/Clinical_Handover_0.pdf
    - Audit and peer review
    - Education, training and research
    - Recreational leave

In some cases these design principles will not accord with current practices, and hospitals should ensure that any risks are appropriately managed. For example, permanent night shift arrangements for specific doctors may achieve the outcome of minimising night shift for others. Similarly, long cycle night shifts with long breaks following may be used to provide predictability in work scheduling and mitigate risk

Other risk control strategies that should be used in managing workloads include:

- Where practicable, complex tasks should be scheduled during the day and routine and administrative tasks should be minimised or redesigned to ensure doctors can focus on core duties in their working time.
- Undertaking complex tasks early in the shift where practicable.
- The allocation of staff numbers to peak times and demands is a fundamental factor in minimising the exposure to risks associated with extended working hours. Numbers and types of doctors should be rostered on the basis of predictable demands for services by daily, weekly, seasonal and annual trends.
- Replacing or substituting rostered doctors where extended hours have created a risk to doctor health and safety and patient welfare.
- Deferring non-urgent work to allow appropriate rest and recuperation for doctors.

2.4.2 Information, Supervision, Consultation and Training

Information

Doctors should be provided with information on shiftwork, extended hours and fatigue management including information on:

- The hazards associated with shiftwork and extended hours.
- Potential health and safety impacts of shiftwork and extended hours.
- Duties under the WHS legislation of employers and employees.
- How to identify problems associated with lack of sleep and fatigue.
- Individual strategies to best manage shiftwork, extended hours fatigue.
- Sleep disorders, sleep hygiene and non-pharmacological approaches to insomnia.
- Services available to assist doctors to cope with the effects of shiftwork, extended hours and fatigue on health and/or quality of life.

- The hospital system for reporting incidents related to shiftwork and extended hours including mechanisms for doctors to report problems they experience in relation to excess hours, fatigue and sleep deprivation.

Supervision

Supervision ensures that tasks are performed safely and work instructions and procedures are adhered to. Supervision should be commensurate with the complexity of tasks to be undertaken and enable prompt action to be taken to maintain health and safety standards.

Access to specialist clinical support should be available especially during night shifts.

Supervisors should be aware of shiftwork and extended hours related hazards and take action within their allocated responsibility to eliminate or minimise hazards. Supervising doctors and hospital administrators must be trained to identify trainees who are working excessive hours and/or are having difficulties in fulfilling their work commitments, and to assist in finding and negotiating solutions and alternatives and support services as necessary.[8]

Consultation

The obligation to consult with employees is an employer duty set out in WHS Acts and Regulations and is part of the process for providing a safe and healthy workplace. Consultation with employees and their representatives, WHS representatives, and WHS Committees is relevant to achieving effective outcomes.

In the case of working hours, consultation is a key part of risk control as schedules and workloads will impact on individuals differently.

Consequently, an important part of developing effective controls through work scheduling and task allocation is consultation with those working shifts and with potential exposure to risk.

Doctors should be involved in the development of rosters having regard to the design principles set out above. They should also be involved in decisions to vary schedules from these design principles.

Individual differences in rhythm characteristics (morning/evening) may mean some are better suited to scheduling at specific periods in a shift cycle. These characteristics may not be as important as broader work/life balance issues but reinforces the need for active staff involvement in work scheduling.

If work scheduling is a managerial task with little staff input then both the regularity and predictability of the roster will decrease as ad hoc adjustments are continually made to address individual circumstances.

Training

Hospital employers should ensure that doctors are provided with appropriate training to minimise the risks associated with extended hours and shiftwork, and to be aware of when safe working hours' limits are being reached in their own practice.

An induction program should include reference to the following:

- Duties of employers and employees.
- Circadian rhythms and their relationship to work scheduling.
- Shiftwork schedules and design principles.
- Hazards associated with shiftwork and extended hours.
- Health and safety impacts of shiftwork and extended hours.
- Incident reporting.
- Individual strategies for coping with shiftwork and extended hours.

Providing appropriate training is essential to risk control by:

a) Enabling informed input to work scheduling.
b) Enabling critical self assessment in terms of readiness for duty.
c) Understanding and recognising sleep debt and fatigue circumstances.

Trainees

Trainees usually have a more formalised working schedule, set out by hospitals, in relation to overtime shifts and daily working hours. The number of working hours for which a trainee is rostered will depend on whether the work occurs mainly during the day or at night. They are also required to fulfil the minimum training requirements of the education and training program they are enrolled in, and hospitals must recognise this requirement and facilitate completion of the training programme. As such, close negotiation between the hospital and training provider is required to ensure that both employment and training obligations can be fulfilled within the context of a working environment that is safe for the patients, the trainees, and their colleagues.[9]

2.4.3 Facilities and Services

An essential control strategy is to provide suitable facilities in which doctors can have short or extended breaks during shifts or short naps within long shifts.

Hospitals should provide:

- Rest areas in which doctors can take short breaks from duty.
- Locker rooms and showers.
- Suitable facilities for doctors where required on the hospital campus to enable a minimum of 8 hours undisturbed sleep between shifts or to have short naps within long shifts.
- Access to suitable catering facilities providing nutritional food and beverages consistent with diet guidelines that maximise the ability to work shifts and extended hours.
- Access to counselling services to assist in any issues arising from the disruption to individual, family or social patterns caused by shifts or extended hours.
- Access to advice on diet and physical fitness.

2.4.4 Monitoring and Review

By the nature of work scheduling and unanticipated workloads in hospitals the system of risk controls needs constant monitoring and review.

The process of monitoring should be done on a single shift basis, over 7, 14 and 28-day periods to establish potential risk exposures and to actively manage known risks in the upcoming period.

Real time monitoring is especially important in known risk periods such as between 2 am and 6 am where body temperature is at its lowest. Similarly risks related to commuting after long shifts have been worked is a matter for both employer and doctor to monitor closely.

Where it is not practicable to keep working hours within the lower risk levels (less than 50 hours per week) then close monitoring of the related risk factors needs to be undertaken.

The schedule of actual hours worked should be reviewed at least every month to identify opportunities to reduce or eliminate risks. This review should involve doctors or their representatives.

The review process should include an examination of any incidents related to doctor or patient welfare that may have been associated with hazards arising from shifts or extended hours. Secondly, the review should draw on longer-term incident reporting to determine any trends requiring preventative action.

In addition health surveillance to monitor doctor's health in relation to established health effects of shiftwork and extended hours is recommended.

2.5 INCIDENT REPORTING AND INVESTIGATION

A required element of a safe system of work is reporting of incidents that either caused injury, or had the potential to do so. Comprehensive and thorough reporting enables corrective action to be taken and allows better prevention planning to take place.

Depending on the nature of the incident regulatory agencies require the reporting of incidents involving death, injury and dangerous occurrences.

The hospital should establish policies and procedures that:

- Define the kinds of incidents that should be reported.
- Encourage staff to report incidents.
- Enable incidents to be recorded and analysed for underlying causes.
- Ensure incidents are investigated and any required corrective action is taken.
- Make information available for the review process outlined in 2.4.4.

2.6 RECORD KEEPING

Most WHS regulation requires records of risk assessments to be kept and to be available to the regulatory authority on request.

Hospitals should keep a record of risk assessments conducted either in a generic sense to apply to all work scheduling or to document how alternative ways of managing specific risks were established.

Risk assessment records should also be available to employees on request.

Keeping records of training provided to doctors is also recommended.

Other record keeping flows from the incident and injury reporting mechanisms referred to in 2.5 and hospitals are already required to keep injury and incident records under relevant WHS, Dangerous Goods and Workers Compensation legislation.

EMPLOYEE DUTIES

As noted earlier in the code, whilst employers have the primary duty of care, there is an employee duty to assist the employer in meeting health and safety obligations and to take reasonable care not to put themselves, or others, at risk.

Translating this duty to shiftwork and extended hours an employee would be expected to:

- Participate in training provided to gain an understanding of the hazards of shiftwork and extended hours.
- Ensure that breaks provided within and between shifts are used for rest and recuperation.
- Report incidents arising from hazards related to shiftwork and extended hours.
- Recognise signs of sleep deprivation or fatigue and the impact on themselves and others, and take active steps to avoid the impact on themselves and others.
- Report to supervisors on circumstances in which fatigue and lack of sleep is impacting on individual well being and patient care.
- Consider the implications of voluntarily seeking additional hours, both at the hospital and elsewhere, that may increase risks to health and safety and patient care.

It is recommended that hospitals develop with doctors and their representatives a policy on work readiness covering such matters as drugs and alcohol, extracurricular commitments including other jobs and education and training commitments.

USEFUL RESOURCES

Some useful sources for more information include:

- AMA Guide Guidance on clinical handover: Safe Handover: Safe Patients 2007. https://ama.com.au/article/guidance-clinical-handover
- Australian Commission on Safety and Quality in Health Care, in particular the Safe Staffing and Patient Safety Literature Review, 2012 http://www.safetyandquality.gov.au/former-publications/safe-staffing-and-patient-safety-literature-review-pdf-673-kb/
- The Centre For Sleep Research, University of Adelaide, South Australia http://www.unisa.edu.au/research/centre-for-sleep-research/
- National Institute for Occupational Safety and Health, Atlanta, Georgia, USA http://www.cdc.gov/niosh/
- Safe Work Australia http://www.safeworkaustralia.gov.au/sites/swa/about/publications/pages/sr200908impactofshiftwork

APPENDIX A - LEGISLATIVE REFERENCES

The following Acts contain the general duties that are referred to in Sections 1.4 and 1.5 of the Code.

Victoria	Occupational Health and Safety Act 2004
New South Wales	Work Health and Safety Act 2011
South Australia	Work Health and Safety Act 2012
Tasmania	Work Health and Safety Act 2012
Queensland	Work Health and Safety Act 2011
Western Australia	Occupational Safety and Health Act 1984
Commonwealth	Work Health and Safety Act 2011
	Employment) Act 1991
Australian Capital Territory	Work Health and Safety Act 2011
Northern Territory	Work Health and Safety (National Uniform Legislation) Act

APPENDIX B – BACKGROUND TO THE CODE

B.1 SHIFTWORK AND EXTENDED HOURS

There is a tradition of onerous working hours in the medical profession. It has been expected that doctors will be able to sustain the highest professional standards despite working extended shifts and demanding on-call rosters.

In the past, some in the profession believed that rigorous training systems for doctors ensured that they could continue to function effectively through 24-hour shifts, continuous on-call rosters, little sleep, and short breaks between episodes of work.

Shift work is associated with adverse health, safety and performance outcomes. Circadian rhythm misalignment, inadequate and poor sleep quality and sleep disorders contribute to these associations.[10]

Until relatively recently, little effort has been made to study the effects of arduous work schedules on the wellbeing of doctors or the patients in their care. There is now a bank of evidence that links the effects of sleep deprivation and fatigue to a greater risk of human error and harm to both patients and doctors. [11]

More recently, systematic reviews of overseas measures to regulate work hours have been published, and the impact of these on safety and quality of care as well as medical education and training is the focus of international debate.[12,13,14,15] The challenge in the Australian context is how to balance this with the demands of training and service delivery in an environment where long working hours are no longer synonymous with professionalism and a growing emphasis on achieving a healthy work life balance.

B.2 QUALITY OF LIFE, SLEEP AND FATIGUE

B.2.1 The Body Clock

In a hospital setting doctors frequently work shifts or extended hours that mean they are working when they normally would be sleeping and sleeping when they would normally be working. Circadian rhythms, which repeat approximately every 24 hours, are associated with many human functions including body temperature, hormone production and sleep and wakefulness.

Work schedules where people are expected to be awake and active at an inappropriate time in the cycle causes disruption of circadian rhythms. In addition environmental cues (like light and dark) that keep an individual's cycles on track are out of coordination.

These disruptions impact on the quantity and quality of sleep, impact on task performance and also create a sense of personal dislocation and imbalance.

B.2.2 Sleep and Fatigue

Disruptions to normal sleep routines are often associated with night shift, where the major difficulty is getting adequate, high quality, restorative sleep during the day. This is not only because of potential disruptions but also because of the different sleep types (e.g. REM sleep) linked to body temperature.

Extended hours sometimes combined with night work creates a similar problem. The cumulative result of these disruptions is lack of sufficient sleep, which may lead to what is called sleep debt.

Fatigue is tiredness that results from physical or mental exertion. In a hospital the need to concentrate and be on one's feet over a long period of time is likely to cause fatigue.

Both lack of sleep and fatigue, individually and in combination, is associated with cognitive and physical impairment including decreased working memory, attention lapses, diminished motor control and micro sleeps, and can adversely affect task performance levels, individual health and safety and the safety of others.[16]

B.2.3 Disruption to Social and Family Life

Long working hours and on-call work have been associated with lower levels of job satisfaction for hospital doctors and doctors in training. While a culture of long working hours is often viewed as necessary to meet patient care and training requirements in medicine[17], work scheduling will influence the availability of employees to participate in social and family activities. Shift workers find it difficult to maintain a social and family life and sometimes may neglect rest and sleep in order to be with friends or family.

The dislocation of family and social life may result in pressures on relationships, excessive domestic workloads and inability to participate in community activity. As with sleep and fatigue, this has implications for task performance and health and safety.

Systematic reviews of the literature on the effect of reducing or eliminating extended shifts have found significant improvements in reported levels of overall fatigue, sleep and satisfaction.[18] Research now confirms that working longer hours is associated with poorer reported health, poor opportunities for professional development and lower job satisfaction amongst doctors'.[19]

B.2.4 Effects on Health

Fatigue is a significant concern for doctors working long hours and rotating shifts and has major health consequences. Strong evidence exists that shiftwork is associated with detrimental effects on mental health, a higher risk of several medical conditions particularly metabolic syndrome and cardiovascular diseases, and higher rates of miscarriage and premature birth for female shiftworkers.[20,21,22,23]

People who have short sleep duration are at 1.48 times greater risk of developing and dying of coronary heart disease than controls and 1.15 times more likely to have a stroke.[24] Insufficient sleep also affects immunologic function and development of mood disorders and is associated with depression; deficits in cognition, memory and learning; and reduced quality of life. [25]

The beyond blue National Mental Health Survey of Doctors and Medical Students survey revealed that long working hours, a need to balance competing work and personal demands, and a stressful work environment contributed to the high general and specific levels of distress, and high levels of burnout reported by both doctors and students in the survey. Sleep deprivation is also cited as one of the main contributes to burnout and poor mental health in other studies.[26] The survey recommended increasing resources and the size of the workforce, and limiting excessive work hours as strategies to reduce the burden on overworked doctors and to address stressful working environments.[27]

One major consequence of insufficient sleep and disturbances to circadian rhythms is daytime sleepiness, which affects performance particularly the speed at which procedures are undertaken, alertness and vigilance to identify problems, leading to occupational and medical errors, workplace injuries, impaired driving, and motor vehicle accidents. The risk of accidents and near miss events is significantly higher in shift workers, and sleep deprivation related to shift work is linked to an increased risk of needle stick injury in health care workers and car accidents after shifts.[28]

Difficulty in being able to follow health or medication regimes because of schedules is another factor influencing the health of employees.

In an examination of all these issues it is important to recognise that individual differences in response to the disruptions of circadian rhythms, normal work and sleep routines and dislocation of social and family life may be significant.

In the absence of definitive evidence about those best suited to shiftwork the best means of managing these differences is through informed participation by doctors in the work scheduling process, allowing adequate time for recovery sleep and minimising extended duration shifts where possible.

B.3 EDUCATION

The evidence is clear that excessive working hours are fatiguing and compromise performance and learning.[29] Research in the Australian context suggests a 21% reduction in night time performance compared with day time performance in tertiary hospital emergency registrars presented with Fellowship exam scenarios.[30]

More recently what is an appropriate balance between working hours, training and lifestyle demands for doctors in training has come under intense scrutiny, with concern being expressed about the impact of reduced working hours on training quality.[31] In this context some Colleges are proactively looking at how requirements for clinical experience and requisite patient exposure can be met, and have developed recommendations for safe working hours and rostering.[32]

Ongoing efforts are needed to ensure training experiences, supervision opportunities, service provision and continuity of care is maximized. Potential solutions include promoting safe rostering practices, redesigning rotas, providing appropriate medical staffing, exploring alternate methods of training e.g. simulation technology, and providing adequate educational governance.[33,34,35]

B.4 PATIENT SAFETY AND QUALITY OF CARE

Sleep propensity, or the likelihood of falling asleep, in doctors has been associated with an increased risk of many types of error, including diagnostic, education and procedural mistakes. US studies have found an increase in preventable medical errors and complications where physicians/medical residents worked frequent extended shifts and long work weeks and were sleep deprived.[363738] While increasing numbers of doctors in training and roster reform presents an opportunity to reduce extended shift hours and improve sleep opportunities, ineffective handover represents a real risk to patient safety, and any changes to rostering must be accompanied by improved handover practices.

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