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EAT, SLEEP AND BE HEALTHY

A PARAMEDIC'S GUIDE TO HEALTHIER SHIFT WORK

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Introduction

We live in a world that doesn't sleep. Around the clock, there is a need for work to be done, from overnight services in hotels and restaurants, maintaining long-term industrial processes to continuous patient care in hospitals, and delivery of care in the prehospital setting. Shift work is fundamental to the demanding 24/7 practice of paramedicine. For many paramedics, a busy shift without returning to station is an everyday reality.

Several studies have shown paramedics are at a higher risk of being overweight, obese and physi-

cally unfit compared to the general population (1,2). This is not a new phenomenon, identified as early as 1991 in Northern Ireland (3). Paramedics are also more likely to smoke, have higher blood pressure and higher cholesterol than the general population (1-3). This can have a negative impact on clinical care. For example, physical fitness has been identified as an important component in assisting the rescuer to perform adequate chest compressions during CPR (4,5).

These findings can in part be attributed to shift work. Paramedics often find themselves relying on fast food, snacks and sometimes skipping

meals altogether, as a result of busy shifts and lack of resources. Shift work for paramedics will not go away, so identifying ways to reduce the risk of adverse health effects should be a priority for the paramedic and their service. Healthier lifestyle choices, including healthy eating and increasing physical activity can help promote the best possible health in the paramedic.

Defining shift work and its prevalence

Shift work - essentially working outside the conventional 8-hour daytime work sched-



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ule – is a reality for approximately three in ten Canadians (6). The vast majority of front-line paramedics work a rotating shift pattern, and these shifts vary depending on service demand and local agreements. According to Williams (7), the following categories of shift work can be identified:

- regular evening schedules (beginning after 3pm, ending before midnight)
- regular night (beginning after 11pm, ending before 11am)
- rotating (day to evening and/or night)
- split (two or more distinct work periods each day)
- on call (no pre-arranged schedule) and irregular shifts (common in newly qualified paramedics)

Shift work and adverse health effects

Shift work makes up a large part of work in the Canadian economy and though the social and economic necessity of shift work is without question, it comes at a heavy cost. In 2010, the Institute for Work and Health (8) researched the evidence on the effects of shift work on employees and it was found that:

- Long-term night shift workers probably have an elevated risk of breast cancer and a potentially elevated risk of colorectal cancer.
- Shift workers are at increased risk of gastrointestinal disorders, mental health problems (including depression) and preterm delivery during pregnancy.
- Shift workers, particularly those working at night, face a higher risk of getting hurt on the job than regular day workers.
- Compared with day workers, people who work night shifts are likely to sleep less and/or more poorly.
- The association between shift work and heart disease is inconsistent.

Research is also ongoing into other areas and compared to individuals who work standard hours, shift workers seem to gain more weight and may be at increased risk of obesity and type 2 diabetes (9–11). Disruption of the body's circadian rhythm is thought to be the main pathway for adverse health effects from shift work, particularly night work (8,11). Working at night intrinsically goes against the “body clock”; a set of physiological fluctuations linked to sunlight and temperature that occur over the 24-hour day (12).

Shift work can also unsettle social and family relationships by putting the shift worker out of sync with the daily work and rest patterns of family, friends and the general community. This social disruption can contribute to stress and thereby to adverse health outcomes (8,11). When this is added to the findings from a

2012 study in Ottawa that paramedics have the highest rate of posttraumatic stress disorder (PTSD) (13), the potential negative impact of shift work becomes apparent. Shift work has been shown to affect health and well-being both physiologically and psychologically, which can impact on paramedics' professional and personal lives (14).

Finally, some of these health issues, may be in part related to the impact shift work has on behaviour and lifestyle choices, such as poor eating habits, poor quality diet or increased smoking or alcohol consumption (8,11)

What is healthy eating?

Healthy eating means eating a variety of foods from the four main food groups in order to feel good and maintain health. The four main food groups are:

- fruit and vegetables
- bread, rice, potatoes and other starchy foods
- meat, fish, eggs, beans and other non-dairy sources of protein
- milk and dairy foods and non-dairy alternatives

Healthy eating combines eating the right types of foods; eating the recommended amounts of foods for your age, gender and activity levels; limiting foods and drinks that are high in sugar, fat and salt with maintaining a good energy balance by keeping as physically active as possible (15,16)

Barriers to healthy eating in paramedicine

Healthy eating may seem less achievable to paramedics working shift patterns. Time allowed for meals and snacks, availability of dining facilities while working shifts and access to “healthy” convenience foods can appear to support this point of view. Eating high fat/sugar foods, in a rush or on-the-go can, however, contribute to gastrointestinal problems, such as constipation, diarrhea, gas and indigestion.

Such problems may affect the shift workers' appetite as well as the ability to form regular, appropriate eating patterns and may promote reliance on high caffeine foods and drinks for energy. These dietary habits can perpetuate gastrointestinal problems, sleep disturbances and ultimately hinder healthy lifestyle practices. Shift working generally decreases opportunities for physical activity and participation in sports (17).

Recommendations for healthy eating in shift-work

It is difficult to make dietary recommendations for paramedics. It is not known whether shift workers should eat during the night or

not and if nocturnal eating is to be encouraged, there is a significant lack of evidence regarding what should be eaten or avoided (18). Given the altered eating habits as well as the metabolic and endocrine disturbances that occur in shift workers, it seems prudent to provide evidence-based nutritional recommendations for this population (17). Current dietary recommendations for shift workers are based on healthy eating advice for the general population and the knowledge of the metabolic consequences of shift work and therefore tend to promote diurnal eating practices, suggesting eating modestly at night.

Practice good sleeping habits

Dietary advice for paramedics should be considered in conjunction with appropriate fatigue management strategies (18). The link between sleep and maintaining a healthy weight has been well documented and a recent update by Beccuti and Pannain (19) confirms previous findings of an association between sleep loss and an increased risk of obesity. Sleep loss and impairments related to resultant fatigue are common among professionals working in healthcare settings. Paramedics may have a higher prevalence of sleep disorders than other healthcare professionals, and left untreated, those problems could increase morbidity and mortality and potentially impair professional performance (20).

Caffeine consumption should be moderated. Drinking coffee, tea and other caffeinated beverages can help increase alertness but consuming more than 400mg of caffeine (about 4 small cups of regular coffee) a day is not recommended (21). Caffeine stays in the body for many hours so limiting caffeine intake four or five hours before the end of shift can help with relaxing prior to returning home. Visit the National Sleep Foundation website listed in the resource section for further tips on how to manage shift work, diet, exercise and sleep.

Workplace strategies to promote healthier lifestyles

Where possible, workplaces should encourage a nutrition strategy that promotes and provides healthy food and beverage choices. Foods and drinks should be consumed in a relaxed eating environment (18). Eating on-the-go encourages mindless snacking. Mindful eating is associated with weight loss and maintaining a healthy weight (22).

Shift schedules should be designed to give employees enough time between shifts to enable them to maintain a healthy lifestyle, i.e. to exercise, to maintain regular meal times, to plan meals and snacks for shift working and to develop sleeping patterns (18).



Preparation is key

Planning meals around shift work schedules is good practice and can help to develop a routine and regular eating pattern. Paramedics should maintain a normal day-and-night pattern of food intake as far as possible. The “main meal” of the day should be eaten before going to work. Afternoon workers should have their main meal in the middle of the day, rather than the middle of their shift. Night workers should eat their main meal before their shift, at evening-meal time. Eating a large meal during the night can cause sleepiness and sluggishness and can lead to constipation, gas or heartburn. Have a light snack before bedtime to avoid waking due to hunger. Avoid eating a large meal one to two hours before sleep, as this can cause difficulty falling asleep (11,18)

Prepare meals for a number of days or more for quick and easy access. Experiment with slow-cookers or freeze portion sizes of healthy meals. This practice can help avoid the temptation of using convenience foods or ordering take-away.

Pack healthy snacks, such as prepared fruit (apple slices, banana, orange segments etc.) and easy-to-eat vegetable pieces like baby carrots and celery with hummus, or a small container of mixed unsalted nuts and seeds. It can be difficult to find healthy snacks during the afternoon and night shifts. Cafeterias are likely to be closed, and vending machines often only carry high calorie drinks and snacks that are high in fat/sugar/salt – avoid these, tempting as though they are. A small cooler bag can easily be stored in the cab of most ambulances, response cars and other workspaces, allowing for access to healthy, pre-prepared foods. See the additional resources section for more snack ideas for adults.

Planning healthy meals and snacks can help to avoid high fat/sugar convenience foods. Avoiding fatty, fried and spicy foods, such as hamburgers, fried chicken and curries is advisable to reduce the risk of heartburn and indigestion. Eating too much fat also increases the risk of developing heart disease and type 2 diabetes. High sugar drinks and food such as cola and chocolate may provide a quick boost of energy but this feeling doesn't last long. Enjoy nutritious snacks and beverages instead to stay alert and maintain energy levels (6). Plan physical activity and exercise in advance and in conjunction with meal planning.

Hydration

Drink fluids regularly to help avoid dehydration which can increase tiredness. Keep a water bottle nearby and sip frequently. Low fat milk, decaffeinated beverages and unsweetened herbal teas are alternatively suitable. Avoid

drinking alcohol after work and before bed as it can cause sleep disturbances (6).

Keeping fit

The benefits of physical activity are vast in a wide variety of physical and mental health aspects. Physical activity has been shown to decrease stress and anxiety, improve endurance, concentration and focus, while boosting mood and energy throughout the day (23). Physical activity promotes metabolism, circulation, and efficient sleeping habits. Furthermore, it has been shown that physical fitness can play an important role in the regulation of circadian rhythm disturbances that result from shift work (17).

As previously mentioned, shift work is an independent predictor of increases in body mass, BMI, prevalence of obesity, and waist to hip ratio (17). A study by Samaha et al. surveying nurses who work irregular shift work found that a lack of regular exercise and recreational activities contributed to chronic fatigue (24). On the other end of the spectrum, physical activity has been shown to increase both the duration, and the quality of sleep. Physical fitness has been shown to increase the amount of slow-wave sleep (SWS) – the phase of sleep that is responsible for brain restoration and recovery. Atkinson et al. also found that appropriately timed exercise can decrease feelings of fatigue, tiredness, fogginess, and other short term effects of shift work by adjusting circadian rhythms and inducing phase delays in the secretion of melatonin (17). In a simulated shift work environment, prior exercise was shown to lower blood pressure throughout a subsequent night shift in healthy individuals within a normotensive range (25). These findings suggest that regular exercise may therefore moderate the association between shift work and raised blood pressure. Moreover, physical activity has been shown to be beneficial by reducing anxiety, providing long term antidepressant effects, improving quality and duration of sleep, promoting a more favourable circadian phase, and boosting mood and energy (17).

Despite the well known benefits of physical activity, many shift workers find that their physical fitness is inevitably pushed to the bottom of their list of priorities. Several strategies for paramedics to improve physical activity while battling an irregular schedule include: blocking out a specific pre-shift time for exercise, focusing on intensity of workout versus duration, performing simple exercises on shift, and utilizing external resources that promote physical activity.

Exercise can enhance paramedic alertness at work in addition to increasing neural activity and clinical performance. Blocking out 20 minutes (or more) prior to a shift to perform physical activity will boost their mood and

combat fatigue while working. That being said, the best time for paramedics to work out is when they feel like it or will commit to actually going, whether it be pre or post shift. Furthermore, the goal of exercise must be shifted from duration to intensity. Circuit weight training will burn more calories than interval training, and significantly more than steady cardiovascular activity (26).

A sample work schedule of four days on/ four days off can be complimented with very intense strength training on the first and the fourth day off, with walks and other recreational forms of physical activity on work days. When time is limited, strength training provides the most “bang for your buck”. No other type of exercise will see the most results with the least amount of time spent exercising. Exhausting all muscle groups (large and small) will burn more calories during the workout, as well as at rest (27). Squats, deadlifts, overhead presses and pull-ups promote both upper body and lower body strength that is imperative in the field of paramedicine.

Workouts should focus on strength and endurance (increased repetitions and decreased weight), core stability (planks), rotational strength (medicine ball twists), and functional exercises (cable row combined with squat). Free weights should be utilized in place of machines in order to promote the development of stabilizer muscles and smaller muscle groups that are easily injured while on the job.

Simple bodyweight exercises can easily be performed while on shift, such as squats, walking lunges, stair climbs, and static stretches. Sitting on an exercise ball while at work can promote proper posture, core strength and rotational stability. Furthermore, resistance bands can be utilized efficiently while at base to develop stabilizer muscles and promote grip strength. Numerous external resources exist to help promote a healthy active lifestyle while keeping participants accountable for their successes and commitments. Several free applications available for iOS and Android are listed in the Resources section.

Conclusion

Shift work can cause adverse health effects, and the nature of paramedic work places paramedics at a higher risk of unhealthy eating and poor physical fitness. Healthier lifestyle choices, including increased physical activity and healthy eating can help to reduce the risk of adverse health effects on paramedics. Paramedics need to take responsibility for their health and practice healthy eating. Employers also have an obligation to help paramedics make healthy eating and physical fitness a priority.



Resources

- EatRight Ontario - www.eatrightontario.ca
 - o Nutrition Tips for Shift Workers and
 - o Healthy Snacks for Adults
- National Sleep Foundation - <https://sleepfoundation.org>
- Fitness Apps:
 - o Tabata Timer – 4 mins of exercise at very high intensity (8 cycles of 20 seconds of exercise, 10 seconds of rest).
 - o FitStar – involves workouts that don't require any equipment (can be completed at home, at work, or on the run).
 - o 7 Minute Workout – squeeze in a workout anytime with a variety of intensity levels.
 - o JEFIT – detailed instructions, thousands of routines, workout planner, exercise log, and progress tracker.

Disclaimer

The views and opinions expressed in this article are those of the authors and do not necessarily reflect the official policy or position of their employers or organisations.

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