Using caffeine strategically to combat fatigue

By Dr Alexandra Holmes

As a fatigue management specialist, I spend much of my time training aviation professionals in how to manage fatigue...

Some training sessions assist managers in implementing organisation-wide fatigue management strategies, for example fatigue risk management systems (FRMS) or duty schedules that limit fatigue. I also provide air traffic controllers, pilots, cabin crew and mechanics with guidance on how they can personally manage the level of fatigue they experience. At these sessions there is always one topic that people are keen to learn more about – caffeine and how it can be used to strategically manage fatigue.

Caffeine is the world's most widely consumed stimulant and most of us consume some caffeine every day in the form of coffee, tea, chocolate or energy drinks. Caffeine's popularity is largely linked to the fact that, by activating our central nervous system, it temporarily overcomes tiredness and improves alertness and performance.

We like to consume caffeine in the morning to overcome sleep inertia, the temporary groggy feeling we have soon after waking up. Many of us also look for a cup of tea or coffee in the afternoon to get through the circadian slump in alertness that occurs at this time of the day. In industries such as aviation, that operate 24 hours and 7 days a week and require people to work in shifts, caffeine is widely used as a strategy to cope with work-related tiredness.

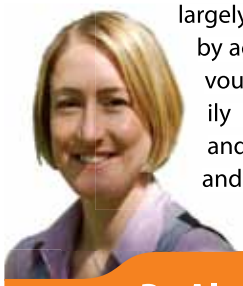
Although caffeine can be beneficial, it can also have significant negative consequences. Signs that you have had too much caffeine include anxiety, jitteriness, sleep disruption, heart palpitations and arrhythmias and stomach complaints.

Strategic caffeine use

In order to use caffeine strategically, we need to harness its benefits and at the same time limit its negative aspects. There are four steps you can take to achieve this aim:

1. **Combine caffeine with a nap**
   This sounds strange at first, but to enhance the benefits of caffeine the best advice is to combine your cup of coffee with a nap. Caffeine takes around 20 minutes to affect the nervous system and you can use this window to take a nap. Research shows that when you wake up, and the caffeine has taken effect, you will be more alert than if you just had the caffeine or the nap alone.

2. **Avoid caffeinated drinks with high levels of sugar**
   Be aware that soft drinks containing caffeine usually also contain large amounts of sugar - to counteract the bitter taste of caffeine. If you are using a caffeinated soft drink as a fatigue countermeasure, try to find a sugar-



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is a fatigue management specialist with over ten years' experience assisting aviation operators and other safety-critical organisations to develop and implement Fatigue Risk Management Systems (FRMS). An experienced researcher, technical author and trainer,Alexandra regularly undertakes fatigue risk assessments and large-scale research studies including the collection of data on sleep, fatigue and performance.

free version. Sugar-free drinks will give you the benefits of the caffeine while avoiding the energy slump that can occur after we consume a large amount of sugar.

3. **Only consume caffeine when you need it**
   As we rapidly develop a tolerance to caffeine, the more caffeine you consume during the day, the less of an effect it will have when you need it. If you limit your habitual caffeine consumption to only when you need it, for example to promote alertness during a nightshift, it will have a greater alerting effect.

4. **Recognise that people differ widely in their sensitivity to caffeine**
   People who are sensitive to caffeine may find that one cup of coffee improves their alertness, while others need a couple of cups. If you are sensitive to caffeine you might not be able to consume caffeine after lunch if you want to have a good night's sleep, while other people can drink coffee before bed and still fall asleep without a problem.

How much caffeine do you consume?

To assist you to use caffeine strategically, you may find it useful to use the caffeine calculator to evaluate your daily consumption. Espresso, drop, filter and percolated coffee all have high caffeine levels, usually between 80-180mg, which is much greater than those of tea (approximately 45 mg) and instant coffee (approximately 75 mg). However, even if you only drink tea you might be surprised to see how much total caffeine you consume across the day.

Low daily caffeine intake of < 500mg is generally considered to be harmless. However, depending on when you take it, levels towards the upper end of this range may still affect your ability to get to sleep. If you are having difficulty sleeping you may want to try cutting down your caffeine consumption. Try stopping having caffeine after around 16:00 or towards the end of your shift and you may be surprised at how much easier it is to fall asleep later.

Consuming more than 500mg of caffeine per day is not recommended and people taking this much caffeine would benefit from taking steps to reduce their intake. Excessive caffeine consumption can be used as a crutch in an attempt to deal with high levels of underlying fatigue. If you consume a lot of caffeine you will first need to identify and address any reason(s) you may be feeling particularly tired. You may need to improve your sleep environment or speak to your doctor if you have been experiencing sleep difficulties.

Once you have successfully tackled the source(s) of your fatigue, you can begin to gradually reduce your caffeine intake over a period of time. It is important that you do not suddenly stop consuming caffeine as this can lead to extreme fatigue, headaches, irritability and anxiety.

How to reduce your caffeine intake without the headache

Reducing your caffeine consumption slowly, preferably over several weeks, will help your body adjust with fewer unpleasant side effects. Below are some tips on how to reduce your caffeine intake gradually.

- Mix decaffeinated coffee powder with ordinary coffee powder to make a lower-caffeine drink.
- Introduce one or two decaffeinated drinks into your daily diet. Then gradually increase this by alternating decaffeinated drinks with caffeine-containing drinks.
- Replace caffeinated soft drinks such as Coca Cola or Pepsi with caffeine-free versions or sparkling mineral water.
- Drink smaller volumes by using a cup instead of a mug.
- Try reducing the amount of coffee powder you use to make a lower-caffeine drink. When using tea bags, take the teabag out sooner.

Summary

In summary, caffeine is an effective short-term strategy for tiredness if used strategically. To harness the benefits of caffeine, while limiting the negative side-effects, try to limit your caffeine consumption to only when you need it to promote alertness. Too much caffeine can cause anxiety and disrupt your sleep, thereby actually making you more tired. For maximum benefit during a difficult shift, have some caffeine and take a short nap while you wait for the caffeine to take effect.

Finally, remember caffeine only masks or delays fatigue – the only real solution is sleep!