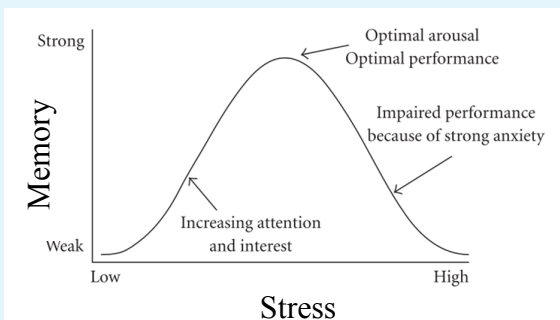




February's edition of the newsletter explored many different topics from exercise to meditation. In this month's edition of the newsletter we explore the effects of chronic stress and strategies to relieve the effects of stress. As well as, investigating some myths about our brains.

STRESS: IS IT GOOD OR BAD?

When we perceive a situation as harmful to us or we get scared, our bodies react with a 'fight-or-flight response'. This response causes different hormones, like adrenaline and cortisol to be released to prepare the body to run from or fight the perceived 'threat'. These 'stress' hormones are important as they increase arousal, keep us alert and increase heart rate. Therefore up to a certain level stress is good, it can help with motivation and arousal. However prolonged stress, chronic stress, can be very harmful and cause drastic changes to our bodies. Usually, once cortisol has been released in response to a stressor, cortisol levels in the body returns to normal upon completion of the task in hand. However, with chronic stress, cortisol levels build up to harmful levels that can cause changes in brain size, structure and function, as well as causing long term health problems.

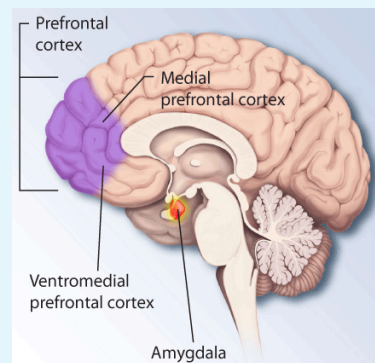


A: This graph illustrates how up to a certain extent stress can be good in improving learning and memory, but high levels impair performance.

HOW CORTISOL CHANGES OUR BRAINS AND AFFECTS OUR THINKING

Cortisol can literally cause the brain to shrink in size and too much can cause a loss of connections within the brain. Notably, an area of the brain that shrinks due to chronic stress is the prefrontal cortex which regulates behaviours like decision making, concentra-

tion, judgement and social interaction. These effects on the brain are reversible as our brains are 'plastic', constantly changing. High levels of cortisol after long periods of time can cause an increase in activity in the 'fear centre' of our brains (the amygdala). The hippocampus, an area of the brain associated with learning, memory and stress control also deteriorates and excess cortisol leads to fewer brain cells being made in this area. So when the hippocampus weakens so does your ability to control stress. Therefore, chronic stress can also make it harder for you to learn and remember things, as well as setting the stage for other serious mental health issues like depression and eventually Alzheimer's disease.



B: Illustration of the brain to show the location of the prefrontal cortex and amygdala ('fear centre').

REVERSING THE EFFECTS OF CHRONIC STRESS

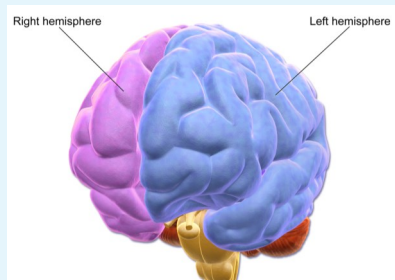
So what can we do to reverse the effects of chronic stress and cortisol? Managing stress involves a range or menu of options that include: physical activity, music, social connectivity, creativity, meditation and laughter. Regular physical activity, like jogging, walking or swimming, are essential to mimic the 'flight' aspect of stress, to 'burn-up' excess cortisol that is released in stressful situations, preventing the build-up of the hormone. Even just 20-30 minutes most days of the week can be very effective. Recent studies have shown that social connectivity is important in reducing the amount of cortisol. Close knit human bonds, like friends and family, produce a 'tend-and-befriend response' in the body, this response does the exact opposite of the 'fight-or flight response'. The 'tend-and-befriend response' increases the amount of a hormone called oxytocin in the body which reduces the amount of cortisol. By introducing mini stress reliever breaks throughout

your day, even as simple as indulging in a 5 minute coffee break or listening to your favourite song, can help reduce stress.

As an individual, you need to find the best combination of items that works best for you to relieve stress. With strategies to reduce your cortisol levels, it is not 'one size fits all', it is unique and individual. By discovering what your stressors are you will also learn what strategies work best for you in relieving your stress. Knowing that as with learning any new skill, these strategies need to be practised on a regular basis; it takes 7 weeks to make or break a habit. By reducing the stressors in your life, this can help to improve your decision making, memory and learning.

MYTHS ABOUT OUR BRAIN

Many of you may have heard of brain dominance, how 'left-brained' or 'right-brained' you are and being more orientated to one than the other. With the left side of the brain more associated with logic and rationality and the right side controlling creativity and emotion.



C: Illustration showing the right and left sides of the brain (also known as the right and left hemispheres).

This popular belief about the brain is simply not true. Although some people are more methodical and logical, while others are more spontaneous, this is not associated with the different functions of the left and right sides of the brain. Recent research shows that individuals do differ in how they think and solve problems but this has nothing to do with different balances of power between the two halves of the brain. In other words, when considering the left and right halves of the brain, one half is not more dominant over the other. However, functions may be more lateralized (more dominant) to one half than the other. For example, in most right-handed individuals when paying attention to language this causes activity more lateralised to the left half of the brain and when paying attention to a visual stimulus this causes activity more lateralised to the right. Lateralization is important for thinking and enhancing cognitive performance. But scientifically, one cannot separate the two halves of the brain into a logical half and an emotional

half, i.e. 'left-brained' and 'right-brained'.

Other popular brain myths include the idea that we only use 10% of our brains. Functional imaging shows that there are very few areas of our brain that can't be activated by something. Functional brain scans show that even a simple task like clenching your fist uses more than 10% of the brain.

If you have found either of these topics interesting and would like to discover more about a topic why not have a look at friendly TED Talks for more information, available at: <https://www.ted.com/talks> or have a listen to the BBC Radio 4 programme Mind Myths, available at: <http://www.bbc.co.uk/programmes/b016wzs9>

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TEASER SECTION:

ANSWER TO FEBRUARY'S TEASER

6	4	2	5	1
8	3	5	4	4
3	0	3	2	1
9	1	8	2	7
?	2	3	1	4

What number should replace the question mark in the grid?

Answer: Five. On each row the second number plus the third number gives the first number and the fourth number plus the fifth number also gives the first number.

THIS MONTH'S TEASER

If Manchester reached 31C, Glasgow reached 30C, Southampton reached 33C and even Inverness reached 28C.

What temperature did Leicester reach?

Find the solution in next month's edition.

CONTACT US:

If you've enjoyed reading this and wish to be added to the mailing list or have any general feedback, please feel free to contact us (defac-tsp-admin@defenceacademy.mod.uk)