

# ANTERIS Psychoeducation sheet for ADHD

## ADHD Brains are Different

Brain scan (PET scan) findings first demonstrated in 1990 showed reduced blood flow to the Pre-Frontal Cortex, the Pre-Motor Cortex and the Striatum. MRI findings have showed asymmetry in several regions of the brain including the Amygdala, Basal Ganglia and Nucleus Accumbens, with a large range of variability between individuals. Brain scan studies (using SPECT scanning) from 2000 indicated reduced dopamine levels in the in the Pre-Frontal Cortex in people with ADHD; this reduction in brain chemicals was also shown to correct with methylphenidate treatment (studies in 2002 and 2007).

In summary, certain parts of the brain are less active than normal in people with ADHD. The Pre-Frontal Cortex is involved in planning, organisation and maintaining alertness and people with ADHD can therefore find it especially difficult to complete repetitive mundane tasks (such as form-filling) within timeframes. The Pre-Frontal Cortex also affects other parts of the brain such as for regulation of emotions and activity levels which furthermore ties in some of the typical symptoms with the brain scan findings above.

Genetic markers with dopamine receptors (so called DRD-4, DRD-5 and DAT1) have consistently been found to be related to ADHD, first in 2005, with new links having being found since then (DBH, HTR1B, WW-25); each gene contributes only a little to the risk of the disorder.

We are however not at a point where scans or genetic testing can be used for diagnostic purposes as a proportion of people with the condition will show a normal brain scan and normal genes. ADHD is therefore a clinical diagnosis from a psychiatrist with specialist knowledge of the condition, who is also able to advise on appropriate treatment choice.

Medications have been shown to change patterns of brain activity in people with ADHD so that they more closely resemble those of people without the condition – these changes are only temporary in the case of stimulant medications.

## Lifestyle changes to benefit ADHD

Exercise: Cardiovascular exercise helps to modulate ADHD by increasing the brain chemicals dopamine and noradrenaline; this improves the tone of certain brain structures (the Locus Coeruleus and the Pre-Frontal Cortex) which in turn control levels of alertness and concentration. Of note medications also work on this pathway. The NZ governments recommendations are at least 30 mins of exercise 5 times per week. There is additional evidence for exercising in green space for benefits on mental wellbeing.

Diet: What we put into our bodies unequivocally affects how our brains perform. A diet high in processed foods, high in refined sugars, with low levels of amino acids (precursors to brain chemicals) or low in essential nutrients can contribute to ADHD symptoms. Mineral and vitamin supplements have no proven benefits and can in some cases can have toxic effects if

taken in large doses. A diet full of vegetables with plenty of high fibre foods and low in refined sugar is most beneficial for ADHD.

Sleep: Achieving good quality sleep must become part of your maintenance and need good habits. Your brain needs 7-8hrs of undisturbed sleep per night to function optimally. Common healthy sleep habits are aimed at reducing the stimulation that will interfere with sleep such as avoidance of caffeine in the evening, not using mobile phones or computers 1-2 hrs before bed and having consistent to-bed and wake-up times.

Relaxation techniques: People with ADHD find it difficult to filter out stimuli from their environment commonly resulting in feeling stressed and overwhelmed. Your body activates a part of the brain called the Amygdala; the Amygdala drains resources from the Pre-Frontal Cortex affecting the ability to think clearly and make rational decisions. Relaxation techniques can stop this stress response from kicking in. Evidence-based activities include meditation, progressive muscle relaxation, yoga and massage.

Please consult your ANTERIS psychiatrist at your follow-up appointment for advice on any of the lifestyle strategies above.

### **Book Recommendation**

There are many books that could be recommended for adults with ADHD but Russell Barkley's book "Taking Charge of Adult ADHD" is perhaps the most comprehensive and evidence based. <https://www.amazon.com/Taking-Charge-ADHD-Fourth-Authoritative/dp/1462543197>

### **Behavioural interventions**

There is evidence to show that behaviour changes in combination with medications can be additionally helpful - although these do not correct the underlying brain chemical abnormalities - rather help the person to manage the symptoms better.

It can be challenging to find a practitioner with the right experience – however we find <https://www.nzccp.co.nz/for-the-public/find-a-clinical-psychologist/> to be a very useful resource.

Membership to an organisation such as <https://www.adhd.org.nz> may be a helpful way of getting support to navigate a new diagnosis.