

**Recovery from Physical, Psychological and Cognitive Trauma using NeuroOptimal Neurofeedback.**

***A case study presenting pre- and post- neuropsychometric tests and SPECT Scan results.***

**ABBREVIATED POWER POINT PRESENTATION OF NEURO-PSYCHOMETRIC RESULTS AND SPECT SCAN RESULTS – PRE AND POST NEUROOPTIMAL NEUROFEEDBACK.**

**DENISE M CULL M.Psych, (Forensic)**

**Summary of video presentation which accompanies the overheads.**

**Denise Cull was for many years a highly regarded Forensic Psychologist in private practice in Perth, Western Australia and a court appointed expert to the Family, Criminal and Children’s Courts of W.A. She was the director of her company, *Victim and Offender Assessment and Treatment Services Pty Ltd.***

**In 2002, Denise suffered a significant spinal injury with associated trauma as a result of an ‘upward-backward’ whiplash injury in a sporting accident. She was forced to retire early on medical grounds.**

**In 2005, it was then realised she had also incurred a closed head injury (Acquired Brain Injury) at that same time. Cognitive damage was widespread and confirmed by results of neuro-psychometric procedures administered in Perth, Western Australia by Dr Leonie Coxon, Ph.D. – a highly regarded Clinical and Forensic Psychologist as well as Court Expert in her field of neuro-psychology.**

**The neuro-psychometric procedures were sufficiently alarming as to cause Denise to seek further information as regards the nature and specific location of the damage incurred. She attended for a SPECT Scan, a nuclear medicine imaging diagnostic procedure reflecting areas of damage. These results were very confirming of those from the neuro-psychometric testing procedures.**

**In 2011 Denise attended for 12 sessions of NeurOptimal Neurofeedback. She felt the gains made were by then sufficient for her to cease, however returned approximately twelve months later when struggling to cope with the impact of a very significant further life-changing event.**

**Denise then proceeded to have approximately thirty more sessions of NeurOptimal Neurofeedback, most accompanied by nasal absorption of oxygen and near daily intranasal use of the Vie Light providing infra-red light therapy. She soon became well aware of very significant and extremely positive benefits as a result. For her own reassurance, in February 2013 she returned for a repeat of the neuro-psychometric tests, the results showing very positive improvement across areas of previously identified damage.**

**For confirmation of these results – and recognising the positive implications as evidence in support of NeurOptimal Neurofeedback – Denise self-referred for a further SPECT Scan. The resulting report presented information beyond her wildest expectations, despite knowing she had progressed well as a consequence of a total of approximately 40 sessions of NeurOptimal.**

**This was scientific evidence at its' best.**

**While preparing her case study for presentation at this conference, Denise continued with further sessions of NeurOptimal and in early February 2014, some two weeks before the conference, she attended for a third battery of the neuro-psychometric tests. The results show even further improvement and provide clear evidence of the gains she has made over the past two years with NeurOptimal with oxygen and infra-red light being the *only* sources toward which such change could be attributed.**

**The three sets of results (2005 – pre-test; 2013 – post-test and 2014 repeat post-test) are described in the following pages and displayed for ease of comparison. They are prepared in power point format for inclusion as part of her paper presentation at the conference.**

# COGNITIVE PROCESSING SPEED

## WAIS – IV Sub-tests

**2005 - raw score 106 – 66<sup>th</sup> %ile ranking - ‘average’**

**2013 - raw score 111 - 77<sup>th</sup> %ile ranking - ‘average’**

## Symbol Digit Processing Speed (WRITTEN)

**2005 - raw score 48 – ‘average’**

**2013 - raw score 46 – ‘average’**

## Symbol Digit Processing Speed (ORAL)

**2005 - raw score 50 'average'**

**2013 - raw score 58 'high average'**

# **MEMORY FUNCTIONING**

## **WECHSLER MEMORY SCALE – III**

### **Visual Immediate Memory**

**2005 - raw score 97 'average' 42<sup>nd</sup> %ile range.**

**2013 - raw score 100 'average' 50<sup>th</sup> %ile range.**

# **WECHSLER MEMORY SCALE – III**

## **Visual Delayed Memory**

**2005 - raw score 106 'average' 66<sup>th</sup> %ile rank.**

**2013 - raw score 115 'average' 84%ile rank.**

# VISUO/SPATIAL FUNCTIONING

**KEY FIGURE (includes measures of memory, attention planning, and executive functions of working memory)**

*Immediate recall*

**2005 - raw score 28.5 'low average' 10<sup>th</sup> % ile rank**

**2013 - raw score 32.0 'average' 40<sup>th</sup> % ile rank**

# **KEY FIGURE (includes measures of memory, attention planning, and executive functions of working memory)**

## **Delayed recall**

**2005 - raw score 17.0 'low-average' 20<sup>th</sup> % ile rank**

**2013 - raw score 15.0 'low-average' 10<sup>th</sup> % ile rank**

***EXTRACTS: from* SPECT Scan Report (March 2013)**

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**1: The reconstructed tomographic images show an even pattern of cortical retention of perfusion tracer WITHOUT ANY DEFINITE REGIONAL ABNORMALITIES ON THIS OCCASION.**

**2: Mildly increased activity in the left Lentiform nucleus and Thalamus;**

**3: Relatively increased activity in the subgenual cortex;**

**4: Temporal lobe blood flow on visual assessment appears NORMAL;**

**5: There is SYMMETRIC cerebella blood flow;**

**6:... increased activity in the medial orbitofrontal cortices and subgenual cortices;**

**7: Increased blood flow ... at the right anterior temporal lobe;**

**8: ... mildly increased cortical blood flow in both frontopolar regions;**

**9: There are NO AREAS OF STATISTICALLY SIGNIFICANT CORTICAL HYPOPERFUSION;**

# **SPECT Scan Report - CONCLUDING COMMENTS:**

**The absence of any areas of cortical hypoperfusion would argue against the presence of any areas of fixed previous traumatic injury.**

## 2014 – Comparisons with Repeat Post-Test results

### Measure of visual memory with immediate recall

2005 raw score 97 (42%ile rank) 'average'

2013 raw score 100 (50%ile rank) 'average'

**2014 raw score 109 (73%ile rank) 'high average'**

## Measure of visual memory with delayed recall

2005 raw score 106 (66%ile rank) 'average'

2013 raw score 115 (74%ile rank) 'high average'

**2014 raw score 136 (99%ile rank) 'very superior'**

## Information Processing Speed results:

2005 raw score 106 (66<sup>th</sup> %ile rank) 'average'

2013 raw score 111 (77<sup>th</sup> %ile rank) 'high average'

**2014 raw score 117 (87<sup>th</sup> %ile rank) 'high average'**

## Measures of Visuo Spatial Immediate results

2005 - raw score 28.5 (10<sup>th</sup> %ile rank) 'low average'

2013 – raw score 32.0 (40<sup>th</sup> %ile rank) 'average'

**2014 – raw score 32.5 (50-55<sup>th</sup> %ile rank) 'average'**

## Measures of Visuo Spatial delayed results

2005 - raw score 17.0 (20<sup>th</sup> %ile rank) 'low average'

2013 – raw score 15.0 (10<sup>th</sup> %ile rank) 'low average'

**2014 – raw score 26.5 (70-75<sup>th</sup> %ile rank) 'high average'**

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