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# Developmental Trauma

## Training and Treatment Service Proposal for 12-25 Age Group

**November 2022**

# Contents

<b>Executive Summary</b> .....	<b>3</b>
<b>What Do We Know?</b> .....	<b>4</b>
Transdiagnostic Risk Factor .....	4
Cognitive Impairment Reduces Life Performance .....	5
Current Therapies Need Help .....	5
Studies + Extensive Experience, Support QEEG Analysis and Neurofeedback Therapy.....	5
Clinicians Need Trauma Targeted Psychotherapy Training .....	7
<b>Why 12-25 Age Group?</b> .....	<b>8</b>
Types of Trauma .....	9
Effects of Developmental Trauma.....	9
<b>Why Invest in Developmental     Trauma Treatment?</b> .....	<b>11</b>
<b>Why a Specialist Service?</b> .....	<b>11</b>
Recommended Evidence-Based Interventions .....	12
Eligibility & Throughput.....	14
Service Design.....	14
Delivery Vehicle Design .....	15
Training Model and Components.....	16
Program Governance.....	18
Prospective Research and Evidence Development .....	18
Funding Model.....	19
2021 National Mental Health and Suicide Prevention Plan .....	19
National Alcohol and Other Drugs Strategies.....	19
Evaluation .....	20
Program Risks .....	20
Future Vision .....	20
<b>Conclusions</b> .....	<b>21</b>
<b>Appendix 1: Developmental Trauma     Staged Treatment Framework</b> .....	<b>22</b>
<b>Appendix 2: Case Vignettes</b> .....	<b>23</b>

## Executive Summary

Developmental trauma is the most significant public health issue that needs to be resolved, as it is causing the most personal, family, social and economic pain.

While increasing programs to encourage trauma-informed care is excellent, they do not treat the brain changes caused by developmental trauma. They are primarily aimed at those that are mild to moderately severely affected. This program targets the more severely traumatised that others avoid.

This combined training and treating service will provide an integrated combination of educational and training inputs from complementary educational providers to already established clinicians ready to take on the severely developmentally traumatised at a difficult stage of development when many disorders emerge – youth 12-25.

Developmental Trauma-related mental and physical disorders result from the interactions between toxic environments and the individual's genes and epigenetic factors while the person is in the development stages from conception until brain maturation around the age of 25.

Technology, including functional Magnetic Resonance Imaging (fMRI) and Quantitative Electroencephalography (QEEG), is now enabling us to examine the organ we wish to treat and devise effective brain-settling methods that significantly improve personal performance.

Operant conditioning, using gentle biofeedback methods, such as EEG neurofeedback, can reverse the effects of trauma on the brain's structures and functions. Improving cognitive and executive functioning, reducing fear and anxiety and increasing affect regulation enables talking and medication therapies to work better so people can get on with their lives confidently, especially those at the severe end of the spectrum.

The Australian workforce with the necessary skills is extremely low, so an aggressive integrated training program is required. The skills acquisition requires two years of theory, practice, and supervision, with longer-term access to expert consultation and supervision. Trainees need to have prior clinical practice experience. It is not for technicians, as more trauma may emerge as anxiety reduces. This program will stretch the available training and supervision capacity to the limit.

To achieve a basic critical mass of trained clinicians, and to provide future trainers/mentors, requires the maximum efficient use of the current rare skill holders. Sydney is the only city where the teaching components are all available.

The pilot training service should be independent of any university but partner with the universities to address the many associated research and evaluation issues, but with a critical mass of subjects to achieve quality research designs and sufficient longevity of funding for prospective studies that need longer follow up.

Australian standards of training and credentialing for QEEG analysis and biofeedback therapies, such as neurofeedback for developmental trauma, need to be established.

Clinical funding and payment methods will require careful consideration to achieve quality outcomes.

The costs to society of developmental trauma are huge, but it is now clear that major savings will progressively occur, as the benefits of neuromodulation are virtually permanent. From local observations we can confidently expect reductions in the use of health, welfare, and justice systems expenditure, that will give impressive returns on the investment.

## What Do We Know?

*Developmental trauma, otherwise known as Complex Post-Traumatic Stress Disorder, is very prevalent, with 30.5% of people exposed to 4 or more types of psychological trauma over their lifetime.*

Studies consistently estimate around 12% or more have very significant levels of childhood trauma. At least one in four children has experienced child abuse or neglect (including physical, emotional, and sexual), and one in seven children experienced abuse or neglect in the last year (USA Centers for Disease Control and Prevention - CDCP). Further traumas occur in adolescence, particularly bullying and sexual assault. The most common and damaging trauma is emotional abuse.

*"Childhood maltreatment is the most important preventable risk factor for psychiatric disorder."*

In a landmark review, Teicher, Gordon & Nemeroff (2021) state that childhood maltreatment is the most important preventable risk factor for a psychiatric disorder. Maltreated individuals typically develop psychiatric disorders at an earlier age, have a more pernicious course, more comorbidities, greater symptom severity, and respond less favourably to treatments than non-maltreated individuals with the same primary DSM-5 diagnosis. Furthermore, maltreated individuals have alterations in stress-susceptible brain regions, hypothalamic-pituitary-adrenal response, and inflammatory marker levels not discernible in their non-maltreated counterparts. Hence, maltreated and non-maltreated individuals with the same primary DSM-5 diagnoses appear to be clinically and neurobiologically distinct. The failure to embody this distinction in DSM-5 has interfered with our ability to discover novel treatments, to recommend currently available treatments most likely to be efficacious. It has been a largely unrecognized confound that has thwarted our ability to identify the biological basis for major psychiatric disorders. They discuss several diagnostic alternatives and recommend the inclusion of a Developmental Trauma Disorder diagnosis for severely dysregulated individuals, of all ages, with numerous comorbidities, who experienced interpersonal victimization and disruptions in attachment, such as emotional

maltreatment or neglect. For less severely affected maltreated individuals, they suggest using conventional diagnostic categories, such as major depression, but with an essential modifier.

Basically, there is an interaction between the particular toxic environment and the individual's genetics and epigenetics, leading to evolution determined brain structural and functional protective mechanisms to come into play. Thus each brain response is unique and needs a unique treatment response.

## Transdiagnostic Risk Factor

Developmental psychological trauma should not be conflated with Post Traumatic Stress Disorder (PTSD), which is a sub-set of symptoms in a wider range of deleterious effects of developmental trauma, including depression and self-hatred, anxiety, dissociation and depersonalization, aggressive behaviour against self and others, problems with intimacy, and impairment in the capacity to experience pleasure, satisfaction and fun. Effects are "dose" related and cause much personal pain, chronic health disorders, early death and societal disturbance. There is a massive whole of life personal, social and economic cost to society, not currently effectively addressed.

The first umbrella meta-analysis, published in October 2022 (Hogg et al), and using data from a large majority of childhood trauma studies, showed "that psychological trauma in childhood is associated with a nearly three times greater risk of having a mental disorder (OR = 2.92), and demonstrate that psychological trauma is a transdiagnostic risk factor for psychopathology. Thus to limit treatment and research to DSM -5 single diagnostic categories is not logical, considering the many comorbidities found in traumatised young people, which need to be treated at the same time, and for which trauma is a major factor.

## Cognitive Impairment Reduces Life Performance

A meta-analysis of executive functions in trauma-exposed youth (Op den Kelder et al 2018) showed that in the age range of 2-25, working memory, inhibition and cognitive flexibility were all significantly impaired, dose related to the severity of trauma. These impairments interfere with the efficacy of talking therapies and life performance.

## Current Therapies Need Help

Mental health disorders represent a worldwide public health concern with high burden of disease. Medications and talking psychotherapies are recommended as evidence based first line treatments. After the benefits of new classes of medications from the 1950s onwards and evolving new psychotherapies with the professional development of psychology, things seem to have stalled, with only marginal improvements for the last 30 years.

But the more severe the disorder, the less the progress. A recent umbrella meta-analytic evaluation of the efficacy of psychotherapies and pharmacotherapies for mental disorders in adults (Leichsenring et al, 2022) reported that across disorders and treatments, the majority of effect sizes for target symptoms were small. The effect size is a statistical calculation (Cohen's d) revealing the practical and clinical significance of a study result – the closer to 1.0 the better. For example, an effect size of 0.8 is very good, 0.5 medium and 0.2 low. They found an effect size (standardized mean difference) of only 0.34 for psychotherapies and 0.36 for medications, compared to placebo or treatment as usual, and combined treatments compared with either monotherapy was only 0.31. They also noted that the risk of positive bias in studies was high.

After more than 50 years of research, thousands of randomized controlled trials and trillions of invested funds around the world, the results are limited, suggesting we have hit a ceiling for standard treatment research. If we are to better help Australians suffering from disabling mental disorders, a paradigm shift is required to achieve further progress! What are we missing?

*The Teicher, Gordon and Nemeroff review strongly suggests it is developmental trauma. Trauma informed care is good, but not enough to reverse brain changes.*

## Studies + Extensive Experience, Support QEEG Analysis and Neurofeedback Therapy

Controlled studies, case series, and extensive experience with those most severely affected by developmental trauma have shown that raw and quantitative electroencephalography (QEEG) enables us to examine the organ we are treating to find otherwise hidden factors, providing diagnostic and treatment choice information. The best practice suggests that the EEG needs to be visually analysed in its "raw" recorded state, then quantified with software tools, and compared with a normative database to ensure that the results are accurately interpreted. Event-related potentials recorded when the brain is given a task can also provide additional information that can help predict the response to medication.

Neurofeedback operant conditioning is the most effective way to improve brain performance, particularly in reducing anxiety and repairing cognitive functioning. It is the most gentle way to invite the brain to find its own solution, re-set functioning back to normal, reduce anxiety and increase life performance (see appended case vignettes).

With over 33 years of experience treating thousands of traumatised refugees of all ages and every type of trauma each year, the NSW Service for the Treatment and Rehabilitation of Torture and Trauma Survivors (STARTTS) introduced EEG and neurofeedback in 2003. The outcomes have been very positive, especially for the most severely traumatised. For example, former child soldiers from Africa have been able to settle in class and complete their education with these modern therapies. Once the fear-driven brain has calmed, psychotherapies, body work, and social therapies work much better! It is essential to know that the improvements in performance are virtually permanent – the brain does not want to reverse into chaos.



Studies have also shown significant benefits for treating severe psychosis, with long follow-up periods. For those that still need medication, doses and side effects are much reduced.

Neurofeedback is an enabler in the comprehensive bio-psycho-social phased treatment model (appended). Forms of body work are also essential, as often "the body keeps the score" in ways not improved by talking therapies.

So much trauma occurs in infancy and early childhood before the development of language and cognitive skills. Neurofeedback can be used in treating very young children, as their brains do not need language to understand or respond to the conditioning.

These learnings must be implemented for the general population, but first many clinicians need to learn these skills. Currently, there are only 56 internationally certified neurofeedback practitioners in Australia, with 19 certified as Supervisors, with several in, or close to, retirement. NSW has 20, with 7 as Supervisors. There are only 20 people with a QEEG Diploma in Australia and 4 in NSW, 2 at STARTTS. Only a minority of these practitioners work with trauma.

STARTTS has created the Australian Neurofeedback Institute in Sydney to ensure that training is available in Australia for treating the range of traumas and for its own workforce needs. Standards must be set for working with developmental trauma to ensure appropriate funding and payment systems.

**Neurofeedback therapy**

- Operant training mediated by feedback of targeted brain activity over multiple sessions
- Complex form of behavioural therapy, with positive and negative feedback determined by related valency of targeted brain activity

**Electrodes**

**AV feedback**

**Amplifier**

**Operant training curve for neurofeedback gains**

Improvement

Treatment sessions

Slow early changes

Fast acquisition stage

Asymptote, consolidation

**Neurofeedback generally involves sensory (auditory, visual, tactile) feedback based on real-time analysis of targeted brain function**

Presentation of the Psychology and Neurofeedback Special Interest Group of the Australian Psychological Society by Professor Richard Clark

## Clinicians Need Trauma Targeted Psychotherapy Training

Caring for people with significant trauma requires specific trauma management skills, and the Blue Knot Foundation in Sydney is a centre of excellence teaching a range of psychotherapies targeting trauma. As a partner with project, integrated training in QEEG, Neurofeedback and a range of appropriate psychotherapies will produce the clinicians with the skills required to be effective.

The Australian and New Zealand Association of Psychotherapy will be able to provide training in the Conversational Model, a trauma-informed psychodynamic approach, for clinicians seeking psychotherapy training. Other psychodynamic training institutions may also be interested in providing person-centred training.

The Westmead Psychotherapy Program for Complex Traumatic Disorders has now substantial experience in treating disorders where transdiagnostically developmental or later complex trauma has been a significant contributor. The program partners with the University of Sydney to run a renewed Masters of Trauma-Informed Psychotherapy and trains clinicians seeking to expand their skills to treat in trauma-informed and integrated approaches. The program also has experience training local mental health clinicians in parallel to degree candidates.

# Why 12-25 Age Group?

Treating developmental trauma can be divided into four natural segments.

## 1 Becoming Parents

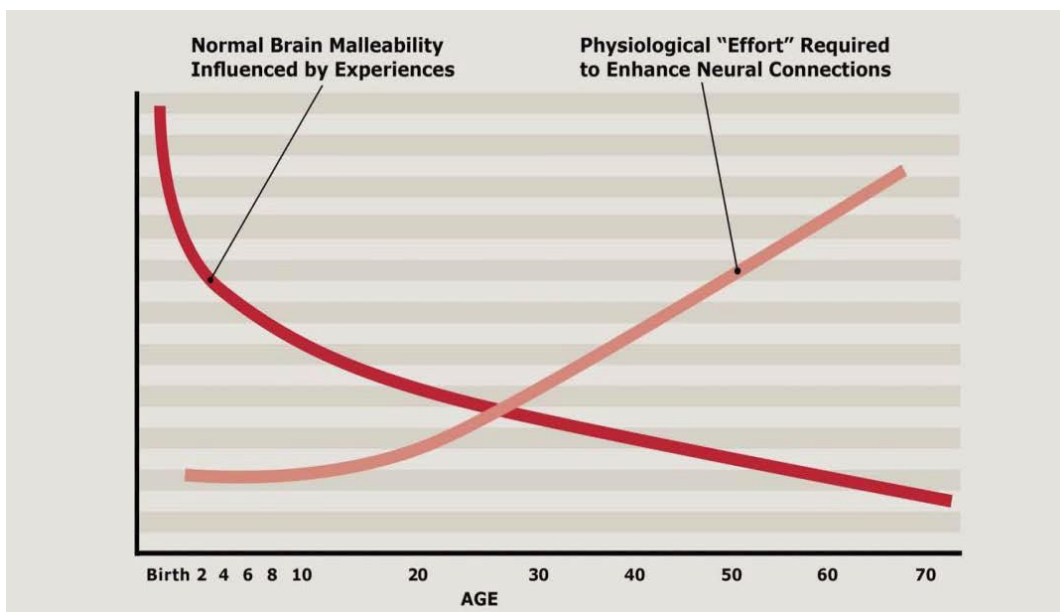
Developmental trauma and its unresolved states of mind can be passed from generation to generation. Parents who have been traumatised as children or experienced transgenerational loss or trauma are much more likely to pass on transgenerational traumatic states of mind to their own children. They can be identified at the time of pregnancy, delivery, or child infancy, and an active program to effectively treat (not just support) parents, would be a primary prevention for their children. This stage of life goes beyond the target of 25 and will need additional support to Perinatal and Infant services, including the new Mother and Baby Units in the state.

## 2 Infancy & Childhood

From pre-school to end of primary school/puberty, developmental trauma could be identified by teachers trained to do so and families referred to a trauma treatment service. Parents who are trauma survivors, missed earlier in the child's life, could be also be identified by other services (general practitioners, mental health, alcohol and other drug services, police, child at risk services etc) and receive treatment for their own developmental trauma or later onset PTSD. Proactively seeking and treating these parents is important in limiting the damage to their children.

The children also need treatment, whether remaining with their parents or in out-of-home care. These services need particular child and family therapy skills, as the parents are still the main influence and carers for children, and attachment issues must be addressed. There needs to be close collaboration with child protection services.

Prof Bessel van der Kolk's group has shown that neurofeedback is effective in treating children 6-13, who had been adopted from out of home care, but who had not responded to loving new parents. The schools could not cope with their behaviours and wanted them medicated or expelled. He now recommends all schools should have neurofeedback facilities.





### 3 Adolescence & youth (12 -25)

This is the period of maximum emergence of mental health disorders, as the brain prunes connections for efficiency, but exposes functional problems, when the most demanding developmental changes are faced, from sexual maturity, peer social competition and the emergence of an independent self. Many studies consistently show developmental trauma creates high vulnerability and adverse outcomes in this age group.

Thus it is a period of great risk, with high levels of stress, social experimentation that can fail, high anxiety, self-medication with illicit drugs and alcohol, depression, self-harming and suicide, and involvement in the criminal justice system.

The CDCP concluded that eradicating child abuse in America would reduce the overall rate of **depression by more than half, alcoholism by two-thirds, and suicide, serious drug abuse, and domestic violence by three quarters.**

Behaviours displaying distress become more visible and effective recognition and treatment at this stage of development will have a life-long benefit, as the brain is more easily re-regulated in this period. This is an important time of brain plasticity with capacities for bodily recovery. This heightens the importance of this window for effective integrated intervention. Treatment should in turn help protect and foster secure attachment in this group's children to stop the transgenerational transmission of trauma and traumatic states of mind. The whole of life return on investment and the decrease of burden of disease will be very high in this age group.

### 4 Adults

Over the age of 25 there is a different mix of trauma experiences – still very many untreated for developmental trauma, but also additional traumas from single traumatic events or multiple events, such as PTSD in soldiers and first responders and the downstream effects of domestic violence. There is clear evidence that it is not too late to apply brain training and new treatments. This age group includes many parents and many caregivers (to children or to elders) who need effective treatment to support the enormous demands of the middle of life responsibilities.

*All of these phases need expert specialist services to provide leadership, to effectively treat the wide range of responses to trauma, and to enable further long term research.*

## Types of Trauma

- Neglect - parental absence both physical and emotional
- Emotional abuse, very common, parental psychopathology, intoxication etc
- Poverty, parental separation and divorce, incarceration
- Violence, direct and vicarious (domestic, community, school, disaster, refugee
- Sexual abuse - Incest, family associate, external perpetrator, opportunistic rape
- Accidental e.g. MVA sport & recreation, war injury etc
- Loss that is unresolved or cumulative of parents or within communities
- Single event versus multiple events versus developmental – 3 basic types that can overlap
- Other vicarious

These types should not be conflated, as they each can cause different changes in the brain and need different treatments. The same traumatic event can result in very different brain responses based on individual factors. Many have parental attachment disorders and/or dissociative responses that require longer term psychotherapies or somatic therapies.

## Effects of Developmental Trauma

For example, trauma could have occurred in a pre-verbal developmental phase e.g. infancy, before the person had words to express their experience, or the stress of the trauma or loss can cause the language areas of the brain to shut down (not needed to fight or run away), so little language based memory is stored, and the person cannot give an articulate story about what happened. Psychological protective mechanisms, such as dissociation to block the conscious mind from feeling the trauma pain repeatedly, can remain

until actively assessed and treated.

Much of the memories of trauma are stored in the parts of the brain and body that defended against the trauma, which is why body based therapies can be important.

The brain controls our bodies, and trauma thus has effects on many physical health management systems, such as the autonomic nervous systems, hormones, bio-rhythms, sleep etc. There is now consistent evidence of the massive detrimental effects that developmental trauma (and later life trauma) has on our physical health. For example, Prof. Anthony Broe (NEURA) recently reported a strong correlation between early dementia and high scoring on the Childhood Trauma Questionnaire., Trauma causes accelerated ageing by shortening telomeres, which may be reversed by control and reduction in stress, regular exercise, anti-oxidant diet, meditation and yoga.

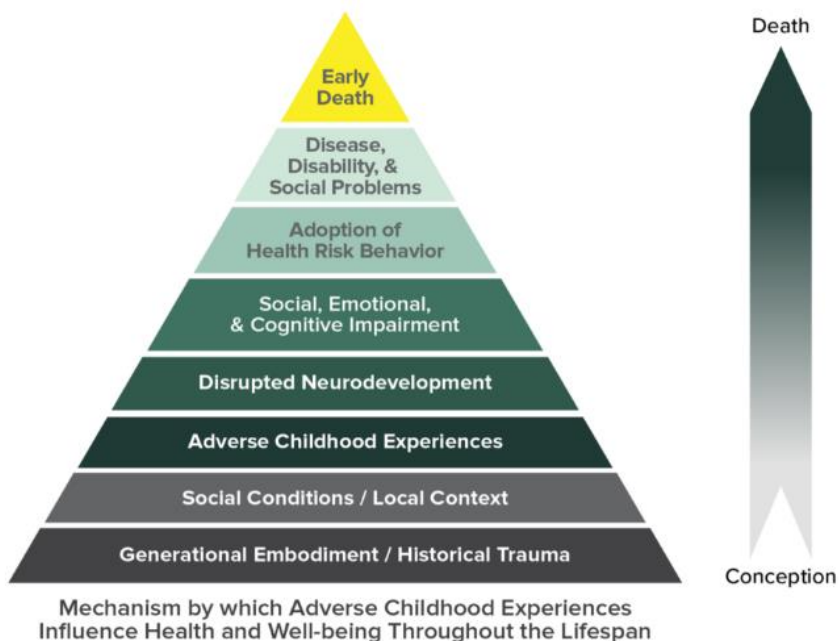
If a person has six or more types of trauma, on average they die 20 years earlier, such as our Indigenous communities, where we struggle to close the gap.

A large longitudinal prospective study, assiduously following up 1,037 consecutive births in Dunedin hospital for 45 years, has shown that, assessed at the age of 3, a segment with Low Socio-Economic Status, Child Maltreatment, Low IQ or Childhood Low Self Control, comprising **22% of the cohort, accounted for about 80% of social and economic costs by the age of 38.** 12.7% had received a diagnosis of PTSD by age 38, and that would not include the other types of trauma responses.

<b>36% of the cohort's injury insurance claims</b>
<b>66% of welfare benefits</b>
<b>40% of excess obese kilograms</b>
<b>77% of fatherless child-rearing</b>
<b>54% of cigarettes smoked</b>
<b>78% of prescription fills</b>
<b>57 % of hospital nights</b>
<b>81% of criminal convictions</b>

The above results show how expensive these people can be.

The Centers for Disease Control and Prevention (CDCP) in the USA have a website dedicated to this issue, with a huge collection of scientific papers supporting the whole of life effects on all aspects of health.



## Why Invest in Developmental Trauma Treatment?

**Australian Pegusus Economics** in 2012 estimated that, if the impacts of child abuse (sexual, emotional and physical) on an estimated 3.7 million adults are adequately addressed, the combined budgets of Federal, State and Territory Governments could be improved by a minimum of \$6.8 Billion. In adult survivors of childhood trauma more broadly, i.e. a figure of 5 million adults, this estimate rises to \$9.1 B. On plausible assumptions, the annual cost of unresolved childhood trauma could be as high as \$24 B, and that is in 2012 dollars.

**Access Economics** took a slightly different approach in 2007, and estimated that 177,000 children under the age of 18 were abused or neglected in Australia that year. This could be as high as 666,000 children and youth. Based on this, the best estimate of the cost incurred in 2007 was \$10.7 B, or as high as \$30.1 B.

The estimated lifetime cost of children abused or neglected for the first time in 2007, which were between 130,237 children and as high as 490,000 children, finding the cost to be \$13.7 B, but could be as high as \$38.7 B, in 2007 dollars.

Commissioned by the NSW Government, **Taylor Fry Actuaries** showed that 7% of the NSW population would use 50% of the state resources by the age of 40. The categories making up this total, clearly experienced developmental trauma

*Investing in effective developmental trauma treatment could be the greatest single public health initiative of all time.*

*Targeting investment at the 12- 25 age group will give the fastest results, before maladaptive behaviours become embedded.*

## Why a Specialist Service?

This pilot service needs to be specialist in order to lead, train and treat developmental trauma disorder across the diagnoses:

- To ensure a comprehensive bio-psycho-social assessment and triage – many hidden factors have been found that change treatment decisions.
- To be able to accept and treat those that other services consider too severe and who are not suitable for private practice settings
- to deal with multiple comorbidities
- to support trainees to deal with their own trauma and vicarious trauma;
- to efficiently provide the full range of therapeutic inputs in a one stop shop, to enable differentiation of needs and solutions for improving outcomes and efficiency over time;
- To allow for sufficient client numbers for relevant targeted evaluation, and research proposed and conducted by external research partners;
- To efficiently use the very few internationally accredited clinicians capable of providing the education and training, and to enable support from international experts;
- To have flexibility to follow the evolving science

Experience at STARTTS has shown that training external health disciplines to treat trauma through theory courses has often not been effective. In salaried public health settings there are team and individual fears of kindling vicarious trauma; a lack of post graduate practical skills training and ongoing supportive and expert supervision. The isolation of a sole skilled trauma practitioner among generically skilled staff can mean the extra time required for treatment is not valued in the team culture. There has often been a lack of service support for treating developmental trauma. It takes skilled consistent care for the traumatised individual and months to years of time.

The historical funding methodology, of fee-for-service private psychotherapy practice, with limited sessions, limited time per session, lack of support for training and ongoing supervision, is not evidence based and not effective, as stated in the Royal Commission into Institutional Responses to Child Sexual Abuse report. A major study in the USA showed that it was impossible to achieve best quality and efficiency in mental health services with this isolated fee-for-service method. It has to be recognised that youth with significant trauma will require more intensive therapy over a longer period of time, with integration with support, supervision and wrap around care, but the outcomes have been worth it, personally and economically.

With many questions still needing to be answered, only properly structured, dedicated services, with motivated leadership, an evidence base, high intensity of care and an active response team culture, will bring optimally effective results. A recently published meta-analysis (2018) of 25 studies, where the people attending specialist mental health services were screened for post-traumatic stress disorder, showed an average of 33% met criteria for PTSD (e.g. substance use 36%, psychotic 31%, affective 39%). However, only 2.5% of case notes mentioned the fact. If they had also screened for developmental trauma these figures would have been higher. This illustrates the lack of understanding about developmental trauma and how to treat it in mainstream specialist mental health services. A new specialist service needs to have capacity to properly assess and treat co-occurring mental health disorders, either directly or through treatment partners.

The next generation of clinicians need an effective training environment including new technology knowledge and practice skills, and case-based learning with intensive supervision. This will only happen in a specialist service set up to do so and to supply ongoing support mechanisms, as clinicians complete basic training and move out to practice in other settings and with particular diagnostic groups.

Currently a lot of money is being spent by state and federal governments on programs for disturbed youth, but they are piecemeal, focussing on small pieces of the jigsaw, such as suicide prevention, other self-harming, substance abuse, criminal activity, homelessness, personality disorder, anxiety and depression etc, when a major

underlying cause is developmental trauma. While these services try their best, they do not have the means or skills to effectively address the underlying brain and body changes due to trauma and to shift the care systems of family and community that these young people still need..

This model could also support placements of trainees in other clinical settings in collaboration with the client's usual therapists.

*This program would work in close collaboration with all the agencies working with young people, to provide the specialist treatment to their clients, while also supporting their staff to provide trauma informed care.*

## Recommended Evidence-Based Interventions

There are 21 highly endorsed consensus clinical guidelines, that have been compiled from the extensive literature and set out in the 'The Last Frontier' – Practice Guidelines for Treatment of Complex Trauma and Trauma Informed Care and Service Delivery, published by the Blue Knot Foundation. These are also elaborated in the "Trauma and young people" policy document published by Orygen & Phoenix Australia. To this can be added the QEEG and neurofeedback training provided by the Australian Neurofeedback Institute.

Assessment and treatment of developmental trauma ideally requires a full bio-psycho-social approach and multidisciplinary teamwork. This model includes learnings from both STARTTS and The Orygen Early Psychosis Youth Service model, with its 16 components of care to achieve world best practice in treating psychosis. Young people presenting with mental health issues can also have brain injuries, epilepsy, inflammatory and endocrine disorders.

There are many gaps in knowledge and the quality of evidence, but that is even more reason to create a specialist services that systematically address these issues, rather than wait for the haphazard academic process to fill the gaps. It is assumed that these guidelines will be implemented by the service funded under this proposal.

In summary, key components include:

- Creation of a safe environment, good engagement and psychotherapeutic relationship
- A thorough bio-psycho-social assessment using validated tools, and interviews, and the recording and analysis of a quantitative EEG. This would include psychiatrist and neurologist involvement as required.
- A strong triage/formulation/case planning capacity, to negotiate the level of involvement of the service with other treatment as usual providers. The rare resources of the service will be in an ocean of need and demand!
- Psychological education about trauma and its effects
- Brain and body regulation;
  - Repair plastic adaptive responses to childhood and adolescent trauma, done in combination with individual psychotherapy (Neurofeedback, EMDR, Heart Rate Variability, Breathing for Better etc.)
  - Group methods – e.g. Trauma Sensitive Yoga, Capoeira Angola, Mindfulness
- Talking therapies;
  - Attachment based psychotherapies (Conversational Model and other person-centred therapies)
  - Appropriate Cognitive Behaviour Therapies, both individual and in groups
  - Other psychological frameworks (e.g. Narrative Therapy, Internal Family Systems)
- Family education and therapies - where appropriate
- Other group therapies (e.g. psychodrama methods, self-defence classes)
- Somatic therapies (e.g. physiotherapy, massage, sensory modulation, exercise physiology)
- Nutrition, diet education and specific treatment of concurrent eating disorders (commonly connected)
- Healthy life-style, social skills development, social connection groups, including sport
- Completion of adolescent and young adult developmental tasks:
- Complete education – Education Support Program;
  - Obtain appropriate paid work – Individual Placement and Support Program;

- Learn skills for appropriate intimacy - Strongest evolutionary driver to produce the next generation, so only feel complete with a sexual partner.

It is necessary that there is a wide selection of treatments and supports available, in house or through partners, due the wide variety of phases of development, individual needs and social environments. An efficient approach will be to develop a hierarchy of treatments, from the more generic to the more specific and individualised, but there will be the need for one-to-one case management and psychotherapy for all in this age group.

It has been found that treatment of developmental trauma takes considerable time, especially for the more severely traumatised.

The range is likely to be from one year to three years, or even longer, but still of great economic benefit. There needs to be good clinical supervision and clinical governance to ensure quality and value.

Thus the model needs to be flexible in how often and how long it is the main provider of services, versus just adding elements of trauma treatment components to the "treatment as usual" service provider.

***To provide the required range of services, there must be sufficient volume and critical mass for efficiency and sustainability.***



## Eligibility & Throughput

Considering the high prevalence of developmental trauma, the service will need to give priority to the more severely affected. Expert advice will be sought on screening, assessment and decision support tools. The number of people that can be treated per year and the size of population that can be covered by this service design is hard to estimate at this time, but will become apparent with diligent data collection. An estimate is a throughput of 800 per year, with others provided with assessments (such as a QEEG) to improve treatment by external services. It is expected that there will be a waiting list, but in the youth age group, delay is not desirable.

Observing the many highly traumatised young people, walking into headspace centres, has shown that none of them were able to receive a fully comprehensive assessment, due to the design of that service for the mild to moderate. The staff employed do not usually have the skills or time to treat the more severe.

## Service Design

While there is much knowledge to implement, when there are further trauma services established, each service would need to adapt to the local ecology – ethnicities, cultures, socio-economic factors, geography and transport etc. A co-design approach is desirable for the implementation of a clear model of care and ideally with a fidelity tool to stop drift over time, though modified by the evolving science. This has been important to ensure the ongoing clear purpose and quality of the headspace Early Psychosis Youth Services.

In the traumatised 12-25 age group there are highly variable connections to families that may be toxic, disorganised, neglectful and lacking in warm attachment. The service will need to work closely with the other services providing welfare and other clinical care, but not take on those areas of responsibility unless unavoidable. However, there will need to be some family/carer or intimate partner psychological support.

## Components of Care

- Comprehensive assessment, diagnosis and formulation, including QEEG, by a complete multidisciplinary team, including senior psychiatrist, neurologist, community physician. It will be first for many.
- Physical health assessment, treatment and monitoring.
- Trainee neurofeedback psychotherapists with case-loads no greater than 15 per fte, with average frequent treatment ranging from one to two years (with extension based on need), with unlimited twice weekly treatment sessions (team supervised for appropriateness). Experience shows clients cease treatment when ready, as they are more interested in getting on with life, whereas set therapy time limits lead to anxiety about separation from the therapy service and can delay progress.
- Regular team case review meetings for support, risk management (higher suicide, violence, health risks), teaching, monitoring of client progress, client flow and demand management. These could include other agency staff who have a shared care role.
- Functional Recovery staff providing a hierarchy of therapies that improve brain and body regulation social connection, and psychological meaning, including:
  - Trauma sensitive Yoga
  - Bodywork (including physiotherapy, massage, sensory modulation, other somatic therapies)
  - Capoeira Angola is useful for integration of brain and peripheral nervous system functions in an enjoyable group environment
  - Art Therapy for those less able to verbalise
  - Drama Therapy; self-defence classes (for those physically or sexually assaulted).
  - Healthy lifestyle – diet and exercise
- Access to alcohol and other drugs specialists, but treatment integrated with core psychotherapy, as it is so commonly a factor.
- Carer and consumer lived experience peer workers for better engagement and support.
- Specialist staff providing education completion support and employment support services.
- Encourage the development of communities of peer support, as the effects of developmental trauma can be long lasting and fluctuate with changing circumstances.



## Delivery Vehicle Design

- Easy non-stigmatising access, such as co-located with primary care headspace sites. As with the headspace Youth Early Psychosis Program, this could add depth to the headspace model, and there can be better critical mass and efficiency for shared group programs and facilities. Could be across two or three headspace sites for ease of access.
- Must be able to provide mobile outreach and home-based assessment and care. The severely affected may be very reluctant to leave home, but they will need to do so for EEG recording and neurofeedback.
- Moderately extended hours of operation for convenient access.
- Specialist teams for fidelity to the model, staff support, training and supervision.
- Must have psychiatrists for strong diagnostic reliability/ fidelity & capability, due to high levels of overlapping disorders, from anxiety, depression, substance abuse, eating disorders, psychosis, neurological disorders, chronic pain and other somatic disorders and for comprehensive individual care planning and implementation.
- Must have neurologist input for EEG medical diagnosis and treatment of relevant conditions.
- Must include teaching and strong supervision capabilities, for postgraduate students (Psychology, Social Work, Occupational Therapy), trainee psychiatrists and ongoing workforce development.
- Designed and resourced to support external clinicians (psychiatrist, GPs, psychologists and other allied health) in surrounding areas and youth agencies, through continuing education and direct consultancy services for case-based learning and support.
- Must have team critical mass for sustainability, attraction of quality staff, efficiency in the use of specialists, and staff turnover management.
- Must include staff with lived experience, including specific peer workers.
- Must include staff from indigenous and culturally and linguistically diverse backgrounds for cultural inputs.
- Staff salaries and conditions must at least be equivalent to the NSW Health staff awards and senior staff contracts must be a minimum of 4 years to enable staffing stability and the further development of expertise through case-based learning and supervision (like an intern arrangement, as expertise is rare). Post-graduate Trainee contracts need to be flexible, as the service develops and finds what works. It takes a long time to get a specialist service such as this recruited, and to a steady state of functioning, with many systems to be developed.
- Active demand management and work flow processes – there will be a lot of demand based on the high prevalence of young people affected by developmental trauma, while needing sufficient time for therapies.
- While the service will work collaboratively with any service currently treating, or supporting young people, there will inevitably be some admissions for whom this service is their only support and treatment provider. Thus a few positions need to be included for case management and family work.
- Active awareness raising, community education, community engagement and advocacy.
- Must include the infrastructure and staffing to build in comprehensive data collection, evaluation and research, so that it is an inalienable function of the whole activity.

## Training Model and Components

This combined training and treating service will provide an integrated combination of educational and training inputs from complementary educational providers, to already established clinicians, who are ready to take on the severely developmentally traumatised at a difficult stage of development, when many disorders emerge – youth 12-25.

This is definitely not a program for new graduates, as the target groups are not easy to work with, having higher levels of every type of psychological trauma, multiple comorbidities, failing in life, very anxious and unhappy, prone to substance abuse and suicide. They have not responded well to talking or medication treatments. They are most likely to be on income support benefits, require expensive support services and major users of health services and the NDIS.

Thus we need to attract trainees with a social conscience and, as developmental trauma is so prevalent, some will want to join to learn how to assist their own needs. Lived experience of trauma can be both useful and sometimes difficult, so we have to help applicants assess whether this program is right for them, and gently help those for whom it is too confronting to find a better professional niche. Likewise there can be more vicarious trauma than the clinician can cope with, and again the program needs to provide safety, support and a supportive exit if appropriate. Thus there will be a structured assessment of suitability for training before being offered a place.

Clinicians need to learn about the effects of different traumas on brain structure and function, to examine the organ that they are treating. They need to learn to do a bio-psycho-social formulation for the individual and create a comprehensive treatment plan within a multidisciplinary team and help to engage the client with the program components.

Learning relevant psychotherapies takes time and the trainee will be assessed as to what skills they already have, and what gaps may exist, so that a personalised learning plan can be agreed. The Blue Knot Foundation training courses will be available and included in the training package. This includes their three phase training and additional subjects

that would be considered essential, along with some supervisions sessions.

The Australian and New Zealand Association of Psychotherapy will be able to provide training in the Conversational Model, a trauma-informed psychodynamic approach, for clinicians seeking psychotherapy training. Other psychodynamic training institutions may also be interested in providing person-centred training.

The Westmead Psychotherapy Program for Complex Traumatic Disorders has now substantial experience in treating disorders where transdiagnostically developmental or later complex trauma has been a significant contributor. The program partners with the University of Sydney to run a renewed Masters of Trauma-Informed Psychotherapy and trains clinicians seeking to expand their skills to treat in trauma-informed and integrated approaches. The program also has experience training local mental health clinicians in parallel to degree candidates.

The education on the brain, QEEG and biofeedback operant conditioning will be provided by the Australian Neurofeedback Institute (ANFI), drawing on local and international experts who are at the cutting edge of understanding the role of trauma on the brain and ways to repair brain function. The Neurofeedback and QEEG Analyst trainees will benefit from ANFI's worldwide and well-established connections with the key researchers and trainers who will provide consultation, mentoring, and supervision. The theoretical education, intensive mentoring and ongoing supervision will cost around \$25,000 for the first year and \$15,000 in the second year per trainee.

Additional training in evidence based skills, such as Eye Movement Desensitisation and Reprocessing (EMDR) will be encouraged.

As a very high proportion of clients will be using alcohol and other drugs to temporarily feel better, the Matilda Centre for Research in Mental Health and Substance Use will collaborate to integrate specific treatment programs for substance use. The Matilda Centre has pioneered the development of integrated treatment for PTSD and Substance Use and are one of the international leaders in the field. They have extensive training resources and experience. The Centre Director Professor Maree Teesson and A/Professor Roger Gurr are long term collaborators. The Matilda Centre for Research in

Mental Health and Substance Use is a multidisciplinary research centre committed to improving the health and wellbeing of people affected by co-occurring substance use and mental disorders. Professor Katherine Mills leads research on the treatment of trauma, PTSD and substance use. The Matilda Centre is pleased to partner and offer a range of training programs and resources for clinicians, families and the community to facilitate knowledge exchange around mental health and substance use, with the aim of improving support and changing lives. They provide extensive state of the art training resources in the link between mental disorders and substance use.

Core educational costs need to be funded as part of the program, as one reason people are not getting trained is that fact they will not earn any more money by acquiring these important skills, while possibly taking on more work stress – it is the clients, families and the taxpayer who get the benefits as government expenditure is reduced. While the trainees train, around 800 severely affected by trauma will have had a proper bio-psycho-social assessment and intensive treatment, with very significant improvements in functioning as a result.

In order to mitigate the risk of trainees leaving too early, they will need to agree to two year contracts that clearly set out the reciprocal obligations arising from the investment in their training and the importance of continuity of care for the young people.

### Support and Training for Consumers, Carers and Families

Connections to training resources for carers and families will be encouraged through Mental Health Carers NSW and their range of free interactive courses.

Consumers will be linked to SUPER CRO, with its mission to aid consumers through education, advocacy, collaboration, feedback and equal representation.

### Staffing Structure

Because this service is aimed at the most severely affected by the various types of trauma (e.g. emotional or physical neglect causes different responses compared to emotional abuse of physical/sexual abuse) and there is a higher risk of

suicide, the trainee staff all need to be established AHPRA registered clinicians, often clinical psychologists, Social Workers and Occupational Therapists who have reached a level of personal maturity and professional confidence. Treatment is very psychotherapy based, with neurofeedback as an enabler to improve cognition and executive functioning, allowing the psychotherapies to be more effective, so the leaders need to have well established psychotherapy skills.

- Service Director with relevant clinical background
- Clinical Director Psychiatrist – full time – quality of care, evaluation/research, clinical risk
- Psychiatrist – 1 FTE – diagnosis and psychiatric treatments
- Neurologist part time 0.1 FTE
- Senior Clinical Psychologists - 2 FTE – training coordination/supervision/limited direct clinical
- Therapy Team Leaders - 2 FTE – limited direct clinical work;
- 20 trainee clinicians (already experienced clinicians - psychology, social work, occupational therapy)
- 3 Clinicians to provide general case management, family work and shared care agencies collaboration.
- Functional Recovery Team Leader – group work coordinator, other therapies coordinator.
- Functional Recovery Staff – 6 FTE including education support specialist, employment specialist, exercise physiologist, dietician, physiotherapist, Capoeira trainer, trauma sensitive yoga therapist, Art Therapist, therapy group leaders.
- Community Liaison, Education and Engagement Officer
- Intake/Work-Flow Coordinator
- Intake and assessment clinicians/waiting list management – 3 - FTE
- Data and Evaluation Coordinator
- Senior Research Officer
- Psychiatry Registrar – full time RANZCP trainee on rotation
- General Practitioner – 0.4 FTE (salaried) for those at health risk and who will not attend an external GP

- Quantitative Electroencephalography (QEEG) Technician – 2 FTE
- Senior Quantitative EEG Analyst – 1 FTE – BCIA international accreditation required
- QEEG trainees – neuroscience degree, clinician degree or equivalent - 2 FTE
- Administration Manager – finance, facilities etc
- Clerical support, reception (extended hours), data and evaluation support – 2 FTE

### Other Costs

- Set up capital and office fit-out
- Vehicles
- IT, communications, clinical equipment and associated software
- Electronic medical record software – may need modification
- Space for visiting external research and evaluation project staff
- Contribution to lead agency organisational overheads – HR, payroll, IT support, etc.
- Building occupation costs
- Repairs, maintenance and replacement.

### Program Governance

Rapidly developing knowledge, so need to build in quality program governance to allow for rational informed changes to the program over time. We can base the program on best available evidence, but there are clear knowledge gaps and we need to let a variety of interventions be tried and tested. We need an expert committee (new clinical service management experience, relevant education providers, academic researchers, lived experience consumers) to provide ongoing advice to the Commonwealth, commissioning PHN and delivery contractor. We need to expect design changes based on emerging evidence. A consortium model would be recommended with the Blue Knot Foundation (centre of excellence in trauma psychotherapies) and the Australian Neurofeedback Institute (centre of excellence in QEEG, Neurofeedback and other neuromodulation), as they would be key providers of educational content.

## Prospective Research and Evidence Development

Controlled research in this area is not easy, due to many variables, therapy processes take a long time and the whole of life rewards for investment will not be fully known for some years. The hypothesis is that benefits will be seen across a wide range of health, social services and employment outcomes. Thus there is a need for both quantitative and qualitative research and evaluation, with long time lines. However, if the infrastructure is already established and research subjects supplied, then researchers should be able to obtain research funds from current sources.

The service needs to be independent from any one university, to allow for research decisions to be based on merit, not connection. The areas of science are broad and no one university would have the range in house. Also, experience shows that university overhead charges are high compared to a charitable NGO contractor.

An academic advisory board will need to be established to consider research proposals.

There is already a Western Sydney University senior health economist who will ensure that the cost/benefit analysis is robust. Under a WSU scheme, a PhD student could be placed with the service on a 50-50% shared cost basis (around 2 x \$17,000 per year for three years).

Ultimately there will be specialist data repositories (e.g. QEEG recordings library for artificial intelligence analysis and machine learning decision support) that connect to others or become national/international in scope.

## Funding Model

The size of the service has been designed for two benefits – a critical mass actually makes the program more effective and also more efficient, enabling the range of specialist input to be available, overheads less expensive per client and trainee, and producing trained clinicians fast enough from such a tiny current base.

Reality of funding sources – the Commonwealth Government is the obvious best source of funds for this program, due to the fiscal imbalance in the Australian federation (Commonwealth receives around 82% of taxes and the states only 18%, but the states need about 40% to provide public services). There have been funding risks in some states, with diversion of funds from community based mental health services to acute hospital care. However, this is not just a mental health program – it is aimed at investing to reduce expenditures, over the whole of government, over the whole of the survivor's life and the next generation.

Block funding initially – hybrid funding potential, but Medicare fee for service design would need considerable changes to match the natural history of effectively treating developmental trauma, especially attachment repair. We will need to create treatment standards and credentialing for access to Medicare, NDIS and Insurance payments.

As a very specialist program, there needs to be an expertly designed commissioning contract, and the commissioning Primary Health Network must rely on advice from the expert oversight committee.

Contracts need to be for a minimum of 5 years, with a guaranteed rollover if performing as expected, as the short-term nature of recent mental health related contracts via PHNs have strongly inhibited implementation of complex clinical models of care (e.g. Early Psychosis Youth Service). Re-tendering for no good reason is very de-stabilising. The Commonwealth needs to change its funding methodology for this specialist clinical service, to factor in professional staff state-award based remuneration and conditions variations, incremental payment scales and inflation, in order to meet the market to attract and keep key staff. The scarce skilled staff we need to attract and keep are very precious!

The current allocation method of initial funds, with no increases to provide for these factors, leads to program instability and deterioration, due to loss of trained and experienced staff over time (not meeting the market for their desirable skills), loss of staff FTE, and loss of quality.

There will be high turnover of trainee staff, who join to get training and then leave to progress their career, but they will not be new graduates, as people need some clinical experience before moving on to this much more complex and demanding client group. They need to be paid equivalent to their level of experience and seniority by the service, as completion of training will not bring them additional monetary benefits, but they will save governments a lot of money.

Some of the work of the service will need the input of external experts (e.g. QEEG analysis, neurofeedback protocols) so some funding needs to be available for this.

## 2021 National Mental Health and Suicide Prevention Plan

This proposal would make a significant contribution to the Plan, as developmental trauma is a major factor leading to suicide, Aboriginal and Torres Strait mental ill health, more severe mental illness and poor chronic physical health. The programs currently funded are targeted at the mild to moderately disordered, using historical therapies, whereas this proposal is squarely aimed at the more severely traumatised who do not do well with standard treatments. Statistics show that suicide rates have not gone down with previously funded programs, so we need a new approach for those most at risk – severely traumatised male youth.

## National Alcohol and Other Drugs Strategies

As people with developmental trauma have very high rates of self-medication with tobacco, alcohol, cannabis, opioids, amphetamines, benzodiazepines, etc, effective treatment of the underlying causes should be taken into account. Due to the high levels of unhappiness and anxiety, they are often diagnosed with depression and prescribed antidepressant and sedative



prescription medications, which are of marginal benefit. These simplistic and expensive attempts at symptom control are not curative, whereas brain re-regulation and targeted best practice psychotherapies can be curative and a lot cheaper over time. People treated with EEG guided neurofeedback significantly reduce alcohol and other drug use. A partnership with the Matilda Centre as Sydney University will assist with the service program designs and evaluation.

## Evaluation

A partnership with the Matilda Centre at Sydney University will assist with the service program evaluation. The Matilda Centre has a staff of over 75 research and professional staff. Senior academics are highly skilled in program evaluation and implementation science. The centre has published over 900 peer reviewed papers and oversees a major research and evaluation program of over \$10M annually with funding through NHMRC, government and philanthropy. Partnership with the Matilda Centre as Sydney University will assist with the service program evaluation.

There is already a Western Sydney University senior health economist who will ensure that the cost/benefit analysis is robust. Under a WSU scheme, a PhD student could be placed with the service on a 50-50% shared cost basis (around 2 x \$17,000 per year for three years).

## Program Risks

Funded design does not include all the essential components of care and the roles that would make the program successful.

Conflicting messages and unrealistic KPIs in contracts between layers of commissioning (Commonwealth Department – Primary Health Network – Non-government Organisation).

Funding and contract uncertainties, leading to staff anxiety and exit stampedes, followed by having to rebuild, when greater funding certainty is restored.

Commonwealth government expectations that quality staff will accept a discount in pay and conditions to work for an NGO on deficient Commonwealth awards

Failure to sustain the program by death by a thousand cuts by not funding award increases and goods and services inflation.

Inability to recruit the desired number of staff or trainees.

## Future Vision

If we are to follow the evidence, programs such as this need to be rolled out to support service delivery for the whole population, whether urban, regional or remote, with variations for language and cultural needs.

Initially it would be good to fund pilot services that can trial adaptations to fit particular communities across the nation, for example Indigenous communities with their generations of multiple traumas. Highest demand is likely in the lowest socio-economic areas.

While many parents and families, of dependent adolescents and young adults living with developmental trauma, will be offered therapy in connection with the traumatic disorders of their offspring, this will not always be appropriate. This program is aimed at the youth age group, but the other age-related segments, discussed above, also need targeted programs and funding. New models of care should be established for those needs, with expert advice and funded concurrently, or as an extension of funding over time. Technology may enable services for remote communities.

Improved funding and payment methodologies need to be developed to ensure quality teamwork, supported by ongoing training, supervision and research.



## Conclusions

We have reached a tipping point in our understanding of the effects of developmental trauma on the brain and some techniques to provide effective care.

Now we need the courage to seriously invest in a journey to implement the knowledge we have, but to do so with open minds for innovation and systematic evaluation of choices.

In medicine it often takes 10-30 years to implement new evidence – what a national shame if we delay this opportunity to heal individuals and communities.

While the 2021 National Mental Health and Suicide Prevention Plan is good in recognising the need to for trauma informed care, the services funded will not be effective for actually treating the trauma of the more severely affected, the ones that actually achieve suicide.

Decisions to invest should not be driven by the size of the investment, but by the heavy cost of inaction, of not investing as soon as possible.

# Appendix 1: Developmental Trauma Staged Treatment Framework

	Biological	Psychological	Social
<b>Assess</b>	List history and symptoms of physical disorder, sexual/gender orientation	Ask about trauma ASAP (current and past), symptoms of psychological disorder, strengths, achievements, life goals	Family, relationships, living situation, housing, financial, social activities, employment
<b>Engagement/Trust</b>	Order investigations QEEG	Demonstrate active, non-judgemental listening, permit taboo topics, Address safety issues Education about trauma	Safe housing, structural protections, secure finances, enable psychological supports
<b>Re-Regulate Brain</b>	Sleep Appropriate medication Diet	Mindfulness, Yoga, Sensory Modulation, Biofeedback including HRV & Neurofeedback, Grounding Psychotherapies	Create support routines Develop Social expectations and connections
<b>Treat Specific Traumas</b>	Physiotherapy, Massage, Body Work, Exercise, Medication	EMDR Internal Family Systems, Schema, CPT, CBT, Compassion, Narrative Therapies, Conversation Model	Group work/activities Support legal processes
<b>Recovery</b>	Monitor biological sequelae, Reduce self-medication with nicotine and illicit drugs	Exercise, Sport, Capoeira Angola, Martial Arts, Music, Arts, Social and Purposeful Activities,	Group work, Supported Education/Employment (IPS), Community Development

These stages overlap each other and need to be adapted to each individual situation and priorities. Evolutionary framework – all human life and behaviour designed by evolution for our best survival as a species. Symbiosis with other organisms – interdependence, inside and outside our bodies.

Brain and nervous system controls almost everything, so need to understand nervous system development. Like vestigial organs (nipples on men) there are leftovers from previous stages of evolution that can become problematic during life (e.g. reptilian shutdown – Stephen Porges Polyvagal Theory).

Trauma interacts with our genes and epigenetic factors, determining the physical and mental disorders that develop. The more severe the trauma, the more severe the disorder. This is also why there are several co-morbidities, as many genes are affected.

These factors are why there is no single therapy, always a mix to match the individual's responses to trauma and trials of therapies.

Roger Gurr, 24/08/2022

# Appendix 2: Case Vignettes

## The Benefits of Quantitative EEG and Neurofeedback: case example of treatment resistant schizophrenia

### Demographics

- 27 year old female living with abusive partner
- On Disability Support Pension

### Past History

- OCD noted at 7 years (swirling around the bed 3 times, superstitions, rituals)
- Anorexia Nervosa at 12 years, Bulimia Nervosa in teens (Westmead Children’s Hospital)
- Developmental trauma, parents split, physical + emotional abuse by caring Grand Mother
- 2016 first admission with ICE induced psychosis for 3 months
- Being watched, brief “voices”; diagnoses as first episode psychosis
- 2017 admission for 2 months, referred to headspace Early Psychosis Youth Service
- Trials of Olanzapine, Quetiapine, Amisulpride, Aripiprazole, Sertraline
- 2019 x 2 admissions, paranoia with suicidal crisis; diagnosed as **Treatment Resistant Schizophrenia**, started on clozapine
- Clozapine 300 mg-reduced due to constipation, weight gain, palpitations

### Psychopathology Before Neurofeedback, while taking Clozapine

- People can read my thoughts, see my imagination, telepathy is real
- People wearing colour orange means *I am going to die*
- strange/mean thoughts popping in head about family (“Die”)
- Very high levels of anxiety, using illicit drugs with abusive boyfriend

### Test of Variables of Attention (TOVA):

Visual Pre - 0.01 After 20 sessions +3.27

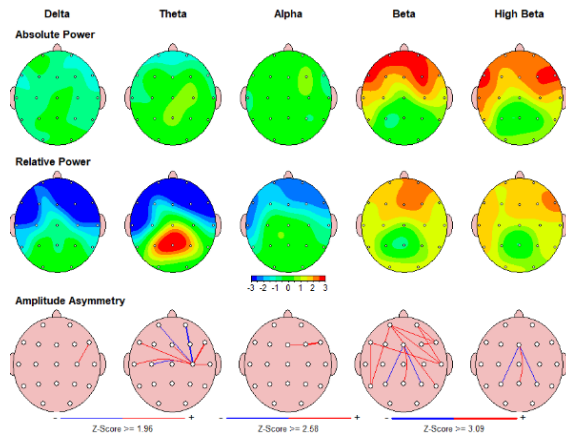
### Progressive effects of Neurofeedback over 43 sessions

- Became calm and able to relax and sleep normally
- Start feeling “good”
- Stopped use of illicit drugs and much reduced alcohol
- Able to control OCD and paranoid thoughts
- Became organised, time management
- Improved concentration, reading and writing skills
- Improved communication, speech more fluent

- Better able to socialise with people, more empathic
- Minimal doses of clozapine and sertraline

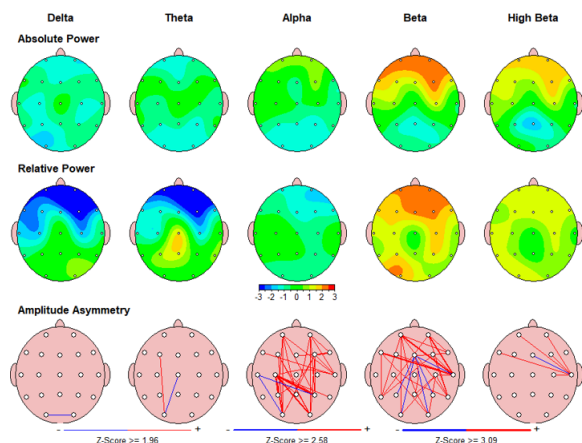
### Quantitative EEG Pre and Post Neurofeedback

#### Baseline



Note excess (Red colour\*) of Theta<sup>S</sup> in the middle, and Beta/ High Beta<sup>#</sup> in bilateral frontal and temporal regions, slightly more on the right side.

#### Post 40 NF session



Note excess of midline Theta has almost disappeared (red to light orange) whereas excess Beta/High Beta has diminished (Red has changed to Orange and Yellow, respectively).

**Ditched abusive boyfriend, learnt to drive, enrolled at university**

**“Overall things have improved 300% since starting neurofeedback!”**

**One year follow up – all the benefits of neurofeedback continue and her sister is now having neurofeedback therapy**

## STARTTS Case 1

A 14-year-old African refugee boy who survived multiple traumas related to war, genocide, displacement, and deprivation. Traumatized from the age of 2, he arrived in Australia aged 9, and was referred to STARTTS following suspension from school for violent behaviour.

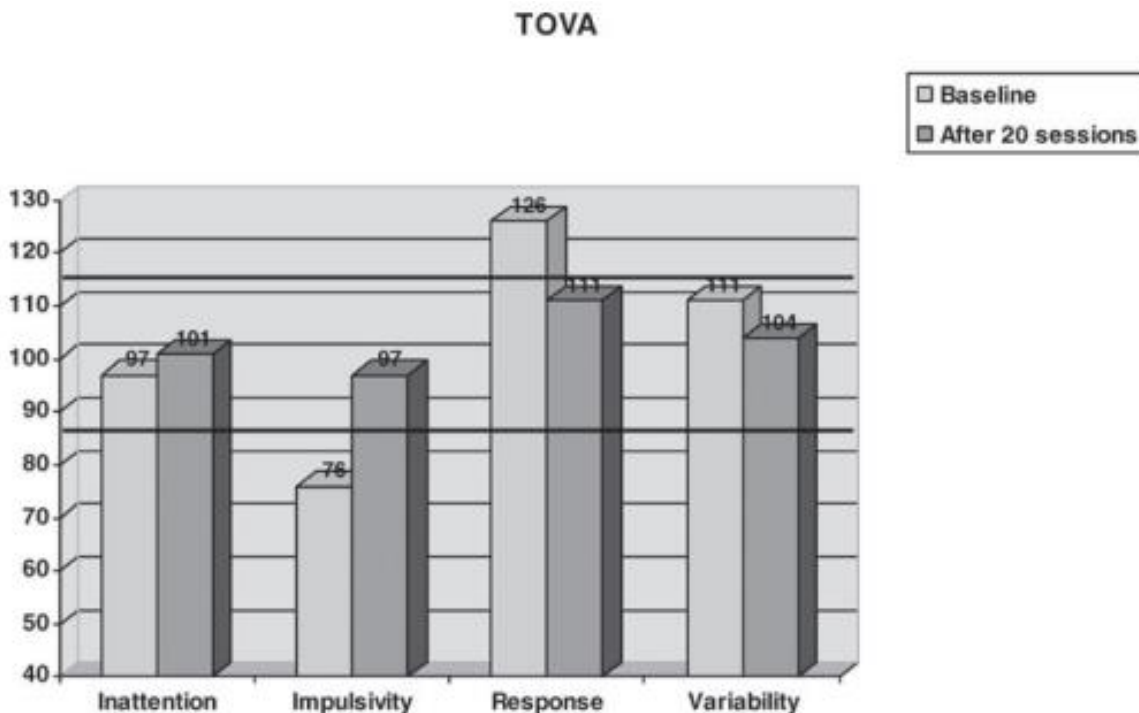
He presented with nightmares with traumatic content, fear of the dark, restlessness, sudden mood swings, anger outbursts with verbal abuse and violence. He had difficulties with attention, concentration and memory. His father was concerned about his reckless behaviour and suicidal ideation. His symptoms were consistent with chronic complex PTSD with prominent affect dysregulation, lack of impulse control and its impact on social functioning.

To address both the core hyper-arousal and the unavailability of the necessary cortical and behavioural skills required to regulate affect, his treatment integrated neurofeedback and psychotherapy.

He completed the TOVA prior to and following his neurofeedback treatment. Pre-treatment test shows clinically significant poor impulse control and a very fast response time. Post-treatment test shows normalization in his impulse control and response time. These results indicated better sustained focus, better school performance, less oppositional and uncooperative behaviour, and moods that are more positive and stable, which was consistent with his behaviour.

*Three years following his treatment he successfully completed his HSC and he became a professional soccer player.*

### Pre- and post-treatment scores on the Test of Variables of Attention (TOVA)



## STARTTS Case 2

A 15 year old Mandaean girl from Iraq was referred to STARTTS because of:

- Severe symptoms of anxiety and PTSD (dissociative subtype), suspected bipolar disorder and suspected anorexia
- History of suicide attempts (2 times hospitalised), self-mutilation
- Limited improvement with psychotherapy, poor response to medication

She was sexually molested at the age of 4 and 9, witnessed killings in Iraq (bombs, grenades), survived bullying and harassment while seeking asylum in Syria. Her parents were traumatised and she was psychologically abused by her mother.

Her presenting symptoms:

- severe PTSD, severe anxiety, frequent panic attacks
- mood swings, anger outburst, self-mutilation
- poor self-image, depressed mood, insecure attachment

Physical health

- vitamin D3 and iron deficiency
- headaches and stomach pain, vomiting, dizziness
- hair loss, painful periods

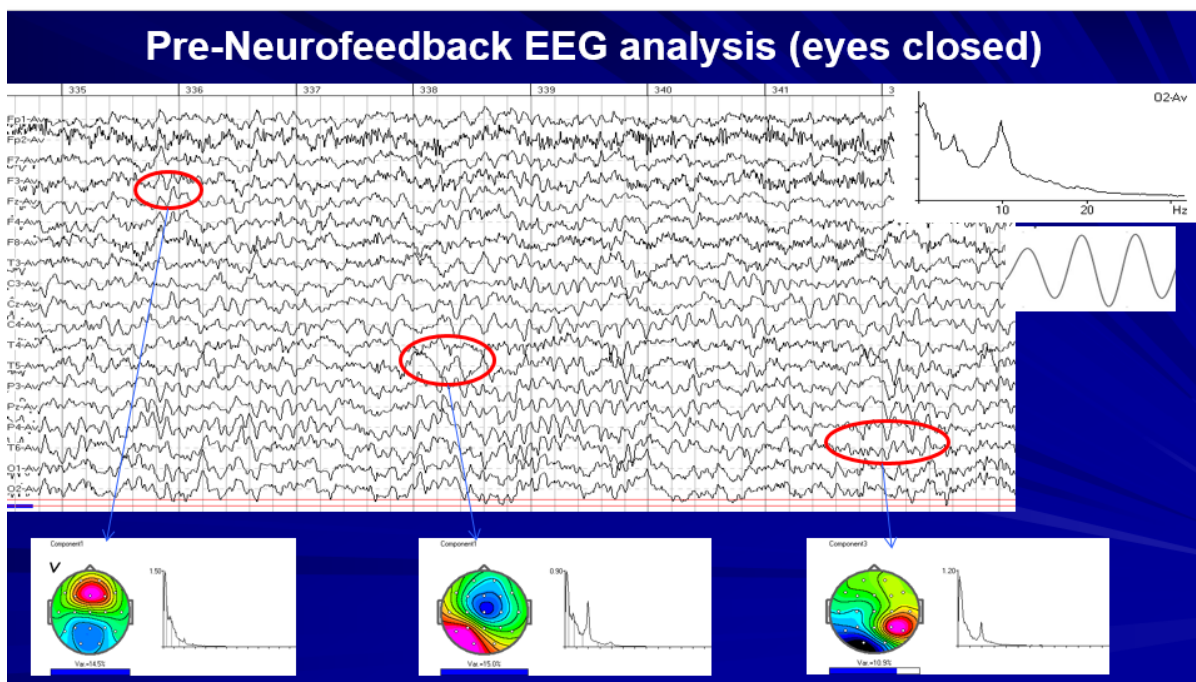
Cognitive difficulties

- poor attention and concentration, memory difficulties

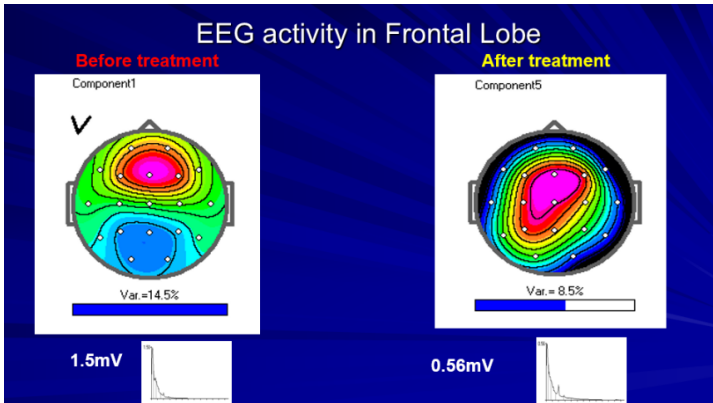
General EEG is disorganized, immature and several areas of her brain are poorly activated and dysfunctional.

Looking specifically at the alpha activity at the back of her head, this gives us a good insight into how this brain receives and process information from the external world. In well a functioning brain we can see well-coordinated neuronal activity, expressed in a graph as a nicely shaped sinusoidal activity. In this case we can see several brainwaves, slower and faster merging, forming this poorly shaped, sharp and notchy rhythms that represent sensory-processing issues and difficulties reading internal body signals and the external environment.

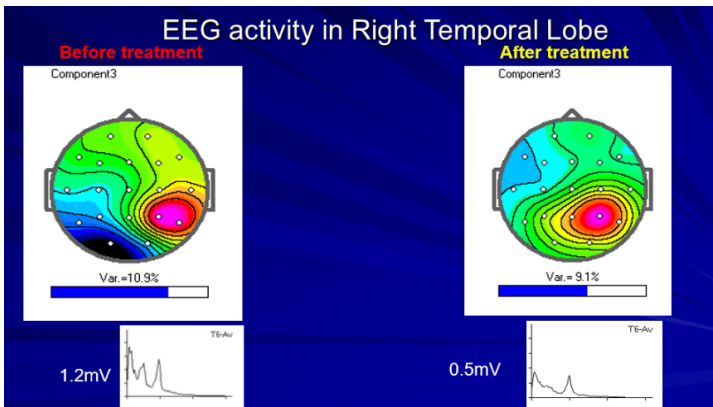
Changes in the right temporal lobe could be considered as a marker for trauma. This emphasizes again the relational nature of trauma.



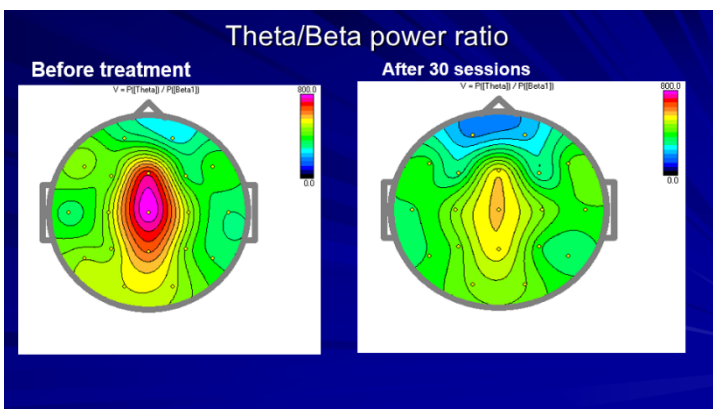
Following 30 sessions of neurofeedback and sand-play therapy, she showed significant improvement in the attentional and emotional regulation and working memory.



Significant changes in the ability to read the internal body signals and the external environment:



Significant improvement in attention and concentration:



*After one year of neurofeedback and trauma therapy, she was emotionally stable, well integrated into her school and was successful with her studies.*





Transforming Australian Mental Health Service Systems (TAMHSS) was formed in 2009 at the Perth TheMHS Conference. The TAMHSS Network recognises the cultural diversity of the many Australian communities, and the importance of engaging them in awareness of their own mental health and prevention and early intervention of mental illness, related stigma and discrimination. We also recognise the many special needs for services to deal with complex disorders.

For more information contact A/Professor Roger Gurr  
Email: [rogurr@netspace.net.au](mailto:rogurr@netspace.net.au)



The National Centre of Excellence for Complex Trauma. That means that we advocate for and provide support to people who have experiences of complex trauma, and those who support them, personally and professionally.

Website: <https://blueknot.org.au>  
Phone: 02 8920 3611



The Australian Neurofeedback Institute (ANFI) was initiated in 2019, as a social enterprise of the NSW Service for the Treatment and Rehabilitation of Torture and Trauma Survivors (STARTTS). We are leaders in the field of neurofeedback and trauma, working with complex and chronic cases. We provide neurofeedback and quantitative EEG training and mentoring. The ANFI neurofeedback course was accredited following extensive review by the Biofeedback Certification International Alliance (BCIA) International Board and BCIA-Australia in 2020.

Website: [www.anfi.org.au](http://www.anfi.org.au)  
Contact: [info@anfi.org.au](mailto:info@anfi.org.au)  
Phone: 02 9646 6700



THE UNIVERSITY OF  
**SYDNEY**  
—  
**Matilda Centre**

The Matilda Centre for Research in Mental Health and Substance Use is a multidisciplinary research centre committed to improving the health and wellbeing of people affected by co-occurring substance use and mental disorders.

Website: [www.sydney.edu.au/matilda-centre](http://www.sydney.edu.au/matilda-centre)  
Phone: 02 8627 9048



Lived Experience Australia is a national systemic advocacy, research and capacity building organisation on behalf of all those with a lived experience of mental ill health, their carers and family members. It is also the peak for private sector consumers and carers.

Website: [www.LivedExperienceAustralia.com.au](http://www.LivedExperienceAustralia.com.au)  
Contact: [admin@LivedExperienceAustralia.com.au](mailto:admin@LivedExperienceAustralia.com.au)  
Phone: 1300 620 042



Our Mission is to aid consumers through education, advocacy, collaboration, feedback and equal representation.

Website: <https://supercro.com>  
Contact: [pm@supercro.com](mailto:pm@supercro.com)



A Conversational Model of Psychodynamic Psychotherapy ANZAP provides advanced clinical training, supervision, and professional development to mental health and related professionals working within or outside of the publicly funded or subsidised mental health care system. The psychotherapy training program offered by ANZAP is specifically designed to help psychologists, mental health nurses, social workers, general practitioners, psychiatrists and registrars and others to work more effectively with patients/clients and particularly those presenting with significant traumatic histories.

Website: [www.anzap.com.au](http://www.anzap.com.au)  
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