



St Andrew's  
HEALTHCARE

REDUCE  
RE-ENGAGE  
REBUILD  
REHABILITATE

Outcomes from a  
neurobehavioural study

*Transforming lives together*



# Enabling rehabilitation for people whose behaviour is the most challenging

Proven reductions in aggressive behaviour and severity coupled with improvements in functional independence while in our care.

**82.54%**

reduction in the incidents of behaviours that challenge



**20.43%**

improvement in FIM+FAM outcomes



**79.26%**

reduction in the severity of incidents



**14.23%**

improvement in SASNOS



Our expert inter-disciplinary approach utilised Positive Behaviour Support (PBS) to dramatically reduce extreme levels of verbal and physical aggression - both the frequency (-82.54%) and severity (-79.26%) as measured

using the Aggregate Aggression Score (AAS), while at the same time successfully engaging patients in the therapeutic rehabilitation process to help them re-build the range of skills needed to engage with society.

# A NEUROBEHAVIOURAL STUDY: CONVERTING BEHAVIOUR THAT CHALLENGES INTO PATIENT ENGAGEMENT

People admitted to Tallis acquired brain injury (ABI) unit typically present with behaviours that can be challenging for rehabilitation services. These combine with co-morbid physical and mental health diagnoses which manifest as physical and verbal aggression that is difficult to manage within local or regional units.

This study demonstrates how the unique neurobehavioural rehabilitation approach developed by St Andrew's national Neuropsychiatry service is interwoven with Positive Behaviour Support (PBS) to enable patients to engage in their recovery, and facilitate community reintegration.



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# An outline of the tools used:

Using proven measures of psychological, functional and independence assessment, such as FIM+FAM, SASNOS and OAS-MNR, we tracked key aspects of behaviour, alongside functional and cognitive change (such as personal hygiene and daily living management) for 11 patients who were admitted to Tallis and progressed through our ABI pathway for

between 9 and 12 months. Patients had been referred from other providers where aggression had escalated or where patients had failed to engage in therapeutic programmes and the placement subsequently broke down.



**Overt Aggression Scale - Modified for Neurorehabilitation (OAS-MNR).** Developed at St Andrew's to standardise the method of describing and reporting overt aggression exhibited by patients. It has a long history of use across our pathways.



**Functional Independence Measure (FIM)** is a global measure of disability and can be scored alone or with the additional 12 items that formulate the **Functional Assessment Measure (FAM)**. FAM does not stand alone, hence the abbreviation of FIM+FAM.



**St Andrew's Swansea Neurobehavioural Outcome Scale (SASNOS)** is a neurobehavioural disability measure that uses rating scales to produce indices of disability. Unlike other measures it has been conceptualised and designed specifically for brain injury, has sufficient items to capture the diversity of neurobehavioural disability and has known, robust psychometric properties on 49 items and five major domains of neurodisability.

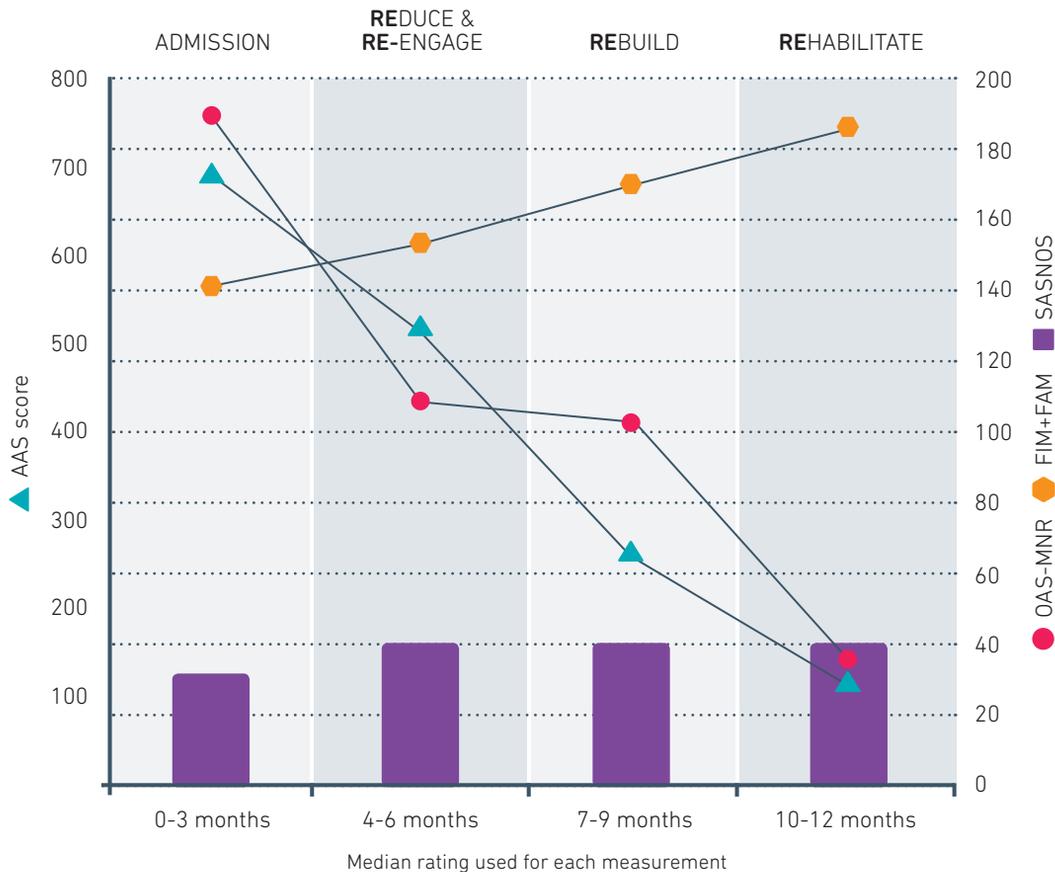


**Aggregate Aggression Score (AAS)** Frequency of aggression alone does not reflect potential change in either type of aggressive behaviour or its severity. Frequency may not change but differences in the type and severity may reflect positive clinical progress. The AAS reflects the variable elements of aggression by calculating frequency multiplied by the mean weighted severity\*.

\* Median values were used because the data is not normally distributed. Further information on AAS can be found in 'Measuring behavioural outcomes in neurodisability', 2012, Alderman, Knight, Stewart and Gayton, St Andrew's Healthcare

# Outcomes

- OAS-MNR (incidents)
- ▲ AAS Score (severity)
- ◆ FIM+FAM (daily living)
- SASNOS (neurodisability gains)



# Admission and stabilisation

0-3

MONTHS

**5,858** individual incidents of aggression in the first 3 months

During the first three months of admission we recorded 5,858 incidents of aggressive verbal or physical behaviours across the 11 patients, with a median rate of 189.

**20,871** Aggregate Aggression Score (AAS) highlighted significant difficulty in self regulation

Using the OAS-MNR we categorised the severity of each incident to create an Aggregate Aggression Score value of 20,871, or a median of 699, reflecting significant difficulty in self-regulation and modulation among this population.

**142** median FIM+FAM rating on admission evidencing reduced functional independence

During the same period the FIM+FAM median rating was only 142 evidencing reduced functional independence, and SASNOS was 35.1 highlighting executive dysfunction and low ability in performing simple tasks.

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# Engaging in therapy

4-6

MONTHS

**47.35%** reduction  
in the number of  
aggressive  
incidents

Overt aggression dramatically reduced among patients during the second phase of treatment by 47.35% to 3,084 incidents, with a median rate of 109.

**47.72%** reduction  
in the severity of  
incidents

The AAS score, which measures the severity of each incident, fell by 47.72% compared to the first period of care, as tailored intervention strategies incorporating RAID®, neurobehavioural programmes and a structured therapeutic milieu, helped staff and patients to recognise triggers and begin to adapt behaviours.

**8.45%**  
improvement in  
functional ability

FIM+FAM measurements improved by over 8.45% as greater engagement in therapy contributed to more functional improvements in recovery.

# Building on early progress

7-9

MONTHS

**27.1%** reduction in total aggressive incidents (-5.5% median)

The total number of incidents reduced a further 27.1% and the median score was 103 (-5.5%) as patients continued to experience new aspects of therapy and test their recovery. This highlights the consequences of higher expectations as patients adjusted to less structure as they moved to new environments in the pathway, which can cause a temporary resurgence of earlier anxieties.

**49.62%** further reduction in median severity

Crucially our staff enabled the severity total to continue to fall to only 7,427.

**11.04%** improvement in median FIM+FAM rating

FIM+FAM measurements continued to improve, achieving a median rate of 171 compared to 142 on admission, an 11% improvement compared to period 2, supported by a range of additional vocational opportunities.

# Continuous rehab and progression

10-12

MONTHS

A further **67.96%** improvement in incidents of avert aggression

**8.3%** FIM+FAM median improvement compared to third period

SASNOS rating of **40**

On final recording the OAS -MNR median achieved 33, or a 67.96% reduction from phase 3, highlighting continuous development and improvement. The AAS severity median also fell significantly by 57.63% in this phase reflecting the transition from aggression to goal fulfilment and participation.

FIM+FAM improved in total by over 30% during the study, with the final period median rising from 171 to 185, despite several patients having left the service at this point.

SASNOS median improvements settled at 40 following the initial phase of 35.1, an improvement of 13.96%.

By the fourth phase only two patients remained on Tallis, with the remainder having progressed through the St Andrew's pathway to community or slow-stream rehab, or discharge.

# St Andrew's Neuropsychiatry service

## Using RESEARCH as a catalyst for change

With over 460 specialist Neuropsychiatry staff we deliver truly tailored care to adults with the most complex, acquired or progressive neurological conditions, alongside their co-morbid physical needs and mental health disorders.

Over the past four decades we have pushed the boundaries of what is possible in neurobehavioural treatment and rehabilitation by repeatedly transforming complex behaviour in to user engagement and goal-fulfilment. We treat the individual, not just the condition, and provide gender-specific units dedicated to those with;

- acquired / traumatic brain injury
- complex dementia
- Huntington's disease

*(including those detained under the Mental Health Act)*

With a pathway of **over 200 beds**, from medium secure through to community-supported transitional living, we can tailor the environment, therapy and vocational support to each patient's needs.

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## Getting in touch

For further information about our service and Neurobehavioural approach please contact:

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