

Update on the Developments in the Assessment of Neurobehavioural Disability: SASNOS

Professor Nick Alderman

Clinical Director, Neurobehavioural Rehabilitation Services,
Elysium Healthcare

Dr Claire Williams

Senior Lecturer, Department of Psychology, Swansea University

Reducing the Burden of Neurobehavioural Disability after Acquired Brain Injury: Past, Present and Future

Swansea University
Prifysgol Abertawe

Presented in
partnership with: **Partnerships in Care**
Where better comes together

This exciting one-day conference will bring together leading experts in acquired brain injury to provide an authoritative account of the conceptualisation, history and management of neurobehavioural disability. Delegates will gain increased awareness of the extent of the challenges neurobehavioural disability causes, and become familiarised with some of the latest thinking regarding assessment and treatment to enable more effective delivery of services.

The programme will appeal to all those interested and/or involved in the care of individuals with an acquired brain injury, including case managers, commissioners, rehabilitation and healthcare professionals, clinicians, academics and legal fraternity.

28 November 2016 between 09:00 - 16.30
Swansea Marriott Hotel, Maritime Quarter, Swansea, SA1 3SS

Registration:

- Professional/Corporate - £75
- Student/Trainee - £50
- Survivors - a limited number of free places are available

How to book:

For further information and to register your place:
<https://abiswan16.eventbrite.com>



Overview

- Setting the context: conference programme organised around the key SASNOS domains
- Brief description of SASNOS
- Updates regarding SASNOS
- Ongoing developments
- How you can contribute

SASNOS



Needs YOU!

Proxy Rating

St Andrew's - Swansea Neurobehavioural Outcome Scale (SASNOS)

This questionnaire looks at some of the difficulties that people with acquired brain injury may experience. Please think about your observations of the person over the last two weeks and for each statement tick the box that best describes how prevalent it has been as per the definitions below. Please complete ALL items. Tick N/A if there have been no opportunities to observe items 1, 11 or 13. See separate Guidance Notes for more information, including scoring.

Name: _____ Date: _____

Descriptor	Definition
Never	No behaviour/symptom observed within the review period
Rarely	The behaviour/symptom has been observed once or twice
Occasionally	The behaviour/symptom has been observed a few times
Sometimes	The behaviour/symptom has been observed on about 50% of occasions when applicable
Fairly Often	The behaviour/symptom has been observed on many occasions
Very Often	The behaviour/symptom has been noticed nearly all the time
Always	The behaviour/symptom has been a constant feature of the person throughout the review period

Interpersonal Relationships

Social Interaction

- Interact appropriately with strangers
- Recognises and responds to the feelings of others
- Maintains good personal appearance
- Recognises when to end conversations
- Willing to accept criticism or feedback from others

Relationships

- Forms close meaningful relationships with others
- Displays warmth and compassion in relationships
- Context of conversation is appropriate to social situation
- Initiates and maintains social interactions independently
- Maintains good eye contact during conversation

Engagement

- Participates in leisure activities
- Considerate and caring about the needs and circumstances of others
- Is well mannered and polite with friends and family
- Behaviour is cheerful and happy
- Demonstrates interest in other people and activities

Page 1 of 5 | SWANSEAUNIVERSITY.AC.UK

Swansea University Prifysgol Abertawe

SASNOS Neurobehavioural Outcome Scale

Setting the Context & Brief Description of SASNOS



Neurobehavioural Disability

Complex, non-homogenous population with a wide range of different needs

In studies conducted over many years, challenging behaviours have been recognized as posing a greater long-term impediment to community integration after TBI than physical disabilities



Neurobehavioural Disability

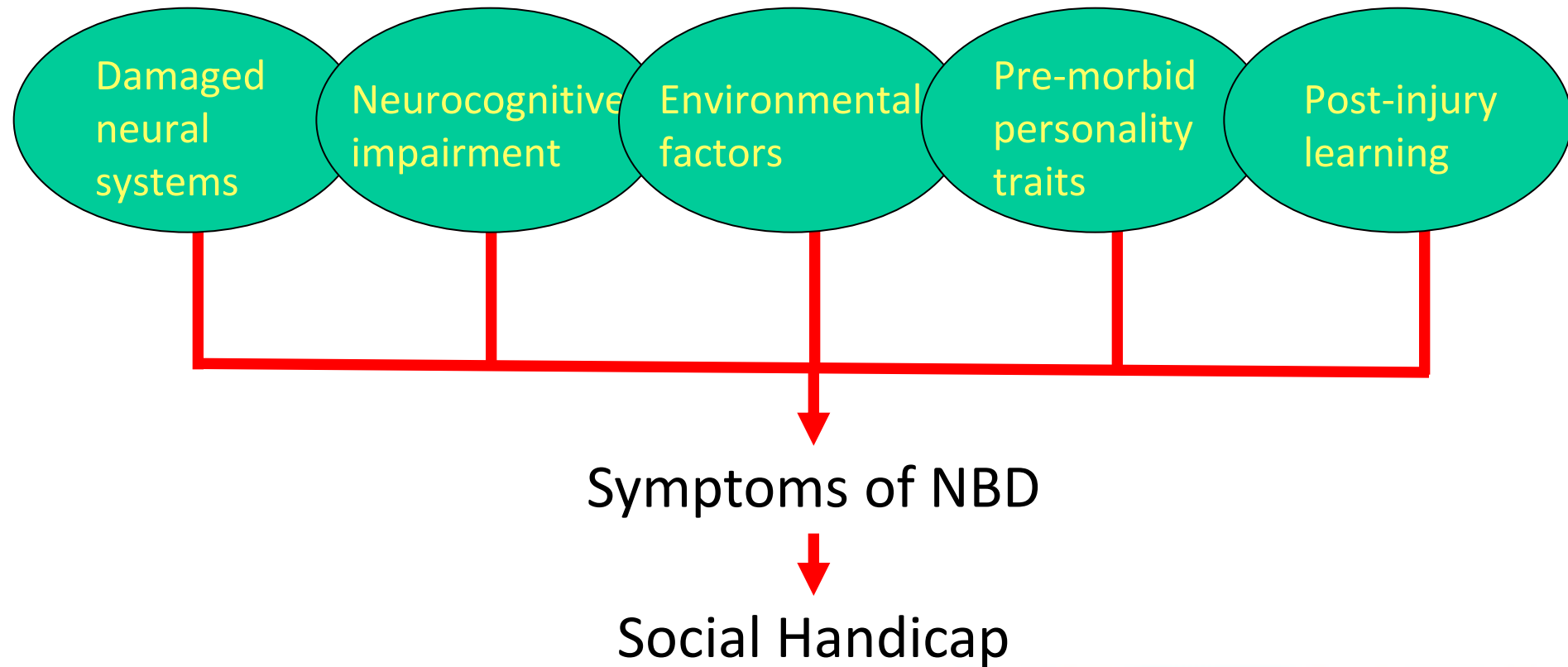
Useful framework for helping understand what drives challenging behaviour after ABI

Prof Rodger Wood (2001)

Complex, subtle, pervasive constellation of cognitive-behavioural changes that characterise post-acute ABI



Neurobehavioural Disability



Neurobehavioural Disability

- Product of interactions between damaged neural systems and neurocognitive impairment, further modified by premorbid personality traits and learning.
 - Executive and attentional dysfunction
 - Altered emotional expression
 - Poor impulse control
 - Range of personality changes
 - Poor insight
 - Problems of awareness and judgement

Neurobehavioural Disability

‘Positive’ Symptoms

- Ill-judged, socially embarrassing, often aggressive behaviours that are impulsive and unpredictable
- Actively interfere with rehabilitation and social reintegration

(From Wood, 2013)

Neurobehavioural Disability

‘Negative’ Symptoms

- Problems associated with apathy, lack of interest, lack of ability to empathise
- Reduce co-operation and effort in rehabilitation
- Negative impact on relationships
- But subtle and insidious, less well understood

(From Wood, 2013)

Neurobehavioural Disability

Social Handicap:

- Reduced autonomy through ‘challenging behaviour’
(e.g. overt aggression, socially inappropriate behaviour, repetitive & dangerous behaviour)
- Longer term aversive consequences of CB
(e.g. reduced social contact, changes in family dynamics and roles, reduced living standards)



Neurobehavioural Disability

Behavioural characteristics associated with NBD are enduring and impose serious long-term social handicap

- Capacity for independent living
- Employment
- Relationships
- Impact on roles & quality of life
- Contact with forensic services
- Choice in where people live

Presence of NBD = poorer prognosis

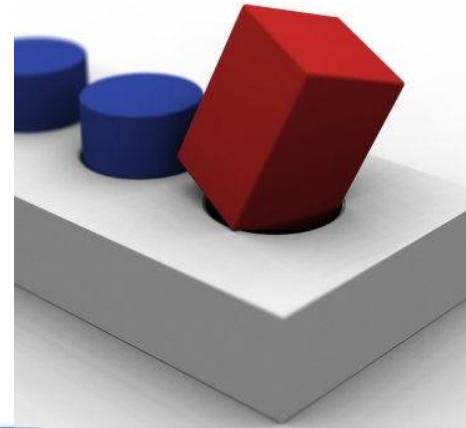
Neurobehavioural Disability

Severe NBD results in challenging behaviour leading to exclusion from:

- Neurorehabilitation programmes
- Home/community settings

Survivors gravitate for management purposes to:

- Nursing homes
- Psychiatric services
- Prison



Neurobehavioural Disability

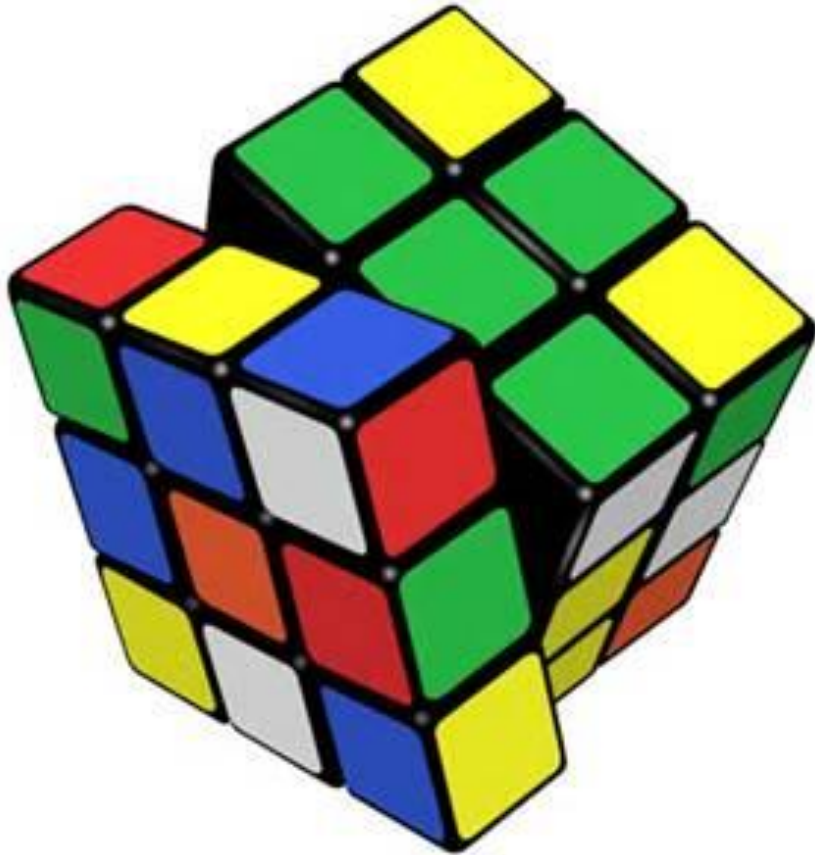
Many forms of NBD are subtle but have a pervasive impact on psychosocial outcome in general and relationships in particular.

They are poorly understood.

Requires a systematic assessment after injury to identify potential obstacles to recovery and provide the focus for early rehabilitation.

(From Wood, 2013)

Given the Potentially Catastrophic Impact of NBD, How Can We Measure It?



Measuring NBD
has proved to be
challenging!

Assessment of NBD

1. Neuropsychological Tests

- Results do not reliably map onto NBD

2. Observational Measures

- observational recording measures
 - *very specific*
- rating scales
 - *global perspective*

Assessment of NBD

1. Screening measure

- *tracking recovery, response to rehabilitation and outcomes*

When scores cross thresholds

2. Very specific measures

- *tests of particular functions & abilities*
- *observational measures, e.g. OBS, OAS-MNR, SASBA*

Widely Used Measures of NBD

- Neurobehavioural Rating Scale (NRS)
- Neurobehavioural Rating Scale – Revised (NRS-R)
- Neurobehavioural Functioning Inventory (NFI)
- Neurobehavioural Functioning Inventory-66 (NFI-66)
- Neuropsychology Behaviour and Affect Profile (NBAP)
- Key Behaviours Change Inventory (KBCI)
- Head Injury Behaviour Scale (HIBS)
- Ruff Neurobehavioural Inventory (RNBI)

Work is Still Needed

Kolitz et al (2003) argued that there was still a need to develop a valid and comprehensive 'global' instrument for the measurement of NBD.



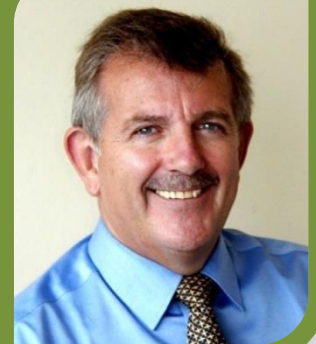
Professor Nick Alderman

Director of Clinical Services and Consultant Clinical Neuropsychologist at Brain Injury Services, Partnerships in Care. He previously held senior posts at the Brain Injury Rehabilitation Trust and St Andrew's Hospital, Northampton. He holds a number of honorary and visiting academic appointments, including at Swansea University, University of the West of England, and the University of Birmingham. Principal interests include neurobehavioural rehabilitation, challenging behaviour, dysexecutive syndrome and outcome measurement.



Dr Claire Williams

Senior Lecturer in the Department of Psychology at Swansea University. She has a strong track record of applied and translational research, leadership experience of delivering research projects with clinical impact, and experience of developing specialist neurobehavioral assessment tools for use in brain injury. Principal research interests include neurobehavioural disability, emotional processing and regulation, dysregulated behaviours, and outcome measurement.

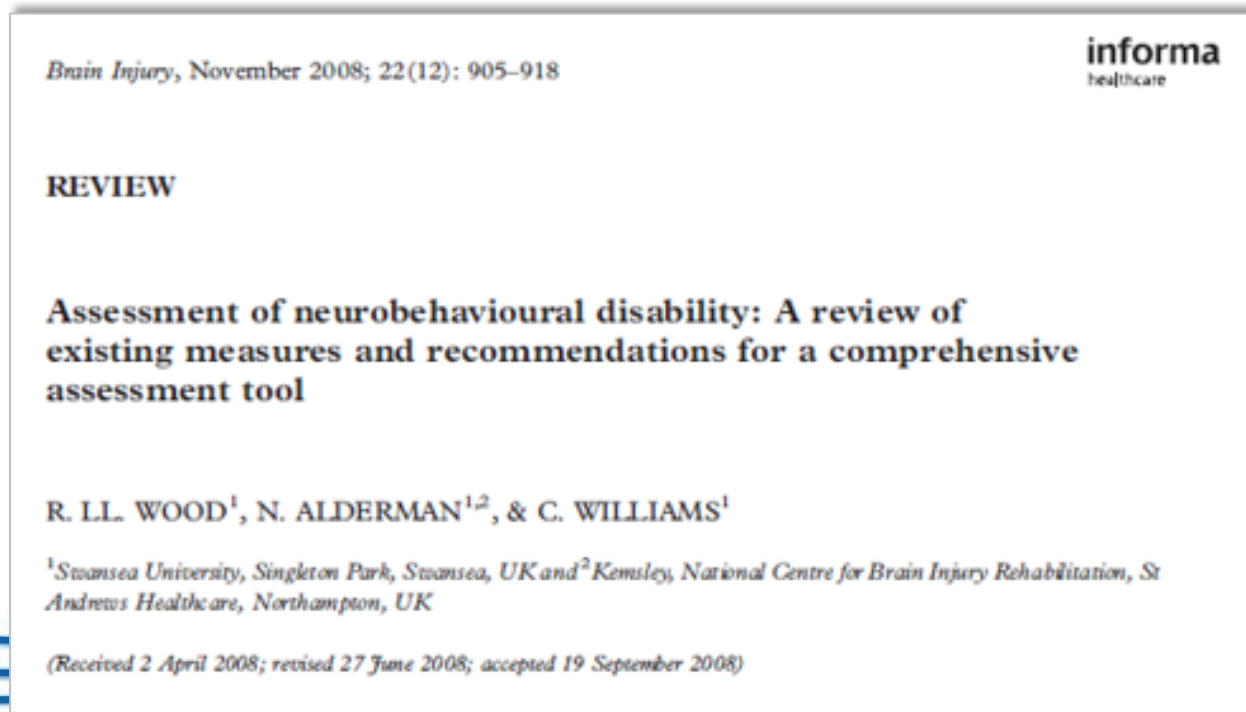


Professor Rodger Llewellyn Wood

Professor Emeritus of Clinical Neuropsychology at Swansea University and Honorary Consultant Clinical Neuropsychologist at ABM University Health Board. He has worked in brain injury rehabilitation since 1978, at the Kemsley Unit, Northampton, Casa Colina Hospital, California, and the Brain Injury Rehabilitation Trust, UK. His current research focuses on the nature and assessment of neurobehavioural legacies of traumatic brain injury.

Review of Existing Measures of NBD

- Undertook review of the psychometric properties of 8 widely used measures of NBD.
- Determine a set of recommendations for future measures of NBD.

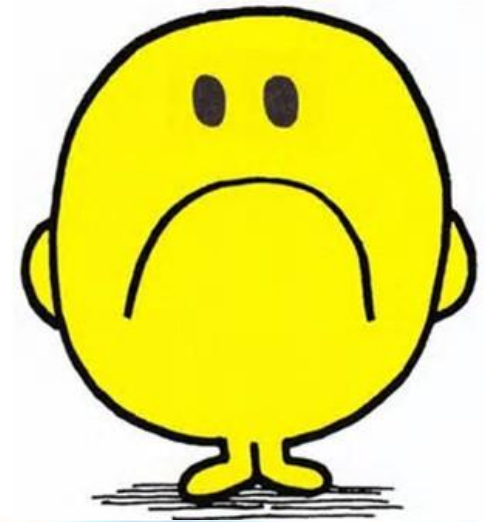


Existing Measures of NBD - Comparison of Psychometric Properties (Wood, Alderman & Williams, 2008)

				Content Validity		Construct Validity			Discriminant/ Diagnostic Validity	Reliability	
				Content	Face	Factorial/ data reduction (no.Items)	Internal consistency	Convergent/ divergent		Inter- rater	Test- retest
NRS ¹		27	yes			4	yes	yes	yes		
NRS-R ²		29	yes			5	yes	yes		yes	
NFI ³		70	yes			6	yes	yes			
NFI-66 ⁴		66	yes			4	yes	yes		yes	
NBAP ⁵	yes	66	yes			5	yes		yes		yes
KBCI ⁶	yes	64	yes			8	yes		yes		
HIBS ⁷	yes	20	yes			2	yes				
RNBI ⁸	yes	243				3	yes				yes

Review of Existing Measures of NBD

- Existing tools contained methodological problems of definition, conceptualisation and measurement of NBD.
- Scores difficult to use in a way that is clinically or socially meaningful as an indication of outcome.



St Andrews - Swansea Neurobehavioural Outcome Scale (SASNOS)

This questionnaire looks at some of the difficulties that people with acquired brain injury may experience. Please think about your observations of the person over the last two weeks and for each statement tick the box that best describes how prevalent it has been as per the definitions below. Please complete ALL items. Tick N/A if there have been no opportunities to observe items 1, 11 or 13. See separate Guidance Notes for more information, including scoring.

Descriptor	Definition
Never	No behaviour/symptom observed within the review period
Rarely	The behaviour/symptom has been observed once or twice
Occasionally	The behaviour/symptom has been observed on about 50% of occasions when applicable
Sometimes	The behaviour/symptom has been observed on many occasions
Fairly Often	The behaviour/symptom has been evident nearly all the time
Very Often	The behaviour/symptom has been a constant feature of the person throughout the review period
Always	The behaviour/symptom has been a constant feature of the person throughout the review period

INTERPERSONAL RELATIONSHIPS

Social Interaction

1. Interacts appropriately with strangers
2. Recognises and responds to the feelings of others
3. Maintains good personal appearance
4. Recognises when to end conversations
5. Willing to accept criticism or feedback from others

Relationships

6. Forms close meaningful relationships with others
7. Displays warmth and compassion in relationships
8. Content of conversation is appropriate to social situation
9. Initiates and maintains social interactions independently
10. Maintains good eye contact during conversation

Engagement

11. Participates in family activities
12. Considerate and caring about the needs and circumstances of others
13. Considerate and polite with friends and family
14. Is well informed and polite with friends and family
15. Behaviour is cheerful and happy
16. Demonstrates interest in other people and activities

© 2011 St Andrew's Healthcare

© 2011 St Andrew's Healthcare

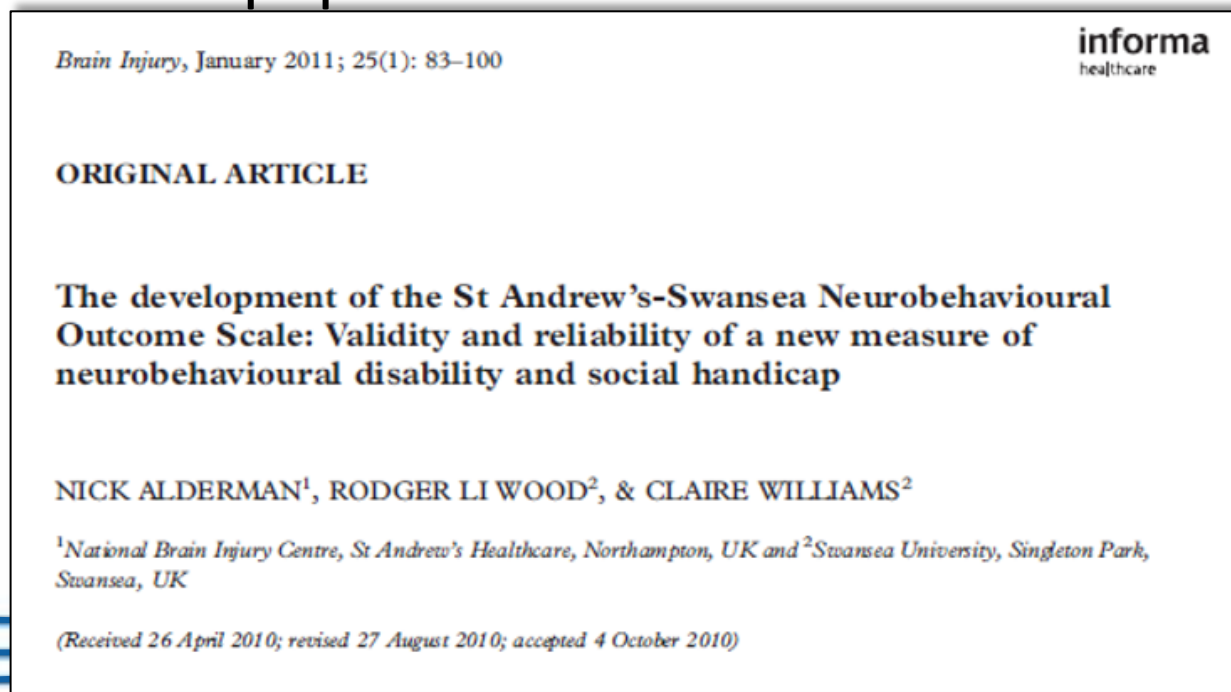
© 2011 St Andrew's Healthcare

© 2011 St Andrew's Healthcare

© 2011 St Andrew's Healthcare

St Andrew's-Swansea Neurobehavioural Outcome Scale (SASNOS)

- Designed specifically to capture NBD.
- Measurement tool that can be used for clinical work and for research purposes.
- Meets many of the recommendations made in our 2008 review paper.



SASNOS Items



- 49 items describing symptoms of NBD
- Items rated by choosing one of seven verbal descriptors
- Balanced keying to reduce likelihood of acquiescence responding (bias)
- Scoring constructive – higher ratings reflect perception of ability

Example Item

8. Content of conversation is appropriate to social situation

Never Rarely Occasionally Sometimes Fairly Often Very Often



Example of Item (reverse scoring)

30. Swears or uses offensive language

Never Rarely Occasionally Sometimes Fairly Often Very Often



Example Item (rated on basis of contact with friends, family and /or strangers during the preceding two weeks)

13. Is well mannered and polite with friends and family

Never Rarely Occasionally Sometimes Fairly Often Very Often N/A *



SASNOS Administration and Scoring

- Completed by one or more people who know the person well.
- Items rated from observations of the person during the preceding 14 day period.
- Ratings entered into Excel file which converts to standardised distribution based on ratings of neurologically healthy controls.
 - total sum of ratings
 - 5 principal domains
 - 12 sub domains
 - 3 graphical representations of data

Principal Domains

Sub Domains

Interpersonal
Behaviour ₁₅



Social interaction ₅
Relationships ₅
Engagements ₅

Cognition ₁₂



Executive function ₆
Attention & memory ₆

Inhibition ₆



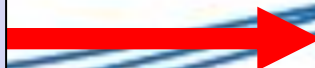
Sexual ₃
Social ₃

Aggression ₁₂



Provocative behaviour ₅
Irritability ₄
Overt aggression ₃

Communication ₄



Speech & language ₂
Mental state ₂

Availability of Normative Data

- Neurologically healthy control data used to transform ratings into T-Scores (mean 50, sd 10)
- Use of standardised distribution enables direct comparison of factor scores and interpretation
- Suggests what scores may fall within the 'normal' or expected range
- Profile of strengths and needs
- Benefits to clinical practice

Comparison of psychometric properties between the SASNOS and the existing measures of neurobehavioural disability and social handicap reviewed by Wood, Alderman & Williams (2008)

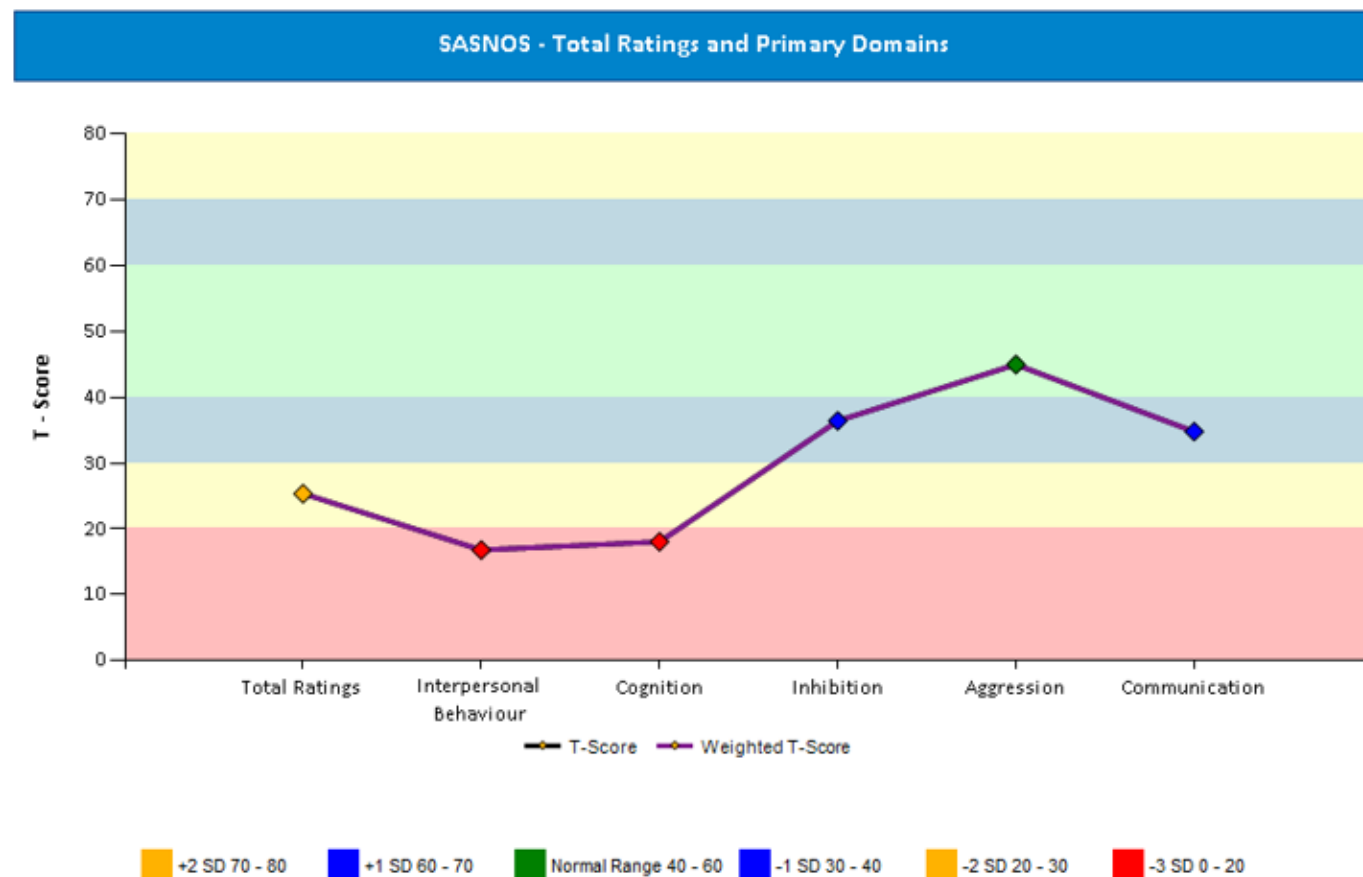
In addition to CTT techniques, Rasch analysis also employed

	Not adapted from non-ABI measure	No. item	Informant version	Content Validity		Construct Validity			Discriminant/ Diagnostic Validity	Reliability	
				Content	Face	Factorial/ data reduction (no.Items)	Internal consistency	Convergent/ divergent		Inter-rater	Test-retest
SASNOS	yes	49	yes	yes	yes	5	yes	yes	yes	yes	yes
NRS ¹		27	yes			4	yes	yes	yes	yes	
NRS-R ²		29	yes			5	yes	yes		yes	
NFI ³		70	yes			6	yes	yes			
NFI-66 ⁴		66	yes			4	yes	yes		yes	
NBAP ⁵	yes	66	yes			5	yes		yes		yes
KBCI ⁶	yes	64	yes			8	yes		yes		
HIBS ⁷	yes	20	yes			2	yes				
RNBI ⁸	yes	243				3	yes				yes

Outcome Measures - SASNOS

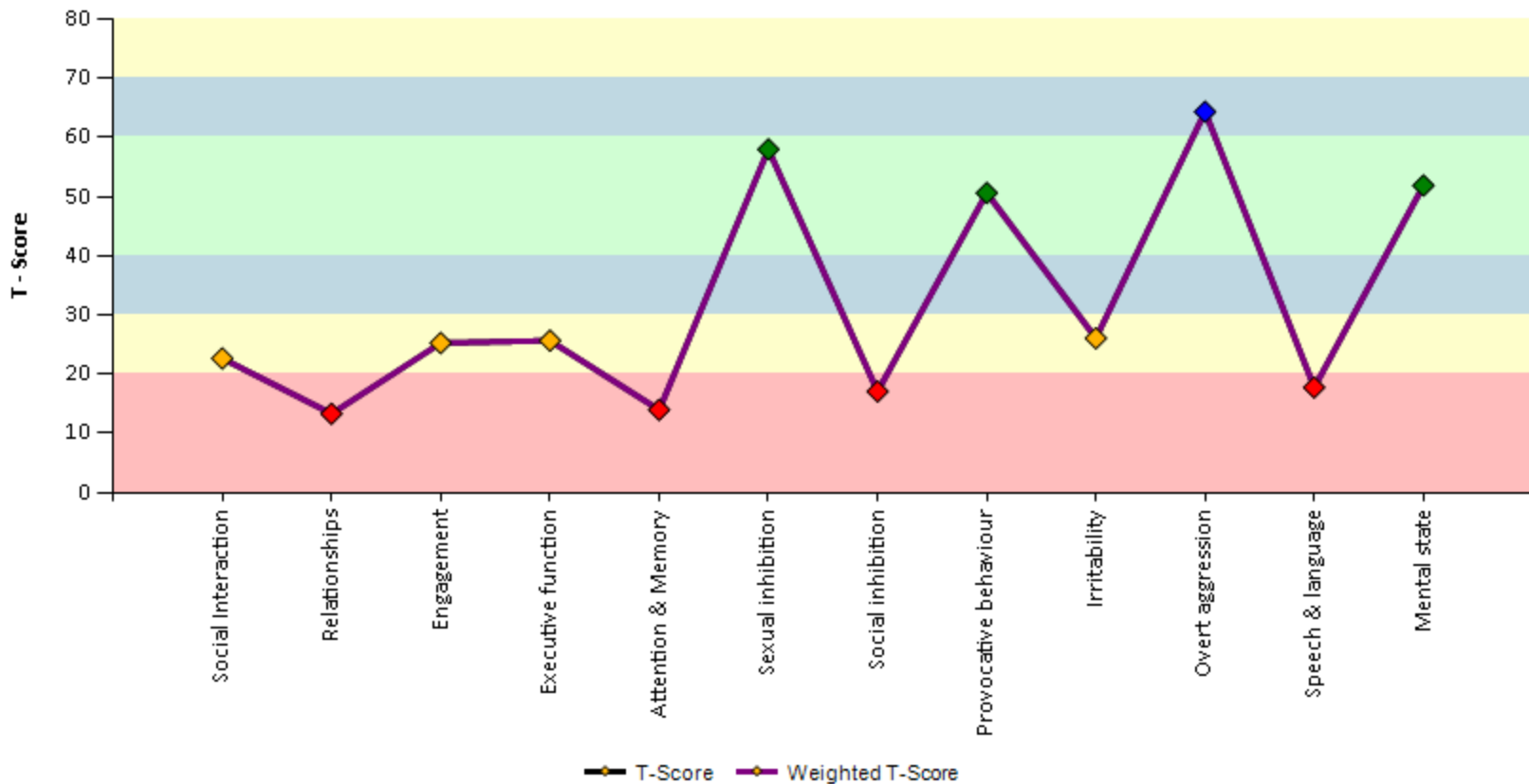
The below scores are based on the SASNOS assessment which took place on 19/10/2017

	T - Scores	Weighted T-Scores
INTERPERSONAL BEHAVIOUR	16.81	16.81
Social interaction	22.64	22.64
Relationships	13.31	13.31
Engagement	25.25	25.25
COGNITION	18.06	18.06
Executive function	25.65	25.65
Attention & Memory	13.96	13.96
INHIBITION	36.42	36.42
Sexual inhibition	57.96	57.96
Social inhibition	17.07	17.07
AGGRESSION	44.98	44.98
Provocative behaviour	50.60	50.60
Irritability	26.06	26.06
Overt aggression	64.31	64.31
COMMUNICATION	34.79	34.79
Speech & language	17.75	17.75
Mental state	51.86	51.86
TOTAL SUM OF RATINGS	25.37	25.37



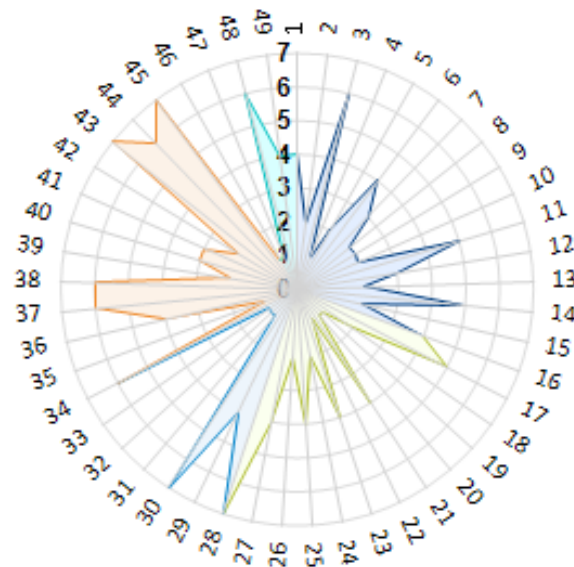
Outcome Measures - SASNOS

SASNOS - Sub Domains



Outcome Measures - SASNOS

Profile Chart - Individual Items



- 1 - 15** Interpersonal relationships
- 16 - 27** Cognition
- 28 - 33** Inhibition
- 34 - 45** Aggression
- 46 - 49** Communication

SASNOS Updates

- Website
- Collaborations
- Rebranding
- Translations
- Responsiveness
- Controlling for context-dependency
- SASNOS-R



St. Andrews-Swansea Neurobehavioural Outcome Scale (SASNOS)

Home

Research Team

The SASNOS ▾

Training

Request SASNOS

Research Projects

Further Reading

News and Events ▾

Contact Us

Home

"It is straightforward to administer, results are easy to display visually, and it has been very helpful in conveying complex information to commissioners and families".

◀ Dr Andrew Worthington, Clinical Director of Headwise & Park Attwood Centre for Neurorehabilitation, UK ▶

Neurobehavioural Disability (NBD) has a major impact on long-term psychosocial outcome following acquired brain injury (ABI). It is a term that describes a complex, subtle, pervasive constellation of cognitive behavioural changes that characterise post-acute ABI. Emotional difficulties, problems with inhibition, intolerance, poor insight, lack of awareness and aggressive behaviour all reflect NBD.

NBD undermines social independence and is associated with poor prognosis. Consequently, availability of reliable, valid means of assessing NBD is highly desirable. Standardised measures have known psychometric properties that inform validity and reliability. However, a review published in the journal *Brain Injury* in 2008 highlighted that a reliable, valid measure that adequately capture the subtle, varied characteristics of NBD had yet to be developed [1].

The 'St Andrew's – Swansea Neurobehavioural Outcome Scale' (SASNOS) was developed to fill this gap.

The SASNOS is conceptualised and designed specifically for ABI, has sufficient items to capture the diversity of NBD, and has robust psychometric properties, meaning single assessments of NBD produce dependable results.

A further strength of SASNOS is the availability of data from neurologically healthy people, facilitating identification of NBD symptoms in individuals with ABI more prevalent than amongst the general population.

Since 2011 SASNOS has seen international use, including Australia, Canada, Denmark, Spain, The Netherlands, Ireland and New Zealand. Within the UK, it has been endorsed by organisations providing neurorehabilitation and it is routinely used to monitor clinical and cost-effectiveness of services. SASNOS is also routinely used for research purposes.

English Cymraeg

Search for:

Search

@SASNOS_ABI

Tweets by @SASNOS_ABI

SASNOS_ABI Retweeted



Claire Williams

@DrCWilliams1

Please RT: Apply for our
@HumanandHealth @INPAAlliance p/t
#ResearchOfficer job: bit.ly/2fDevlH -
Fab #BrainInjury #ABI projects!



Sep 21, 2017

SASNOS_ABI Retweeted



Claire Williams

Embed

View on Twitter

St. Andrews-Swansea Neurobehavioural Outcome Scale (SASNOS)

[Home](#)[Research Team](#)[The SASNOS ▾](#)[Training](#)[Request SASNOS](#)[Research Projects](#)[Further Reading](#)[News and Events ▾](#)[Contact Us](#)

SASNOS Request Page

If you would like to use the SASNOS for clinical or research purposes, please complete the form below. **There is NO user or registration fee.**

Once we have received your request you will receive an electronic copy of the SASNOS via email.

Your personal details will be kept confidential. We may contact you from time to time, alerting you to new SASNOS developments and updates.

All SASNOS guidance and scoring material are available to download from this website.

Your Name (required):

Your Email (required):

Affiliation (University, Health Clinic etc.):

Job Title (Required):

Your Message:

English Cymraeg

Search for:

@SASNOS_ABI

Tweets by @SASNOS_ABI

SASNOS_ABI Retweeted



Claire Williams

@DrCWilliams1

Please RT: Apply for our
@HumanandHealth @INPAliance p/t
#ResearchOfficer job: bit.ly/2fDevlH -
Fab #BrainInjury #ABI projects!



Sep 21, 2017

SASNOS_ABI Retweeted



Claire Williams

Embed

View on Twitter

St. Andrews-Swansea Neurobehavioural Outcome Scale (SASNOS)

[Home](#)[Research Team](#)[The SASNOS ▾](#)[Training](#)[Request SASNOS](#)[Research Projects](#)[Further Reading](#)[News and Events ▾](#)[Contact Us](#)

Recent News

June 24 2017 – Conference is Live!

This year's conference will take place on **27 November 2017** and will address "**Neurobehavioural Disability after Acquired Brain Injury: Advances in the Management of Social Handicap**".

The conference will bring together leading experts in neurobehavioural rehabilitation to provide authoritative accounts of the latest developments in the management of challenging behaviour and social handicap.

Speakers will present state of the art reviews and describe the latest innovations regarding how social handicap can be minimised in the five domains of neurobehavioural disability captured by the St Andrew's-Swansea Neurobehavioural Outcome Scale: interpersonal relationships, neurocognitive function, inhibition, aggression, and communication.

To register or for more information, please see: <http://abiswan17.eventbrite.com>

June 23 2017 – SASNOS will soon be available in Welsh, French, Spanish, and German!

We are thrilled to announce that the SASNOS will soon be available in Welsh, French, Spanish, and German. In addition to proxy and self-rated versions, the SASNOS guidance document will also be available in each language.

May 2 2017 – Hot off the press: Conference Announcement!

Following the success of our November 2016 conference on '**Reducing the Burden of Neurobehavioural Disability after Acquired Brain Injury: Past, Present and Future**', we are pleased to announce that we have secured funding to hold another conference in November 2017. The programme for the event is shaping up nicely and the event is set to take place at the Swansea Marriott Hotel, Swansea. We will be in touch soon with further details and instructions on how to book. Watch this space!

April 5 2017 – Paper published in Archives of Clinical Neuropsychology

Alderman, Williams, Knight & Wood have just published new research exploring the responsiveness of the SASNOS. To read the full article:

Measuring Change in Symptoms of Neurobehavioural Disability: Responsiveness of the St Andrew's-Swansea Neurobehavioural Outcome Scale. Archives of Clinical Neuropsychology, 1-12. doi:10.1093/arclin/acx026

[Recent News](#)[Past News and Events](#)

Search for:

Search

@SASNOS_ABI

Tweets by @SASNOS_ABI

SASNOS_ABI Retweeted



Claire Williams
@DrCWilliams1

Please RT: Apply for our
@HumanandHealth @INPAliance p/t
#ResearchOfficer job: bit.ly/2fDevIH -
Fab #BrainInjury #ABI projects!



Sep 21, 2017

SASNOS_ABI Retweeted



Claire Williams

Embed

View on Twitter

Alderman, Williams, Knight & Wood have just published new research exploring the responsiveness of the SASNOS. To read the full article:

Measuring Change in Symptoms of Neurobehavioural Disability: Responsiveness of the St Andrew's-Swansea Neurobehavioural Outcome Scale. Archives of Clinical Neuropsychology, 1-12. doi:10.1093/arclin/acx026

January 18 2017 – SASNOS training event coming soon!

In response to requests from ABI professionals across South Wales, we are busy planning a FREE SASNOS training session. The training will be held locally at Swansea University and will be advertised shortly.

November 30 2016 – Paper published in Advances in Clinical Neuroscience and Rehabilitation

Alderman, Williams, & Wood have published a Special Feature in ACNR discussing the application of the SASNOS and new developments. Read the full article [here](#).

To cite: Alderman N, Williams C, Wood R LI. ACNR 2016;16(3):24-25.

November 28 2016 – Reducing the Burden of Neurobehavioural Disability after Acquired Brain Injury: Past, Present and Future.

On the 28 November 2016, Swansea University and Partnerships in Care hosted a one-day conference at the Swansea Marriott Hotel.

The conference brought together some of the UK's leading experts in acquired brain injury, presenting an exciting programme of talks on the conceptualisation, history and management of neurobehavioural disability.

Alongside keynote presentations from Professor Rodger Wood (Clinical Neuropsychologist and Professor Emeritus of Clinical Psychology, Swansea University) and Professor Tom McMillan (Professor of Clinical Neuropsychology, University of Glasgow), invited speakers comprised an impressive ensemble of clinicians and academics from across the UK.

The day also included a dedicated session on the use of St Andrews-Swansea Neurobehavioural Outcome Scale (SASNOS), providing delegates with valuable training to support ongoing clinical practice and research. The full conference programme can be accessed [here](#).

With over 90 delegates in attendance and exhibitors from several key organisations, the day was a resounding success.

We thank the delegates, speakers, sponsors and exhibitors who attended and we look forward to hosting a similar event in 2017!

Check out the [Conference Highlights](#).

Talks from the day can also be found on our [Training Page](#).



For more conference photos click [here](#).

SASNOS_ABI Retweeted



Claire Williams

[Embed](#)

[View on Twitter](#)

Meta

[Log in](#)

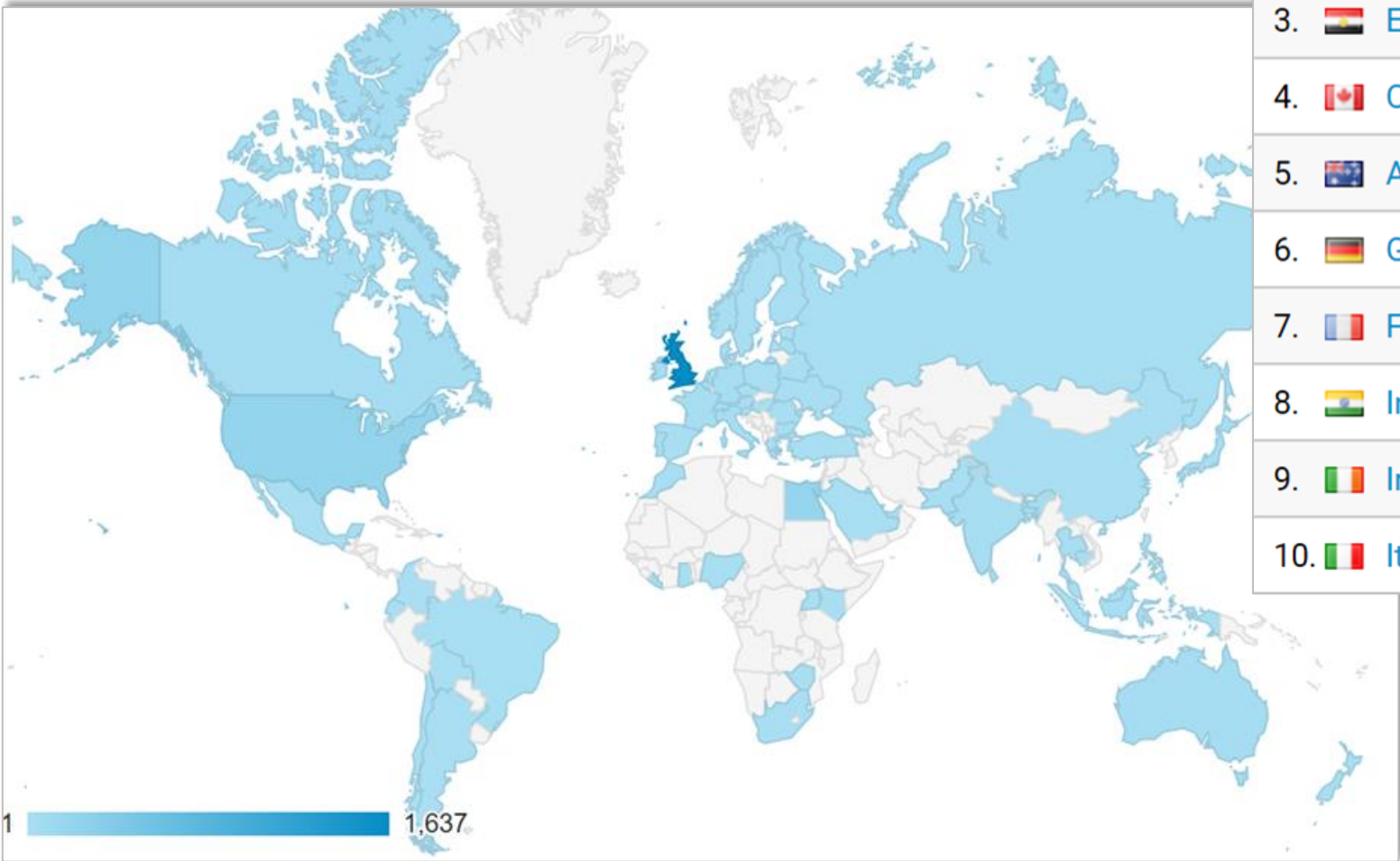
[Entries RSS](#)

[Comments RSS](#)

[WordPress.org](#)

Number of unique users: 1830 unique users
(Jan – today 2017)

International Access/Usage: Unique users
from 73 countries and 63 different languages



Country	
1.	 United Kingdom
2.	 United States
3.	 Egypt
4.	 Canada
5.	 Australia
6.	 Germany
7.	 France
8.	 India
9.	 Ireland
10.	 Italy

SASNOS Updates

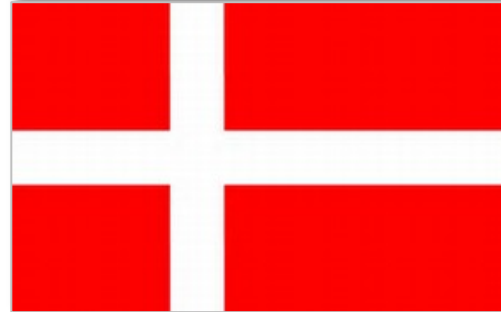
- Website
- Collaborations
- Rebranding
- Translations
- Responsiveness
- Controlling for context-dependency
- SASNOS-R



India



Denmark



Switzerland



USA



SASNOS Updates

- Website
- Collaborations
- Rebranding
- Translations
- Responsiveness
- Controlling for context-dependency
- SASNOS-R



SASNOS Rebrand

SASNOS given
bespoke makeover
to enhance the
end-user
experience

Proxy Rating

St Andrew's - Swansea
Neurobehavioural Outcome Scale (SASNOS)

Swansea University
Prifysgol Abertawe

SASNOS Neurobehavioural Outcome Scale

This questionnaire looks at some of the difficulties that people with acquired brain injury may experience. Please think about your observations of the person over the last two weeks and for each statement tick the box that best describes how prevalent it has been as per the definitions below. Please complete ALL items. Tick N/A if there have been no opportunities to observe items 1, 11 or 13. See separate Guidance Notes for more information, including scoring.

Name: _____

Date: _____

Descriptor	Definition
Never	No behaviour/symptom observed within the review period
Rarely	The behaviour/symptom has been observed once or twice
Occasionally	The behaviour/symptom has been observed a few times
Sometimes	The behaviour/symptom has been observed on about 50% of occasions when applicable
Fairly Often	The behaviour/symptom has been observed on many occasions
Very Often	The behaviour/symptom has been evident nearly all the time
Always	The behaviour/symptom has been a constant feature of the person throughout the review period

Interpersonal Relationships

	Never	Rarely	Occasionally	Sometimes	Fairly Often	Very Often	Always	N/A
Social Interaction								
1. Interacts appropriately with strangers								
2. Recognises and responds to the feelings of others								
3. Maintains good personal appearance								
4. Recognises when to end conversations								
5. Willing to accept criticism or feedback from others								
Relationships								
6. Forms close meaningful relationships with others								
7. Displays warmth and compassion in relationships								
8. Content of conversation is appropriate to social situation								
9. Initiates and maintains social interactions independently								
10. Maintains good eye contact during conversation								
Engagement								
11. Participates in family activities								
12. Considerate and caring about the needs and circumstances of others								
13. Is well mannered and polite with friends and family								
14. Behaviour is cheerful and happy								
15. Demonstrates interest in other people and activities								

Page 1 of 5 | sasnos.swansea.ac.uk

Swansea University
Prifysgol Abertawe

SASNOS Neurobehavioural Outcome Scale

SASNOS Updates

- Website
- Collaborations
- Rebranding
- Translations
- Responsiveness
- Controlling for context-dependency
- SASNOS-R



SASNOS Translations

- SASNOS is now available in English, Welsh, French, Spanish and German available from the website
- Proxy and self-rated versions
- SASNOS Guidance Document
- Danish version also exists

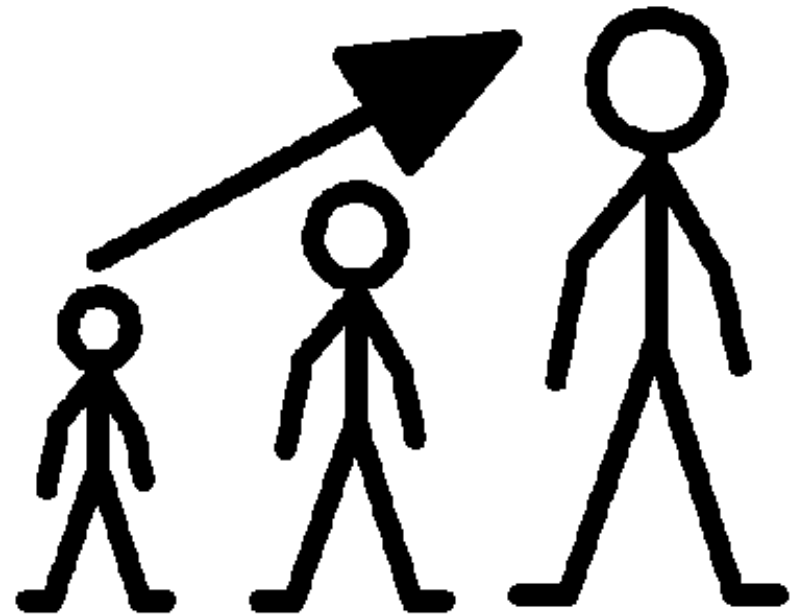


SASNOS Updates

- Website
- Collaborations
- Rebranding
- Translations
- Responsiveness
- Controlling for context-dependency
- SASNOS-R



Responsiveness: how much change on SASNOS is evidence of improvement in NBD symptoms?



Measuring Outcomes

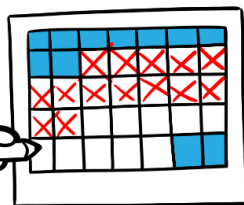
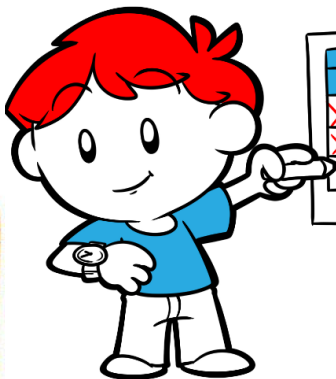
- ‘Holy Trinity’ of Psychometric Properties
 - Validity
 - Reliability
 - Responsiveness
- *The ability of an instrument to detect change*
- Essential property to demonstrate for standardised measures used for repeated measurement
- “What is the minimum T1-T2 difference score that reflects change?”

Measuring Outcomes

*“Is my treatment the cause of this person’s change?”
(Wilson, 1991)*



T₁



T₂

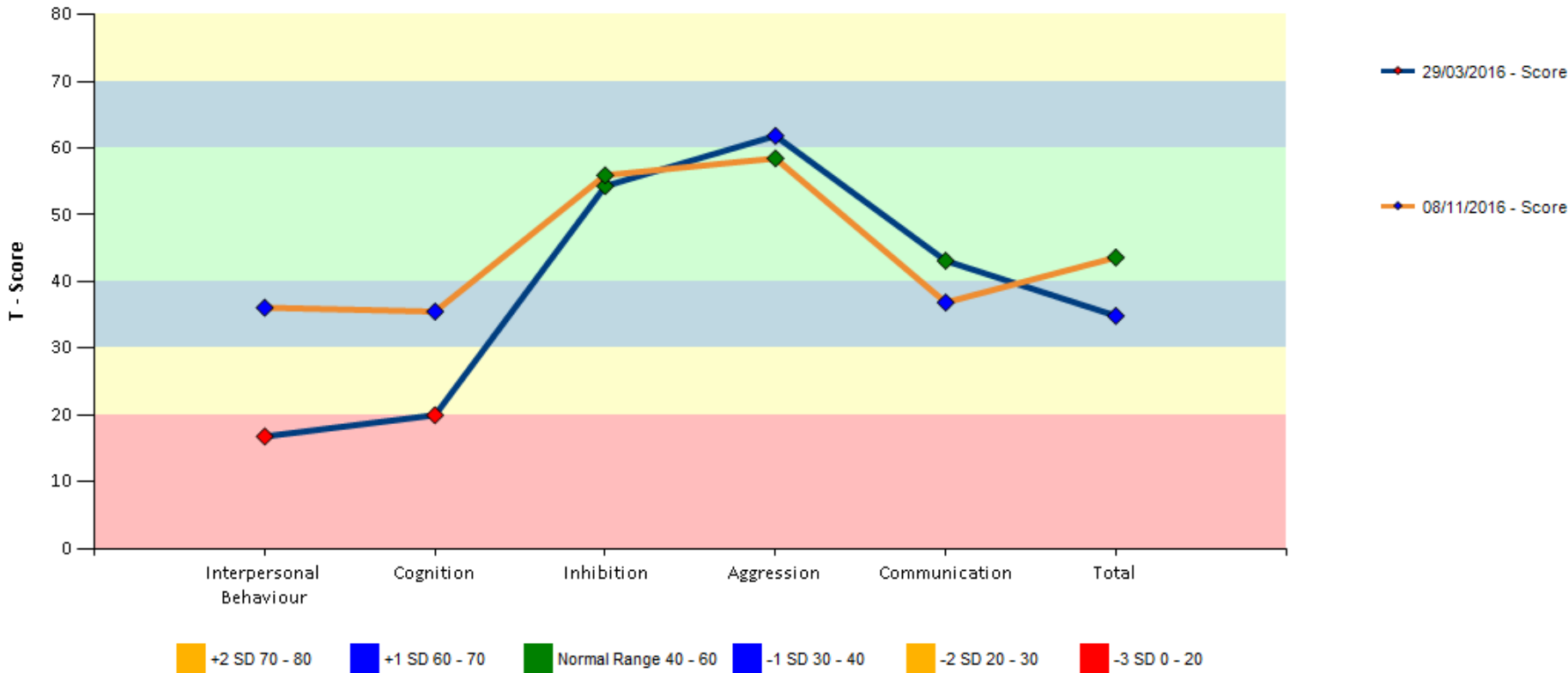


*Repeated
measurement can
inform range of
contexts at
individual and group
levels*

Outcome Measures - SASNOS

Patient	SASNOS Date	INTERPERSONAL BEHAVIOUR		COGNITION		INHIBITION		AGGRESSION		COMMUNICATION		Total	
		T-Score	Weighted	T-Score	Weighted	T-Score	Weighted	T-Score	Weighted	T-Score	Weighted	T-Score	Weighted
10-61-94	29.03.2016	16.8	14.0	20.0	13.3	54.3	46.6	61.8	61.8	43.1	28.8	34.9	28.0
	08.11.2016	36.1	27.1	35.5	23.7	55.9	47.9	58.5	58.5	36.9	29.5	43.6	34.5

SASNOS - Total Ratings and Primary Domains



Measuring Outcomes

- Lack of consensus re definitions of Responsiveness, no 'gold standard' agreed on how determined
- Minimally Detectable Change (MDC)

Smallest $T1-T2$ difference that falls outside the measurement error of an instrument

- Minimally Important Change (MIC)

Smallest $T1-T2$ difference that corresponds to the smallest change in status that stakeholders (persons, patients, significant others, or clinicians) consider meaningful.

Detecting Change in NBD using SASNOS

- Investigated responsiveness by examining SASNOS ratings completed twice for 145 NbR participants in a number of UK services
- Identified cut-off scores for clinicians and researchers to employ across a range of contexts to reliably discriminate genuine improvement from those due to error in the instrument.

OXFORD
UNIVERSITY PRESS

Archives
of
CLINICAL
NEUROPSYCHOLOGY

Measuring Change in Symptoms of Neurobehavioural Disability: Responsiveness of the St Andrew's-Swansea Neurobehavioural Outcome Scale

Nick Alderman^{1,2,*}, Claire Williams², Caroline Knight^{3,4}, Rodger Ll. Wood⁵

¹Brain Injury Services, Priory Healthcare & Partnerships in Care, Grafton Manor, Grafton Regis, Northants, UK

²Department of Psychology, College of Human and Health Sciences, Swansea University, Swansea, UK

³Brain Injury Services, Priory Healthcare & Partnerships in Care, Burton Park, Melton Mowbray, Leicestershire, UK

⁴School of Psychology, University of Leicester, Leicester, Leicestershire, UK

⁵Neuropsychology Clinic, College of Medicine, Swansea University, Swansea, UK

*Corresponding author at: Clinical Services, Brain Injury Services, Priory Group & Partnerships in Care, Grafton Manor, Grafton Regis, Northants NN12 7SS, UK. Tel.: +44-1908-300204.

E-mail address: nick.alderman@partnershipsincare.co.uk (N. Alderman).

Editorial Decision 4 March 2017; Accepted 15 March 2017

Detecting Change on Psychometric Measures

- Range of distribution-based methods employed:
 - Paired t-tests
 - Effect Size (SRM)
 - Standard Error of Measurement (SEM)
 - MDC Confidence Intervals (90, 95%)
 - 0.5 Standard Deviation
- Information in paper enables clinicians/researchers to decide what method to use depending on the question asked
- We especially favoured SEM as it is cited in literature as both a method used to discriminate change that is both unlikely to be due to instrument error, and is meaningful

When to Use

- Change over time within groups

Research purposes

E.g. effectiveness of new therapy, tracking natural trajectory of NBD over time

Audit purposes

Service level evaluation, benchmarking

Is change
expected
across all
recipients
of NbR?



SASNOS Responsiveness: measures of change

	Effect Size SRM	SEM % 'improved'		
Total	moderate	53.1		
Interpersonal Behaviour	moderate	59.3		
Cognition	large	64.8		
Inhibition	small	35.9		
Aggression	small	32.4		
Communication	small	43.4		

† <20 'trivial'; ≥20 to <50 'small'; ≥50 to <80 'medium'; ≥80 'large' effect size

†† T1-T2 difference > 1 SEM = meaningful change

SASNOS Responsiveness: measures of change

	Effect Size SRM	SEM % 'improved'	Effect Size SRM (expected to improve) [†]	SEM % 'improved' (expected to improve) ^{††}
Total	moderate	53.1	moderate	63.7
Interpersonal Behaviour	moderate	59.3	moderate	64.3
Cognition	large	64.8	large	68.2
Inhibition	small	35.9	large	68.8
Aggression	small	32.4	large	77.8
Communication	small	43.4	large	66.7

[†]<20 'trivial'; ≥20 to <50 'small'; ≥50 to <80 'medium'; ≥80 'large' effect size

^{††} T1-T2 difference > 1 SEM = meaningful change

When to Use

- Change over time within groups

Research purposes

E.g. effectiveness of new therapy, tracking natural trajectory of NBD over time

Audit purposes

Service level evaluation, benchmarking

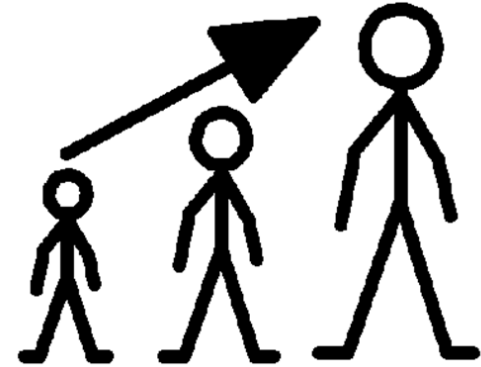
- Change over time within individuals

Clinical purposes

Reviewing response to rehabilitation

SASNOS Responsiveness: determining individual change

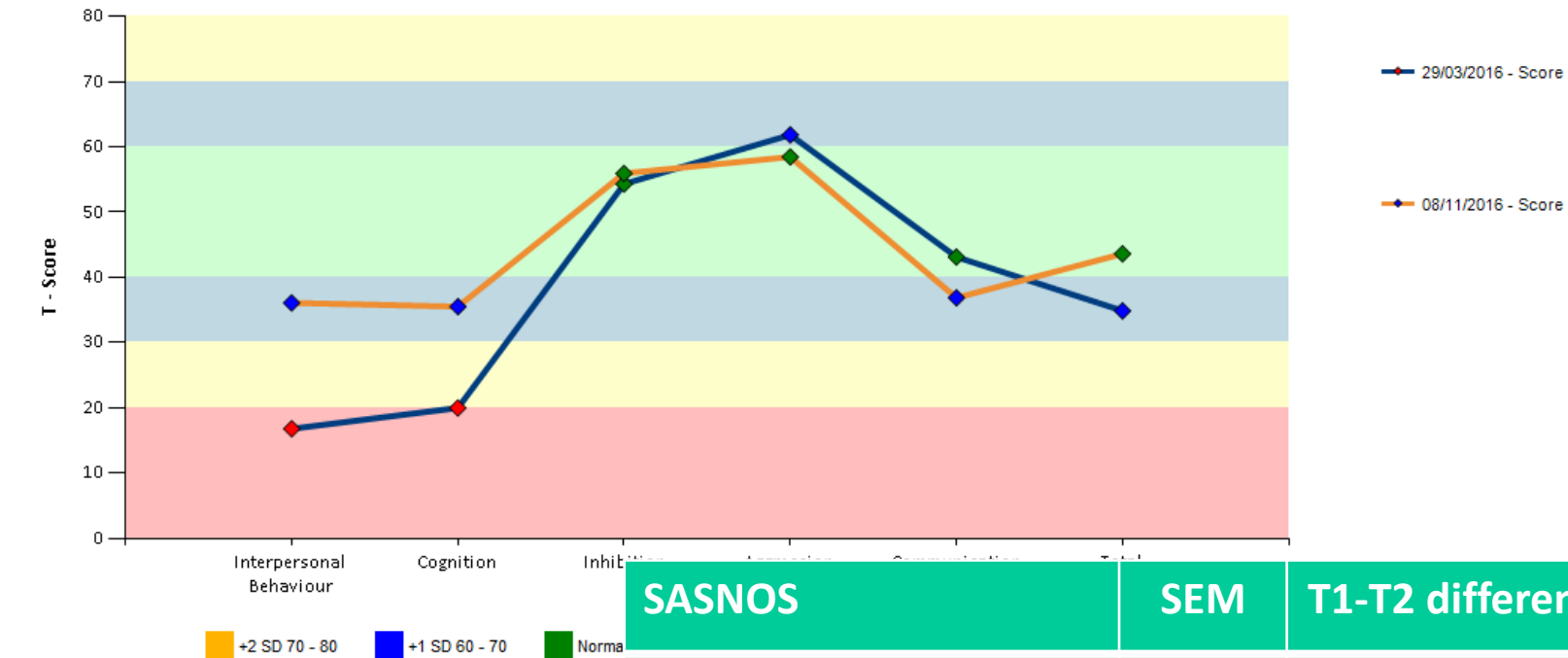
Probabilities of the normal curve applied to SEM values



- 68% probability $T_1 - T_2$ difference falls ± 1 SEM
- 96% probability $T_1 - T_2$ difference falls ± 2 SEM
- If $T_1 - T_2$ difference > 1 SEM = meaningful change
- If $T_1 - T_2$ difference > 2 SEM = meaningful change, beyond error

Patient	SASNOS Date	INTERPERSONAL BEHAVIOUR		COGNITION		INHIBITION		AGGRESSION		COMMUNICATION		Total	
		T-Score	Weighted	T-Score	Weighted	T-Score	Weighted	T-Score	Weighted	T-Score	Weighted	T-Score	Weighted
10-61-94	29.03.2016	16.8	14.0	20.0	13.3	54.3	46.6	61.8	61.8	43.1	28.8	34.9	28.0
	08.11.2016	36.1	27.1	35.5	23.7	55.9	47.9	58.5	58.5	36.9	29.5	43.6	34.5

SASNOS - Total Ratings and Primary Domains



SASNOS	SEM	T1-T2 difference	Outcome
Interpersonal Behaviour	3.77	19.3	> 2 SEM
Cognition	2.67	15.5	> 2 SEM
Inhibition	4.56	1.6	< 1 SEM
Aggression	3.58	-3.3	< 1 SEM
Communication	3.79	-6.2	< 2 SEM
Total Score	2.88	8.7	> 2 SEM

SASNOS Responsiveness: conclusions

Evidence SASNOS reliably measures change over time in NBD symptoms (clinical, audit, research applications)

- Recommend using SRM for cohort data
- When goal is to determine change in scores for an individual, SEM thresholds recommended, associated with MDC and MIC



SASNOS Updates

- Website
- Collaborations
- Rebranding
- Translations
- Responsiveness
- Controlling for context-dependency
- SASNOS-R



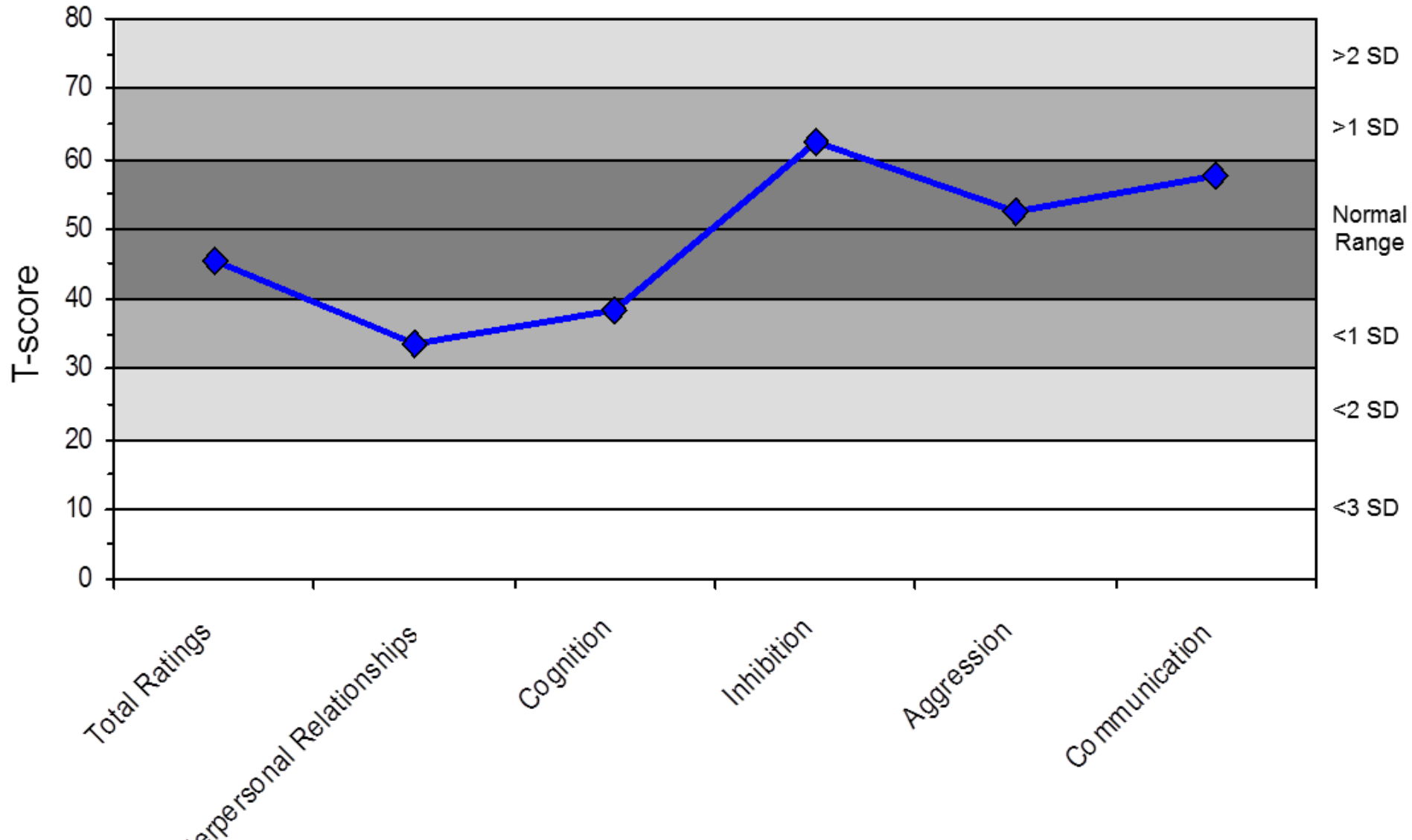
When normal scores don't equate to independence: recalibrating SASNOS ratings to reflect context-dependent support



Is This Person Ready for Discharge?

SASNOS TOTAL RATINGS AND PRIMARY DOMAINS

TDT SASNOS
Wtd SASNOS

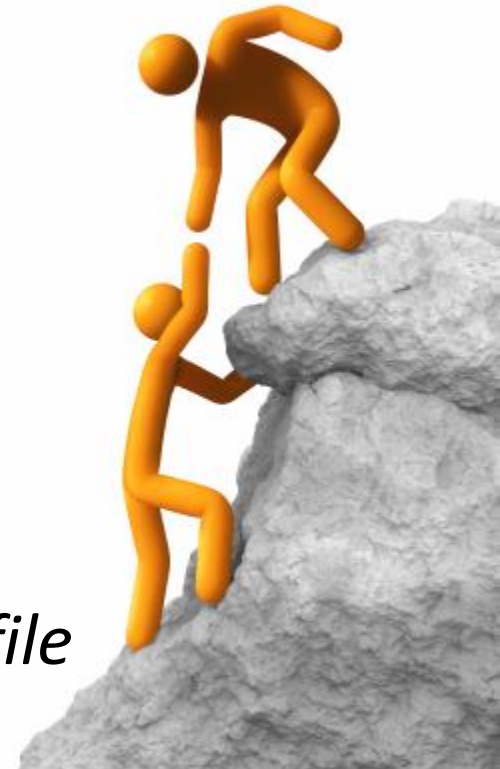


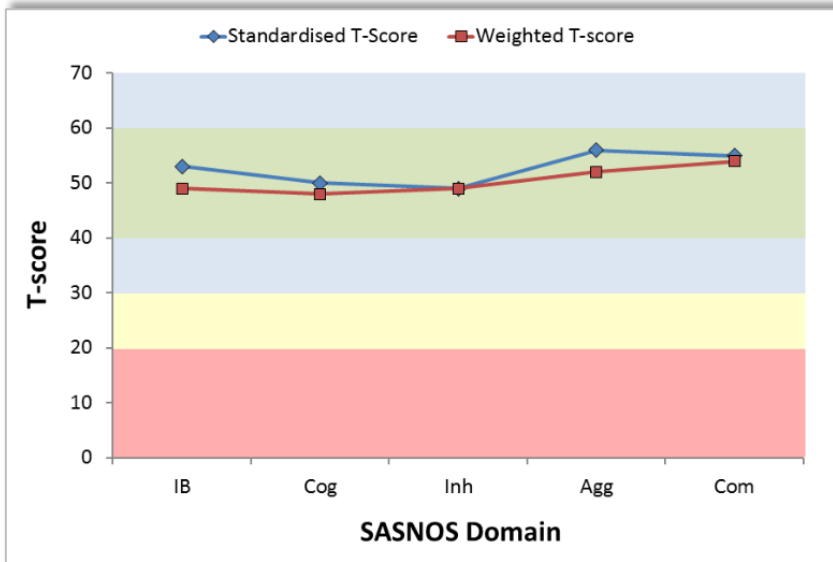
Alderman, Williams & Wood have suggested use of a supplementary scale measure to weight SASNOS ratings to reflect context-dependent support

Each SASNOS item further rated:

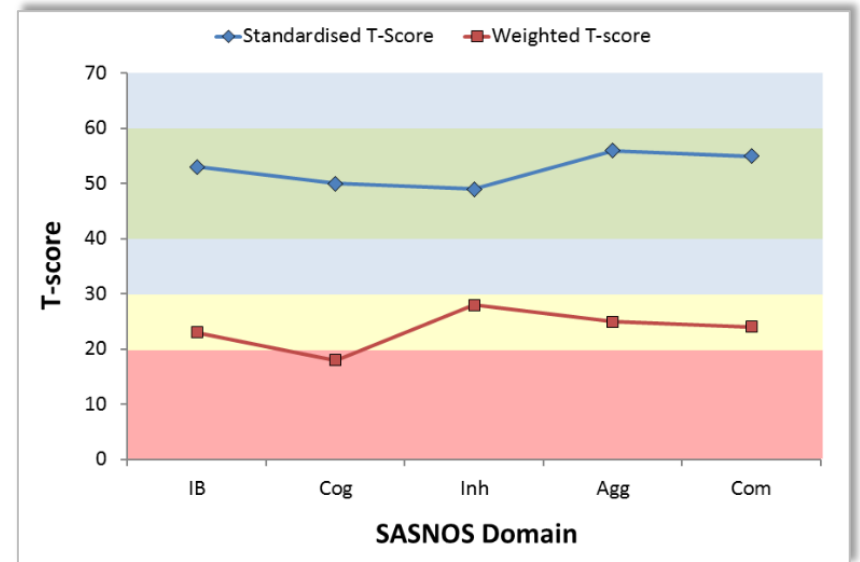
- 1. No help/support*
- 2. Requires help/support*
- 3. Requires structured programme*

Consequently identified 3 Dependency Profile categories to help inform clinical work

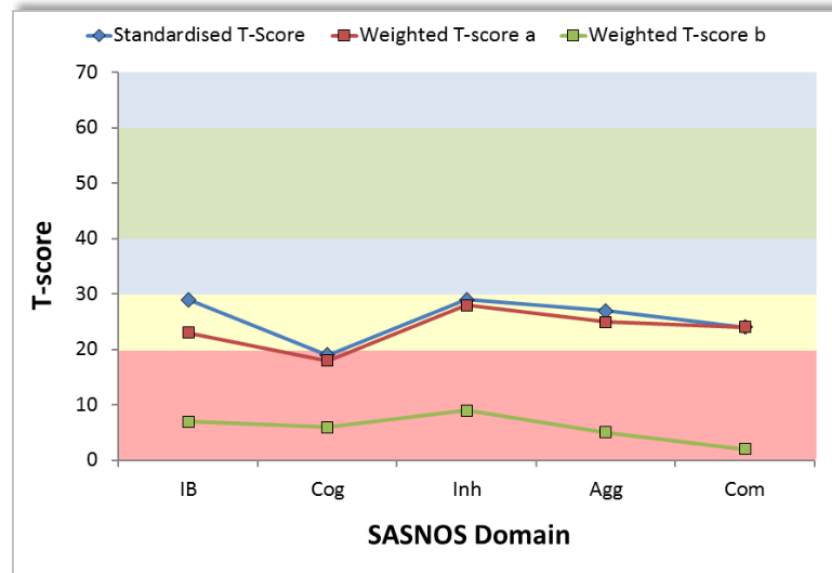




‘Normal/Independent’



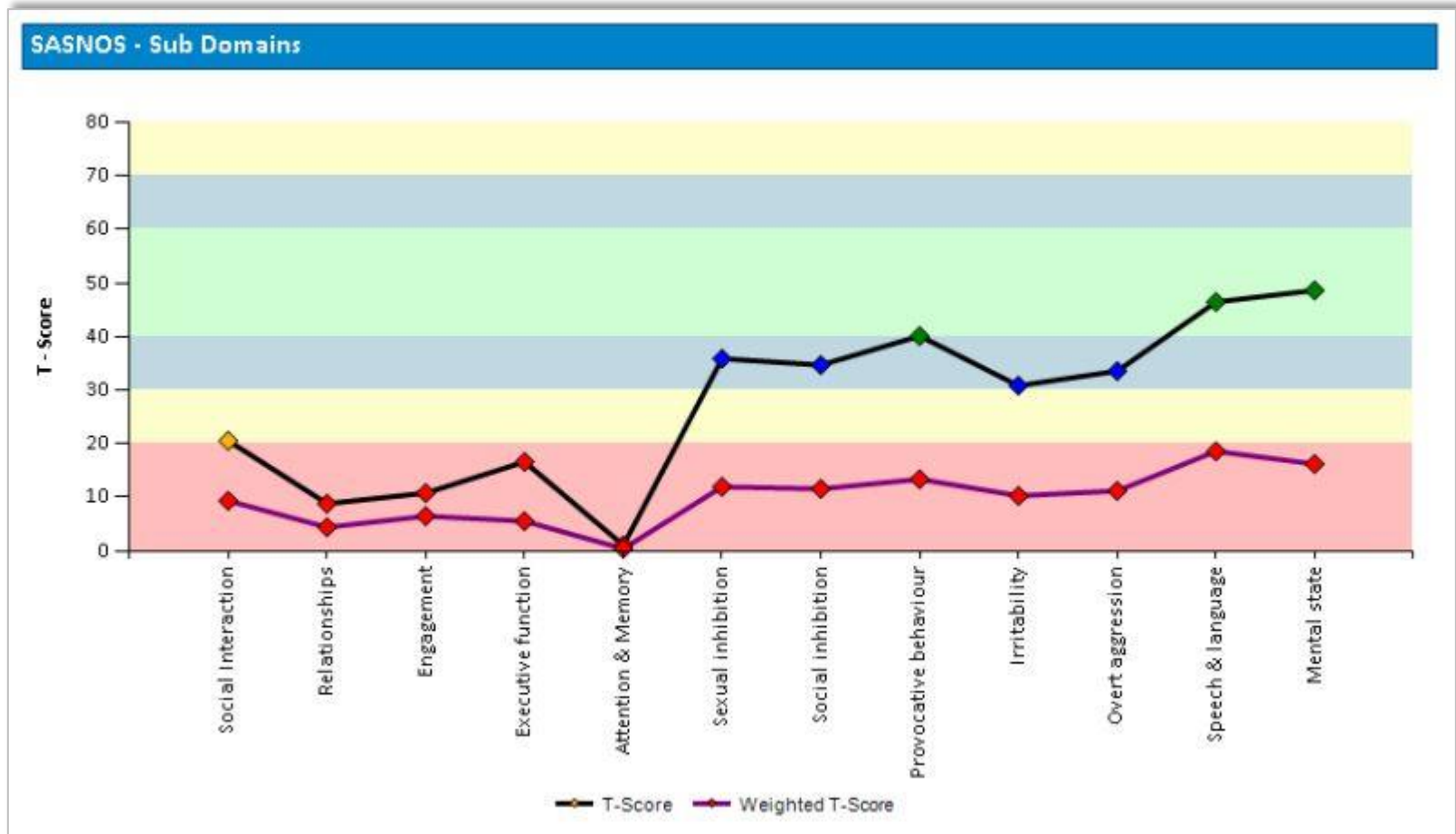
‘Normal/Dependent’



‘Abnormal/Review’

SO: Subdomain Profile

Mix of 'Normal/Dependent' & 'Abnormal/Review'



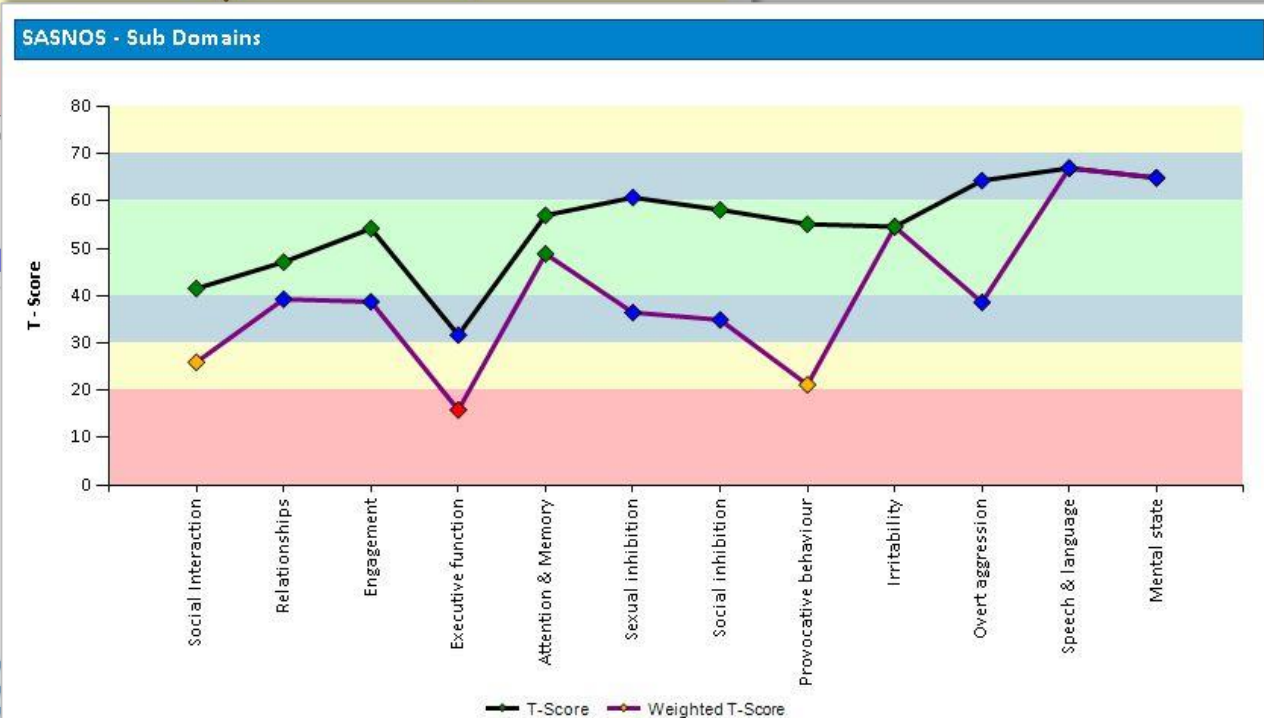
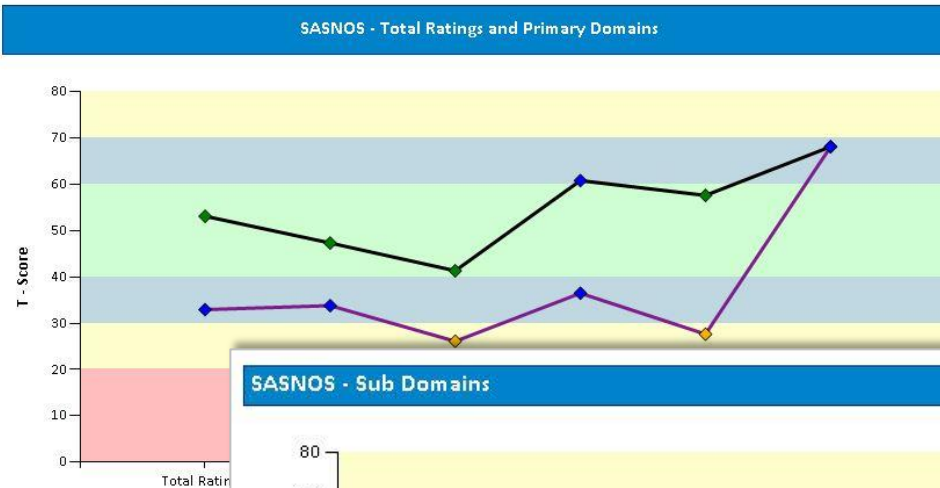
JB: Subdomain Profile

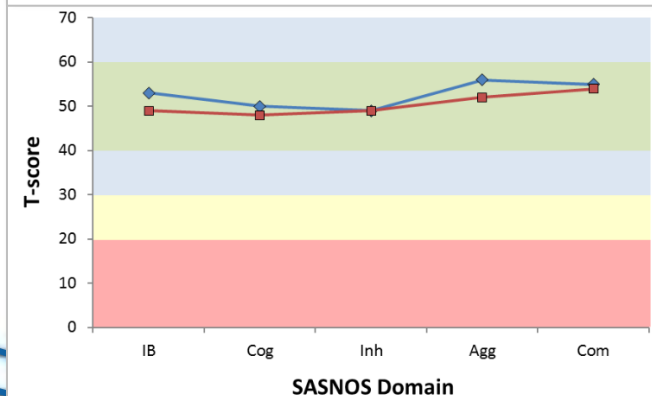
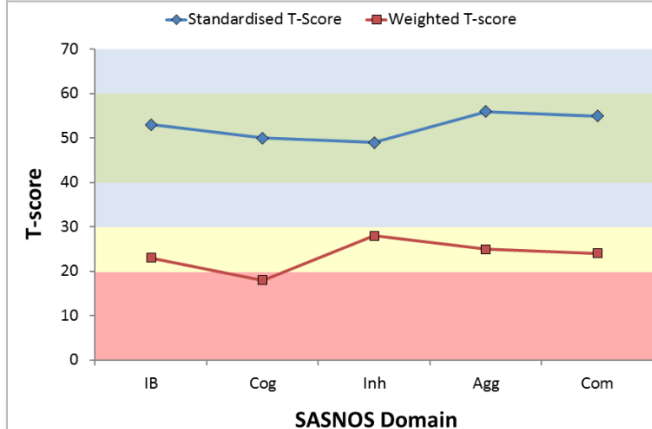
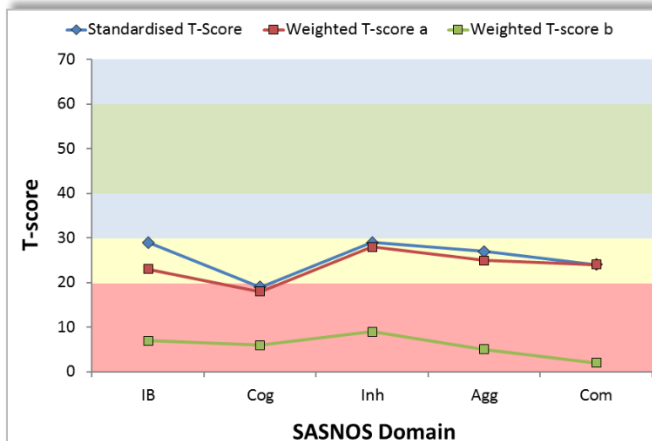
Mix of all three Dependency Profile categories

Outcome Measures - SASNOS: 10-38-43 (JN)

The below scores are based on the SASNOS assessment which took place on 01/04/2015

	T - Scores	Weighted T-Scores
INTERPERSONAL BEHAVIOUR		
Social interaction	41.51	25.94
Relationships	47.09	39.25
Engagement	54.17	38.70
COGNITION		
Executive function	31.67	15.84
Attention & Memory	56.97	48.83
INHIBITION		
Sexual inhibition	60.72	36.43
Social inhibition	58.12	34.87
AGGRESSION		
Provocative behaviour	55.11	21.19
Irritability	54.56	54.56
Overt aggression	64.31	38.58
COMMUNICATION		
Speech & language	66.93	66.93
Mental state	64.89	64.89
TOTAL SUM OF RATINGS	53.12	32.95





Assessment

Repeat Assessment

Suggested implications & actions

Abnormal/
Review

Urgent
assessment &
rehabilitation
input required

Abnormal/
Review

Normal/
Dependent

Normal/
Independent

Rehabilitation unsuccessful; reconsider
formulation, inputs, suitability of service

NBD symptoms reduced to expected level;
determine if drivers modifiable, or static

NBD symptoms reduced to expected level;
gains likely to be independent of support

Normal/
Dependent

Determine if
drivers of NBD
amenable to
modification

Abnormal/
Review

Normal/
Dependent

Normal/
Independent

Deterioration & increase in NBD; re-evaluate
current levels of support

NBD symptoms remain at expected level;
drivers static, long-term support likely

NBD symptoms reduced to expected level;
gains likely to be independent of support

Normal/
Independent

NBD absent;
monitor only

Abnormal/
Review

Normal/
Dependent

Normal/
Independent

Deterioration & increase in NBD; urgent
assessment regarding reasons for this

NBD symptoms remain at expected level;
determine if support provided is required

NBD symptoms remain at expected level;
gains likely to be independent of support



When normal scores don't equate to independence: Recalibrating ratings of neurobehavioural disability from the 'St Andrew's – Swansea Neurobehavioural Outcome Scale' to reflect context-dependent support

Nick Alderman^{a,b}, Claire Williams^b, and Rodger LI. Wood^c

^aElysium Neurological, Badby Park, Daventry, Northants; ^bDepartment of Psychology, College of Human and Health Sciences, Swansea University, Swansea, UK; ^cNeuropsychology Clinic, College of Medicine, Swansea University, Swansea, UK

ABSTRACT

Primary objective: Context is critical to the interpretation of measurement instruments that capture acquired brain injury (ABI) outcomes. Ratings reflect behaviours and abilities observed in a particular setting; it cannot be assumed that results are generalizable beyond these. This study explored the utility of a method to convey the impact of context-dependent support given on ratings of neurobehavioural disability (NBD) using the St Andrews-Swansea Neurobehavioural Outcome Scale (SASNOS).

Methods and procedures: A supplementary SASNOS scoring system was developed using a mixed-methods approach. Dependency ratings were used to recalibrate standardised SASNOS scores to reflect support received. To aid interpretation, an expert panel reviewed SASNOS ratings for 50 ABI cases participating in residential neurobehavioural rehabilitation programmes. An end-user survey was undertaken to explore some of its psychometric properties. Finally, a representative case study was employed to illustrate its clinical utility.

Main outcomes: The expert panel identified three dependency profiles: (1) *Normal/Independent*; (2) *Normal/Dependent*; and (3) *Abnormal/Review*. Survey results supported face and construct validity of the supplementary system; the case study demonstrated benefits of discriminating between dependency profiles.

Conclusions: The supplementary scoring system enables SASNOS to convey the impact of support received on ratings of NBD, solidifying its usefulness for measuring outcomes in rehabilitation.

ARTICLE HISTORY

Received 7 February 2017
Revised 3 August 2017
Accepted 15 November 2017
Published online XX XX XXXX

KEYWORDS

Head injury; traumatic brain injury; assessment; neurobehavioural; rehabilitation

SASNOS Updates

- Website
- Collaborations
- Rebranding
- Translations
- Responsiveness
- Controlling for context-dependency
- SASNOS-R



What's Next: SASNOS-Revised

No instrument is perfect first time round...



What's Next: SASNOS-Revised

Recommendations from original SASNOS (2011) paper included:

- Replication of factor structure
- Larger, more representative samples
- Ability to distinguish between different neurological conditions

What's Next: SASNOS-Revised

Recommendations from original SASNOS (2011) paper included:

	SASNOS	SASNOS-R
Ratings people with ABI	Clinicians at the Kemsley Unit rated 95 service users	Larger sample (300+) to be rated from a full range of settings – community, residential & hospital To be rated by broad range of informants – relatives, clinicians & carers
Ratings neurologically healthy controls	100 staff & students at Swansea rated a person they knew well	Larger sample (300+), online recruitment, reflecting broader sample from society; includes demographic data from raters and those rated
Self-ratings	None	To include people with ABI & neurologically healthy controls

NBD Symptoms that Impact on Communication

- Current version has only 4 Communication items
- Feedback indicated current set of communication items was insufficient
- 30 potential new communication items identified



30 Potential Additional Items Identified

Speech

1. Speech is clear and intelligible.
2. Volume of speech is appropriate for context.
3. Maintains appropriate rate of speech.
4. Talks too fast.
5. Speech is slow.
6. Pitch of speech is appropriate to context.
7. Has difficulty with word finding.
8. Able to articulate ideas and needs clearly.

Communication with Others

1. Follows social routines and niceties in conversation e.g. asks how are you?
2. Makes inappropriate disclosures
3. Uses and interprets humour in conversation effectively.
4. Interprets all conversation literally, regardless of messaging intent.
5. Limited range of conversational topics.
6. Makes repetitive statements.
7. Fabricates information during conversation

Conversational Skills

1. Has difficulty keeping to topic in conversation.
2. Independently initiates communication with others.
3. Appears interested in what people are saying.
4. Dominates conversation.
5. Contributes little during conversation.
6. Conversation is characterised by turn taking.
7. Lacks awareness of communication errors.
8. Content of conversation is appropriate to context.
9. Conveys messages clearly.

Body Language

1. Stands too close to others.
2. Positions body to maximise effectiveness of communication.
3. Uses gesture appropriately.
4. Facial expressions are not appropriate to conversation topic.
5. Appears disinterested during conversations.
6. Appears detached from immediate surroundings (daydreaming).

Work Stream for Delivering SASNOS-R

- User feedback regarding Communication domain
- Generation of potential new Communication items
- Initial cleansing to improve reliability of items
- Data collection from neurologically healthy controls
- Data collection from people with ABI
- Item reduction – Rasch analysis
- Psychometrics - Reliability & Validity
- Dissemination
- Psychometrics - Responsiveness

Some Preliminary Demographics for Controls

- 331 response to date, 228 of which are complete
- 59 males/214 females rated 147 males/107 females
- Mean age rater 37.1 yrs, person rated 39.7 yrs
- Known person average 15.9 yrs (5 mths – 59 yrs)
- Rated: partner - 52.4%
relative - 25.2%
friend - 19.3%
colleague - 3.1%



Summary

- Context for today's programme
- Revisited SASNOS
- SASNOS updates:
 - ✓ Website
 - ✓ Collaborations
 - ✓ Rebranding
 - ✓ Translations
 - ✓ Responsiveness
 - ✓ Controlling for context-dependency
- Developments – SASNOS-R

News, Updates &
and Information

Join the SASNOS Community!

- Add <https://projects.swan.ac.uk/sasnos/> to your favourites
- Be a participant in our online study to generate normative data for SASNOS-R – visit the ‘Research Projects’ page on the website or go directly to <https://www.surveymonkey.co.uk/r/MZSJ3GS>
- Follow us on twitter @SASNOS_ABI
- Email us: SASNOS@swansea.ac.uk

Join our **community!**



An aerial photograph of the Swansea University campus. The university buildings are clustered in the center, surrounded by green lawns and trees. To the left, a sandy beach runs along the coast, with the sea visible. In the background, a residential area and rolling hills are visible under a clear blue sky.

Thanks for Listening



Swansea University
Prifysgol Abertawe