



A Neurobehavioural Rehabilitation Approach to the Management of Post-ABI Aggressive Behaviour Disorders

Professor Nick Alderman
Clinical Director, Neurobehavioural Rehabilitation Services
Elysium Neurological



In this session we will...

- Set the context – prevalence of aggression after ABI
- Aggression in NbR services
- Reduction of aggression – as a consequence of the therapeutic culture within NbR
- Reduction of aggression – as a consequence of additional individual interventions



Context of ever changing moral, ethical and legal back drop

- Mental Health Act
- Mental Capacity Act
- DoLS
- Political decrees
- Society attitudes
- Rights of the individual
- Growing culture of litigiousness?



Long-term Outcome

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



Fleminger, Greenwood & Oliver (2003)

“Of the many psychiatric symptoms that may result from brain injury, agitation and/or aggression are often the most troublesome.”



Baguley, Cooper & Felmingham (2006)

- Followed up TBI survivors (moderate – severe injury) 6, 24 and 60 months post-injury in Australia
- 25% demonstrated significant levels of aggression at each of these times, as defined by the researchers
- Concluded it was common and long-term following of TBI



Aggression after ABI

Kelly, Brown, Todd & Kremer (2008)

- Investigated challenging behaviour profiles of people with ABI in the community
- Aggression prolific
 - *86% verbally aggressive*
 - *41% aggressive to people*
 - *35% aggressive to objects*
- Aggression was a long-term consequence of ABI (*mean TSI 10 yrs, max 41 yrs*)



Tateno, Jorge & Robinson (2003)

- Literature review
- Prevalence varied 11 – 96% studies
- In their study, 34% had engaged in significant aggressive behaviour within 6 months after injury, as defined by the researchers



Aggression after ABI

Variability in outcome data, uncertainty about proportion of people with ABI for whom aggressive behaviour is an issue...

Tateno et al.(2003)

Found prevalence varied
11-96% studies

Confounded by inconsistent use of different terminology and methodologies



Irritability

Agitation

Anger

Aggression



Aggression after ABI



Is Aggression after ABI
Talked Up Too Much??



Aggressive Behavior Following Traumatic Brain Injury

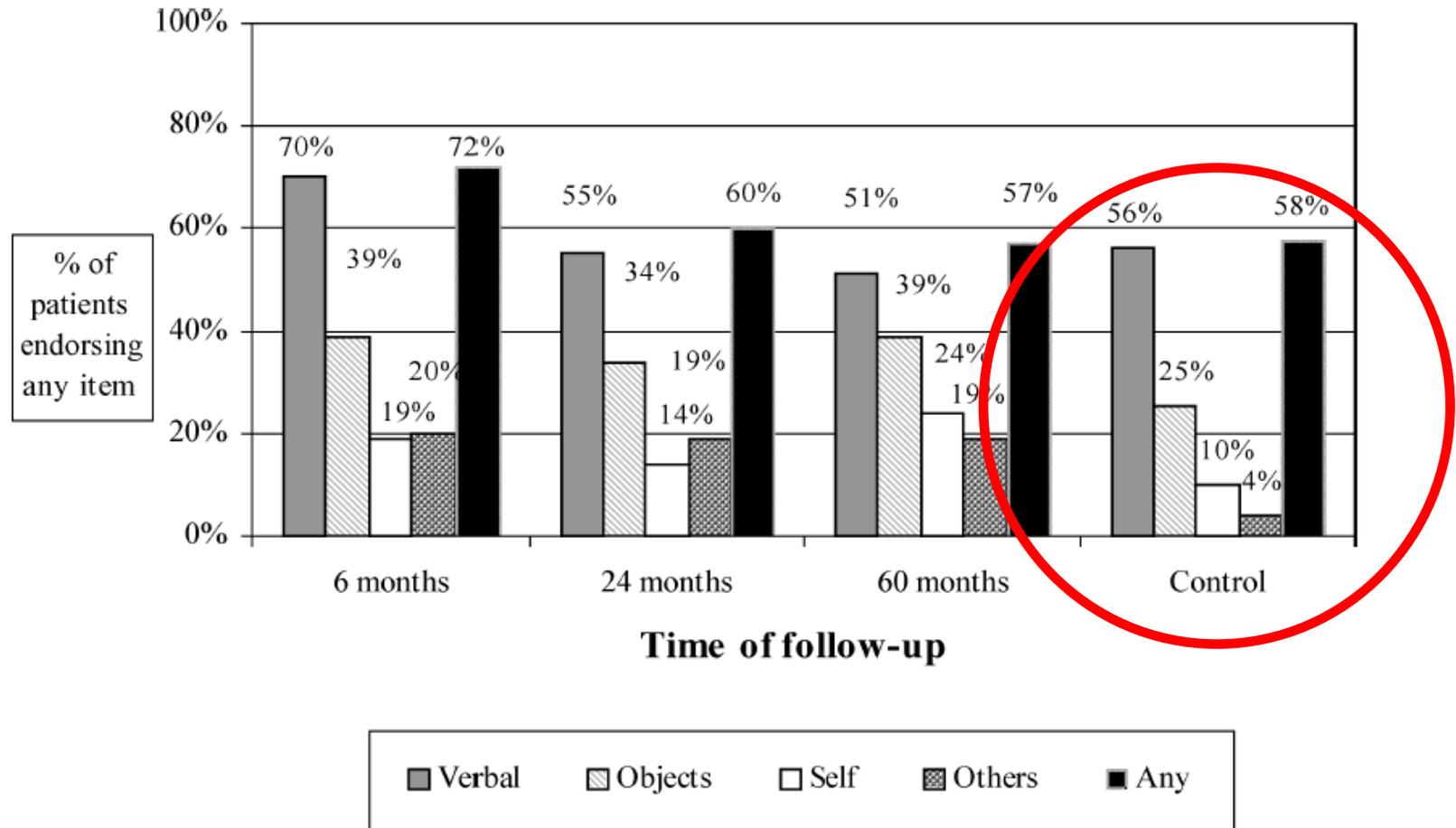


Figure 2. Endorsement of items on the subscales of the Overt Aggression Scale. *Note:* Legend refers to number of patients who ticked any item on the following Overt Aggression Scale subscales: verbal = verbal aggression; objects = physical to objects; self = physical to self; others = physical to others; any = any item at all on the Overt Aggression Scale. (More details about the Overt Aggression Scale and its subscales can be found in Appendix.)

Aggressive Behavior Following Traumatic Brain Injury

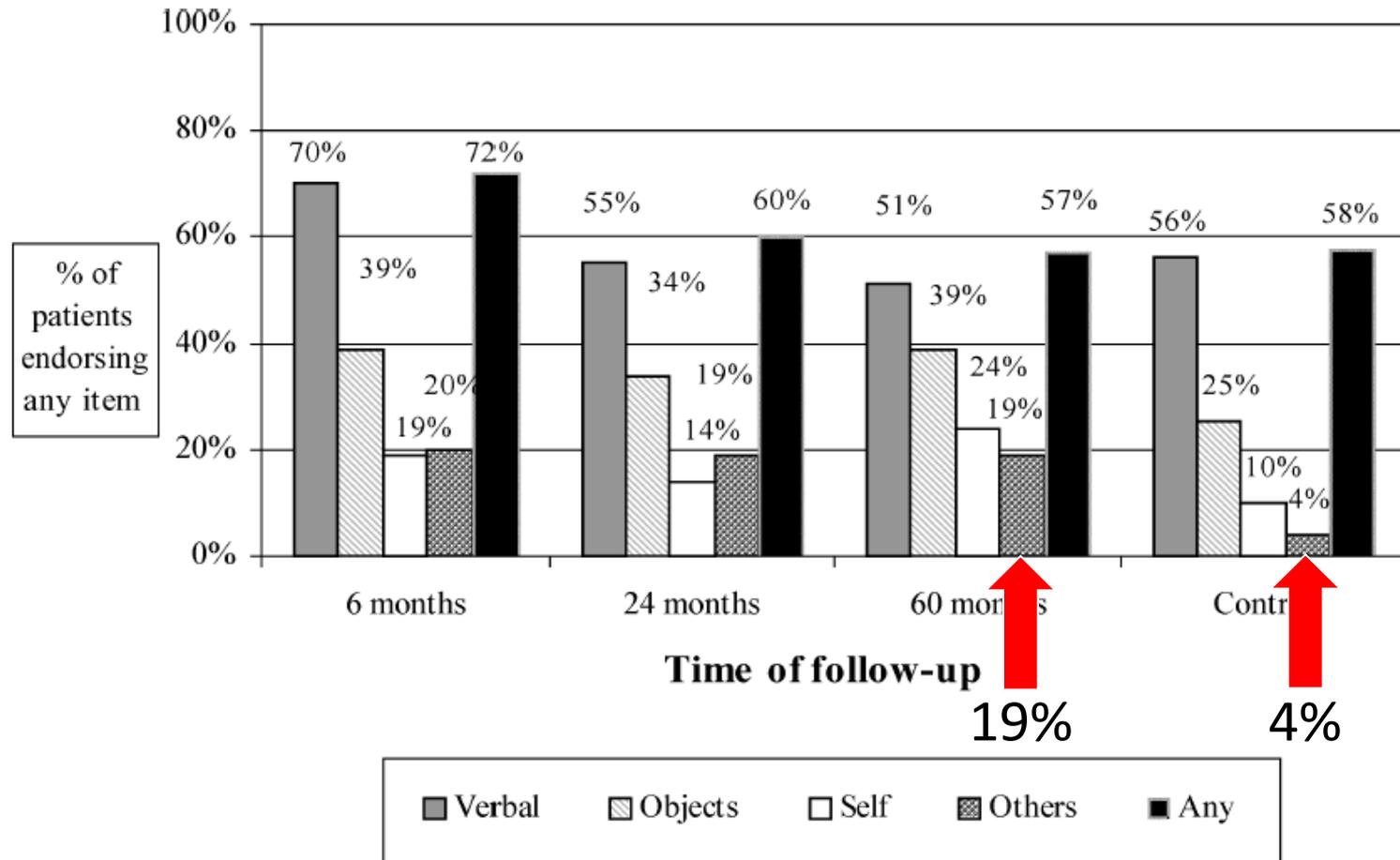


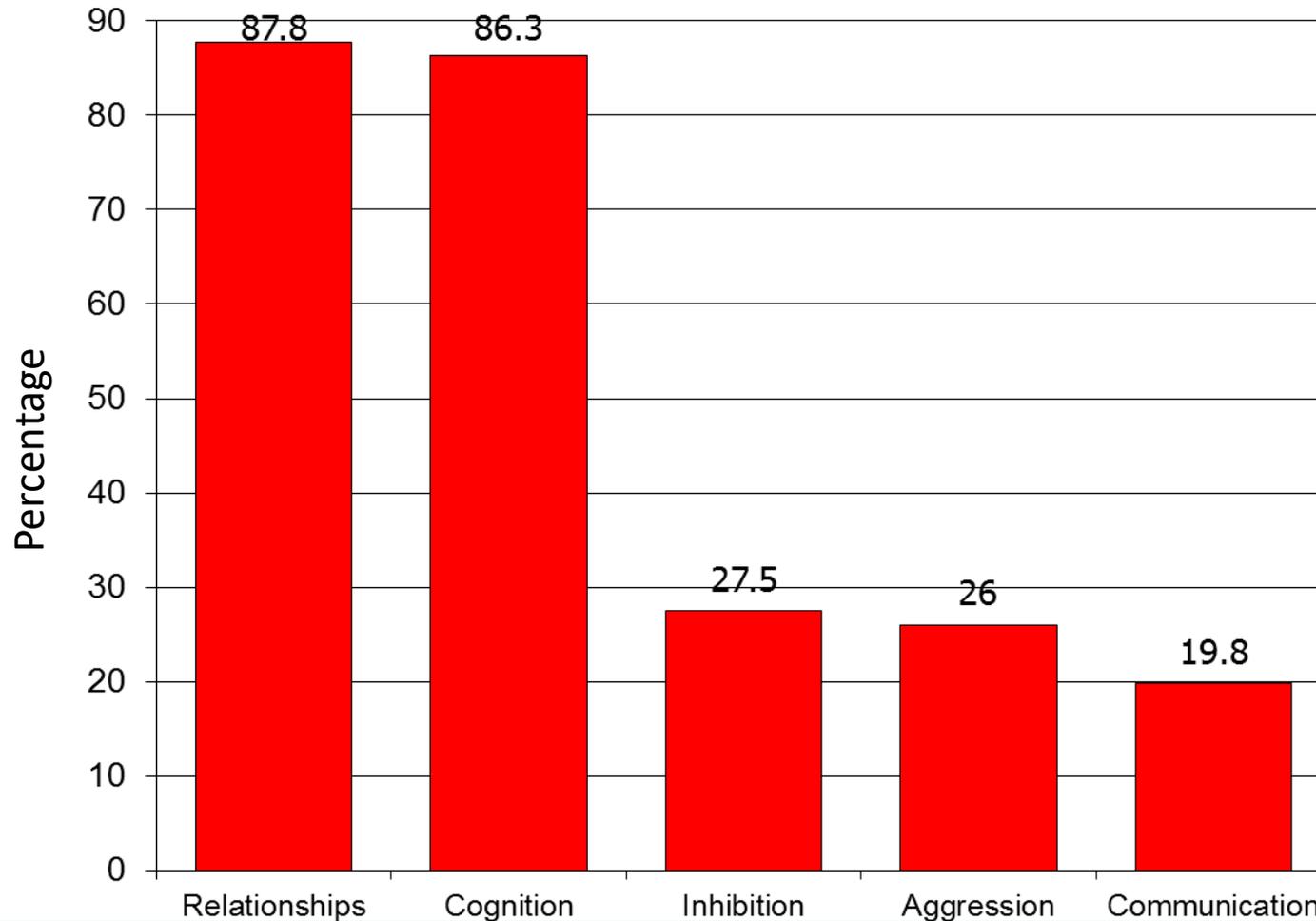
Figure 2. Endorsement of items on the subscales of the Overt Aggression Scale. *Note:* Legend refers to number of patients who ticked any item on the following Overt Aggression Scale subscales: verbal = verbal aggression; objects = physical to objects; self = physical to self; others = physical to others; any = any item at all on the Overt Aggression Scale. (More details about the Overt Aggression Scale and its subscales can be found in Appendix.)

How Characteristic is Aggressive Behaviour Typical of People Referred to Neurobehavioural Services?



Aggression in NbR Services

Percentage Admissions to NbR Services Whose SASNOS Domain Scores Are $<1SD$ from Neurologically Healthy Norms

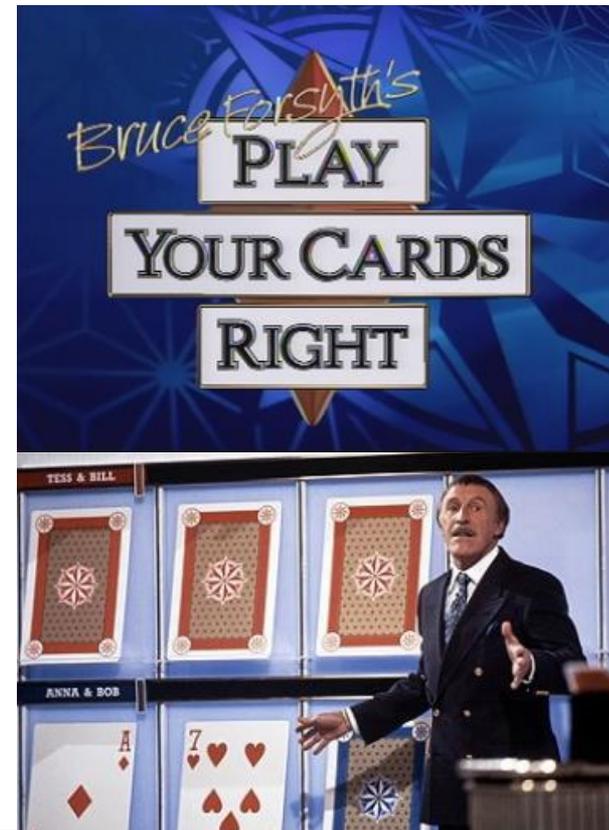


Aggression in NbR Services

Aggressive behaviour
exhibited by 108
participants in NbR over
a 14 day period



5548 episodes



Aggression in NbR Services

Prevalence of Aggression in NbR Services

	N	Days	Total	Percent patients by percent aggressive incidents		
				None	<50%	50% or more
Current study	76	28	4559	19.7	77.7	2.6
Alderman et al., 2002	46	14	3914	23.9	71.9	4.2
Alderman et al., 2007	108	14	5548	26.9	69.1	4.0
Alderman et al., 2009	91	84	9804	17.6	74.7	7.7

Source:

Alderman, N., Major, G. and Brooks, J. (2016). What can structured professional judgement tools contribute to management of neurobehavioural disability? Predictive validity of the Short-Term Assessment of Risk and Treatability (START) in acquired brain injury. Neuropsychological Rehabilitation.



Aggression & NbR Services

- Neurobehavioural services are asked to manage very high levels of aggression
- Expert assessment of NBD including aggression
- Capability to manage and reduce aggression
- Structures and organisation promote rich, positive therapeutic climate that encourages success
- Therapeutic milieu acts as prosthetic that circumvents some neurocognitive and social drivers of aggression
- Comprehensive evidence base



Outcomes from NbR

J Head Trauma Rehabil
Vol. 26, No. 3, pp. 202–211
Copyright © 2011 Wolters Kluwer Health | Lippincott Williams & Wilkins

Applications of Operant Learning Theory to the Management of Challenging Behavior After Traumatic Brain Injury

Rodger LI Wood, PhD; Nick Alderman, PhD

For more than 3 decades, interventions derived from learning theory have been delivered within a neurobehavioral framework to manage challenging behavior after traumatic brain injury with the aim of promoting engagement in the rehabilitation process and ameliorating social handicap. Learning theory provides a conceptual structure that facilitates our ability to understand the relationship between challenging behavior and environmental contingencies, while accommodating the constraints upon learning imposed by impaired cognition. Interventions derived from operant learning theory have most frequently been described in the literature because this method of associational learning provides good evidence for the effectiveness of differential reinforcement methods. This article therefore examines the efficacy of applying operant learning theory to manage challenging behavior after TBI as well as some of the limitations of this approach. Future developments in the application of learning theory are also considered.

Keywords: behavior management, challenging behavior, cognitive impairment, operant learning theory, traumatic brain injury

AN IMPORTANT ELEMENT of brain injury rehabilitation is behavior change. Although this statement may initially evoke surprise, most rehabilitation practitioners would accept that a fundamental goal of rehabilitation is to help people change from being disabled and dependent to achieve a level of functioning that allows at least semi-independent living in the community. Following brain injury, many people have to learn new domestic and social routines. These need to be established as habit patterns in order that they can operate in a more or less automatic manner, independent of cognitive constraints, such as limited insight, poor social cognition, and a loss of cognitive flexibility, all of which impair decision making and act as obstacles to adaptive behavior. Other obstacles to community independence are challenging behaviors, such as labile mood, impulsivity, low tolerance, irritability, and poor temper control.¹ These forms of challenging behavior are so frequent after traumatic brain injury (TBI)^{2–3} that behavior

management methods to control them should be intrinsic to every brain injury rehabilitation unit because such behavior can impose constraints on a person's ability to engage in postacute rehabilitation programs, and may even prevent access to rehabilitation altogether, leading to poor psychosocial outcome.^{4–6} Unfortunately, this goal is yet to be achieved. The reluctance of many rehabilitation centers to accept patients who present a high risk of aggression is understandable when one considers how such behavior can jeopardize the safety of staff and other patients. However, this invariably means that many individuals will gravitate to unsuitable long-term management facilities¹⁰ because families are not able to cope with the stress of living with relatives who exhibit challenging behavior.^{11–14}

Many staff members who feel intimidated by the prospect of addressing challenging behavior have not been trained in behavior management techniques and often, the structure of their staff team does not lend itself to behavioral treatment interventions. This review therefore aims to examine a range of behavior management applications, derived largely from operant learning theory, that have been applied in a variety of postacute settings. The reason we focus on operant methods is that of the 3 major learning theories (classical, operant, and observational), brain injury rehabilitation has tended to rely most heavily on operant learning to address problems of challenging behavior. It is a method that has

Author Affiliations: Psychology Department, Swansea University, Swansea, United Kingdom (Dr Wood); National Brain Injury Centre, St Andrew's Healthcare, Northampton, United Kingdom (Dr Alderman); and St Andrew's Academic Centre, Kings College London, Northampton, United Kingdom (Dr Alderman).

Corresponding Author: Rodger LI Wood, PhD, Psychology Department, Swansea University, Singleton Park, Swansea SA2 8PP, Wales, United Kingdom (r.l.wood@swansea.ac.uk).

DOI: 10.1097/HTR.0b013e318217766d

202

STATE OF THE ART REVIEWS

Rehabilitation Approaches to the Management of Aggressive Behaviour Disorders after Acquired Brain Injury

Nick Alderman,^{1,2} Caroline Knight,^{3,4} and Jennifer Brooks³

¹ Brain Injury Services, Partnerships in Care, Grafton Manor, Grafton Regis, UK

² Brain Injury Research Group, College of Human and Health Science, Swansea University, Swansea, Wales

³ National Brain Injury Centre, St Andrew's Healthcare, Billing Road, Northampton, UK

⁴ Kings College London, St Andrew's Academic Centre, Northampton, UK

Symptoms of neurobehavioural disability acquired through brain injury, especially aggression, are associated with severe social handicap. Differences in terminology have resulted in varying estimates, but aggressive behaviour disorder appears to be characteristic of survivors at some point in their recovery journey. This paper provides a brief review regarding the prevalence, development and causes of aggression associated with acquired brain injury (ABI), and what can be done to help manage them. The advantages of using standardised measures conceptualised for ABI in the assessment and formulation of aggressive behaviour disorders are especially highlighted. A range of treatment methods and the evidence base relating to these are described. The contribution of pharmacological therapies, cognitive behavioural therapy and behavioural interventions are explored. It is argued that the strongest evidence base is associated with behaviour therapy, especially when carried out in the context of neurobehavioural rehabilitation, and two case studies are described to illustrate the clinical advantages of interventions derived from operant theory. Comparative lack of ABI experts trained in the management of post-acute behaviour disorders remains a limiting factor.

Keywords: acquired brain injury, neurobehavioural disability, aggression, treatment, rehabilitation

Introduction

Acquired brain injury (ABI) is characterised by a wide range of physical, functional, cognitive, behavioural and psychosocial disorders, impairments and handicaps. Disturbance of behaviour is enduring and creates severe difficulties for people with ABI and their families (Hall et al., 1994). 'Neurobehavioural disability' (NBD) is a term that has evolved to highlight the combination of neurological and neuropsychological origins of behaviour disorders observed amongst people with ABI (Wood, 1990). NBD comprises elements of executive and attentional dysfunction, poor insight, problems with awareness and social judgement, labile mood, poor impulse control and a range

of personality changes (Wood, 2001). These result in serious long-term social handicap and poor psychosocial outcome (Kreutzer, Marwitz, Seel, & Serio, 1996).

Aggression is a distressing and debilitating consequence of NBD (Fleminger, Greenwood, & Oliver, 2006) and creates particular challenges for management. When this occurs in the context of rehabilitation, it can potentially prevent people with ABI from achieving their full potential for recovery (Burke, Wesolowski, & Lane, 1988). Some people are excluded from rehabilitation altogether (Prigatano, 1987). When this happens, people with ABI gravitate to placements for management purposes that are ill-equipped to meet their needs, including forensic services (Alderman, 2001).

Address for correspondence: Professor Nick Alderman, Brain Injury Services, Partnerships in Care, Grafton Manor, Grafton Regis, Northampton NN12 7SS, UK.
E-mail: N.Alderman@swansea.ac.uk

BRAIN IMPAIRMENT volume 14 NUMBER 1 May pp 5–20 © The Author(s), published by Cambridge University Press on behalf of Australian Academic Press Pty Ltd 2013 doi: 10.1017/brimp.2013.7

5

NeuroRehabilitation 32 (2013) 761–770
DOI:10.1233/NRE.130900
IOS Press

Review Article

Neurobehavioural approaches to the rehabilitation of challenging behaviour

Nick Alderman^{a,b,*} and Rodger LI Wood^b

^aBrain Injury Services, Partnerships in Care, Grafton Regis, UK

^bBrain Injury Research Group, College of Human & Health Science, Swansea University Swansea, Wales, UK

Abstract

BACKGROUND: Neurobehavioural disability (NBD) following acquired brain injury undermines capacity for independent social behaviour and results in serious long-term social handicap. The presence of challenging behaviour as a feature of NBD has obvious implications for rehabilitation and community reintegration.

OBJECTIVES: Behavioural approaches are seen by many as fundamental to the successful rehabilitation of challenging behaviour. This paper will a) define the nature of neurobehavioural rehabilitation; b) explore the characteristics of cases referred, and c) the outcomes achieved. Strengths, limitations and future developments of neurobehavioural approaches for challenging behaviour will be considered along with potential factors that limit generalisation and longevity of treatment gains.

METHODS: Literature review.

RESULTS: Neurobehavioural services are distinguishable from other forms of neurorehabilitation. There is considerable evidence supporting the central role of both positive behaviour supports and contingency management approaches in creating conditions that minimise neurocognitive impairment, facilitate new learning, and ensure a positive social climate in both specialised inpatient units and community settings. Possible limitations include over-reliance on evidence from successful accounts of single cases and lack of knowledge regarding generalisation.

CONCLUSIONS: Neurobehavioural rehabilitation is effective and can save care costs in the long term. More evidence regarding maintenance of gains is required.

Keywords: Challenging behaviour, aggression, operant learning theory, rehabilitation

1. Introduction

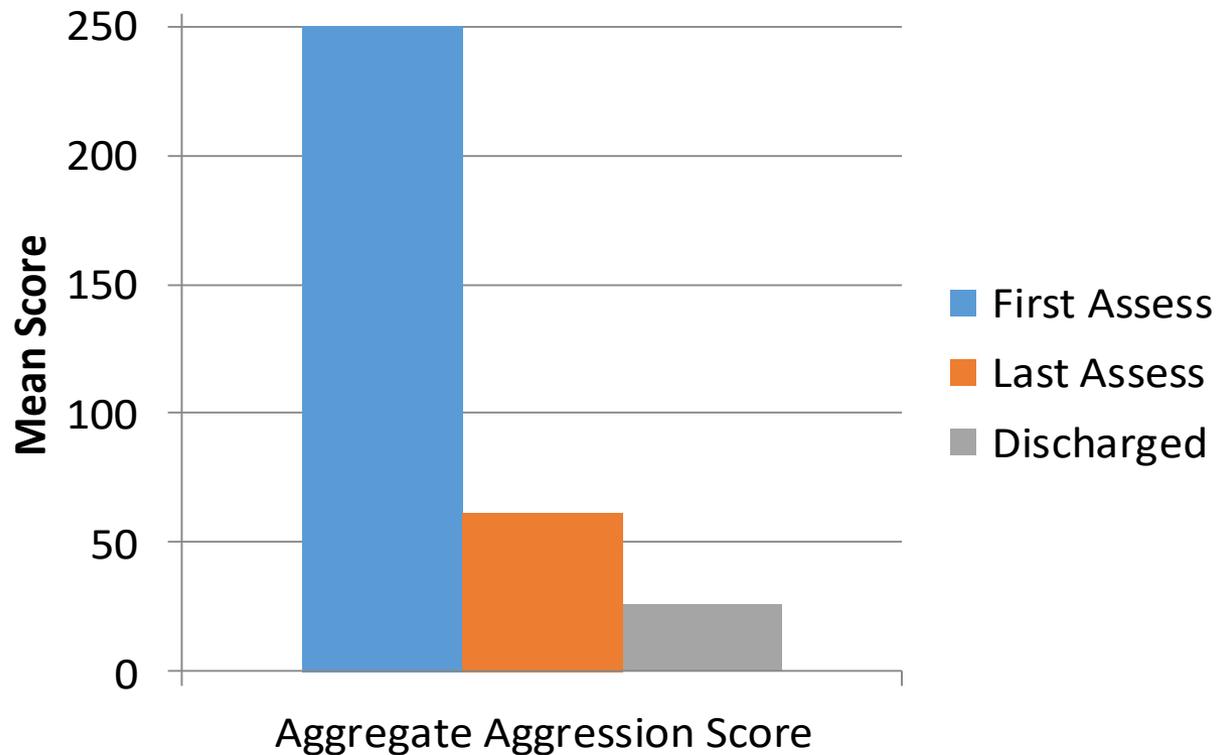
Neurobehavioural disability (NBD) comprises elements of executive and attentional dysfunction, poor insight, problems of awareness and social judgement, labile mood, altered emotional expression, poor impulse control and a range of personality changes (Wood, 1987, 1990a & b, 2001). This complex pattern of disability is the product of an interaction between

*Address for correspondence: Prof. Nick Alderman, Brain Injury Services, Partnerships in Care, Grafton Manor, Grafton Regis, Northampton, NN12 7SS, UK. E-mail: nick.alderman@partnershipsincare.co.uk.

1053-8135/13/\$27.50 © 2013 – IOS Press and the authors. All rights reserved

Outcomes from NbR

Reduction in Aggression on the OAS-MNR



- Percentage reduction in the AAS was 75.6% (61.7% previous year)
- Percentage reduction for discharged cases was just under 90%
- Remains superior to the benchmark figure of 53.2% for another major NbR provider



Why are NbR services able to manage and reduce aggression?

Suggest rehab participants require either:

1. A 'standard' NbR programme is sufficient...

...or...

2. A 'standard' NbR programme ***plus*** additional specialist intervention is required



What is 'Neurobehavioural Rehabilitation'?



NEUROBEHAVIOURAL REHABILITATION

An approach inspired by Gavin Tennent and pioneered in the UK by Peter Eames & Rodger Wood



Neurobehavioural rehabilitation attempts to alleviate social handicap arising from neurobehavioural disability

Delivered in context that understands ABI, determines brain-behaviour relationships, and intervenes to maximise personal autonomy



Characteristics of NbR

- Post-acute
- Neuropsychological model of rehabilitation
- Slow-stream rehabilitation
- Behaviour management capability
- Structured environment (incorporating systems of feedback & reinforcement)
- Transdisciplinary Team approach (TDT)
- Behaviourally-defined rehabilitation goals
- Community-based training



NbR in Practice

Social handicap arising from neurobehavioural disability improved through

1. The (re)acquisition of functional and social skills
2. Spontaneous and adaptive performance of these skills in the context of social behaviour

Learning theory is central to neurobehavioural rehabilitation as a means of understanding handicap and managing symptoms

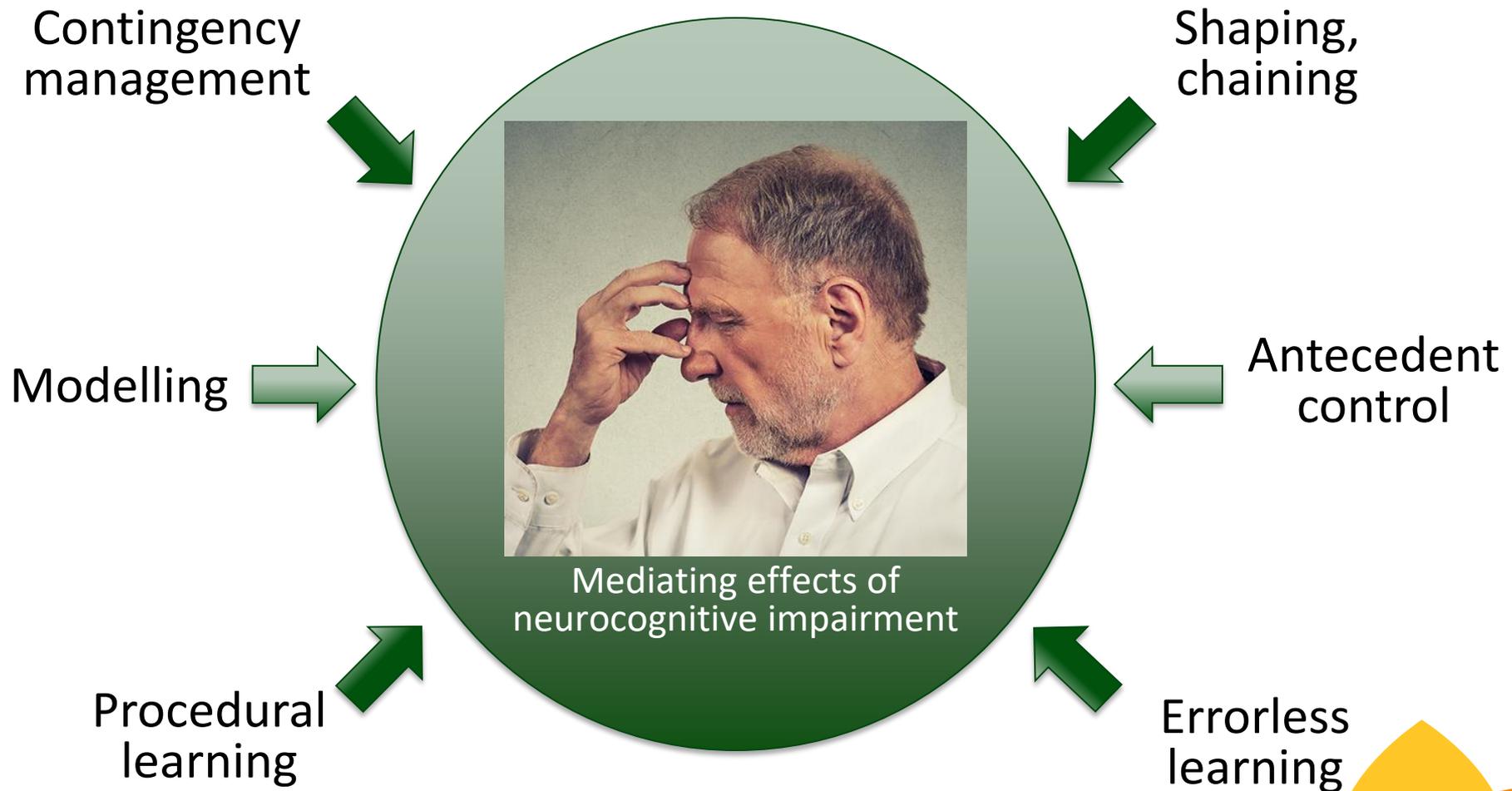


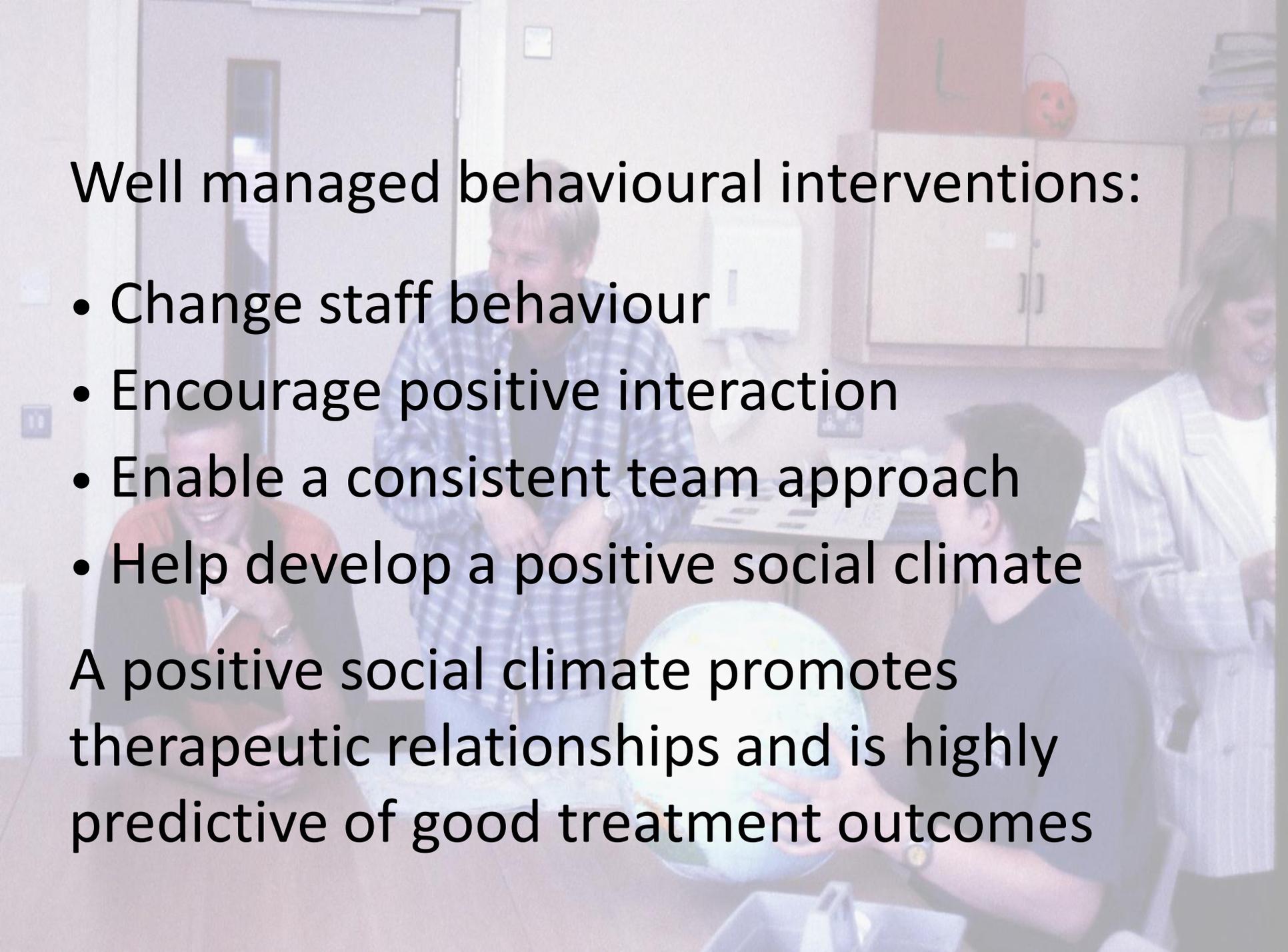
Learning Theory Underpins NbR

- Promotes and underpins a highly structured approach.
- Framework to understand NBD symptoms, and plan and deliver rehabilitation.
- Therapy interventions in every discipline draw heavily from learning theory, especially operant conditioning & procedural learning
- Practitioners need to have knowledge of these methods and supervision to devise effective rehabilitation interventions
- NbR programmes therefore typically led by clinical neuropsychologists rather than medical doctors



NbR in Practice – applying learning theory





Well managed behavioural interventions:

- Change staff behaviour
- Encourage positive interaction
- Enable a consistent team approach
- Help develop a positive social climate

A positive social climate promotes therapeutic relationships and is highly predictive of good treatment outcomes

NbR in Practice

The Transdisciplinary Team (TDT)



The Transdisciplinary Team (TDT)

- Therapy does is not limited to timetabled *sessions*, with qualified *therapists* during the nine-to-five working day
- Interventions are continually applied
- Effort and achievements are reinforced through interaction with every member of the team
- The whole team are empowered to regard their role as that of agent for behaviour change



NbR in Practice

The overall effect of these structures is creation of a 'prosthetic environment' within which a person's awareness and capacity for social learning are optimised
(Wood & Worthington, 2001)

- Increases awareness
- Improves motivation
- Shapes behavioural responses into acceptable forms
(Wood, 1990)



Aggression Reduction in NbR

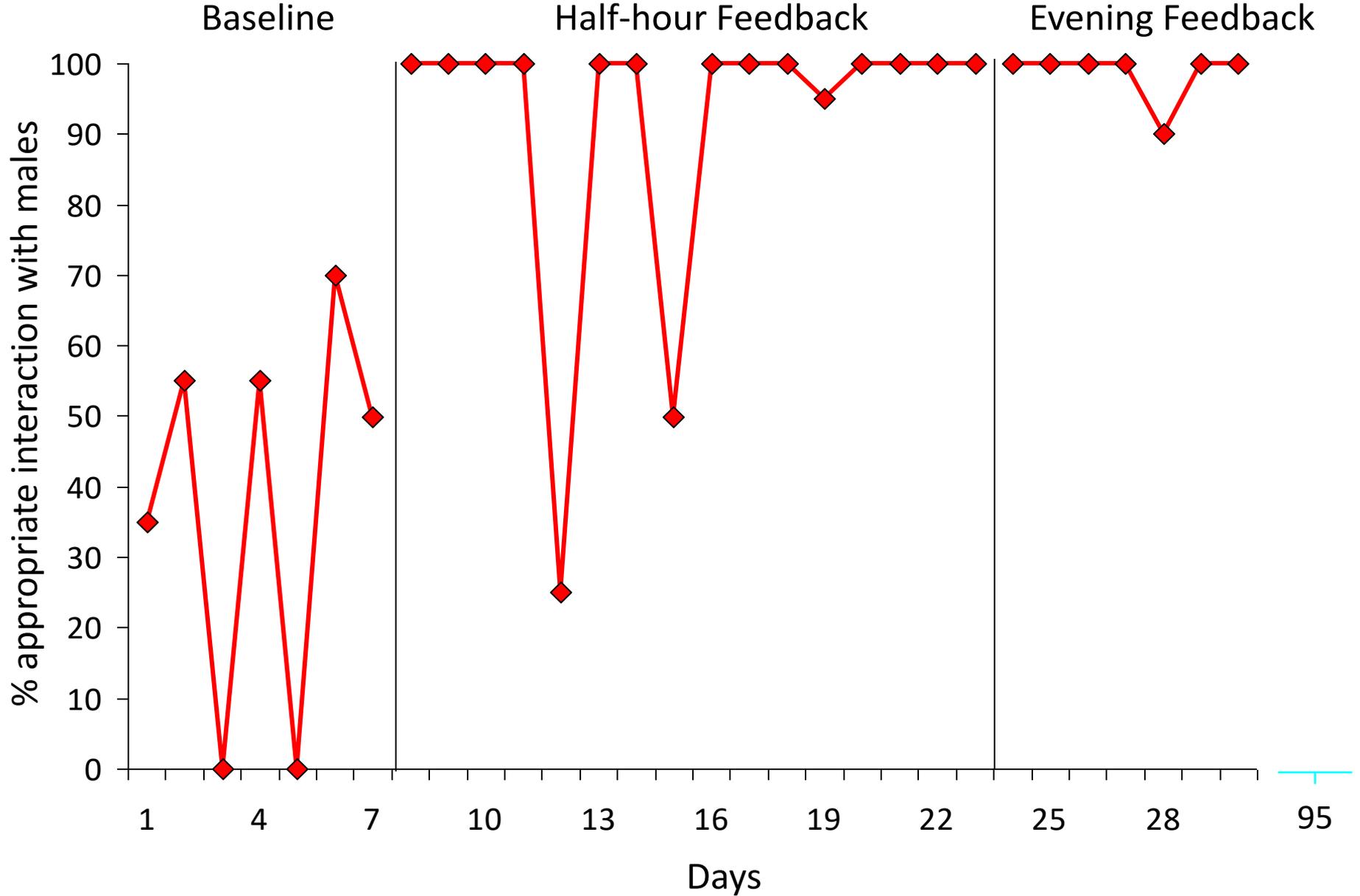
“Disinhibition is characterised by inadequate self-monitoring resulting in impulsive and inappropriate social behaviour”

(Becker & Vakil, 1993)

Programmed feedback may circumvent monitoring difficulties that drive behaviour problems



Effect of Scheduled Feedback on Inappropriate Interaction with Males in a 19 yr Old Female with Severe CHI



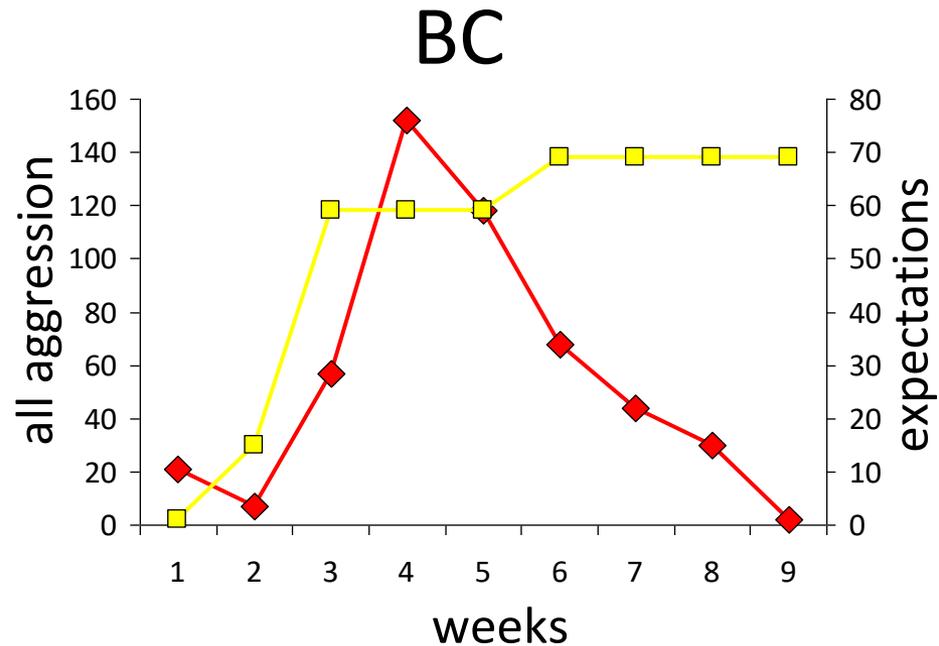
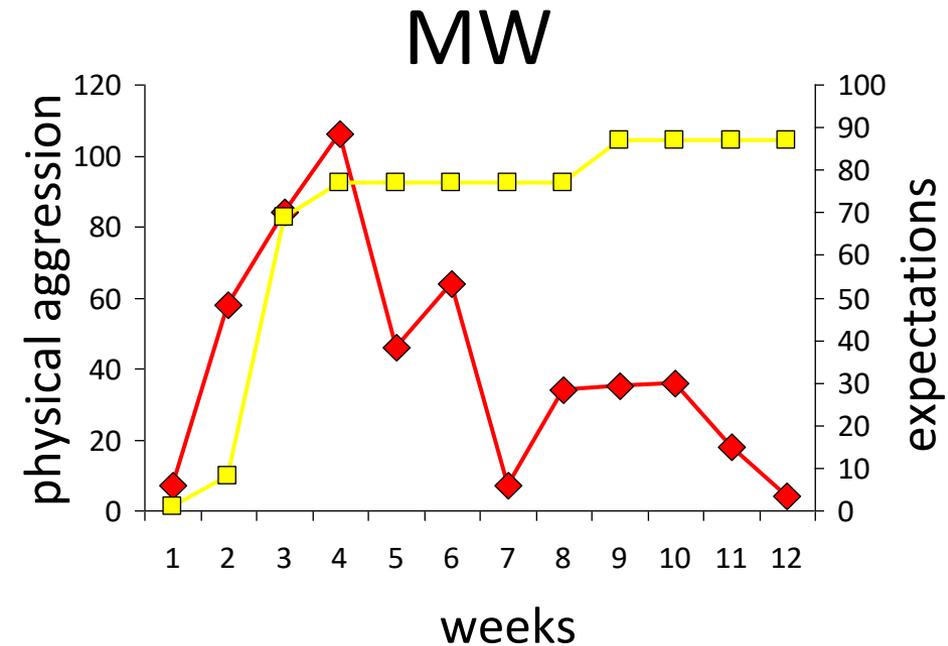
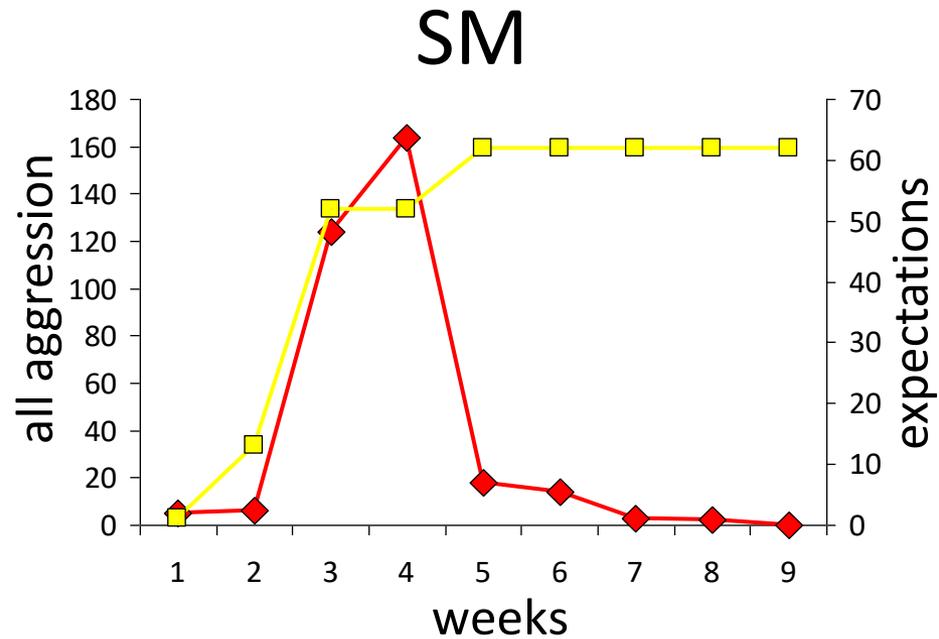
Creation of prosthetic environment that circumvents cognitive and other problems that drive/maintain DES behaviour problems

May be one reason why some aggressive behaviour disorders quickly resolve following admission to NbR or implementation of a system that emphasises feedback



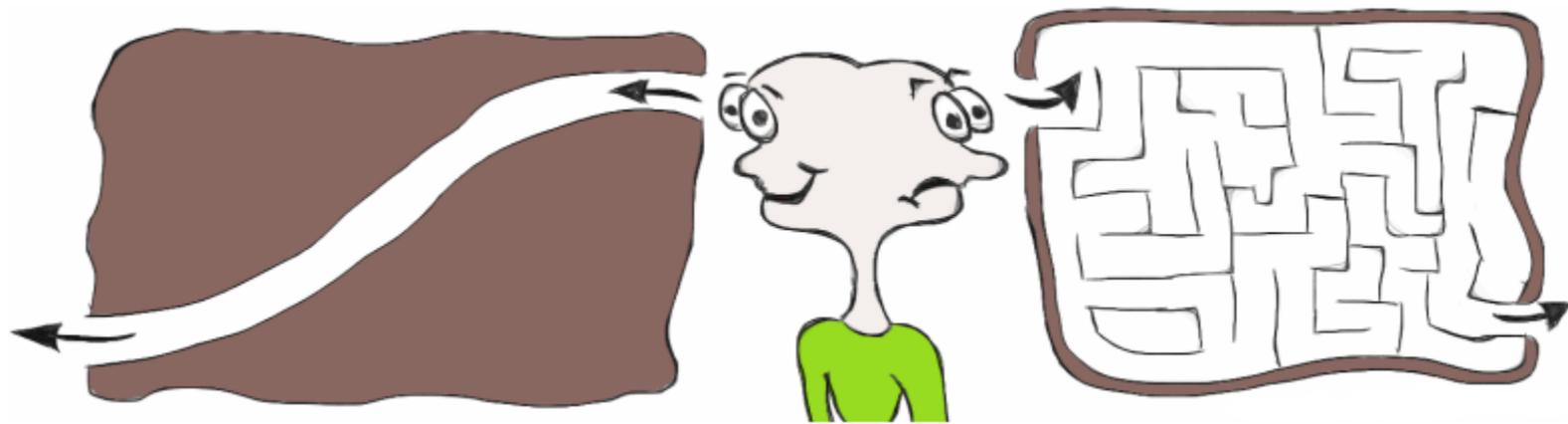
Reduction of Overt Aggression Whilst Increasing Rehabilitation Expectations in NbR

- Frequency aggression (OAS-MNR)
- Expectations (NES)



Aggression Reduction in NbR

When a 'Standard' NbR Programme is not enough...

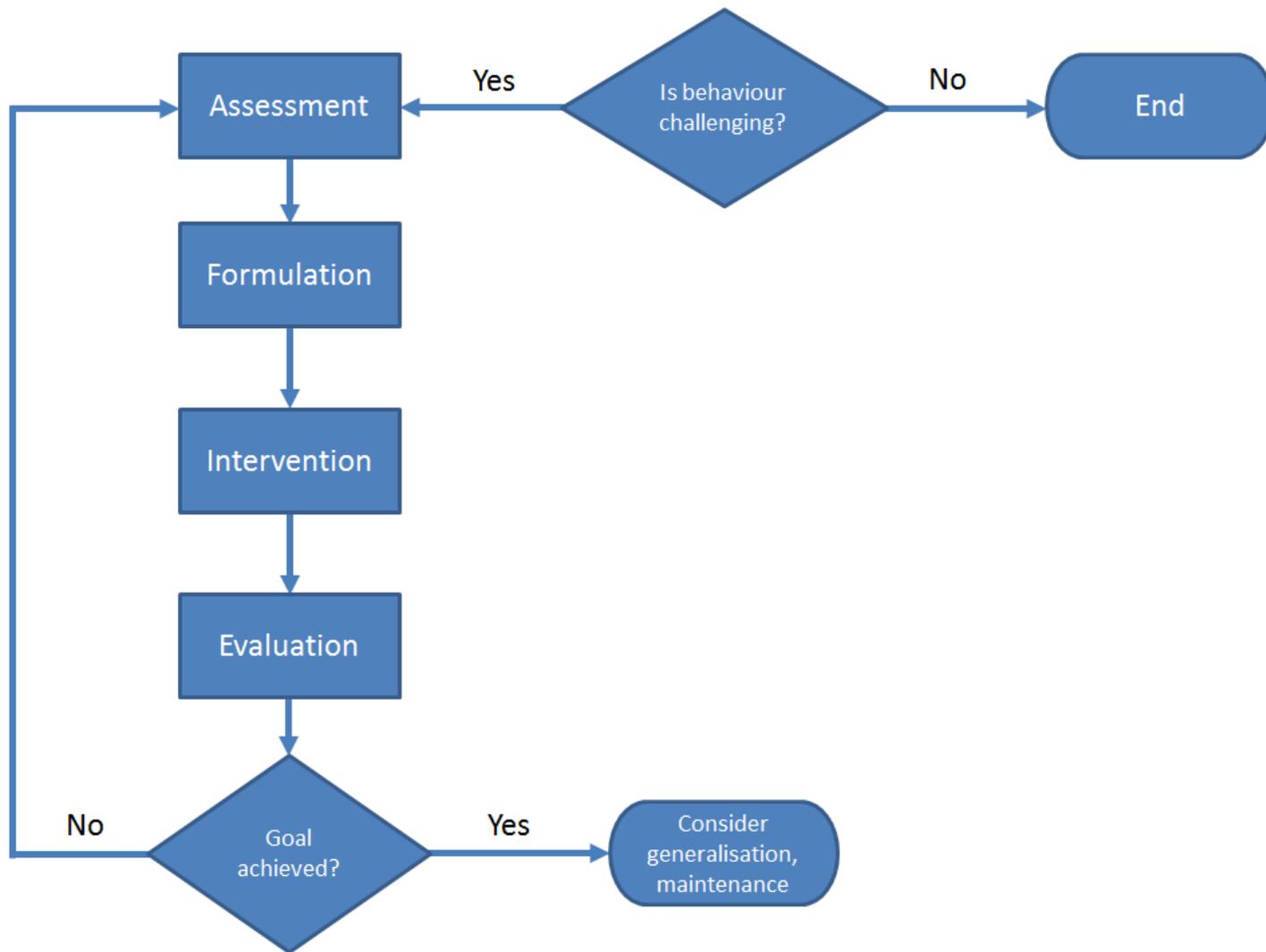


'Standard'

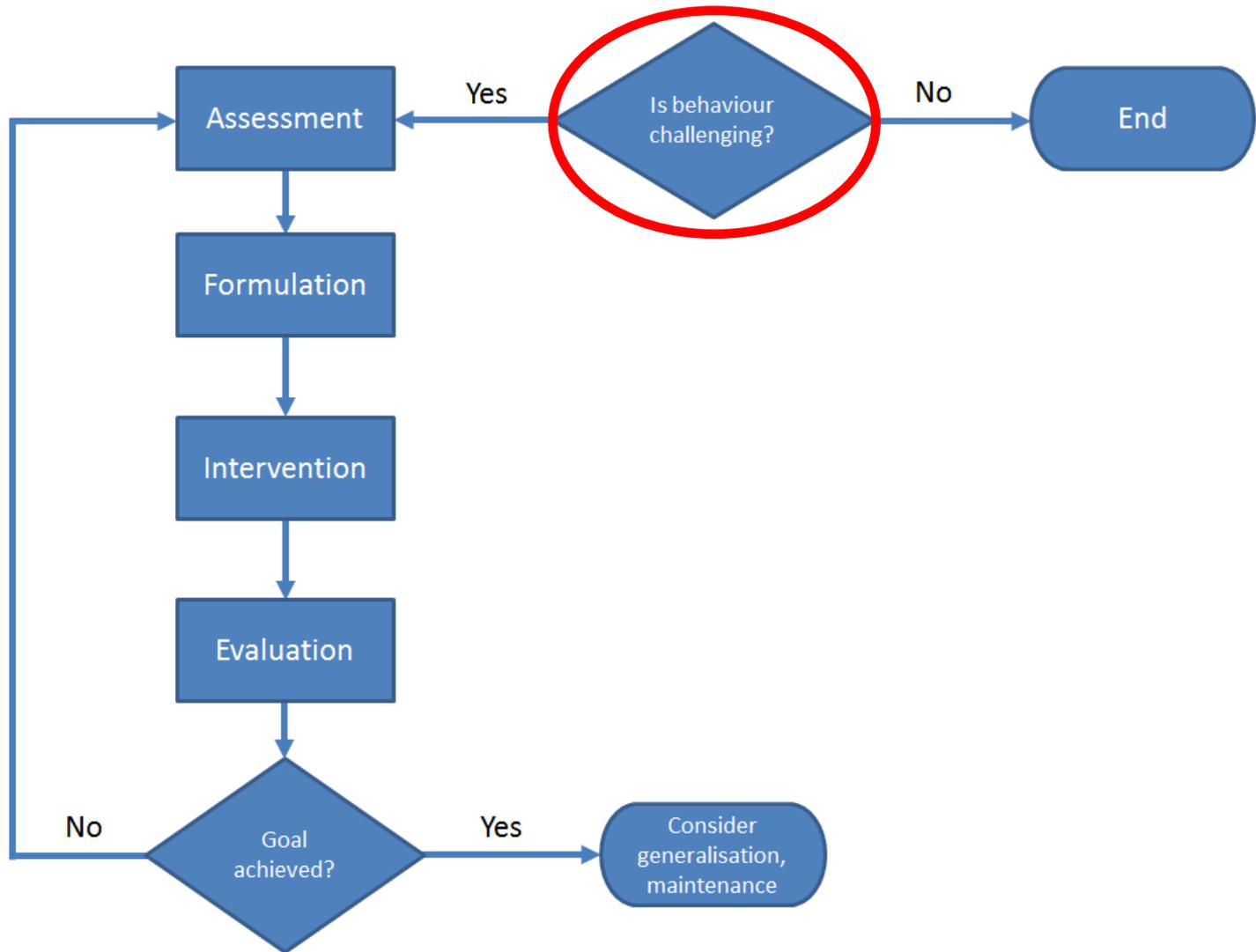
'More Complex'



NbR in Practice



NbR in Practice



Consider the
morality of
behaviour
change



What constitutes ABI 'challenging behaviour'?



- *Is the behaviour 'challenging'?*
- *Is it 'right' to intervene?*





Behaviour judged by many yardsticks...
...e.g. society norms vs. individual beliefs

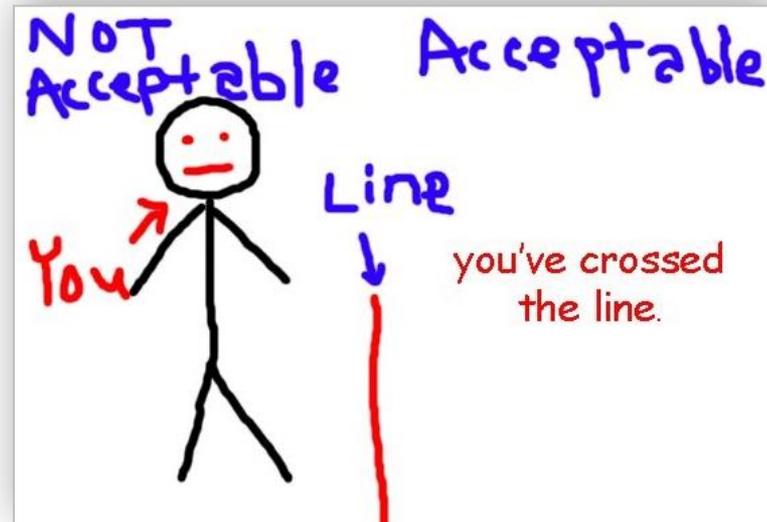




Aggression in NbR Services

Aggression that is 'acceptable' vs. 'not acceptable' dependent on many factors:

- Age & gender
- Context
- Applicable norms
- Status of aggressor
- Perception and values of perceiver



Aggression in NbR Services

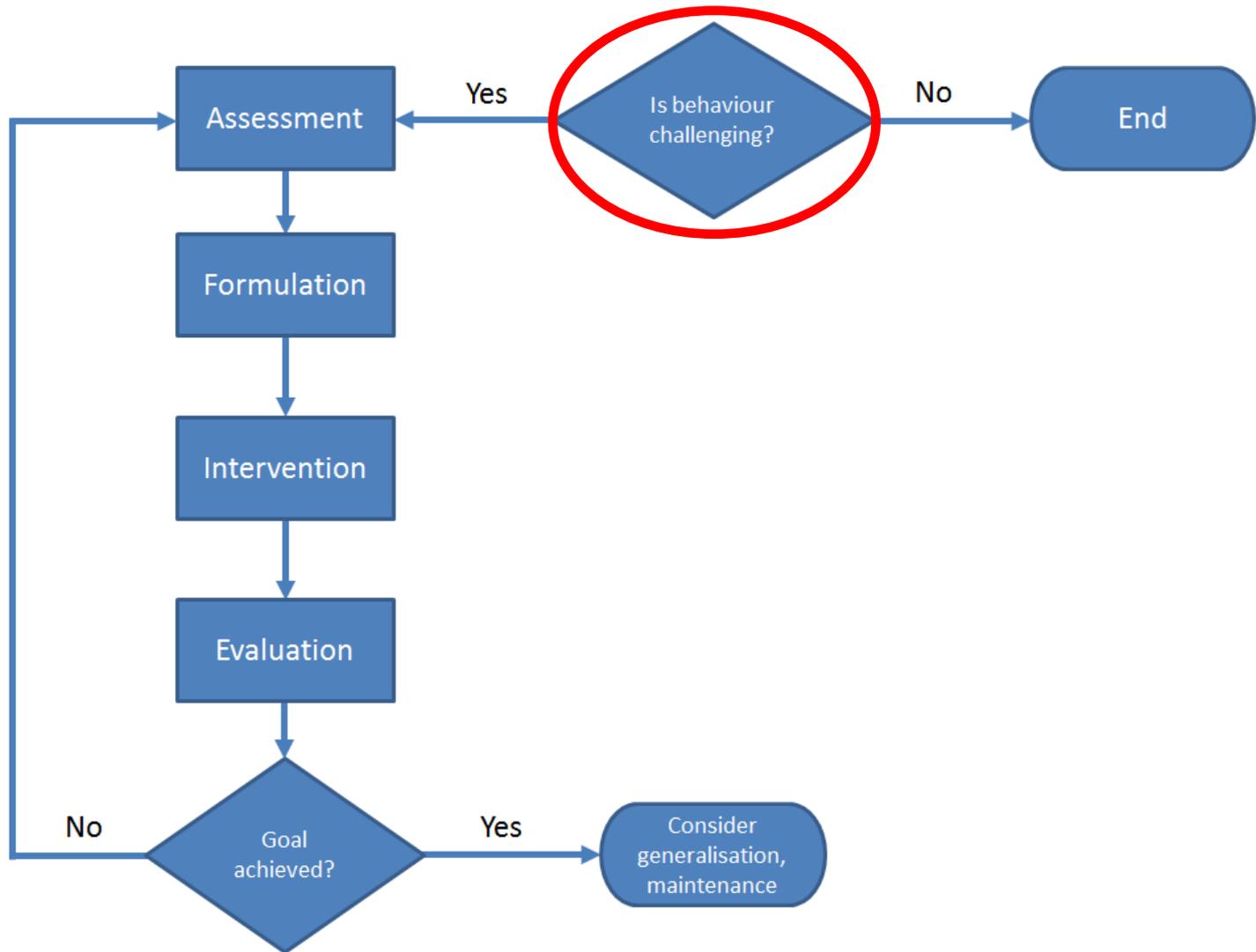
Behaviours (inc. aggression) whose presence:

- Increases vulnerability
- Limits/delays access to community resources
- Constrains participation in post-acute neurorehabilitation leading to failure to exploit and attain the persons full potential for recovery



(Eames & Wood, 1985; Wood, 1987; Alderman, 2001)

NbR in Practice



Intervention Must be Preceded by Assessment

- Determine factors driving behaviour disorder
- ABI knowledge essential to understand these factors
- Knowledge of ABI, leaning theory and especially functional analysis provides a means of understanding symptoms of NBD
- Provides individualised approach



Why can aggressive behaviour be a consequence of ABI?



Aggression After ABI

Miller (1994)

- Neurologically mediated
 - ✓ Orbitofrontal cortex and its connections, deprives cognitive functions of ability to suppress emotional reactions – has clear antecedents
 - ✓ Episodic dyscontrol syndrome (EDS) – trivial antecedents, aggression out of proportion
- Exacerbation Negative Premorbid Traits
 - ✓ Impulsive, inflexible, poorly developed self-control pre-injury, more evident post-injury



From Miller (1990):

“Hey, so I get drunk and start fights - what do you expect?”

I was a mean mother ** before my accident, and my brain damage has made me one biogeneticlly dangerous dude.”***

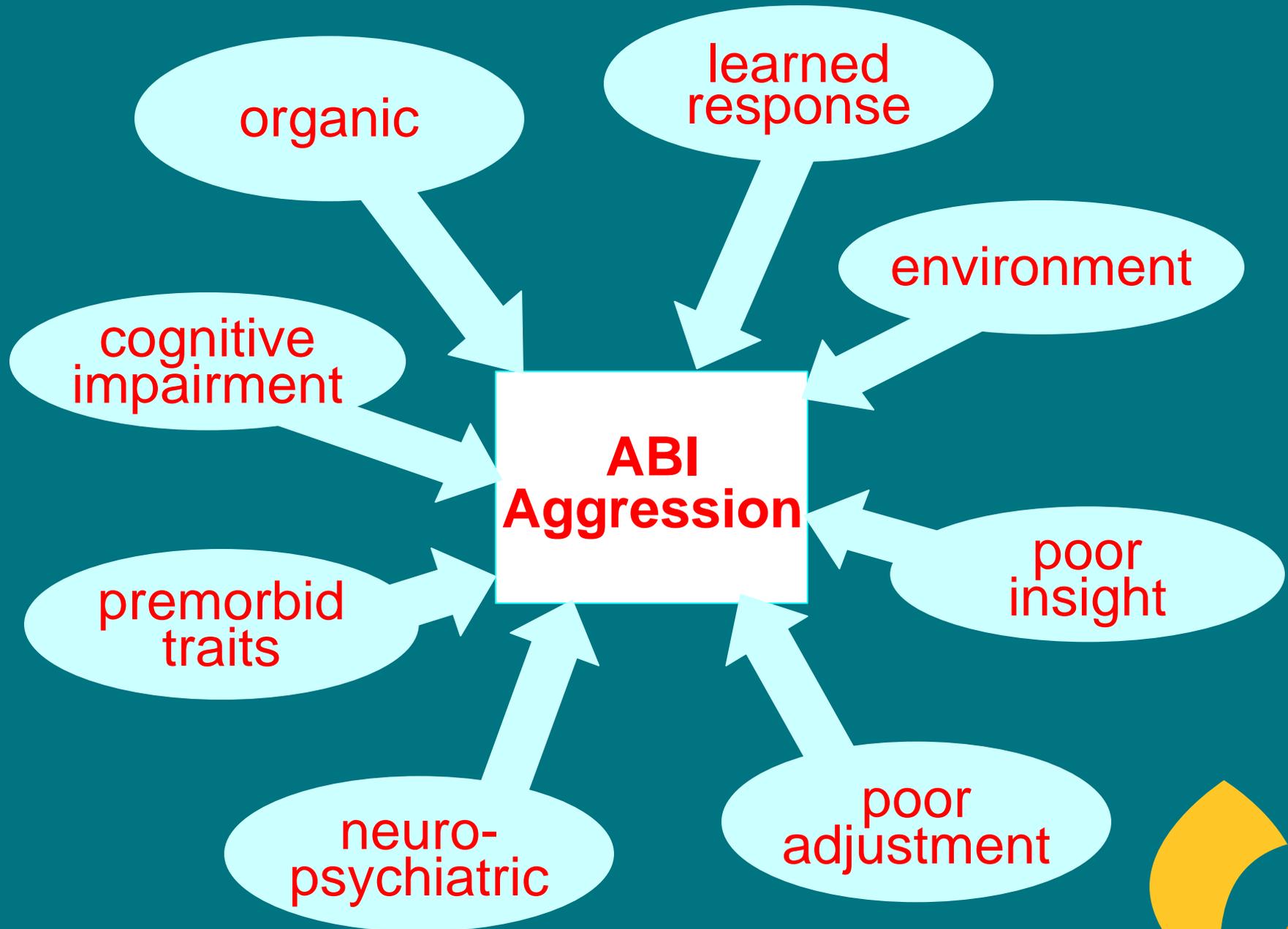
(stated with a grin)



Aggression After ABI

- Neurocognitive impairment
 - ✓ executive function disorders especially
 - ✓ lack of 'error awareness' results in frustration and aggression
- Environmental factors
 - ✓ interaction with carers and clinicians
- Post-injury learning
 - ✓ aggression serves avoidance/escape function





Functional Assessment of Behaviour

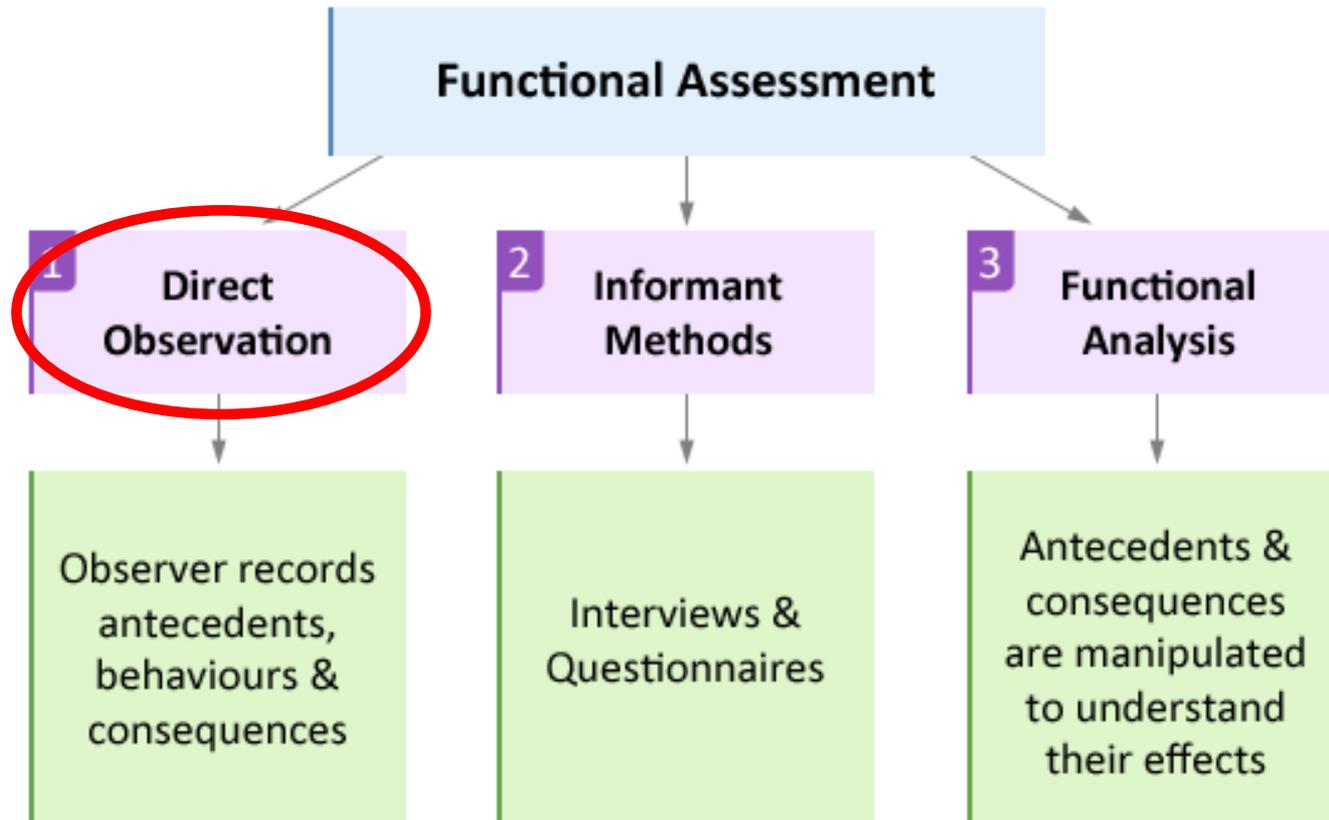
Determining reasons that drive behaviour using conceptual framework provided by operant conditioning:

- Identify relationship of behaviour with environment
- Setting events?
- Antecedents that evoke behaviour?
- Reinforcing consequences that maintain it?



Assessment of ABI Aggression

Functional Assessment Methods



Assessment of ABI Aggression

- Whilst there are many measures of aggression, the OAS-MNR was specifically validated for use with ABI and NbR
- The OAS-MNR has known psychometric properties (Alderman, Knight & Morgan, 1997; Giles and Mohr, 2007)

BRAIN INJURY, 1997, VOL. 11, NO. 7, 503-523

Use of a modified version of the Overt Aggression Scale in the measurement and assessment of aggressive behaviours following brain injury

NICK ALDERMAN, CAROLINE KNIGHT
and COLLETTE MORGAN

Kemsley Division, St Andrew's Hospital, Northampton, UK

(Received 13 August 1996; revision received 16 December 1996; accepted 20 December 1996)

Aggressive behaviour creates a significant challenge in neurorehabilitation. Despite the success in using behaviour modification principles in the treatment of post-acute behavioural problems, psychopharmacological approaches to the management of aggression are more frequently reported. However, inconsistencies apparent in the literature hinder inter-study comparisons of treatment methods. These include severity of brain injury, neuropsychological status and rigour of experimental methodology used. Data about aggression is also inconsistently reported, especially with regard to classification and severity. Descriptions of how aggressive behaviour responded to pre-treatment is also generally absent. In this paper an observational rating scale is described in an attempt to address these inconsistencies. The Overt Aggression Scale has been modified by increasing the range of interventions to reflect current practice in neurorehabilitation, and by changing the language to make it suitable for UK users. A range of antecedents has also been added to make the scale useful in behavioural analysis. Preliminary results indicate inter-rater reliability is good, and it is a valid indicator of type and severity of aggression. Antecedents and interventions used in the management of aggressive behaviours in neurorehabilitation are also illustrated. Clinical use of the scale is also discussed.

Introduction

In addition to the complex physical, emotional and cognitive problems imposed through severe brain injury, the presence of behavioural problems is a serious obstacle to overcome if the survivor is to successfully reintegrate within society. Although the range of behavioural problems is diverse, it is the presence of aggression that characteristically causes most concern. As well as being persistent and enjoying longevity, aggressive behaviour disorders may also increase in severity with the passage of time [1,2].

The presence of aggression, particularly when this involves physical assaults on others creates special problems for units who attempt to deliver rehabilitation to survivors of brain injury. Physical aggression compromises the safety of patients and staff, increases the vulnerability of the person who engages in it, and may prevent the individual from achieving their full rehabilitation potential [3]. Uncontrolled aggression may totally exclude the individual from some rehabilitation programmes

Correspondence to: Dr Nick Alderman, Consultant Neuropsychologist, Kemsley Division, St Andrew's Hospital, Billing Road, Northampton NN1 5DG, UK.

0269-9052/97 \$12.00 © 1997 Taylor & Francis Ltd.

Downloaded By: [Swets Content Distribution] At: 13:08 5 September 2007

OVERT AGGRESSION SCALE – MODIFIED FOR NEUROREHABILITATION (OAS-MNR)

Alderman, Knight & Morgan, 1997

1. BEHAVIOURS

	Verbal aggression VA	Physical aggression against objects PO	Physical aggression against self PS	Physical aggression against other people PP
1	Makes loud noises, shouts angrily, is not person directed. E.g. "Bloody hell"	Slams doors scatters clothing, makes a mess in response to clear antecedent	Picks/scratches skin, hits self, pulls hair (with no/minor injury)	Threatening gesture clearly person directed, swings at people, grabs clothes, spitting at people
2	Mild personal insults clearly directed at some other person, not including swearing/offensive sexual comments. E.g. "You are stupid, idiot"	Throws objects down, kicks furniture without breaking it, marks the wall (without others being at risk of being hit)	Bangs head, hits fist into object, throws self onto floor or into objects (hurts self without serious injury)	Strikes, kicks, pushes, pulls hair (without significant injury)
3	Swearing, moderate threats clearly person directed at others or self e.g. "Fuck off you bastard"	Breaks objects, smashes windows	Inflicts small cuts, bruises, minor burns to self	Attacks others causing mild-moderate physical injury (bruises sprains, welts) to person aggression directed at
4	Clear threats of violence directed at others or self. E.g. "I'm going to kill you"	Sets fire, throws objects dangerously (some other person is at risk of being hit, regardless of intention)	Mutilates self, causes deep cuts, bites that bleed, internal injury, fracture, loss of consciousness, loss of teeth	Causes severe physical injury (broken bones, internal injury) to person aggression directed at

2. ANTECEDENTS

Set One Contributing Factors (coded 1-3)
<ol style="list-style-type: none"> 1 Structured activity 2 Noisy environment 3 Had epileptic fit in last 24 hrs
Set Two Observed Directly Before Behaviour (coded 11-25)
<ol style="list-style-type: none"> 11 Given direct verbal prompt to comply with instruction 12 Given verbal guidance/advice to assist completion of task/activity 13 Given verbal/visual feedback about performance 14 Direct response to other clients verbal behaviour 15 Request specifically denied by other person 16 Any other verbal interaction 17 Physical guidance/facilitation to complete a task 18 Direct response to other clients physically aggressive behaviour when directed at them 19 Direct response to other clients physically aggressive behaviour when directed at another person 20 During restraint 21 Given item e.g. food/therapy materials 22 Purposeful behaviour is ignored or "played down" by person to whom it is directed at 23 Obviously agitated or distressed 24 No obvious antecedent 25 Other (please specify on the back of the recording form)

3. INTERVENTIONS

Set One Contributing Factors (coded A-N)
<ol style="list-style-type: none"> A Aggression ignored or "played down" completely B Talking to patient including prompts C Closer observation D Holding patient (physical restraint) E Immediate medication given by mouth F Immediate medication given by injection G Isolation without seclusion H Seclusion I Activity distraction J Injury requires immediate medical treatment for patient K Injury requires immediate medical treatment for other L Special programme M Physical distraction (leading the patient away) N Other (please specify on the back of the recording form)

1. BEHAVIOURS

	Verbal aggression VA	Physical aggression against objects PO	Physical aggression against self PS	Physical aggression against other people PP
1	Makes loud noises, shouts angrily, is not person directed. E.g. "Bloody hell"	Slams doors scatters clothing, makes a mess in response to clear antecedent	Picks/scratches skin, hits self, pulls hair (with no/minor injury)	Threatening gesture clearly person directed, swings at people, grabs clothes, spitting at people
2	Mild personal insults clearly directed at some other person, not including swearing/offensive sexual comments. E.g. "You are stupid, idiot"	Throws objects down, kicks furniture without breaking it, marks the wall (without others being at risk of being hit)	Bangs head, hits fist into object, throws self onto floor or into objects (hurts self without serious injury)	Strikes, kicks, pushes, pulls hair (without significant injury)
3	Swearing, moderate threats clearly person directed at others or self e.g. "Fuck off you bastard"	Breaks objects, smashes windows	Inflicts small cuts, bruises, minor burns to self	Attacks others causing mild-moderate physical injury (bruises sprains, welts) to person aggression directed at
4	Clear threats of violence directed at others or self. E.g. "I'm going to kill you"	Sets fire, throws objects dangerously (some other person is at risk of being hit, regardless of intention)	Mutilates self, causes deep cuts, bites that bleed, internal injury, fracture, loss of consciousness, loss of teeth	Causes severe physical injury (broken bones, internal injury) to person aggression directed at

categories

cross reference
category x
severity

behavioural
descriptors
four levels
severity

2.ANTECEDENTS

Set One

Contributing Factors (coded 1-3)

- 1 Structured activity
- 2 Noisy environment
- 3 Had epileptic fit in last 24 hrs

Set Two

Observed directly before behaviour(Coded 11-25)

- 11 Given direct verbal prompt to comply with instruction
- 12 Given verbal guidance/advice to assist completion of task/activity
- 13 Given verbal/visual feedback about performance
- 14 Direct response to other clients verbal behaviour
- 15 Request specifically denied by other person
- 16 Any other verbal interaction
- 17 Physical guidance/facilitation to complete a task
- 18 Direct response to other clients physically aggressive behaviour when directed at them
- 19 Direct response to other clients physically aggressive behaviour when directed at another person
- 20 During restraint
- 21 Given item e.g. food/therapy materials
- 22 Purposeful behaviour is ignored or "played down" by person to whom it is directed at
- 23 Obviously agitated or distressed
- 23 Obviously agitated or distressed
- 24 No obvious antecedent
- 25 Other (please specify on the back of the recording form)

There are 18 antecedents
numbered from 1 -25

1-3 comprise possible
'setting events'

for example

'1' – *'structured activity'*

11-25 are events
observed immediately
before behaviour -
'antecedents'

for example

'21' – *'given item'*

3. INTERVENTIONS

Set One

Contributing Factors (coded 1-3)

- A** Behaviour ignored or "played down" completely
- B** Talking to patient including prompts
- C** Closer observation
- D** Holding Patient (physical restraint)
- E** Immediate medication given by mouth
- F** Immediate medication given by injection
- G** Isolation without seclusion
- H** Seclusion
- I** Activity distraction
- J** Injury requires immediate medical treatment for patient
- K** Injury requires immediate medical treatment for other
- L** Special programme
- M** Physical distraction (leading the patient away)
- N** Other (please specify on the back of the recording form)

← There are 14 categories for recording interventions used to respond to/manage behaviour

Each is coded with a letter ranging from A - N

for example
'M' – *'physical distraction'*

OVERT AGGRESSION SCALE – MODIFIED FOR NEUROREHABILITATION (OAS-MNR)

Alderman, Knight & Morgan, 1997

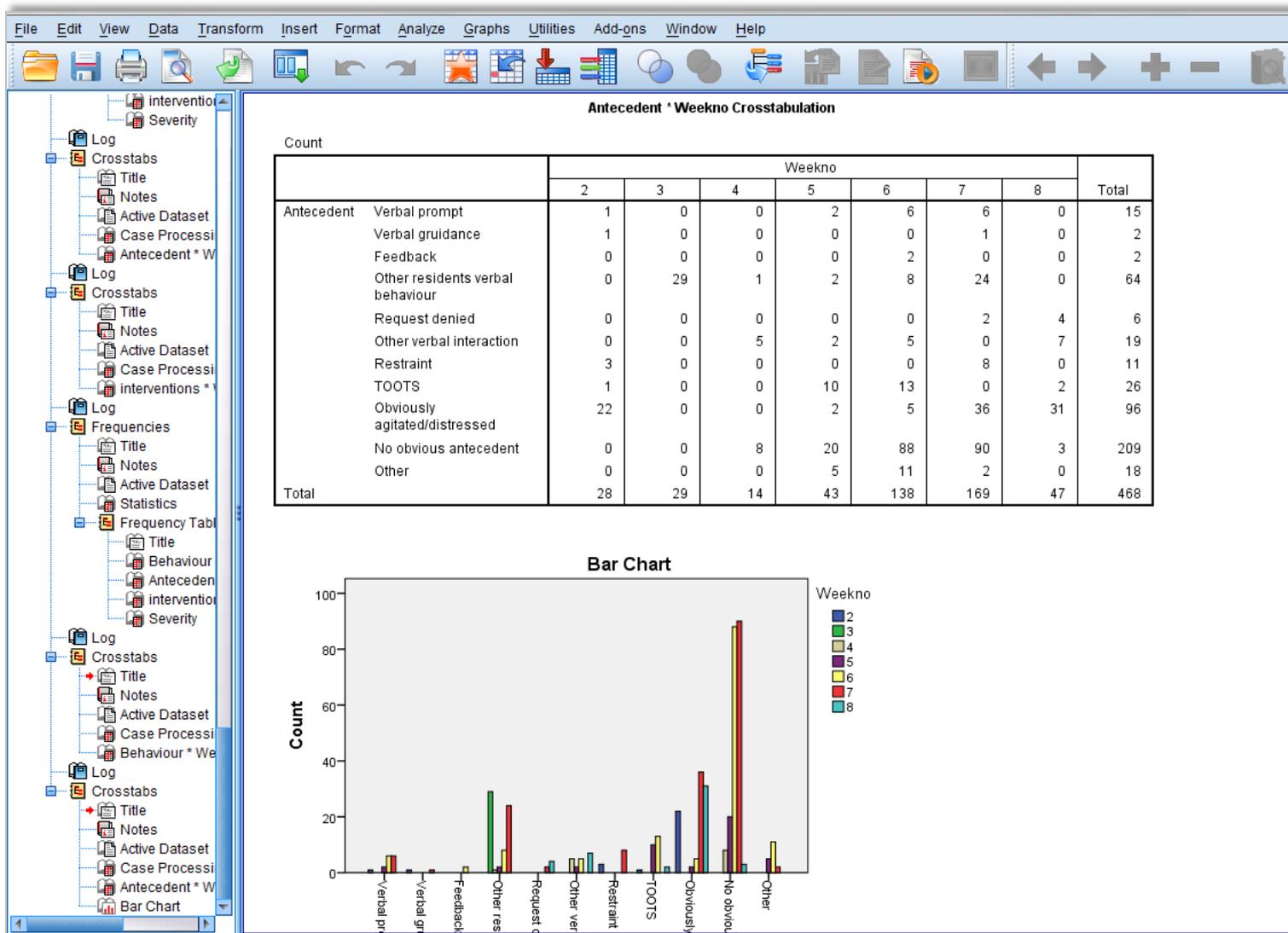


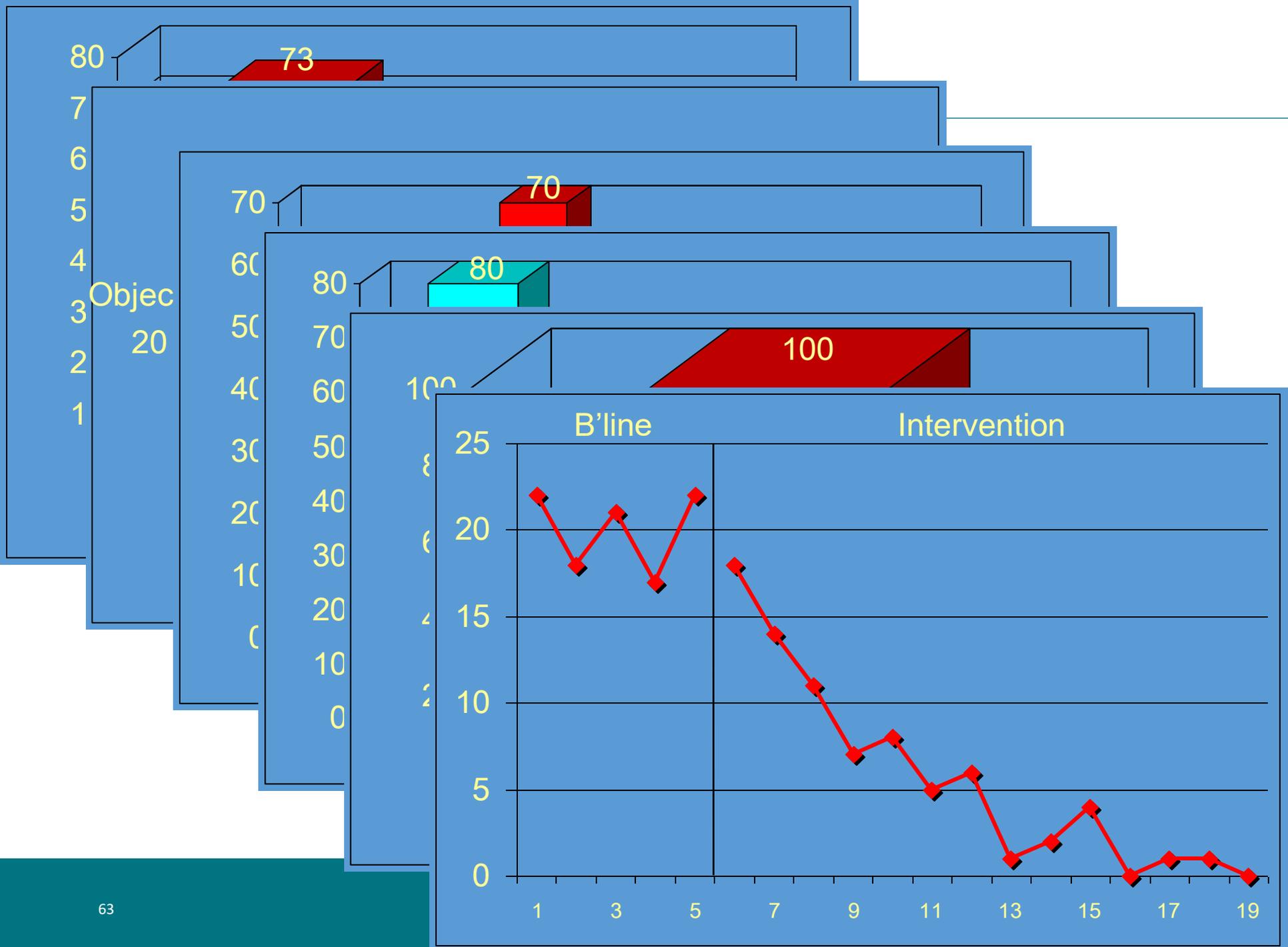
Name: Nick Alderman

Date	Time	Observer Initials	Antecedents				Observed Directly Beforehand (1-25)	Agression (type, rating)	Interventions (A-N)	Multiple Recordings* (when multiple identical incidents take place in quick succession)
			Contributing Factors – tick if applies							
			Structured Activity	Noisy Environment	Epilepsy prev 24 hrs					
11/6	10:25	CK	✓			11	VA1	A	✓✓✓✓	
11/6	10:30	CK	✓			22	PP2	L		
11/6	10:36	CK		✓		16	PO3	D		
11/6	10:50	CK				23	VA3	A	✓✓	
11/6	11:00	CK	✓			24	VA1	A		

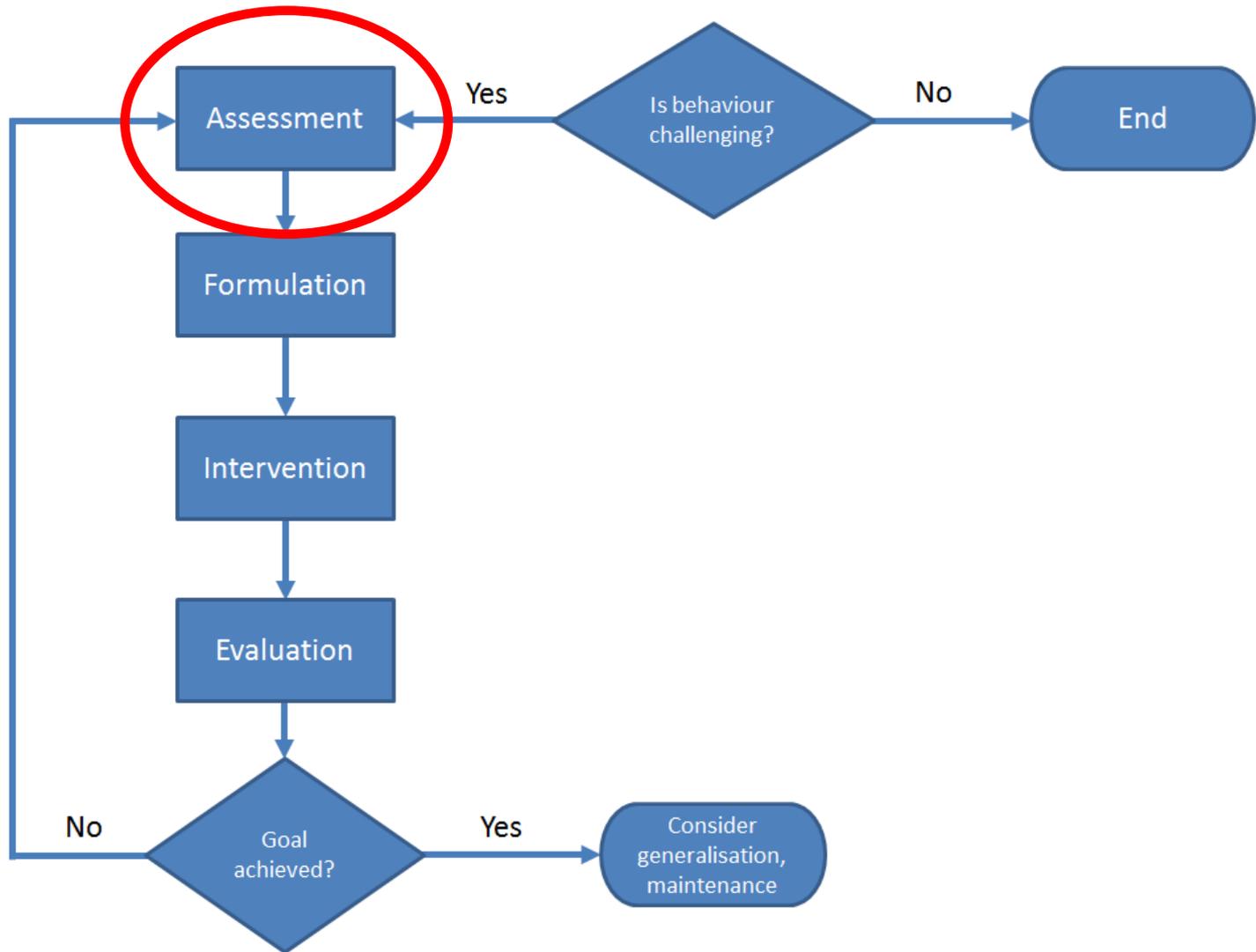
*Each separate incident recorded in this way must be separated by at least 2 seconds.

Assessment of NbR Aggression





NbR in Practice



Case Formulation

A hypothesis about the causes, precipitants, and maintaining influences of a person's psychological, interpersonal, and behavioural problems.

This hypothesis drives intervention.



Formulation

Draws on assessment data and information from multiple sources:

- Neuropsychological Assessment
- Neuropsychiatric Assessment
- Functional Assessments
- Informants
- History
- ABI Literature



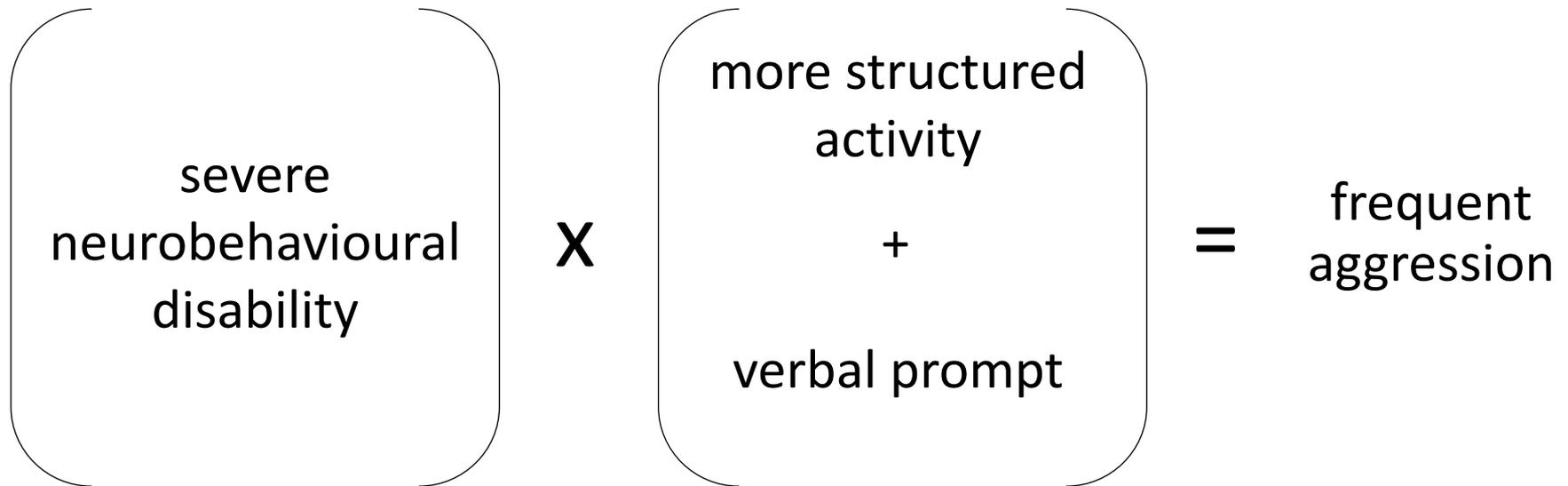
Effect of Both Situational and Individual Characteristics on Aggressive Behaviour

Do these interact?



Formulation

Aggression may be function of complex interactions between individual and situational variables

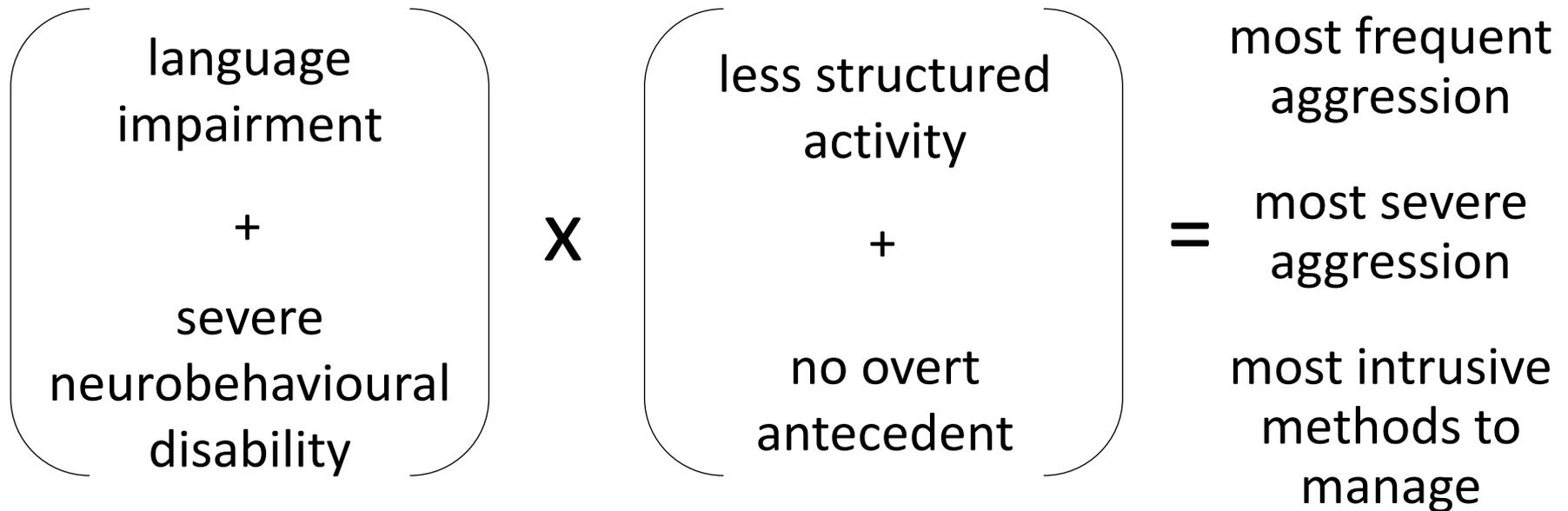


Predictable, planned intervention possible,
more risks may be taken in rehab



Formulation

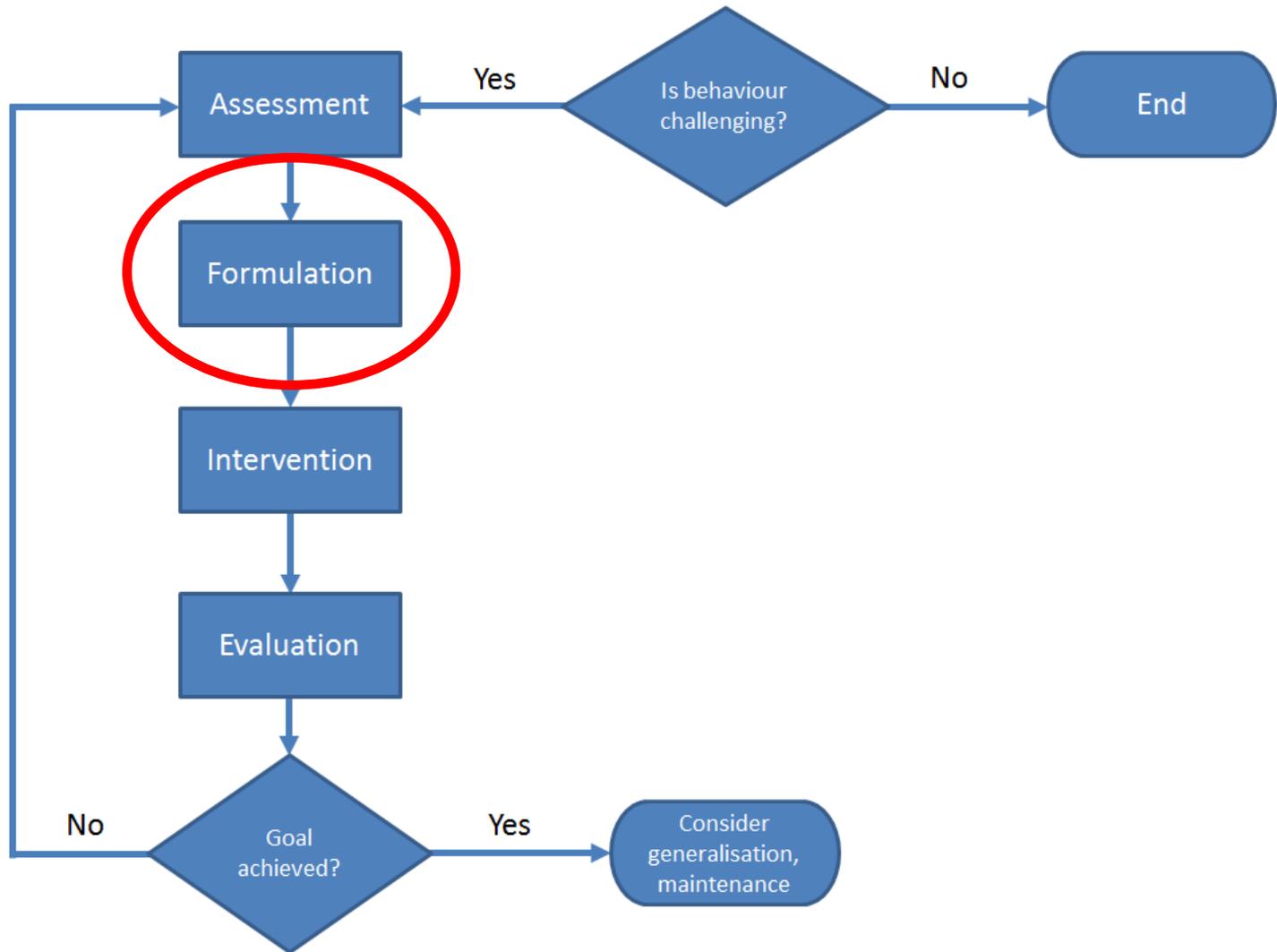
Aggression may be function of complex interactions between individual and situational variables



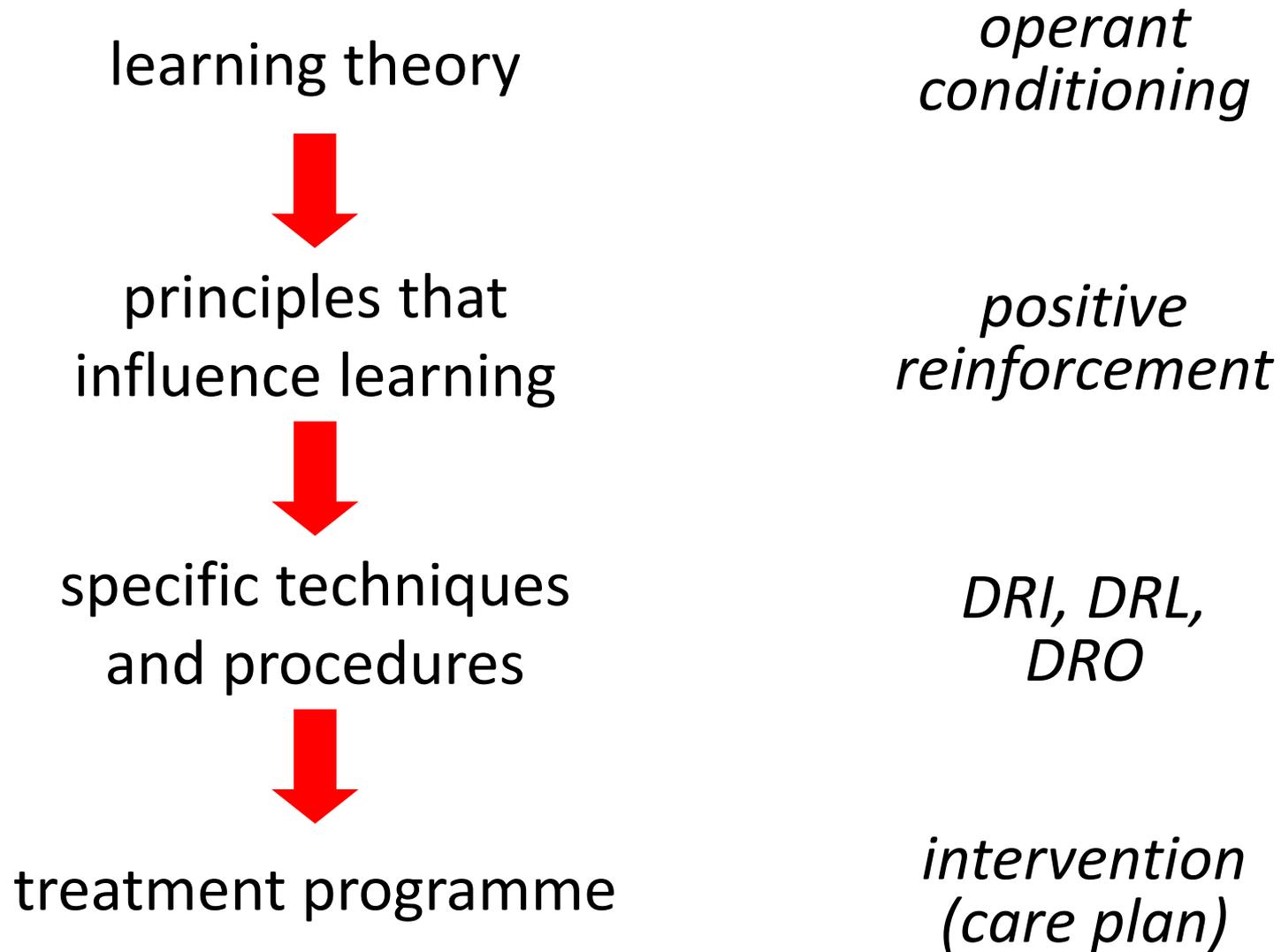
Unpredictable, more reactive management,
greater challenge to rehab services



NbR in Practice



Intervention



Intervention

- Contingency Management
(Rodger Wood, Peter Eames, Nick Alderman)

Vs. (??)

- Positive Behaviour Support
(Mark Ylvisaker, Tim Feeney, Gordon Muir-Giles)



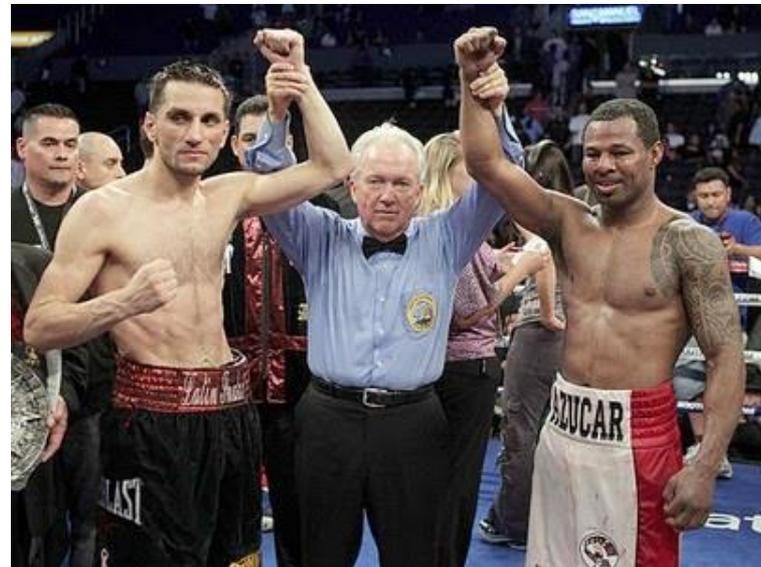
Positive Behaviour Support

- Systematic gathering of relevant information
- Conducting a functional assessment of behaviour
- Highlights involvement of the person concerned
- Designing support plans (proactive strategies, early warning signs, reactive strategies, managing the aftermath)
- Implementation and ongoing evaluation



Multicomponent Interventions are the Norm

Combination of methods is ideally suited to meeting the complex needs of people with ABI



'Example of a PBS Approach'

Rothwell, LaVigna & Willis (1999)

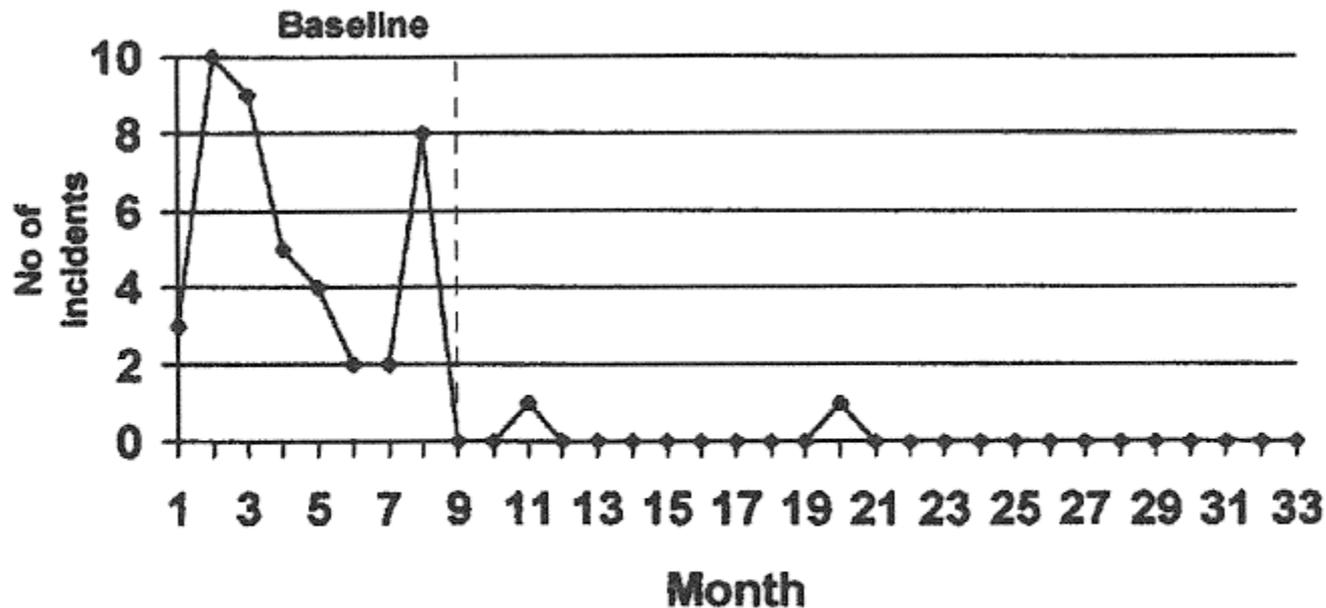


Figure 1. Gordon—frequency of physical aggression (orientation programme faded at month 10.5, male staff reintroduced at month 11.5).

Actually a multicomponent intervention employing:
functional assessment; positive programming;
environmental modification; behavioural
contingencies; & reactive strategies

Differential Reinforcement Procedures

NbR Services have a culture in which:

- Desirable behaviour is reinforced at **every** opportunity
- Undesirable behaviour is downplayed as much as possible (TOOTS)



Differential Reinforcement Procedures

Positive Reinforcement

Ensuring a pleasant consequence increases the likelihood the same behaviour will occur again in the future



If frequency/duration of target behaviour subsequently increases, it has been positively reinforced.



Differential Reinforcement can be very useful in the management of ABI aggressive behaviour disorders

Differential Reinforcement of...

- Incompatible behaviour (DRI)
- Other behaviour (DRO)
- Low rates of responding (DRL)



Differential Reinforcement Procedures

Differential Reinforcement of Incompatible Behaviour (DRI)

Substitute a Behaviour

*Reinforcement delivered when engages in
behaviour incompatible with target behaviour*

Core characteristic of NbR Environment

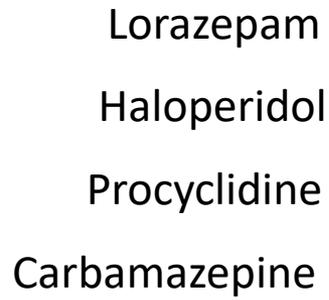
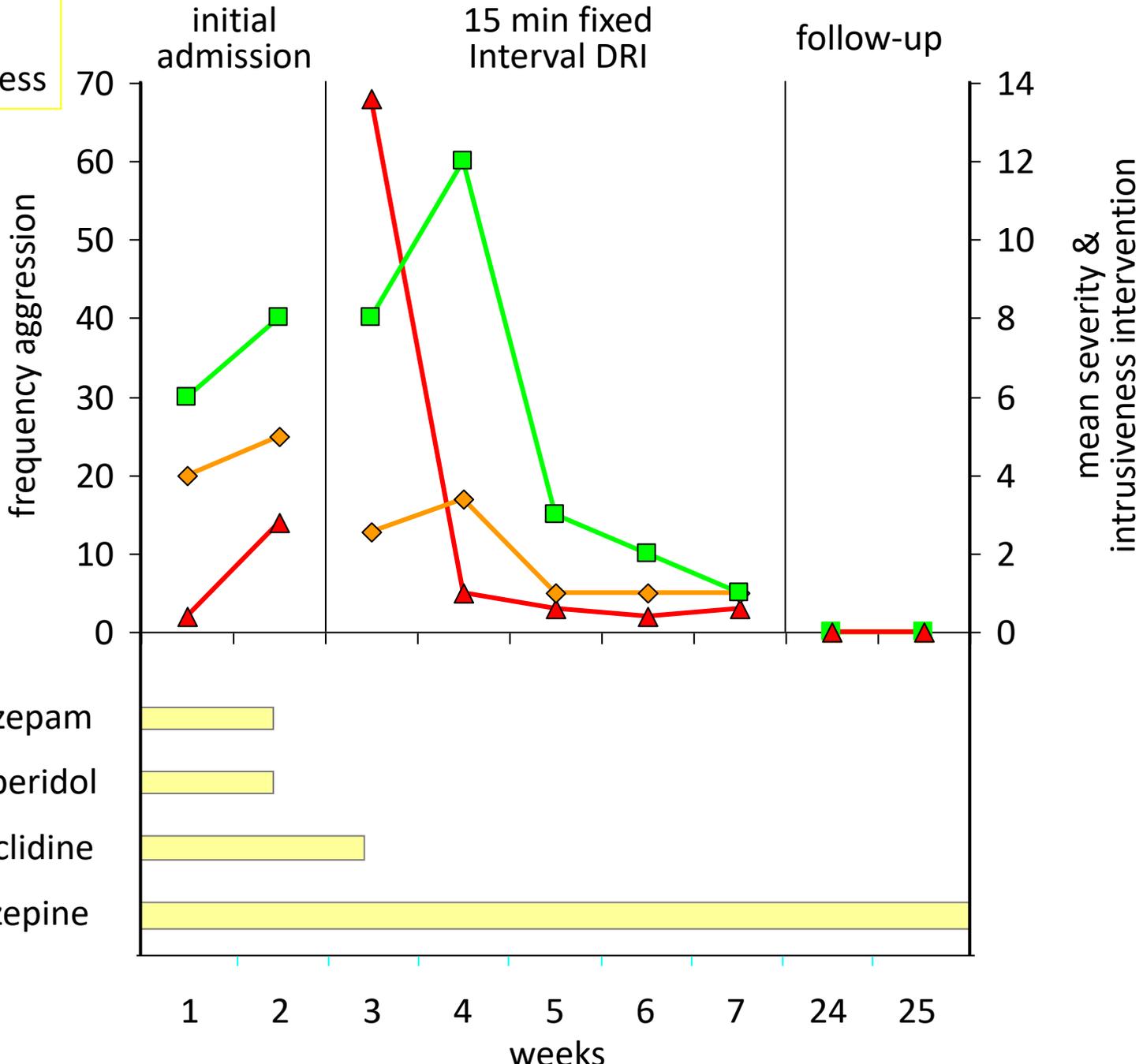
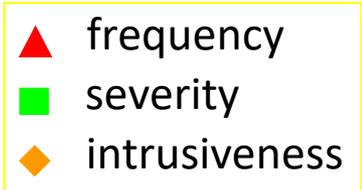


Case LM

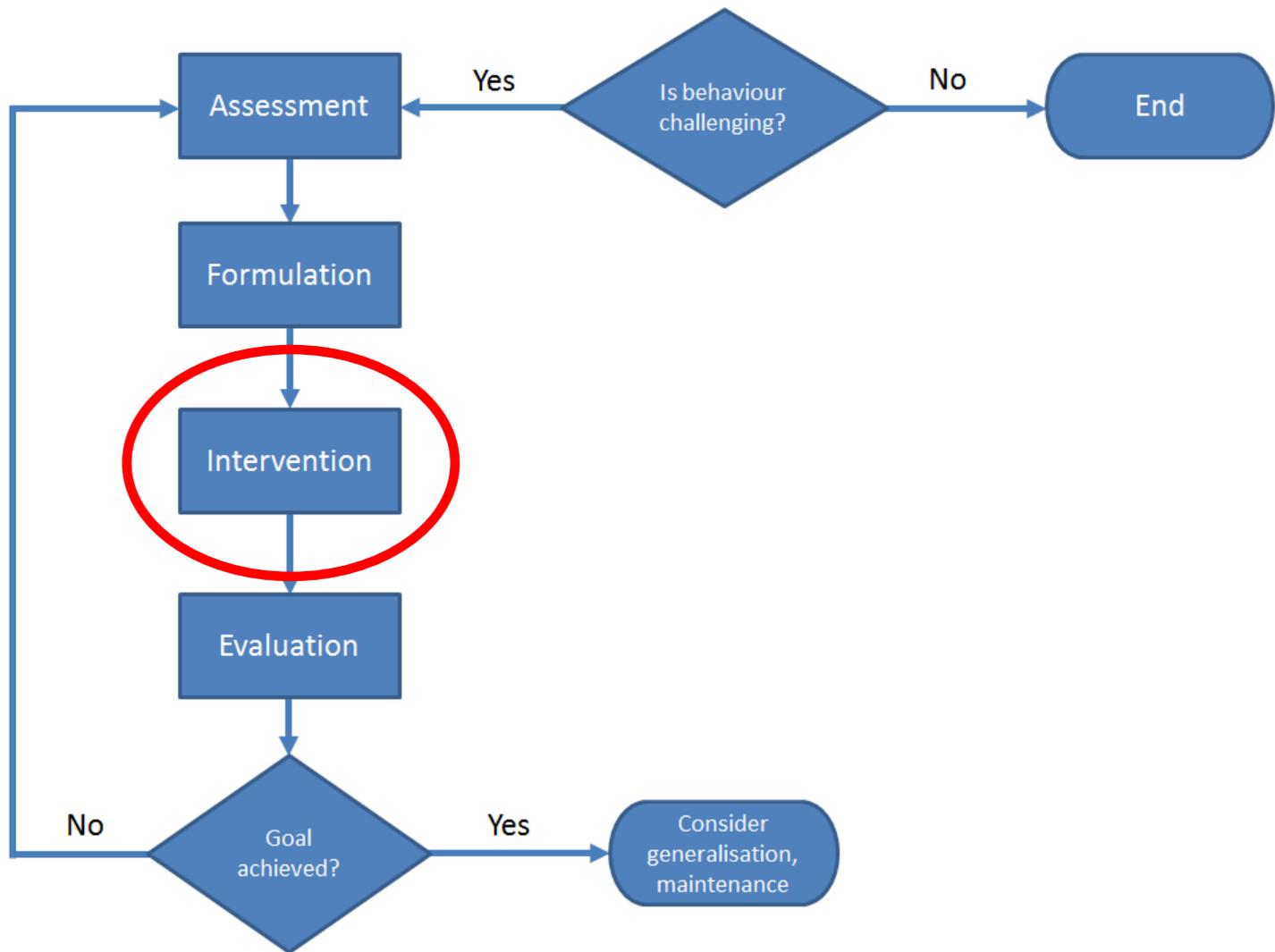
Alderman, Davies, Jones & McDonnell (1999)

- 'Very severe' TBI through RTA
- Poor memory, impaired executive functions, significant expression/comprehension difficulties
- History frequent, severe physical assaults
- 72% physical assaults, 60% 'severe'
- 66% followed attempts to engage in rehabilitation (verbal prompts, guidance, feedback)
- 15 minute DRI programme, including feedback, throughout the day



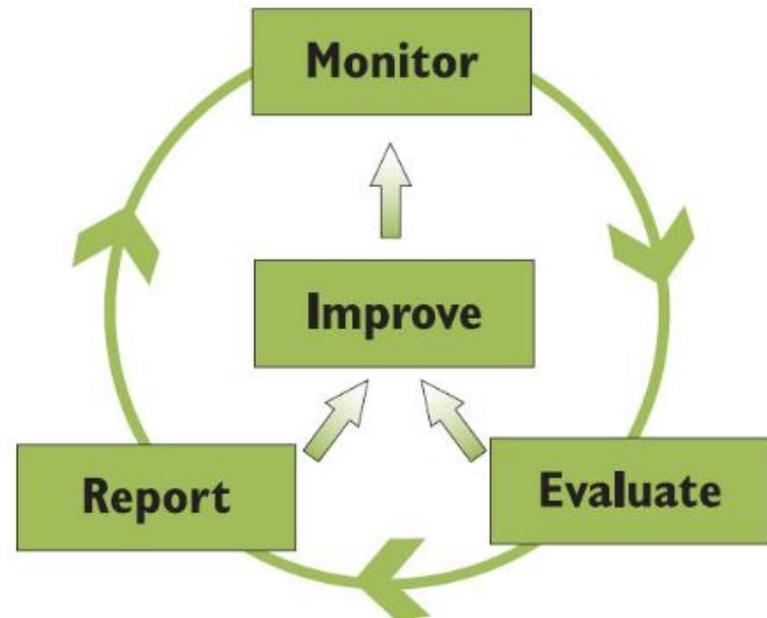


NbR in Practice

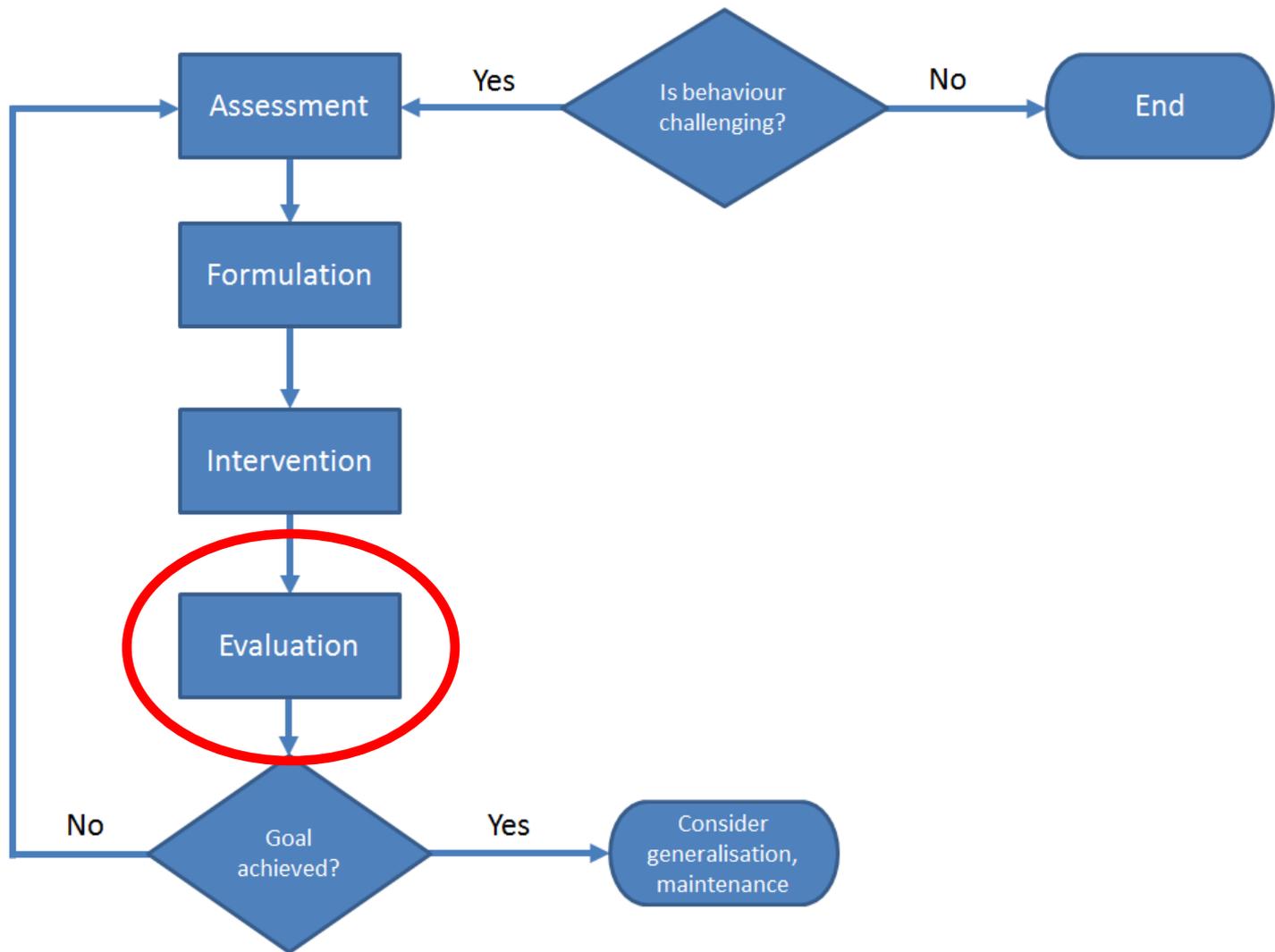


Evaluation

- Continuous evaluation within behavioural approach
- Monitoring of data
- Online adjustments to maximise gains



NbR in Practice



Differential Reinforcement Procedures

Differential Reinforcement of Low Rates of Behaviour (DRL)

Reduce a Behaviour

*Reinforcement delivered when target
behaviour is performed less often*



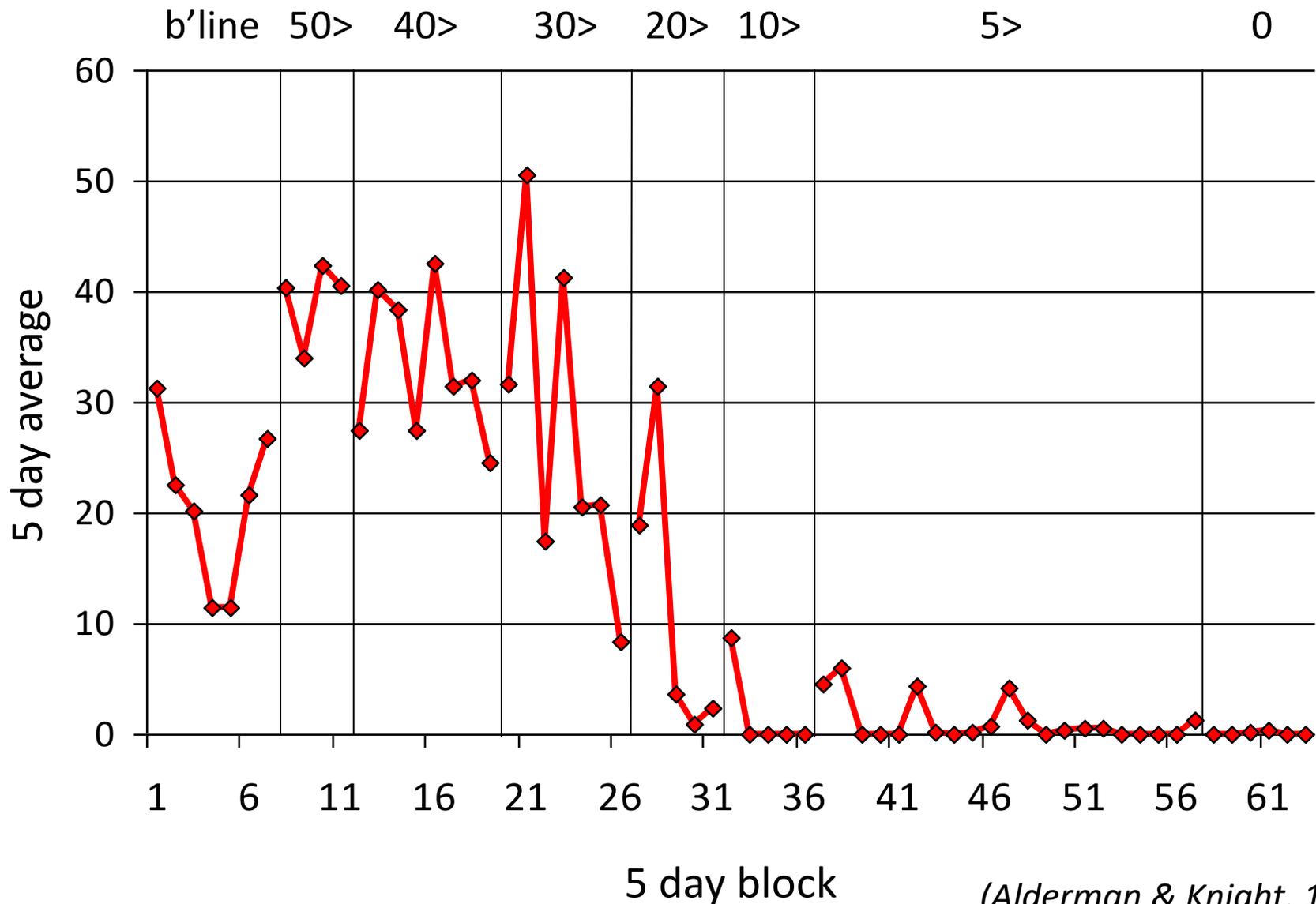
Differential Reinforcement Procedures

Differential Reinforcement of Low Rates of Responding (DRL)

- Define and measure target behaviour
- Collaborate with participant of intervention
- Set target low to ensure success from onset
- Increase expectations whilst maintaining success
- Reduce target to lowest rate possible, ideally move to fixed interval DRI with zero target & fade out
- Or maintain minimum structure that supports participant in long-term



FS: reduction in aggressive outbursts during hygiene routine using DRL



Case JH

Watson, Rutterford, Shortland, Williamson & Alderman (2001)

DRL Intervention

- OAS-MNR - 200 episodes, 4-55 p/day
- 4 opportunities to earn a star throughout day
- Earned if did not exceed target of being aggressive (initially) >18, VA2 or above
- Feedback about programme and performance at end of each interval
- Rehab team played down response when aggressive
- Stars exchanged for items from reinforcement menu at end of day or banked for more substantial reward



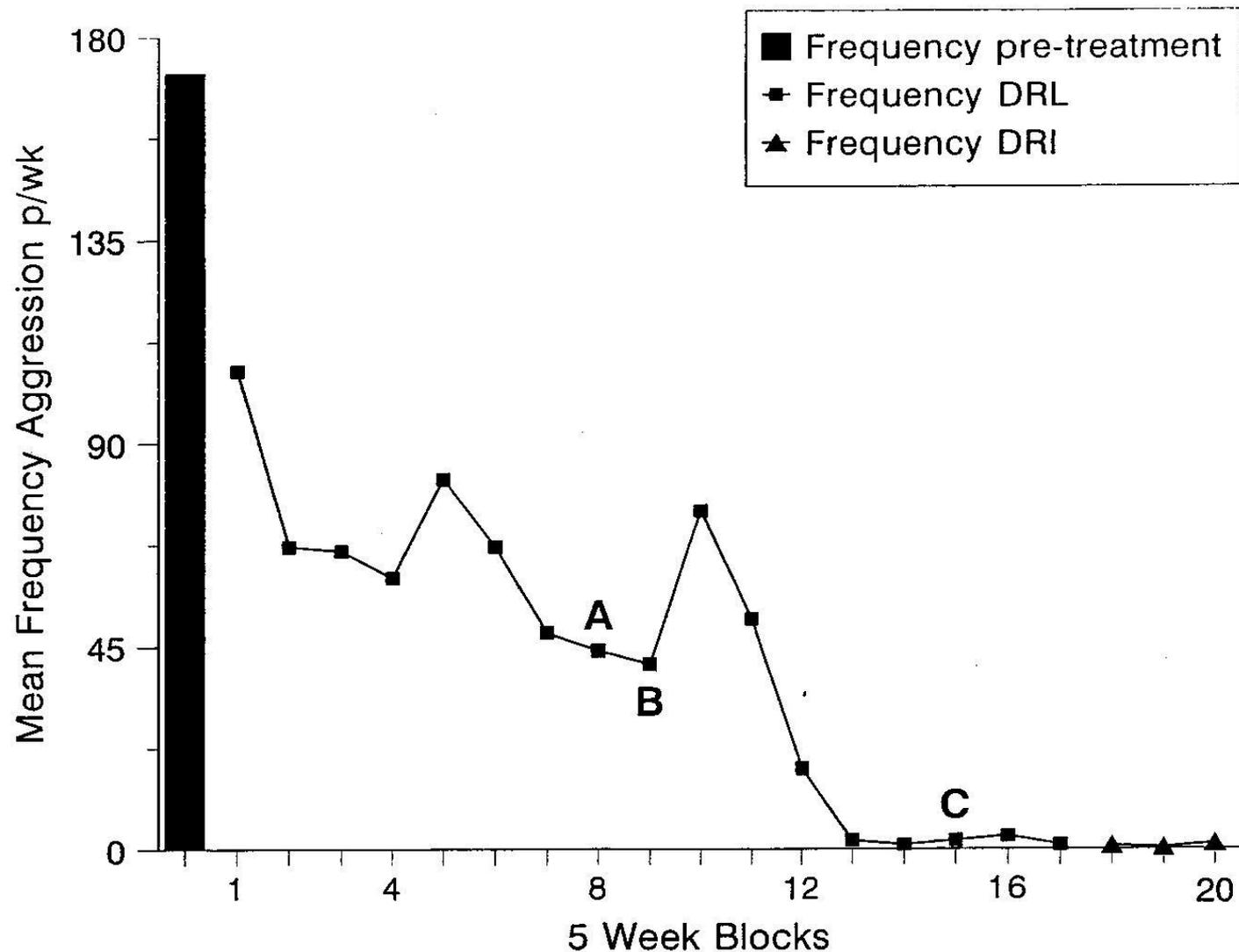


Figure 1. Reduction in the frequency of JH's aggressive behaviour using DRL. Key: 'A' - number of stars to earn increased from four to five, and increase in functional/physical expectations; 'B' - Clopixol reduced from 10 mg three times a day to twice a day; 'C' - transferred from the neurorehabilitation unit to a satellite group home. (Note: pre-treatment frequency count compiled from the last 7 of the 11 day period behavioural analysis conducted in; frequency aggression taken from all recordings made on the OAS-MNR.)

Differential Reinforcement Procedures

Particularly relevant when:

- Inappropriate behaviour/inability to acquire new skills are function of poor monitoring

Reinforcement programmes improve monitoring by creating systems that provide participants with systematic feedback about performance that enables learning

- Challenging behaviour previously reinforced in settings where people routinely ignored

Reinforcement programmes reverse these contingencies by compelling carers to engage in positive ways with participants, creating positive relationships



NbR Services Reduce Aggression

- Enriched environments that change behaviour
- Create positive social climate
- Promote therapeutic relationships
- Encourage new learning, skill acquisition
- Promote independence, increased autonomy

“...giving people more choice, control, and freedom as they progress.”

Wood & Alderman (2011)

Gladstone House, Stoke-On-Trent

Create new NbR services that set the bar re quality, reputation, cost effectiveness and outcomes

NbR pathway to be created over 3 floors:

- Ground floor
Acute neurobehavioural rehabilitation
- First floor
Mainstream neurobehavioural rehabilitation
- Second floor
Supported & independent living



Thanks for Listening!



Neurobehavioural Disability after Acquired Brain Injury: Advances in the Management of Social Handicap

Presented in
partnership with:

Elysium Neurological



Building on the success of our 2016 conference entitled "Reducing the Burden of Neurobehavioural Disability after Acquired Brain Injury: Past, Present and Future", and extremely positive feedback from delegates, we are pleased to announce the second conference in our series of events concerned with acquired brain injury.

This exciting one-day 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.

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.

27 November 2017 from 09:00 – 16:30
Swansea Marriott Hotel, Maritime Quarter, Swansea, SA1 3SS



Registration:

- Professional/Corporate: £100
 - Student/Trainee: £75
 - Survivors – a limited number of free places are available
 - Exhibitors: a number of packages are available.
- Please contact claire.williams@swansea.ac.uk



For further
information and
to register your
place:
[https://abiswan17.
eventbrite.com](https://abiswan17.eventbrite.com)

Potentially Useful References

Alderman, N., Knight, C. and Brooks, J. (in press). Therapy for acquired brain injury. In A.Beech, A.J.Carter, R.Mann and P.Rotshtein (Eds.). The Wiley handbook of forensic neuroscience. John Wiley & Sons, Ltd.

Alderman, N., Wood, R.LI. and Worthington, A. (in press). Environmental and Behavioral Management. In J.M. Silver, T.W. McAllister and D.B. Arciniegas (Eds.). Textbook of Traumatic Brain Injury (3rd edition). American Psychiatric Publishing Inc.

Alderman, N. (2017). Interventions for Challenging Behaviour. In T.McMillan and R.L.Wood (Eds.). Neurobehavioural Disability and Social handicap Following Traumatic Brain Injury (2nd edition). Psychology Press, Routledge.

Alderman, N. and Knight, C. (2017). Managing disorders of social and behavioural control and disorders of apathy. In B.A.Wilson, C. van Heugten, J.Winegardner and T.Ownsworth (Eds.). The International Handbook of Neuropsychological Rehabilitation. Psychology Press.

Alderman, N. (2015). Acquired brain injury, trauma and aggression. In G.Dickens, M.Picchioni and P.Sugarman (Eds.) Handbook of specialist secure inpatient mental healthcare. London: The Royal College of Psychiatrists.

Alderman, N., Knight, C. and Brooks, J. (2013). Rehabilitation approaches to the management of aggressive behaviour disorders after acquired brain injury. Brain Impairment (Special Issue: state of the art reviews on mental health in traumatic brain injury), 14, 5-20.

Alderman, N. and Wood, R.LI. (2013). Neurobehavioural approaches to the rehabilitation of challenging behaviour. NeuroRehabilitation, 32, 761-770.

Alderman, N., Davies, J.A., Jones, C. and McDonnell, P. (1999). Reduction of severe aggressive behaviour in acquired brain injury: case studies illustrating clinical use of the OAS-MNR in the management of challenging behaviours. Brain Injury, 13, 669-704.

Alderman, N. and Knight, C. (1997). The effectiveness of DRL in the management and treatment of severe behaviour disorders following brain injury. Brain Injury, 11, 79-101.

Watson, C., Rutterford, N., Shortland, D., Williamson, N. and Alderman, N. (2001). Reduction of chronic aggressive behaviour ten years after brain injury. Brain Injury, 15, 1003-1015.

Wood, R.LI. and Alderman, N. (2011). Applications of operant learning theory to the management of challenging behaviour after traumatic brain injury. Journal of Head Trauma Rehabilitation, 26, 202-211.

