Assessment and management of people with a Disorder of Consciousness (DoC)

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Aims of the session

- Improve understanding of DoC.
- Introduce the team to the assessment procedure for DoC patients
- Review and implement the RCP guidelines for the treatment and care of people with a Disorder of consciousness to enable the best practice and intervention for our patients .
- How to improve practise at Holy Cross?

Plan

- What are Disorders of consciousness?
  - Anatomy and Physiology of VS and MCS
  - Causes
  - Terminologies
- Assessment and diagnosis using the RCP Guidelines (2013)
  - Responses
  - Objectivity
  - Scales used
- Management of DoC patients – the role of MDT
- Discuss how we can improve practice at HXH?

Exercise

- What is the difference between VS and MCS?
- Patient list, current and past
- What groups of medications cause drowsiness?
- Observation of people with DoC.

Disorder of consciousness

- Vegetative state
- Minimally conscious state
  - MCS +
  - MCS –
  - Emerging MCS
- Coma
- Differential diagnosis
  - Locked-in syndrome
  - Brain death

Coma/ altered states of consciousness

- GCS of 3 - Deep Coma
- GCS of 4,5,6 or 7 are referred to be in altered states of consciousness

	1	2	3	4	5	6
Eye	Does not open eyes	Opens eyes in response to painful stimuli	Opens eyes in response to voice	Opens eyes spontaneously	N/A	N/A
Verbal	Makes no sounds	Incomprehensible sounds	Utters incoherent words	Confused, disoriented	Oriented, converses normally	N/A
Motor	Makes no movements	Extension to painful stimuli (decerebrate response)	Abnormal flexion to painful stimuli (decorticate response)	Flexion / Withdrawal to painful stimuli	Localizes to painful stimuli	Obeys commands

Vegetative State

- Vegetate: “To live merely physical life, devoid of intellectual activity or social intercourse” (Oxford English Dictionary)
- A patient who demonstrates a sleep-awake pattern, responding to stimuli at a reflexive level and without meaningful response to the environment (Jennett and Plum, 1972)

VS nomenclature

- Disorders of Consciousness
- Apallic syndrome
- Akinetic mutism
- Prolonged coma
- Low awareness state
- Unresponsive wakefulness syndrome

- Understanding is still incomplete!

VS/ MCS/ Locked in syndrome

- Two components of consciousness
- Arousal (wakefulness or vigilance)
- Awareness (awareness of the environment or of self)

VS/ MCS/ Locked in comparison

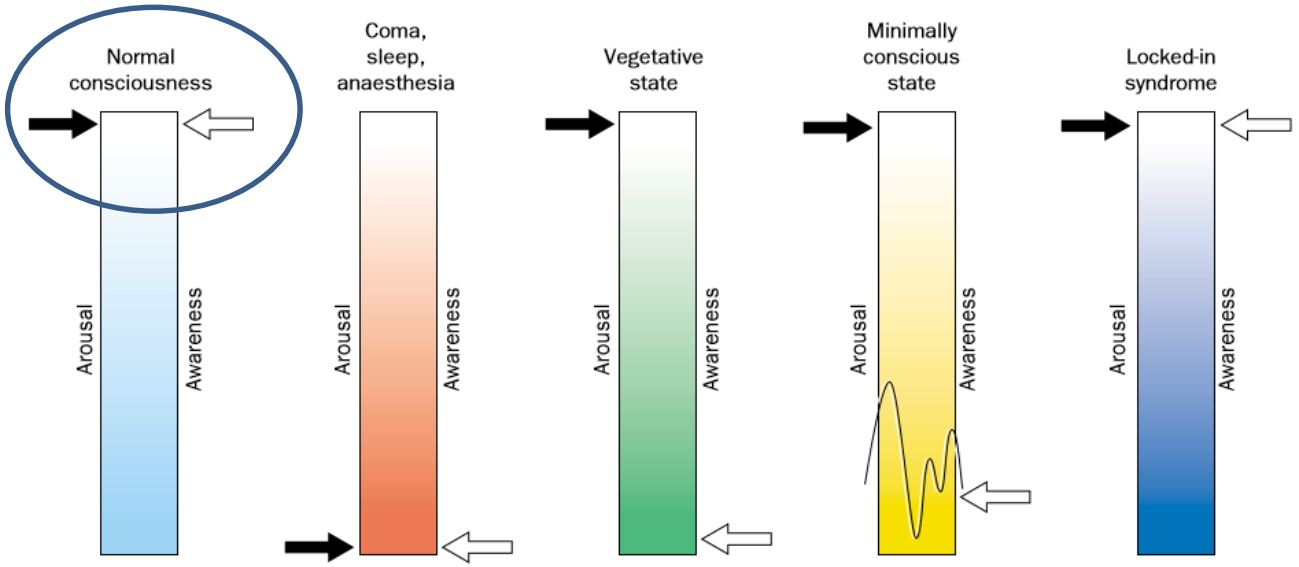

Figure 2. Arousal and awareness, the two components of consciousness in coma, vegetative state, minimally conscious state, and locked-in syndrome.

From: Brain function in coma, vegetative state, and related disorders. Steven Laureys, Adrian M Owen, and Nicholas D Schiff. The Lancet. Neurology Vol 3 2004

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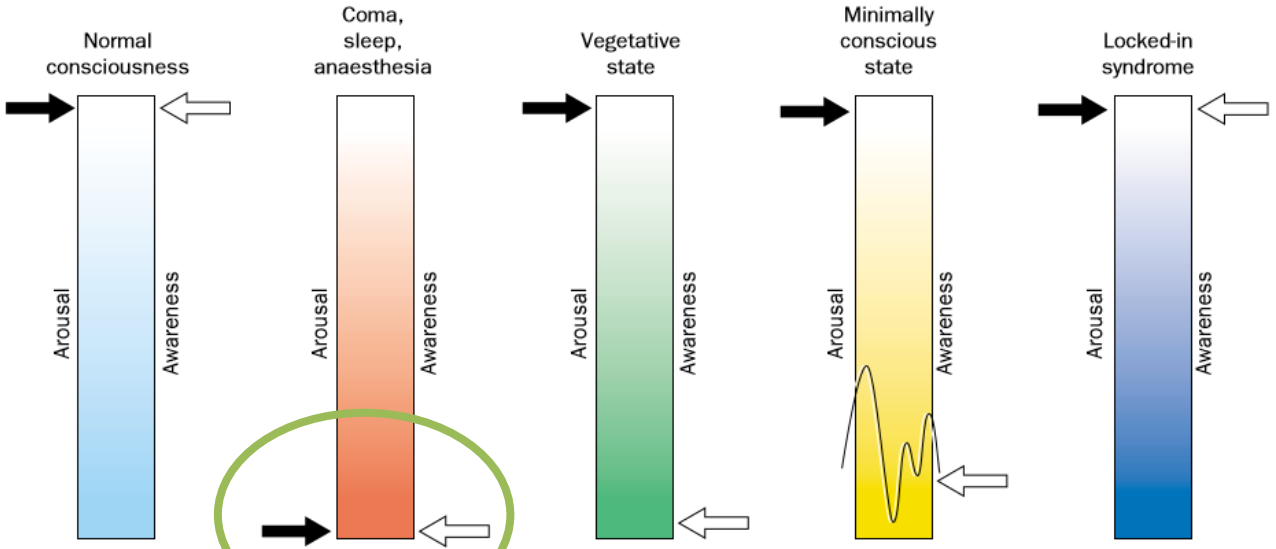

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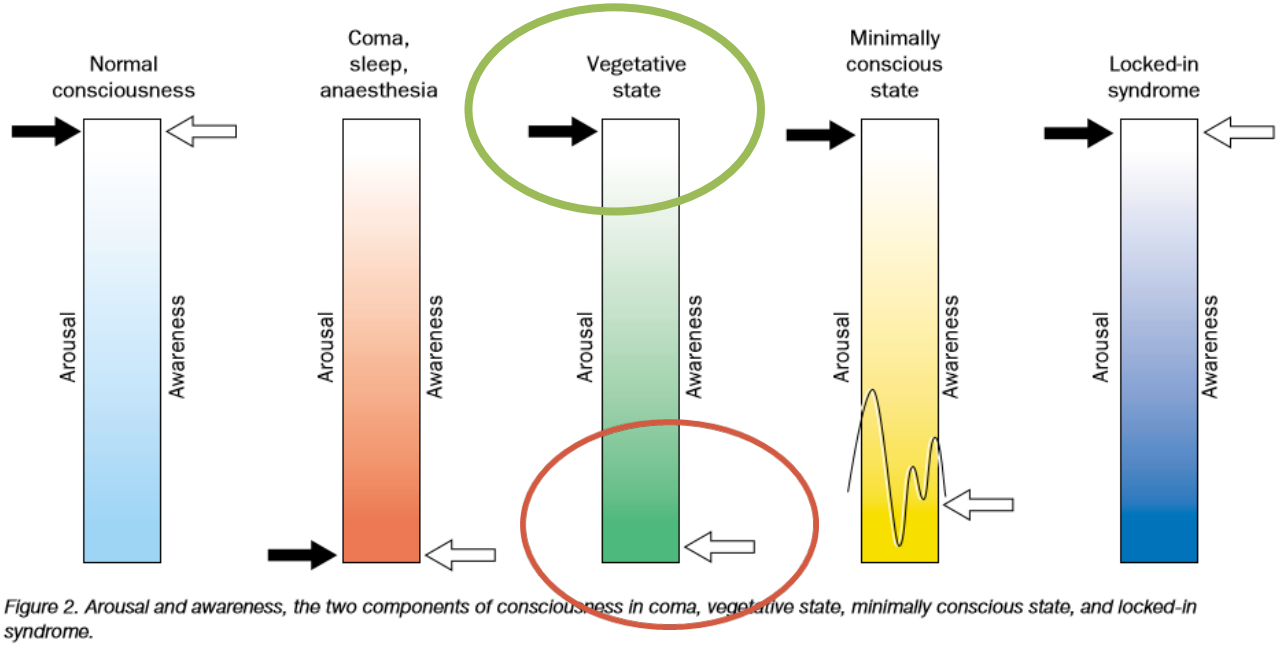

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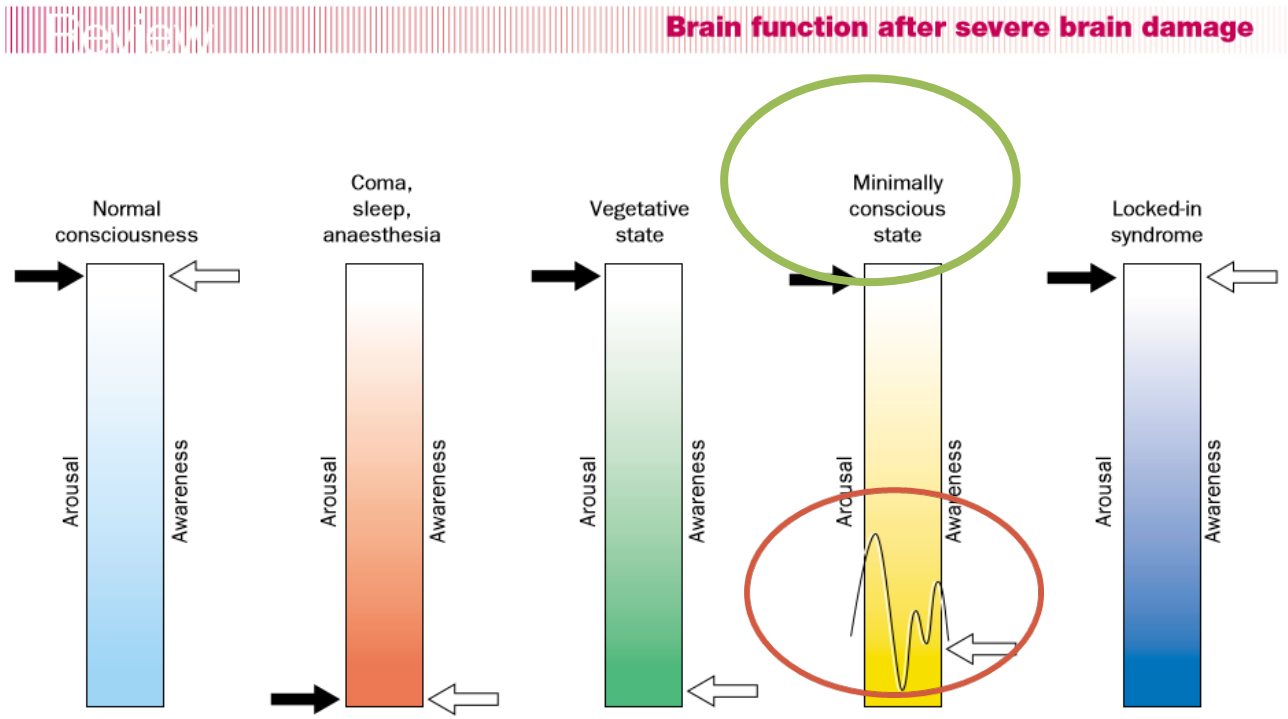

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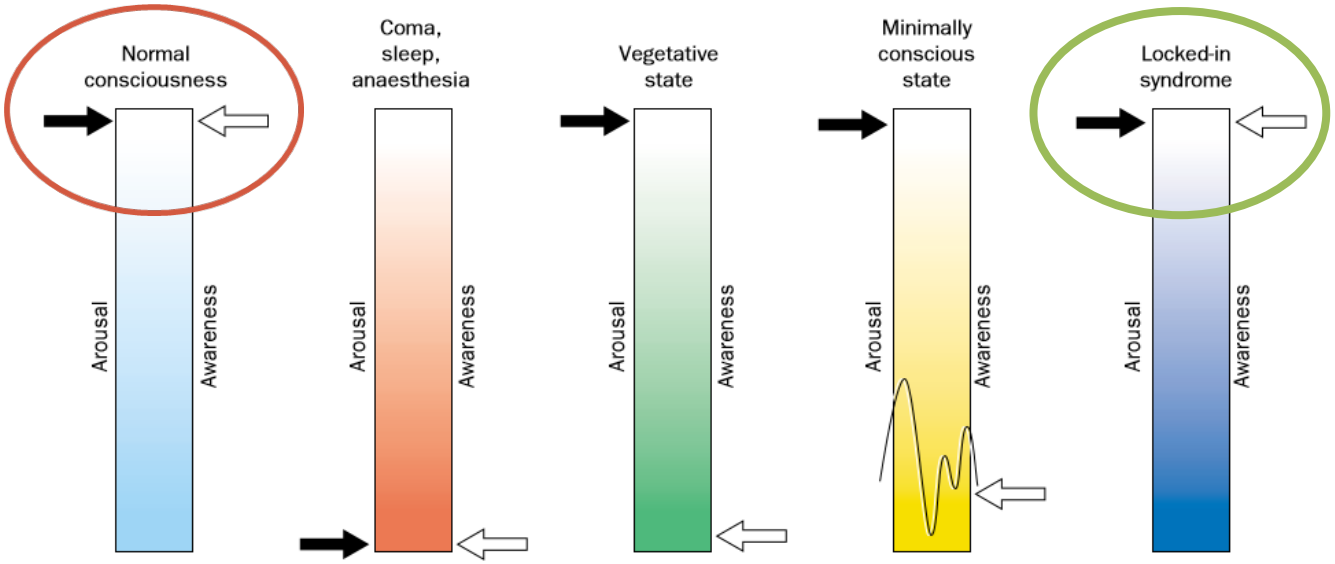

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Definitions

- Vegetative State: A patient who demonstrates a sleep-awake pattern, responding to stimuli at a reflexive level and without meaningful response to the environment (Jennett and Plum, 1972).
- Minimally Conscious State: A person with a severe brain injury who show signs which are not reflex in nature and do not occur consistently enough to be used to demonstrate awareness or to communicate (Giacino et al, 2002).
- Coma

Causes of VS

- Head trauma and hypoxic-ischeamic encephalopathy (Multi Society Taskforce, 1994)
  - Road traffic accidents/ assaults/ fall
  - Hypoxia post Cardiac/ respiratory arrest
- Severe strokes
- Some advanced degenerative neurological disorders
  - Multiple Sclerosis
  - Huntingdon's disease
  - Alzhiemer’s disease
  - Prion conditions (e.g. CJD - creutzfeldt jacobs disease)

Pathology - VS

- Better described than MCS
- Histologically
  - TBI – white matter tracts more damaged
  - HBI – Grey matter tracts more damaged
- Anatomically
  - Diffuse damage to cortical neurons, Thalami OR
  - The white matter tracts that connect them
  - Brain stem and Hypothalamus spared

Wakefulness

- Consciousness is an ambiguous term, encompassing both wakefulness and awareness
- State in which the eyes are open
- Motor arousal
- it contrasts with sleep – a state of eye closure and inactivity
- Wakefulness can recover in VS

Awareness

- ‘Ability to have and the having of experience of any kind’ (RCP, 2013)
- Brain damage can selectively impair some aspects of awareness
- No single clinical test or sign of awareness
- Assessed from a range of behaviours which indicate the person can perceive self, surroundings and has an intention to communicate

Essential criteria for VS (RCP 2013)

- There is no evidence of
  - awareness of self or environment or the ability to interact with others
  - sustained purposeful or voluntary behaviours, either spontaneously or in response to visual, auditory, tactile or noxious stimuli
  - language, comprehension or meaningful expression
- The following are also usually present
  - cycles of eye closure and eye opening, giving the appearance of a sleep–wake cycle
  - spontaneous respiration and circulation

Compatible features

- Reflexive movements
  - brainstem reflexes (pupillary, oculocephalic (doll's eye), oculovestibular (caloric)
  - corneal reflex
  - reflexive oral/facial reflexes (eg gag, saliva swallowing, tongue thrust, bite reflex, rooting, lip pursing)
  - grasp reflex
- Spontaneous movements
  - chewing
  - teeth grinding
  - tongue-pumping
  - roving eye movements
  - purposeless movements of limbs and/or trunk
  - facial movements, such as smiles or grimaces
  - shedding tears
  - grunting or groaning sounds

Compatible features (contd)

- Various stimuli (eg noxious or noise) may produce a generalised arousal response,
  - quickening of respiration
  - grimaces, or
  - non-localising limb movements (eg extension, flexor or withdrawal reflexes).
  - Eyes may turn fleetingly to
    - follow a moving object or towards a loud sound
    - fixate a target
    - react to visual menace but they do not usually follow a moving target for more than a fraction of a second.
- Compatible, but atypical features such as the utterance of a single inappropriate word may also occur

Incompatible features

- Smiling specifically on arrival of a friend/ family member or appropriately reaching out for an object will be incompatible and could denote recovery of awareness

Incidence

- Life expectancy and survival rate of severely impaired people has increased (RCP, 2003)
- Incidence of moderate to severe head injury 25/ 100,000 of which 10% -20% remain in low awareness states (RCP, 2003)
- Beaumont and Kenealy (2005) suggested an incidence rate of 5 and 25 per million population in the United Kingdom for vegetative state continuing for more than 6 months giving 300 – 1500 new cases every year!!

Prevalence of VS

- Multi Society Task Force: 56-140 per million population in the USA (RCP, 2003)
- Point prevalence study in Vienna - 19 per million population (Stephan et al, 2004)
- Cross-sectional survey in Dutch nursing homes between 2000 and 2003 - 2 per million (Lavrijsen et al, 2005)

Prognosis

- Influenced by age
- Duration of VS
- The underlying cause of the VS
  - Poor prognosis 1 year after trauma
  - 3 months after non-traumatic cause

Prognosis

- Life expectancy
  - Difficult to estimate due to the non availability of uniform treatment protocols
  - 70% mortality at 3 years, 84% at 5 years
  - DNAR status ?an important factor
  - Many patients could have been left to die when they had a bad infection

The issue!

- More people survive after road traffic accidents due to improved safety in cars
- Increase in the number of drug users – post overdose hypoxic event resulting in VS & MCS
- Advances in emergency medicine and acute interventions save many people with catastrophic injuries

Misdiagnosis

- In about 40% cases (Monti et al, 2010)
- Rare condition
- Clinicians without experience
- Confusion in terminology
- Medication
- Fatigue
- Nutrition

Misdiagnosis

- Cortical blindness
- Aphasia/ Apraxia (disorder of motor planning)
- Physical/ Motor problems: Tone/ contractures
- Environmental factors: stimuli, objectivity in Assessment
- Assessor skills/ experience
- Time constraints/ consistency
- Appropriate assessment tool

Management

- Assessment is key
- Management by a specialist MDT

Medical management

- Spasticity management
- Epilepsy
- Diabetes
- Respiratory management/ Infections
- Bladder and bowel management/ infections
- Pressure ulcers

MDT management

- Nursing
- Physio
- OT
- SLT
- Dietician
- Clinical Neuropsychologist
- Doctors

Assessment of awareness in PDoC and their management at Holy Cross
A Team approach

Management

- Using the guidelines to provide best practice
- Assessment, Review, Treatment, opportunity
- Patients day –activity /rest –a 24 hour approach.
- Profiles – Getting to know me - to enable targeted activities, understanding of the person before their injury, likes, dislikes pets etc (making our care person centred)

Assessment criteria

- Adequate stimulation
  - Smell, tactile, visual, auditory
  - Not in a noisy environment
- Sedating medications
  - Better in am/pm
  - Timing of medications
  - When were the drugs reviewed
- Patient's motor capability
  - Any movement unmasked due to weakness, spasticity, poor posture etc
- Staff with appropriate skills

Main Assessment Tools

- Wessex Head Injury Matrix (WHIM)
- Coma Recovery Scale (CRS)
- Checklist for families and volunteers

Disorders of Consciousness
Formal Assessment Protocol Pathway.

Patient Status	Criteria protocol	Tools	Repetition	Standard s
New Admission Up to 1 year post injury	• Formal assessment after 2 weeks • Assessment length 3 weeks • Assessment repetitions 10 • Assessment 6 month then annual (see below)	• WHIM • CRS to be triggered by behaviours above 3 on the WHIM after completion of WHIM • Family and care observation record	• Triggered by observed change in responsiveness – reassessment within 1 week • 6 monthly WHIM assessment for patients admitted within one year • Annual WHIM assessment after one year • Ongoing family and care observation record	• Patient to be medically stable • **10 assessment areas** ; Personal care -1 Sensory room -2 Night -1 Morning -3 Afternoon -3 • In a variety of settings including care, Activities and Therapy • Varied positioning Bed /Wheelchair
Long Stay post injury 5years	• Formal annual assessment • Plateaux of responses identified on the WHIM	• WHIM • CRS assessment to be triggered if WHIM scores change	• Annual review • Ongoing family and care observation record.	• Patient to be medically stable • Assessment to be administered in the same location where the past highest WHIM score was achieved

The Holy Cross Checklist of features for families, volunteers and staff to look for

Please fill in any responses observed at **any** time. Therapist will check forms on a regular basis to help inform the assessment process. The form will go with the patient where ever they go within Holy Cross Hospital.

Name of Patient **D O B**							
Question	**Date Sign (Y/N)**	**Location**	**Date Sign (Y/N**	**Location**	**Date Sign (Y/N**	**Location**	**Date Sign (Y/N**
Seeing							
1. Do they follow movement with their eyes?							
2. Do they look at people, pictures, photos etc?							
3. Do they follow written instruction?							

Question	Date Sign (Y/N)	Location	Date Sign (Y/N)	Location	Date Sign (Y/N)	Location	Date Sign (Y/N)
Movement/function							
10 Have you seen them make purposeful movements?							
11 Do they hold objects or move them?							
12 Do they move towards objects?							
13 Do they move in response to command?							
Communication							
14 Do they show a preference for certain people?							
15 Do they smile in response to a joke or cry/grimace or moan in response to something unpleasant?							
16 Do they make gestures, eg thumbs up?							
17 Do they communicate, ie blink or say words, to indicate 'yes' or 'no'?							

Name -Date	**Additional Comments**

Objective /Subjective

- To be objective is to record the facts observed not emotions.
- To be subjective is to record your thoughts e.g. emotions – sad ,happy

People with DOC can not tell you how they feel so its important our recordings are objective i.e. factual.

Patterns of movement

- Eye closure
- Flexion of the body
- Extension of the body
- Open and closing of the mouth
- Isolated or combined movements

- A repeatable pattern that is often present with or without stimulation but maybe triggered by stimulation e.g. changes in position, environment, noise etc

Reflex

A reflex action, differently known as a reflex, is an involuntary and nearly instantaneous movement in response to a stimulus

Examples

- Pupil dilation to light
- Grasp reflex
- Startle Reflex

Involuntary response

- Pulling your hand away from a hot object, blinking because it's very bright or kicking when someone taps the tendon below your kneecap - these are all innate reflex actions. They happen rapidly, you don't control them and the result is always the same.

WHIM

- The Wessex head injury Matrix is a behavioural scale designed to assess and monitor recovery in patients after severe head injury
- It documents behaviours -62 behaviours – include most advanced behaviours observed
- A patients performance can not be summarised on the score but only on the behaviour description .

Wessex Head Injury Matrix (WHIM)

- WHIM accurately assesses – patient in and emerging from Coma, Vegetative or Minimal conscious state
- WHIM records behaviour irrespective of cognitive, physical impairment or both together in varying proportions
- WHIM identify signs demonstrating recovery, provide objective evidence so that prediction is neither over optimistic nor over pessimistic
- Focus is on what the patient does or does not do rather than upon clinical diagnostic features
- Examines behaviours in areas of motor ability, cognitive skills and social interaction

WHIM

- Observe the person at rest for 10 minuets prior to any recording
- Use the Whim score sheet record position and time of the patient
- Work your way systematically through the observation sheet –following close attention to the time taken for each response –only tick if observed in that time
- Fill in the front sheet with the highest behaviour observed and the score

The Wessex Head Injury Matrix

	Assessment number →	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15	
	Behaviour observed		**Operational definitions**
1	Eyes open briefly	☐☐☐☐☐ ☐☐☐☐☐ ☐☐☐☐☐	Less than 30 seconds.
2	Eyes open for extended period	☐☐☐☐☐ ☐☐☐☐☐ ☐☐☐☐☐	More than 30 seconds
3	Eyes open/move but do not focus on object/person	☐☐☐☐☐ ☐☐☐☐☐ ☐☐☐☐☐	Eyes move in random manner. No sign of tracking and eyes do not rest on object or person.
4	Attention held momentarily by dominant stimulus	☐☐☐☐☐ ☐☐☐☐☐ ☐☐☐☐☐	Momentarily = 2 seconds or longer. Dominant stimulus = noisy/large/brightly-coloured/painful. Identifiable change in behaviour however momentary e.g. from agitated to quiet, eyes closed to open, not moving to moving etc.
5	Looks at person briefly	☐☐☐☐☐ ☐☐☐☐☐ ☐☐☐☐☐	Looks at = eyes move around room aimlessly ... when object/person is noticed eyes remain on this. Briefly = momentarily – impression of 'looking at'.
6	Volitional vocalisation, to express feelings	☐☐☐☐☐ ☐☐☐☐☐ ☐☐☐☐☐	Moans or groans as if to express discomfort, either spontaneously or when having procedures carried out e.g. passive movements to contracted limbs /injections /blood taken.
7	Grinding of teeth/clamping down of teeth	☐☐☐☐☐ ☐☐☐☐☐ ☐☐☐☐☐	Teeth grinding spontaneously or when swab placed in mouth. Teeth clamp down in response to a foam mouth swab when placed in mouth.
8	Makes eye contact	☐☐☐☐☐ ☐☐☐☐☐ ☐☐☐☐☐	Stand where patient is not directly looking at you and call patient's name. Patient switches gaze to you and maintains eye contact for at least 3 seconds.
9	Patient looks at person who is talking to them	☐☐☐☐☐ ☐☐☐☐☐ ☐☐☐☐☐	Switches gaze from somewhere else to look at person talking directly to patient. Continues to look for at least 3 seconds.
10	Expletive utterance ('Get off!', etc.)	☐☐☐☐☐ ☐☐☐☐☐ ☐☐☐☐☐	('Get off!', etc.).

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1) Eyes open briefly
2) Eyes open for extended period
3) Eyes open and move but do not focus on object/person
4) Attention held momentarily by dominant stimulus
5) Looks at person briefly
6) Volitional vocalization, to express feelings
7) Distressed when cloth put on face
8) Makes eye contact
9) Looks at person talking
10) Expletive utterance ('Get off!', etc.)
11) Eyes follow person moving in line of vision
12) Looks at person giving attention
13) Closes eyes and becomes quiescent when cloth put on face
14) Mechanical vocalization (with yawn, sigh, etc.)
15) Performs physical movement on verbal request
16) Turns head/eyes to look when someone is talking
17) Watches person moving in line of vision
18) Tracks for 3–5 seconds
19) Vocalizes to express mood or needs
20) Tracks a source of sound
21) Shows selective response to preferred people
22) Maintains eye contact over 5 seconds
23) Removes cloth from face by headshake, hand grasp, etc. × 3
24) Silent mouthing
25) Frowns, grimaces, etc. to show dislike
26) Is able to ignore distraction
27) Looks at object when requested
28) Imitates gesture (blink x 2, thumb up, etc.)
29) Indicates understanding by headshake, nod, gesture, etc.

WHIM
The Wessex Head Injury Matrix
Scoring sheet

Thames Valley Test Company

General instructions

Start at item one of the matrix (which starts on page 2).

Tick/check all behaviours observed and cross those not observed.

Once you have 10 consecutive crosses: **stop**.

In the Score summary (below) record, as the score, the number of the most advanced behaviour that has been observed (ticked/checked).

Patient details

Name	
Date of birth	
Date of injury	
Age	
Gender	☐ Male ☐ Female
Hospital	
Unit/ward	
Hospital number	

Score summary

Assessment number

Total number of behaviours observed during the sessi

Score (i.e. number of the most advanced behaviour observed)

	Date	Name of assessor	Stimulus used	Assessment conditions	Duration of observation	
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						

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WHIM

- Behaviours signal beginning of social interaction, actions which are more purposeful in nature
- For e.g. Vocalizing to express mood or need, showing selective responses to preferred people, frowning to show dislike
- These behaviours demonstrate the beginning of communication

WHIM

- Behaviours showing increasing evidence of recovery of attention and cognitive organization
- E.g. Being distracted by any external stimulus and then progressing to being distracted briefly but able to return to task
- Final group behaviours – items of orientation and continuous memory, recovery of these behaviours indicates emergence from PTA

	Behaviours Observed	Operational definitions
3	Eyes open/move but do not focus on object/person	Eyes move in random manner. No sign of tracking and eyes do not rest on object person
16	Turns head/eyes to look when someone is talking	Eyes initially directed elsewhere. Moves eyes or turns head to look at person talking. Person not necessarily talking to pt
27	Is able to ignore distraction	When pt giving attention e.g. looking at someone talking can ignore distraction e.g. someone coming into room
45	Can say what part of day it is	Give pt 3 options morning afternoon evening or mealtimes after breakfast and before lunch etc

Coma Recover Scale -CRS

- Provides detailed assessment concentrating on reflex responses as well as behaviours
- Divided into 6 Scales
- Following specific protocol in administration
- The charting of the responses have a direct correlation to the patients progress

CRS Scales	
Visual Function	0-5
Motor Function	0-6
Oromotor/Verbal Function	0-3
Communication	0-2
Arousal	0-3
Auditory Function	0-4

CRS Video

Link - https://healthtalk.org/family-experiences-vegetative-and-minimally-conscious-states/what-is-a-coma-and-what-is-a-vegetative-state#51787

Sensory Modality Assessment and Rehabilitation Technique (SMART)

SMART

- SMART recommended when there is inconclusive diagnosis when using WHIM or CRS-R
- Developed in 1989 at Royal Hospital for Neurodisability, Putney
- Designed for patients With a disorder of consciousness
- 5 essential factors: medical stability, physical management, Environment, Approach and awareness

SMART

- 8 modalities (5 sensory)
  - Visual, auditory, tactile, olfactory, Gustatory
  - Motor function, functional communication, wakefulness
- 29 standardised techniques
- For example, to assess the patients' responses within the auditory modality, a range of standardized auditory stimuli are presented, including loud sound, voice and a variety of specifically selected verbal instructions.
- The verbal instructions are carefully selected from the patient's behavioral repertoire exhibited as being potentially meaningful in the SMART behavioral observation, such as "raise your eyebrows", "move your thumb", to provide the patient with the best opportunity to follow any one or more instructions

SMART

- The SMART's 5 point hierarchical scale is consistent and comparable across all of the sensory modalities.
- 'no response' (level 1)
- 'reflexive' (level 2)
- 'withdrawal' (level 3)
- 'localizing' (level 4)
- discriminating' responses (level 5)
- a consistent response (on five consecutive assessments) at SMART level 5 in any one of the sensory modalities demonstrates a meaningful response and thus indicates that the patient is showing behaviours indicative of a minimally conscious state or higher levels of function

Available evidence…

fMRI Case Study

- Detecting Awareness in the Vegetative State Adrian M. Owen, Martin R. Coleman, Melanie Boly, Matthew H. Davis, Steven Laureys, John D. Pickard (Cambridge coma study group) **Science 313, 1402 (2006);**
- http://perso.univ-rennes1.fr/pascal.benquet/index_fichiers/science%20FRMI%20vegetatif.pdf

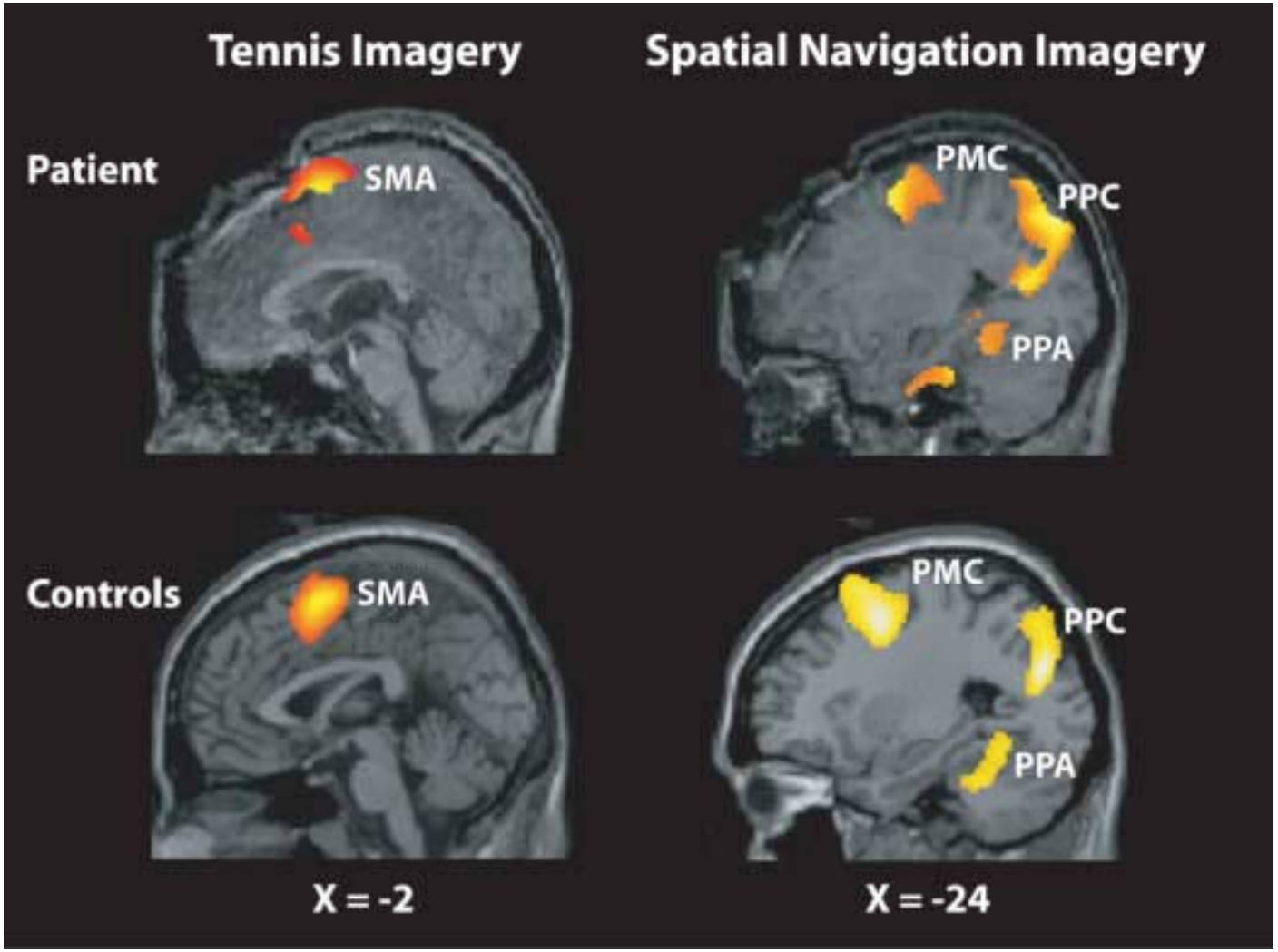
fMRI Study

- Patient: 5 months post severe TBI - remained in a VS
- Compared with 34 healthy volunteers
- First task: responses observed in MRI for spoken sentences *"There was milk and sugar in his coffee"* and *"The creak came from the beam in the ceiling" - ambiguous*
- Produced appropriate neural responses to meaning of spoken sentences – (demonstrated speech perception/ semantic processing – this can go ahead without conscious awareness*)

fMRI Study

- Second task – spoken instructions to perform mental imagery tasks
- “Imagine playing a game of tennis”
- “Imagine visiting all the rooms in your house starting from the front door”
- First task – activity in the supplementary motor area
- Second task – activity in the parahippocampal gyrus, posterior parietal cortex, lateral premotor cortex

fMRI study


Tennis Imagery
Spatial Navigation Imagery
Patient
SMA
PMC
PPC
PPA
Controls
SMA
PMC
PPC
PPA
X = -2
X = -24

fMRI Study - discussion

- Patient was in VS – tests, clinical features
- Patient was able to understand the command
- Patient obeyed instructions – act of intention
- Future studies with larger samples are planned
- Patients in VS/ MCS may be able to communicate in the future

Minimally Conscious State

Minimally Conscious State

- Minimally conscious state (MCS) is defined as a condition of severely altered consciousness in which minimal but definite behavioural evidence of self or environmental awareness is demonstrated (Giacino et al, 2002)

Epidemiology

- MCS prevalence – ten times that of VS (Lombardi et al, 2002) – different at HXH…due to our referrals!
- No specific data available

Pathology - MCS

- Less severe than VS
- Not well described
- Less thalamic injury
- Less high-grade Diffuse Axonal Injury (DAI)

Clinical criteria (Giacino et al, 2002)

- One of the following MUST BE REPRODUCIBLE or ON A SUSTAINED BASIS (can be inconsistent)
- Limited but apparent evidence of self or the environment
  - Follow simple commands
  - Gestural/ verbal response to yes/no questions
  - Intelligible verbalisation
  - Purposeful behaviour e.g scratching

Behavioural repertoire - MCS (Giacino et al, 2002)

- Reaching for objects
- Vocalisation or gestures in direct response to linguistic content
- Touch and hold objects in a way that accommodates the size and shape of the object
- Sustained visual pursuit to a moving stimuli
- Smile or cry appropriately to linguistic or visual content of emotional but not to neutral topics or stimuli
- Other localising (moving towards a perceived object) or discriminating responses (different response to different people/ objects)

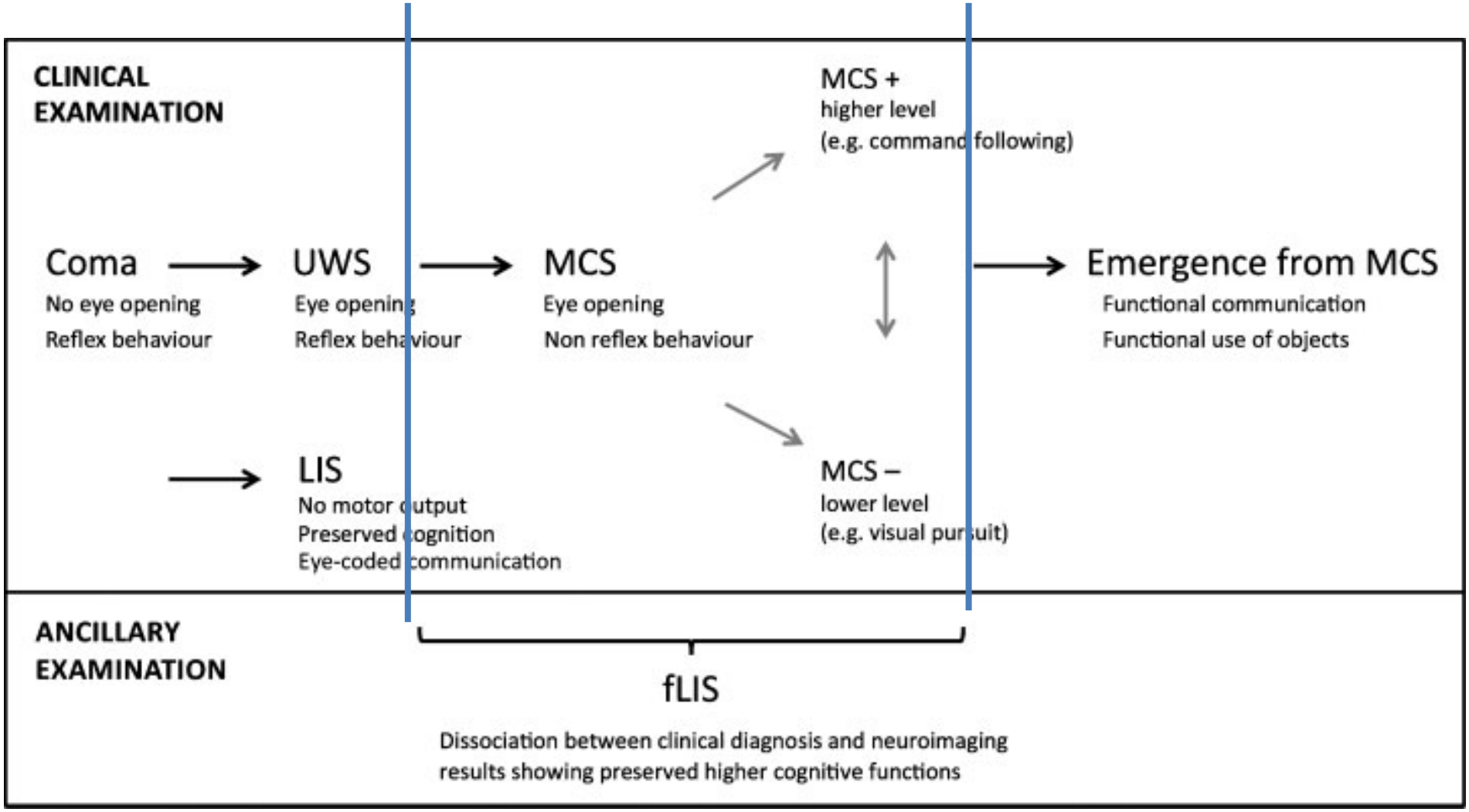
Table 1.4. Operational parameters for demonstrating response reliability and consistency.

Patients should demonstrate a consistent response in at least one of the following types:	
Functional use of objects	Generally appropriate use of at least 2 different objects on 2 consecutive evaluations (with or without instruction) Eg attempts to write using a pen or pencil *and* to use a comb or hairbrush
Consistent discriminatory choice-making	Consistently indicates the correct choice from 2 pictures or matches paired objects on 6/6 trials on 2 consecutive evaluations. (Use at least 3 different pairs.)
Functional interactive communication	
Evidence of awareness of self	Gives correct yes/no responses to 6/6 autobiographical questions on 2 consecutive evaluations*
Evidence of awareness of their environment	Gives correct yes/no responses to 6/6 basic situational questions on 2 consecutive evaluations

*NB When assessing awareness using forced-choice questions, the presentation must be counterbalanced: half the questions correct and half incorrect. Visual information should be presented in both left and right visual fields on each trial to prevent response bias (McMillan TM. *Brain Inj* 1997;11:483–90).

Bruno and colleagues (2011)

- Recommended a division of MCS into ‘plus’ and ‘minus’ subcategories based on the level of complexity of observed behavioural responses
- MCS-plus patients show more complex behaviours such as command following
- MCS-minus patients show only non-reflexive movements such as orientation to noxious stimuli, pursuit eye movements, etc


CLINICAL EXAMINATION
MCS +
higher level
(e.g. command following)
Coma
No eye opening
Reflex behaviour
UWS
Eye opening
Reflex behaviour
MCS
Eye opening
Non reflex behaviour
Emergence from MCS
Functional communication
Functional use of objects
LIS
No motor output
Preserved cognition
Eye-coded communication
MCS –
lower level
(e.g. visual pursuit)
ANCILLARY EXAMINATION
fLIS
Dissociation between clinical diagnosis and neuroimaging results showing preserved higher cognitive functions

A note

- Need to consider if the following are the cause for non responsiveness rather than diminished level of consciousness (Giacino et al, 2002)
- Aphasia
- Agnosia (loss of ability to recognise objects, shapes, smell)
- Apraxia
- Sensorimotor impairment

Emerging out of MCS

- *'Inconsistent, but reproducible'* - MCS
- '*Reliable and consistent'* demonstration of one or both of the following
  - Functional interactive communication
    - Accurate yes/no responses to six of six basic situational orientation questions e.g. Are you sitting down?
  - Functional use of two different objects
    - Appropriate use of two different objects on at least two consecutive evaluations e.g. comb to the hair, pencil to the paper

MCS - Prognosis

- Shorter the duration better the prognosis!
- Recovery is heterogeneous in MCS patients than in VS patients
- If recovering most do so within 24 months
- Rare after 5 yrs

Persistent → Continuing

- ‘continuing VS’ when they have continued to demonstrate complete absence of behavioural evidence for self- or environmental awareness for more than 4 weeks, or
- ‘continuing MCS’ when they continue to demonstrate inconsistent, but reproducible, interaction with their surroundings (above the level of spontaneous or reflexive behaviour) for more than 4 weeks.

Permanent VS/ MCS

- A vegetative state may be classified as a ‘permanent VS’ if it has persisted for
  - >6 months following anoxic or other metabolic brain injury
  - >1 year following traumatic brain injury
  - Use more time if needed before finalising a diagnosis (e.g. 6-12 months)
- Permanent MCS – usually after 5 years

Progressive neurological disease

- MS
- MND
- Huntingdon’s Disease
- Parkinson’s Disease
- Alzheimer's Disease

- Many more….

Patient progression – acute injury/ insult

Coma (after TBI/ acute episode)

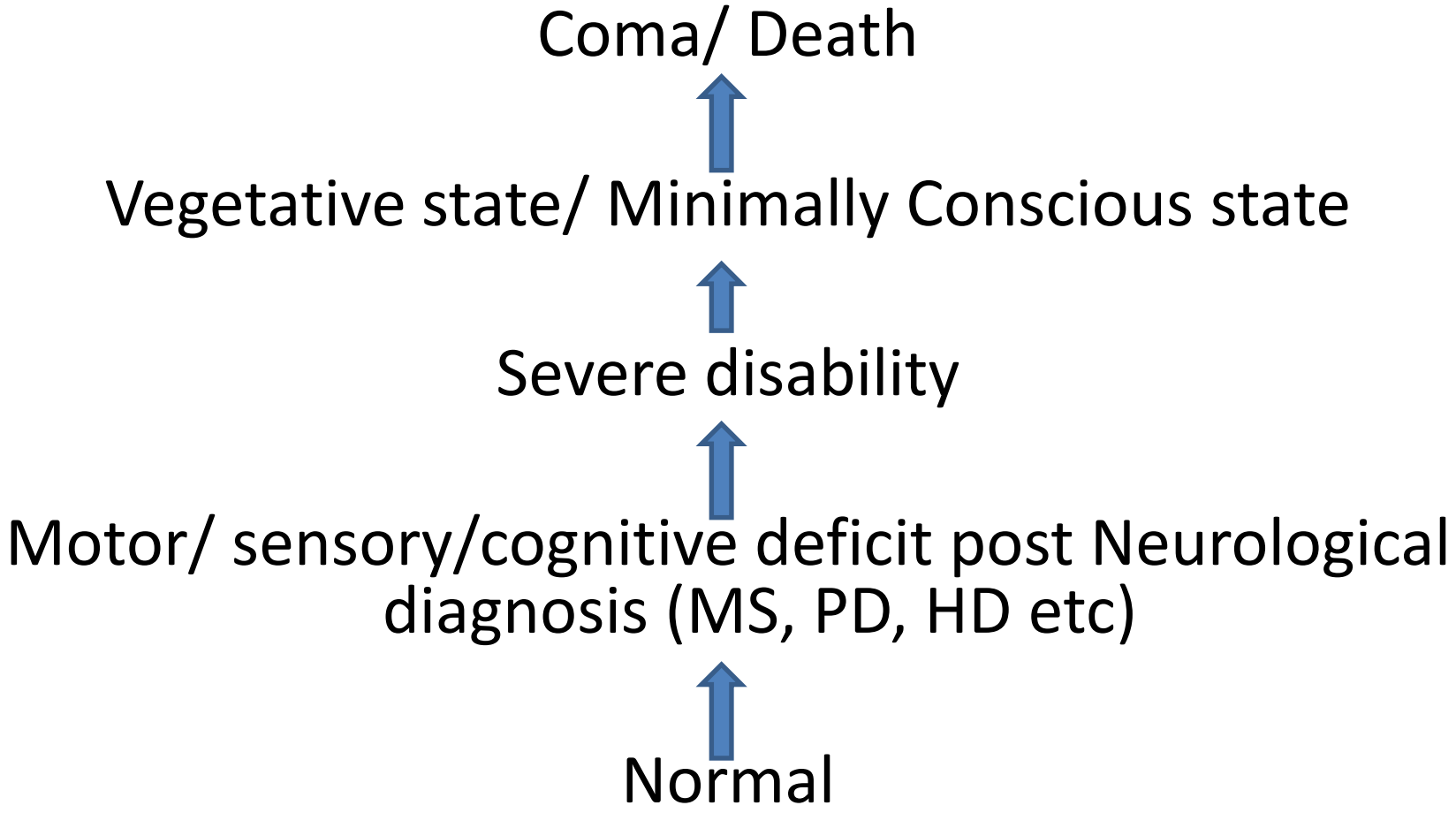
Vegetative state

Minimally Conscious state

Impaired cognitive state

Normal

Patient progression degenerative disease



What is the difference between the two sets of patients?

- Awareness/ consciousness assessments
- Relatives expectations
- Overall management of these patients
- Discuss with your group for 5 minutes.

Guidelines/ protocols/reviews HXH management plan is based on…

RCP (2020) on pDoC

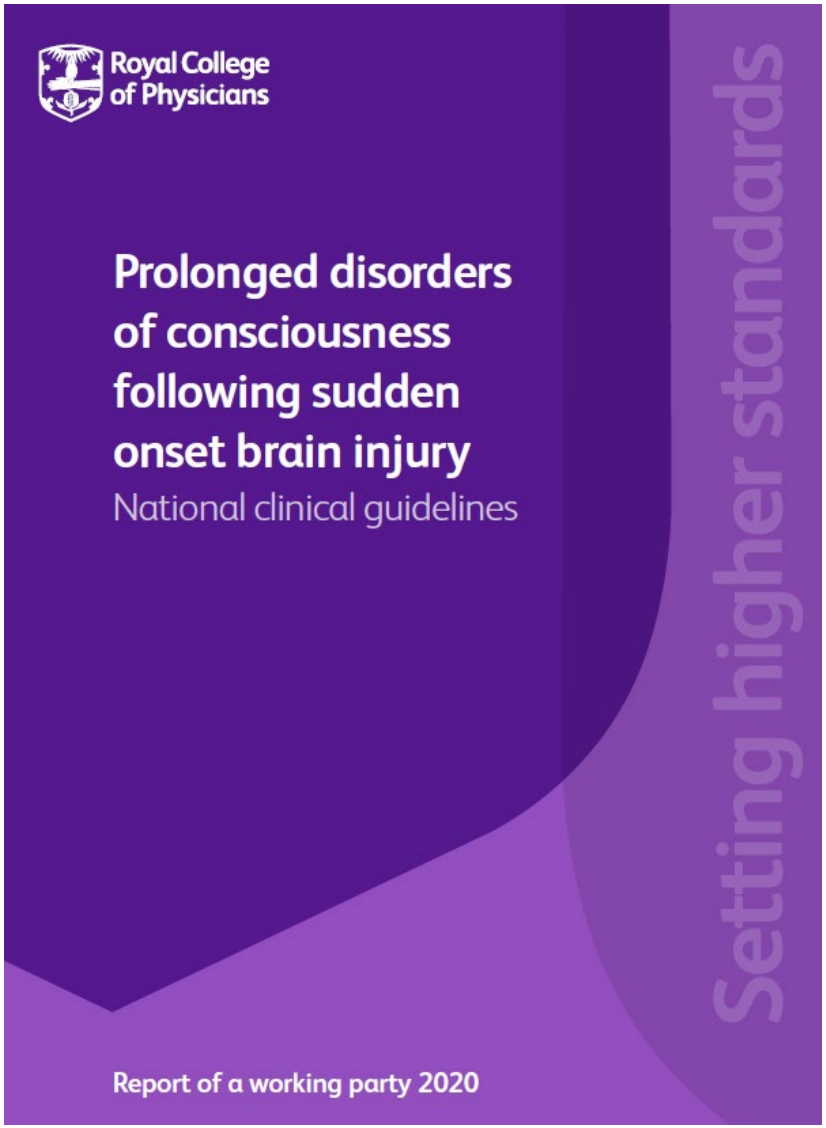
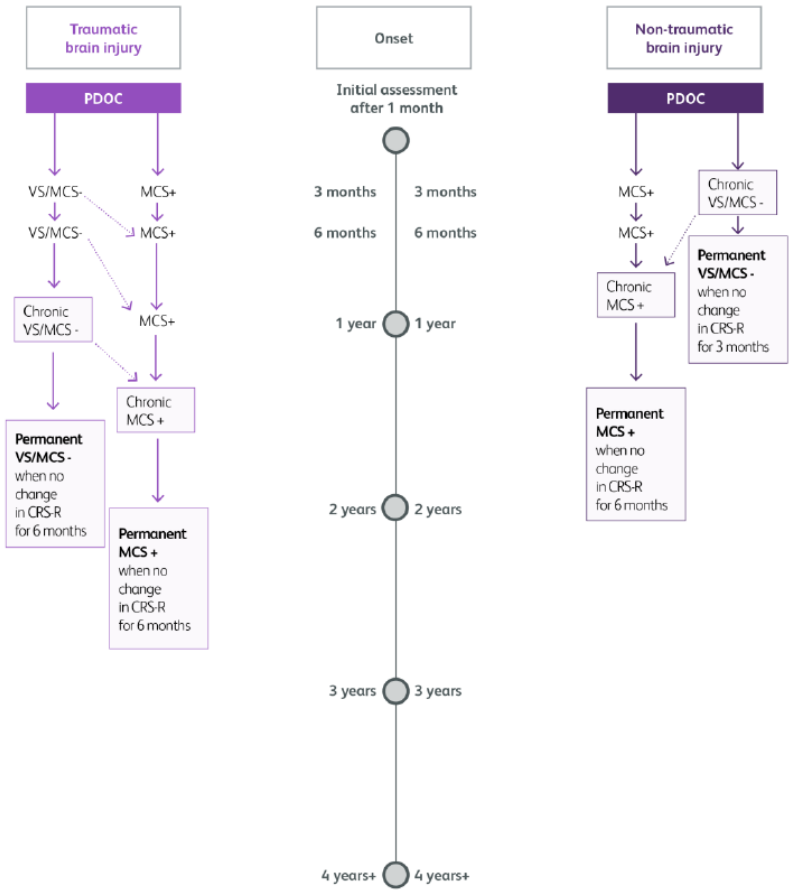


Fig 2.1 Key timepoints for evaluation of patients in VS, MCS-minus and MCS-plus



- At HXH, awareness assessments are carried out at 3, 6 and 12 months – then yearly or if patient change
- Physical assessments will be ongoing and improvements can be observed in different areas like trache decannulation, active movements (used for communication, operating environmental control systems), eating (QOL) etc

Our past experiences

- Case studies
  - Late recovery
  - Can all interventions make a difference
  - Complex patients (posture, spasticity)
  - Withdrawal of nutrition and hydration
  - Managing relatives expectations
    - Education
    - Conflict

Healthtalk online videos

Functions of the SIGs

- Objectives
- Lead
- Sig members

How can we improve practise at HXH?

- Specialist DoC nurse and a DoC SIG
- Support and provide appropriate information to relatives.
- Undertake suitable research projects
- Improve skills and knowledge of HXH team
- Provide learning and development opportunities for external professionals e.g. conference

dochub.org.uk

DOC HUB

In association with Holy Cross Hospital, Surrey

About DOC | Resources | Collaborators | Projects | Events | News | Contact | Portal | Chat Forum

Research

- No dedicated research team/ limited infrastructure currently
- Small funding secured in 2008, 2012
- Published a chapter in the Royal College of Physicians PDOC guidelines re physical management 2020
- Presented works in International conferences – 24-hr posture management, guideline development 2010, 2017, 2019
- Research collaboration mainly through Keele University and other UK centres of excellence
- Close informal links with the expert networks at Boston (USA), Cambridge/ Addenbrookes Hospital and University of Liege (Belgium), Royal Hospital for Neurodisability

Publications

SHARING GOOD PRACTICE

Design and implementation

of an internal clinic referral form to improve interdisciplinary working in splinting and posture management for people with complex disabilities

Physiotherapy Team, Holy Cross Hospital

Cochrane Library
Trusted evidence.
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Title Abstrac

Cochrane Reviews | Trials | Clinical Answers | About | Help

Cochrane Database of Systematic Reviews | Protocol - Intervention

Assistive technology, including orthotic devices, for the management of contractures in adult stroke patients

Rasheed Ahamed Mohammed Meeran, Venugopal Durairaj, Padmanaban Sekaran, Sybil E Farmer, Anand D Pandyan
Authors' declarations of interest

Version published: 10 October 2013 Version history
https://doi.org/10.1002/14651858.CD010779

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Positioning patients in low awareness states (2008)

Rasheed Meeran, Holy Cross Hospital, Haselmere

DOWNLOAD MEERAN FULL REPORT

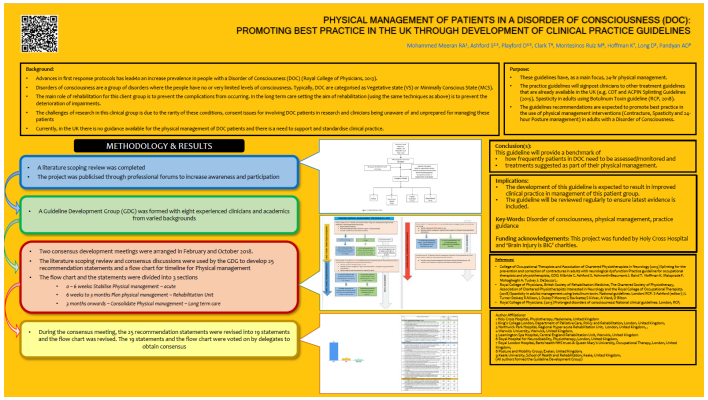
Positioning patients in low awareness states in wheelchair and bed: experiences of nurses and health care assistants (HCAs)

Electronic Annex 3c

Physical management of people in a disorder of consciousness

Aims, scope and definitions

To promote best practice in the use of physical and postural interventions for management of posture and prevention of secondary complications in adults with a disorder of consciousness (DOC).

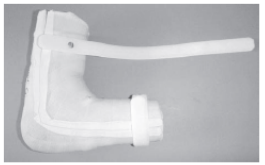


SHARING GOOD PRACTICE 4

A novel technique

to attach Velcro straps to fibreglass splints

Splinting is one of the important interventions in the treatment or prevention of contractures.



The physiotherapists at Holy Cross Hospital, a specialist centre providing rehabilitation and long term care for people with severe and complex disability, developed a technique to incorporate aluminium screw rivets (homecraft Rolyan) when fabricating fibreglass splints. These screw rivets were used to attach straps which were used instead of a crepe bandage to hold the splints in position. When fabricating the splint one part of the rivet was placed between the Scotch Cast layers and a custom made strap was attached to the splint by using the other (screw) part of the rivet. Positioning of the screws and the length of the straps are flexible depending on the part of the body/limb that is being splinted eg a figure of '8' strap can be used when applying an elbow splint. The use of straps for application/ securing of the splint has become popular with staff as it has made the process easier especially in patients with high muscle tone. A document with step-by-step instructions on how to incorporate the screw rivets and attach the strap will be made available in the neurology section of the interactive CSP. Please acknowledge source (Holy Cross Hospital) when using or quoting this technique.

If you have any questions please contact:
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Poster presented at the World Confederation of Physiotherapy – 2019 Geneva

PO-G-24-MON2 PHYSICAL MANAGEMENT OF PATIENTS IN A DISORDER OF CONSCIOUSNESS (DOC): PROMOTING BEST PRACTICE IN UK THROUGH DEVELOPMENT OF CLINICAL PRACTICE GUIDELINES

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Background: Advances in medical sciences and technology have allowed more severely impaired people to survive, leading to an increase in the number of people with a Disorder Of Consciousness (DOC) (Royal College of Physicians, 2013). Disorders of consciousness are a group of disorders where the patients have no or very limited levels of consciousness. A patient in a Vegetative state (VS) or Minimally Conscious State (MCS) will be considered to be with a disorder of consciousness.
The main role of rehabilitation for this client group is to maximise the potential for recovery, maintain their present physical status and to prevent deterioration (Andrews 2005).This is crucial as survival rates in DOC patients are increasing and as a result the long-term cost burden to both the State and/ or an individual will increase (current estimated cost for managing these patients vary from £100,000 to £200,000 / year depending on level of complications).
Purpose: These guidelines have, as a main focus, 24-hr posture management. The practice guidelines will signpost clinicians to other treatment guidelines that are already available in the UK (e.g. COT and ACPIN Splinting Guidelines (2015), Spasticity in adults using Botulinum Toxin guideline (RCP, 2018). The guidelines recommendations are expected to promote best practice in the use of physical management interventions (Contracture, Spasticity and 24-hour Posture management) in adults with a Disorder of Consciousness.
Methods: A Guideline Development Group (GDG) was formed with eight experienced clinicians and academics from varied backgrounds.
A literature scoping review was completed prior to arranging two consensus development meetings with a large group (25 for first meeting and 50 for the second) experienced clinicians and academics.
The project was publicised through professional forums to increase awareness and participation.
In addition to gaining consensus on various topics, professionals shared knowledge (assessment and treatment protocols used in their units) at the first consensus meeting
The literature scoping review and consensus discussions were used by the GDG to prepare drafts of the guideline.
Results: The Guideline drafts were circulated within the GDG and the final draft will be shared with a large group of 50 professionals attending the second consensus meeting in October 2018. Upon obtaining consensus on the recommendations and other content of the document, professional organisations will be approached to secure endorsements before publication.
Conclusion(s): The scarcity of literature related to physical management of people with a DOC was highlighted in the scoping review. It was encouraging to note that there was good consensus among clinicians on what physical management interventions were provided to DOC patients. This guideline will provide a benchmark of how frequently patients in DOC need to be assessed/monitored and treatments suggested as part of their physical management.
Implications: The development of this guideline is expected to result in improved clinical practice in the treatment of DOC patients, who usually need monitoring and treatment for very long periods, often decades. The guideline will be reviewed at regular intervals to ensure latest evidence base is appropriately highlighted in the recommendations.
Key-Words: Disorder of consciousness, physical management, practice guidance
Funding acknowledgements: This project was funded by Holy Cross Hospital and Brain Injury is BIG charities.
Ethics approval: Did this work require ethics approval?: No
Institution: Holy Cross Hospital
Ethics Committee: Holy Cross Hospital Ethics committee
Please state the reasons why ethics approval was not required:
This is a Systematic review and guideline development project

Any questions?

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