



Neurologic Music Therapy within Inpatient Neurorehabilitation

Roz Cabrita, Clinical Lead for Chiltern-MusAbility partnership and Director, MusAbility

Nuala Goggins, Speech & Language Therapist, NHS Trafford Healthcare NHS Trust

The Pilot



- Funded by the ‘Small Change, Big Difference’ charity fund at Manchester Foundation Trust
- 12 Full days of NMT across 3 months
- Mix of individual and group sessions



Project aims:

- *to improve outcomes for patients at discharge*
- *To evidence the benefits of Neurologic Music Therapy to staff, patients and families in the context of UK hospital care*
- *To evidence the need for expansion of the service with project hospital site and further sites in UK*
- *To evidence a need for further research using UK data*

Neurologic Music Therapy

NMT is an evidence-based, neuro-scientific model of practice



SENSORIMOTOR TRAINING



SPEECH AND LANGUAGE TRAINING

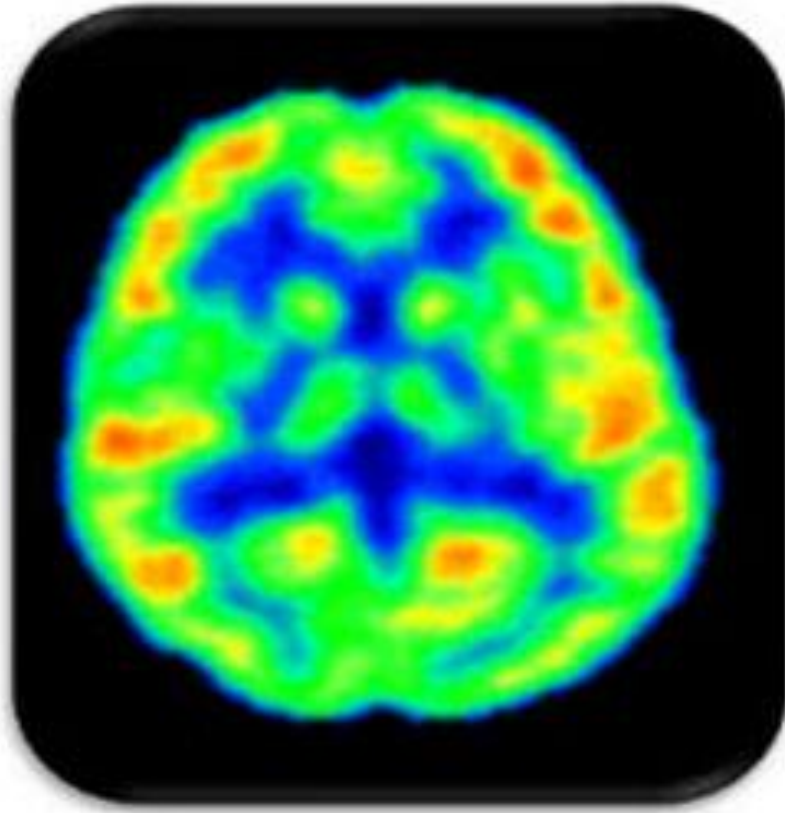


COGNITIVE TRAINING

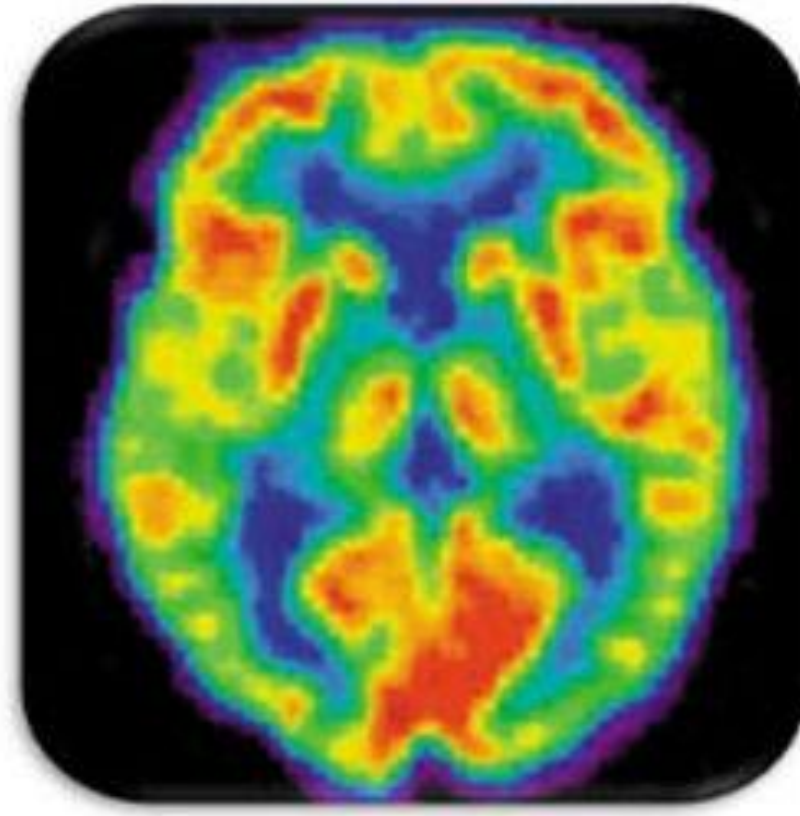


Music and the Brain

The brain at rest



The brain's reaction to music



Music and the brain

Playing and listening to music works several areas of the brain

Corpus callosum:

Connects both sides of the brain

Motor cortex:

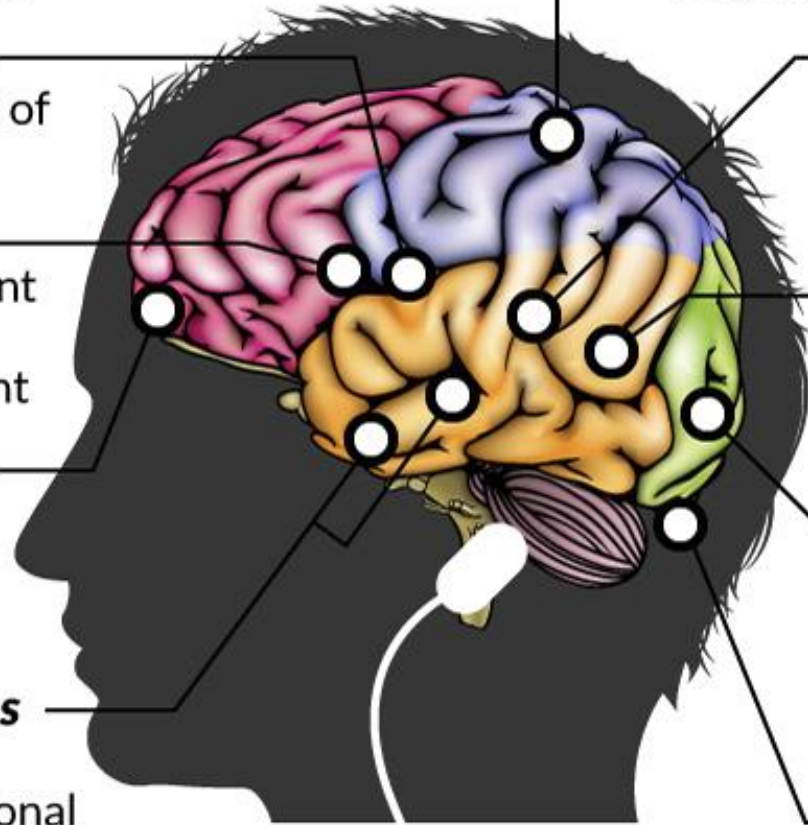
Involved in movement while dancing or playing an instrument

Prefrontal cortex:

Controls behavior, expression and decision-making

Nucleus accumbens and amygdala:

Involved with emotional reactions to music



Sensory Cortex:

Controls tactile feedback while playing instruments or dancing

Auditory cortex:

Listens to sounds; perceives and analyzes tones

Hippocampus:

Involved in music memories, experiences and context

Visual Cortex:

Involved in reading music or looking at your own dance moves

Cerebellum:

Involved in movement while dancing or playing an instrument, as well as emotional reactions

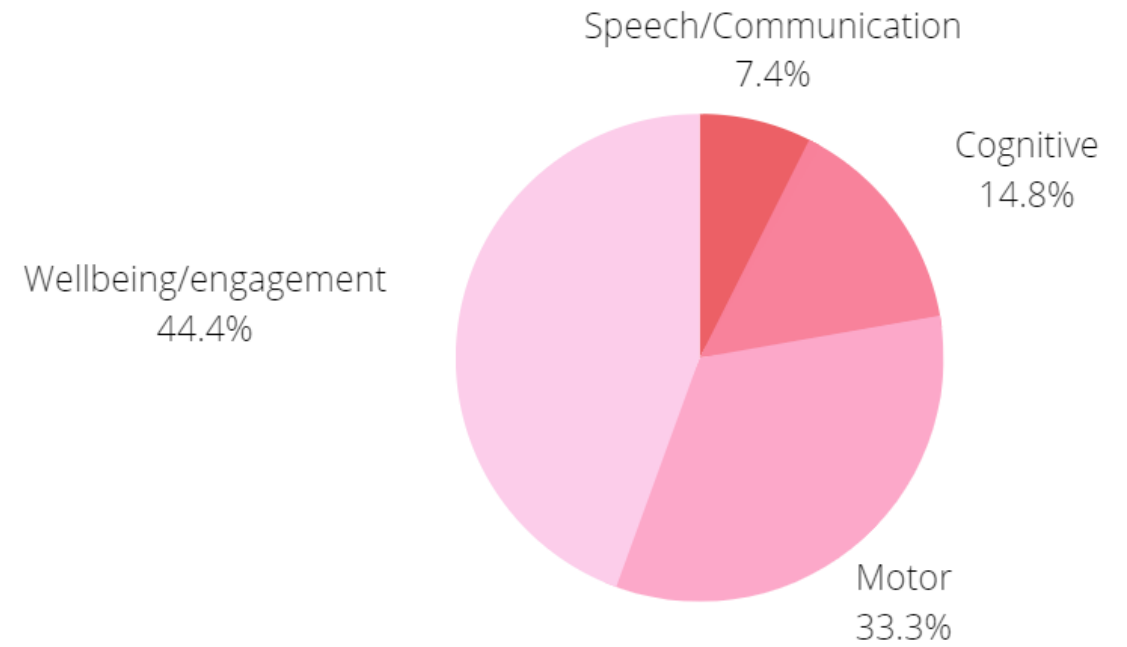


Referral Criteria

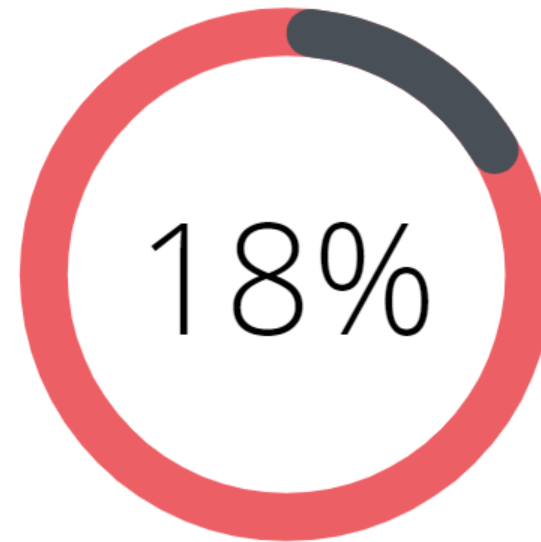
P1 – Patient not engaging in any therapy

P2 – To supplement the patient's current rehab program

P3 – To support quality of life, leisure and enjoyment



% of referrals to NMT by primary domain reason



% of Priority 1 referrals during the project



Case Study: Ben

- 46 years old, in INRU for 6 months prior to NMT input.

- Cortically blind and suffering severe cognitive and sensory impairment following a left frontal intracerebral haemorrhage in 2021.

- Struggled to engage in any therapy despite intensive input from MDT. Goals discontinued as unable to attend or concentrate. Passive and unintelligible.



Session 1

- Understanding and responding to verbal interaction.
- Spontaneously recalling lyrics.
- Spontaneously improvising and exploring rhythms.



Ben

SMART goals included:

- choosing between x3 objects,
- discriminating and understanding sounds,
- following verbal commands and
- initiating communicative vocalisations

Discharge Report with recommendations for care and clinical approach and potential for rehabilitation.



96.5%

% of NMT SMART goals achieved across treatment

Session 10

- Direction following
- Memory and exercise retention
- Functional movement for ADLs
- Character and humour!





Case Study: Mobility Group

Collaborative Physical Aims

- Improve joint ROM
- Improve co-ordination, balance, precision and position
- Improve fine and gross motor movement patterns
- Improve functional ability for independence for ADLs
- Improve muscle activity, endurance and strength
- Maintain cardiac health
- Reduce pain and pain perception
- Improve quality of life
- Plus additional cognitive aims!

**“It was on my timetable and I was
like...YAY!”**

- Upper and lower limb functional movement.
- Exercises centred around personalised rehab aims.
- Fun!



INRU: 3-Month NMT Pilot Review highlights



87%

87% of patients achieved their SMART goals in NMT sessions.

21 unique patients were seen during the pilot



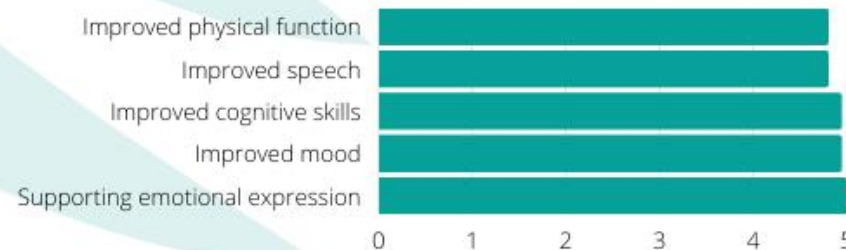
95% of patients improved in mood following NMT

"I've never seen him as engaged, ever"
- MDT member

100% 

100 % of patients agreed they would like to come back for more sessions

All staff agreed or strongly agreed that NMT was effective for improving physical function, speech, cognitive skills, mood, and emotional expression for patients on the unit.



EQ-5D Data

Mean change in EQ-5D index = 0.2584

There was a mean clinically important difference between admission and discharge.

EQ-5D data suggesting music therapy group sessions were shown to be beneficial to the patients' quality of life.

What's next?

- Clear positive impact evident on both staff and patients
- EQ-5D data and patient and staff data show that there is a need for NMT
- Securing funding for an extended pilot study to determine longer term impact of NMT in INRU.



“The only comment one wishes to make
is to implement a music therapist
permanently on INRU!!!!”

Rehabilitation Assistant

Thank you for listening

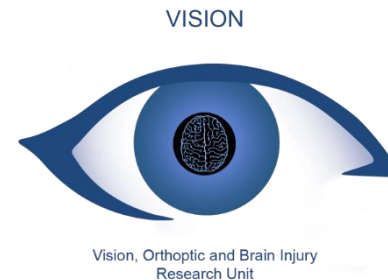


@ChilternMusic @musabilitymt
www.chilternmusictherapy.co.uk
www.musability.co.uk

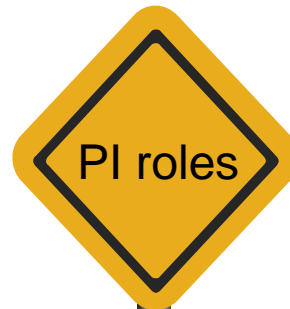


Dr Claire Howard

Stroke / Brain injury Specialist Research Orthoptist



A journey into research and visual impairment



Lack of evidence

2004

Stroke



FACE
Has their face fallen on one side? Can they smile?

ARMS
Can they raise both arms and keep them there?

SPEECH
Is their speech slurred?

TIME
To call 999 if you see any single one of these signs

NHS

Act F.A.S.T. help us help you

WHEN STROKE STRIKES, Act F.A.S.T.

Unanswered questions



First steps

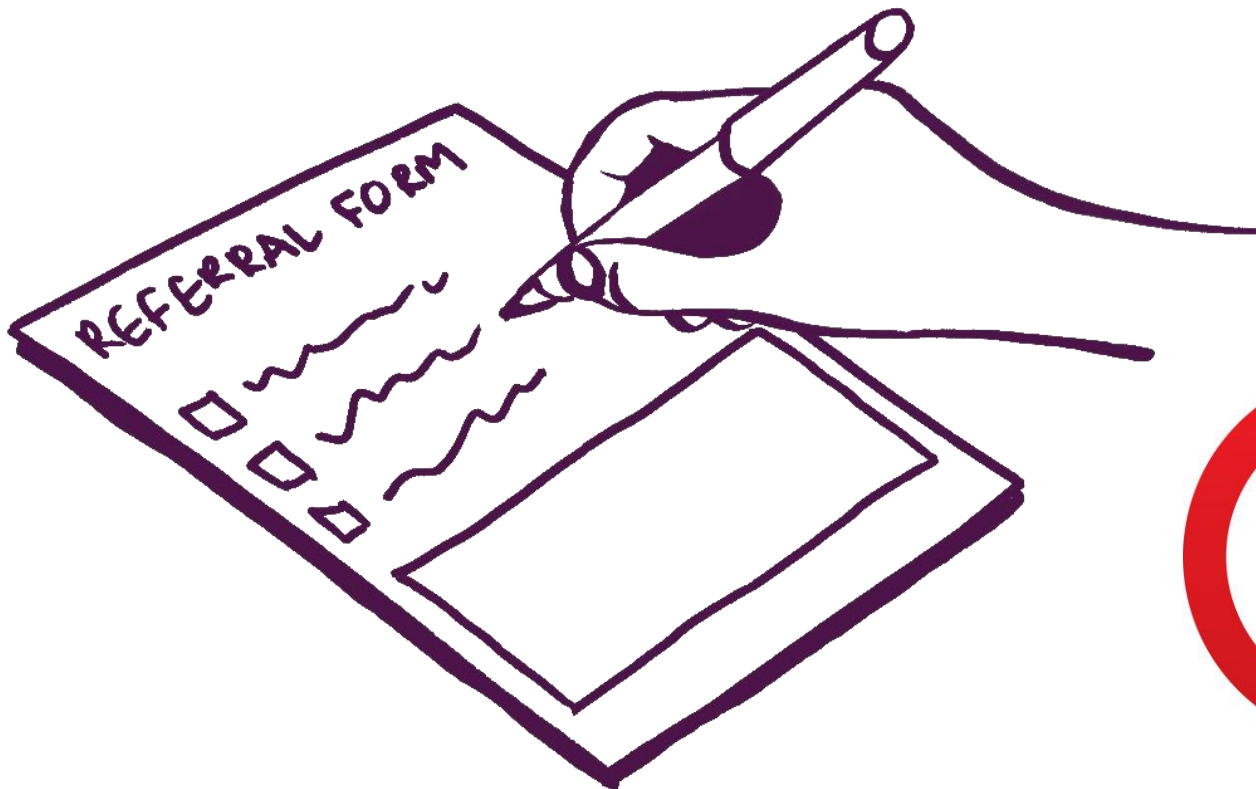


VIS Study

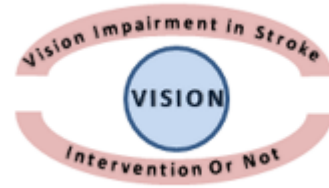


- 915 recruited
- 92% had confirmed visual impairment

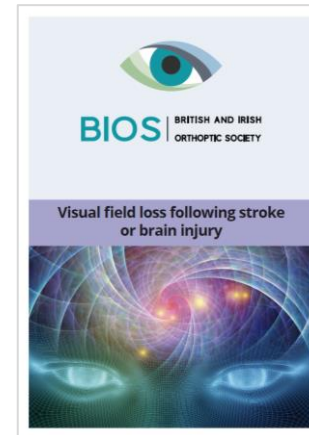
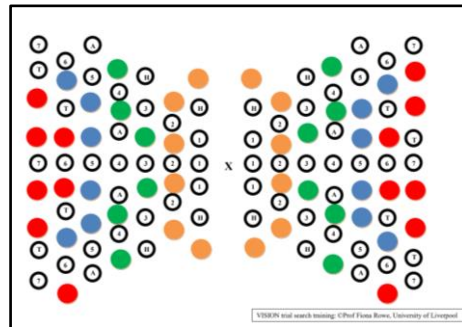
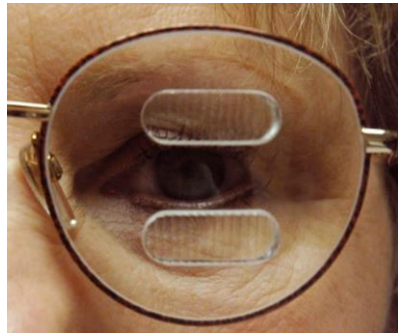
2006-2009



VISION trial



- Pilot trial hemianopia
- 3 arm RCT



2011-2013

Stroke
Association



IVIS Study



2013-2018



CONSEQUENCES OF VISUAL IMPAIRMENT

 3x more likely to be unemployed	 3x more likely to be involved in a motor vehicle collision	 3x more likely to suffer from depression and anxiety disorders	 2x more likely to have a fall while walking
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FUNDED BY

NIHR | National Institute for Health and Care Research

NIHR CDRF

Leadership



2015

Accepted: 28 November 2016
DOI: 10.1111/ane.12725

ORIGINAL ARTICLE

WILEY **ACTA Neurologica Scandinavica**

A pilot randomized controlled trial comparing effectiveness of prism glasses, visual search training and standard care in hemianopia

F. J. Rowe¹ | E. J. Conroy² | E. Bedson³ | E. Cwiklinski³ | A. Drummond⁴ |
M. García-Fiñana² | C. Howard⁵ | A. Pollock⁶ | T. Shipman⁷ | C. Dodridge⁸ |
C. MacIntosh⁸ | S. Johnson⁹ | C. Noonan¹⁰ | G. Barton¹¹ | C. Sackley¹²



NIHR CDRF

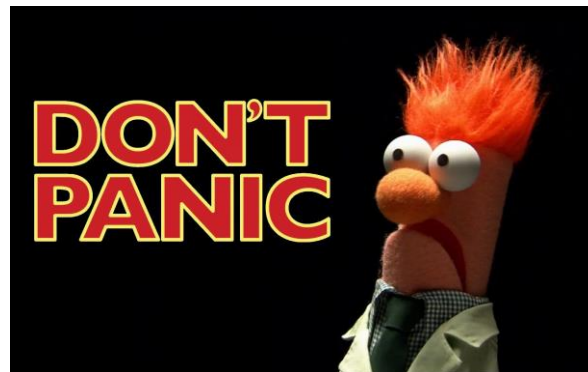


2016-2020



NIHR CDRF - Tips

NIHR | Research Design Service
North West



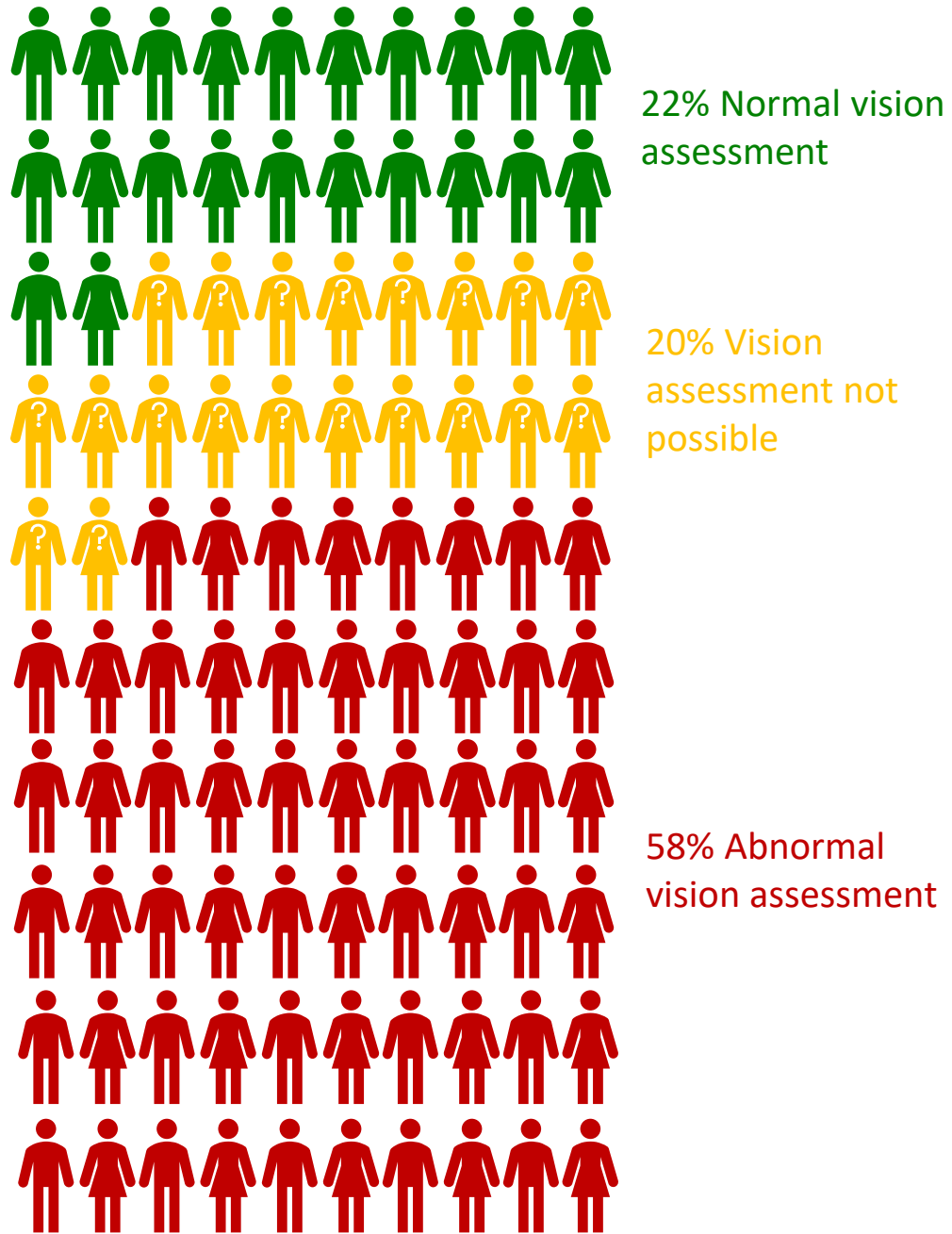
IVIS Results



2013-2018

- 1033 stroke patients screened
- **73%** had visual impairment

Rowe et al 2019. High incidence and prevalence of visual problems after acute stroke: An epidemiology study with implications for service delivery. PLoS One.





Symptoms

**Journal
of Stroke
& Cerebrovascular Diseases**

FULL LENGTH ARTICLE | [VOLUME 30, ISSUE 6, 105759, JUNE 01, 2021](#)

“Eye” Don't See: An Analysis of Visual Symptom Reporting by Stroke Survivors from a Large Epidemiology Study

[Lauren R Hepworth, PhD](#) • [Claire Howard, PhD](#) • [Kerry L Hanna, PhD](#) • [Jim Currie](#) • [Fiona J Rowe, PhD](#)  

Published: April 01, 2021 • DOI: <https://doi.org/10.1016/j.jstrokecerebrovasdis.2021.105759>

Almost 40% of stroke survivors with new onset visual impairment do not or cannot report visual symptoms

Visual Impairment Screening Assessment (VISA)

Open access

Original research

BMJ Open Vision Screening Assessment (VISA)
tool: diagnostic accuracy validation of a
novel screening tool in detecting visual
impairment among stroke survivors

Fiona J Rowe ¹, Lauren Hepworth ¹, Claire Howard ¹, Alison Bruce ^{2,3},
Victoria Smerdon,⁴ Terry Payne,⁵ Phil Jimmieson,⁵ Girvan Burnside⁶

2016-2019



UNIVERSITY OF
LIVERPOOL

Print version - 97% sensitive 67% specific

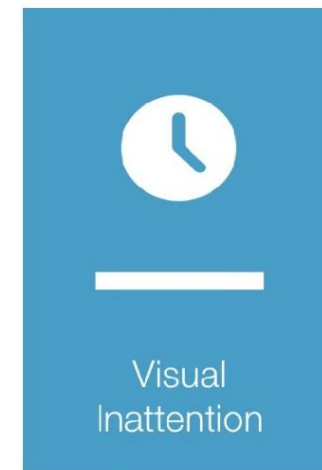
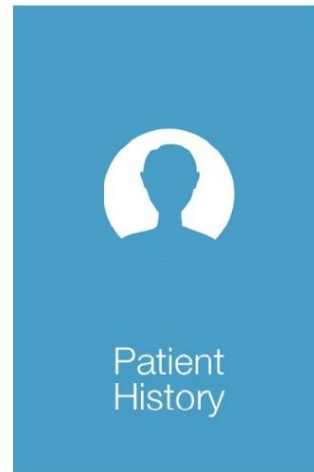
App version - 88% sensitive 87% specific

Visual Impairment Screening Assessment (VISA)



Available as:

- Booklet
- App
- Detailed instructions
- Video



Visual Impairment Screening Assessment (VISA)



Visual Impairment Screening Assessment (VISA)

Institute of Population Health

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VFAST

VISION



ANY NEW EYE OR VISION PROBLEMS?

FACE



HAS THEIR FACE FALLEN ON ONE SIDE? CAN THEY SMILE?

ARMS



CAN THEY RAISE BOTH ARMS AND KEEP THEM THERE?

SPEECH



IS THEIR SPEECH SLURRED?

TIME



TIME TO CALL 999 IF YOU SEE ANY OF THESE SIGNS

Vision, Orthoptic and Brain Injury Research Unit

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- [PAVE V-FAST](#)
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VISA (Visual Impairment Screening Assessment)

The Vision Screening Assessment (VISA) tool has been developed by the VISION research unit, University of Liverpool. The tool is available free of charge to healthcare professionals.

VISA follows extensive research through the Vision In Stroke (VIS) study, Impact of Visual Impairment in Stroke (IVIS) programme and PERIMETRY programme, leading to the development, pilot and validation of the screening tool.

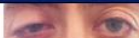




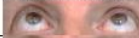




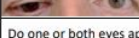
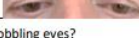


VISA tool resources



[Download VISA Resources](#)

www.vision-research.co.uk

V-FAST

Paramedic Vision Evaluation Checklist	
Symptoms	Observations
From patient or their family: What do they report?	 Are the lids different?
Reported a new problem with eyes/vision and/or dizziness or problems with balance	 Are pupils different sizes? (anisocoria)
Is vision different between the 2 eyes? Ask the person to cover each eye in turn.	 Do they have a squint? (eye turn)
Have visual symptoms lasted >1 hour?	 Are they closing one eye to focus?
When did the most recent visual problems start?	Do they move their head position to try to see better?
Eye Alignment	Eye Movements
Use a spotlight to check the pupil position in both eyes. Then, using one finger ask the person to follow it into the 4 positions to extremes (below left), keeping their head still. Tips: - If you cannot move your hand/arm fully to one side, e.g. wall on that side, turn the person's head towards you to test - If person is confused/cannot understand to follow your finger, move your head side to side to check how they follow your face	
 Does one eye turn in	 Do both eyes move smoothly upwards?
 Does one eye turn out	 Do both eyes move smoothly to the right?
 Does one eye turn up	 Do both eyes move smoothly to the left?
 Does one eye turn down	 Do both eyes move smoothly downwards?
Do one or both eyes appear to have nystagmus – wobbling eyes?	
Reading	Ask the person to read the following text
Can you read this sentence without any problems?	
Visual Fields	Visual Inattention / Extinction
<ol style="list-style-type: none"> Holding both of your arms out to the side, asking the person to look at your nose, slowly bring one finger from in from the periphery for all 6 positions (below left) in a random order. Holding both arms up (one to each side) briefly raise one or two fingers of one hand and ask how any are seen, repeat in the 4 quadrant positions (below right) Ask if they can see all parts of your face or if part or one side appears more blurred than the rest Tips: If you cannot move your hand/arm fully to one side, e.g. wall on that side, turn the individuals head towards you to test	<ol style="list-style-type: none"> Asking the person to look at your nose, hold up two fingers (one from each hand) to the individual's right side and ask how many fingers they can see Slowly move one finger across to the left side, keeping the other finger on the right side, asking again how many fingers they can see Repeat to other side Tips: - One finger may not be seen but individual may be aware it should be seen or alternately they are unaware and only see one - Watch whether they ignore things to left or right side e.g. they miss that someone has approached them from one side
	Example for testing left sided inattention/extinction  Are they ignoring or showing neglect or extinction to left or to right side

NHS
 North West
 Ambulance Service
 NHS Trust



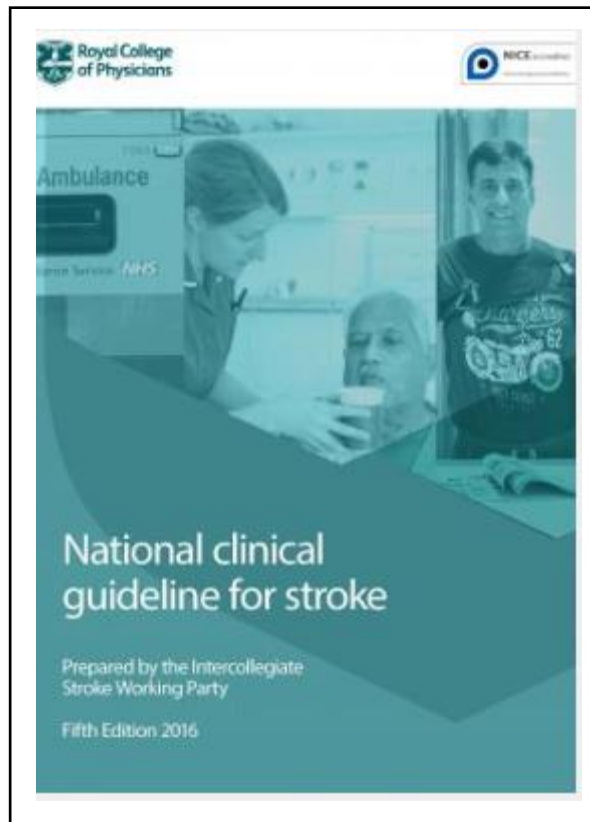
Rowe FJ et al 2020. Development of V-FAST: a vision screening tool for ambulance staff. Journal of Paramedic Practice.





VISable



RCP National Stroke Guidelines



Orthoptics concise guide for stroke 2016

This profession-specific concise guide contains recommendations extracted from the National Clinical Guideline for Stroke, 5th edition, which contains over 400 recommendations covering almost every aspect of stroke management. The reference number of each recommendation is provided so that they can be found in the main guideline www.nice.org.uk/guidance/CG147. The recommendations below have direct implications for orthoptists. This concise guide should not be read in isolation, and as members of the stroke multidisciplinary team, orthoptists should consider the guideline in full.

Specialised stroke services

2.3.10 Acute stroke services should have management protocols for the admission pathway including links with the ambulance services, emergency stroke treatments, acute imaging, neurological and physiological monitoring, swallow assessment, hydration and nutrition, vascular surgical referrals, rehabilitation, end-of-life (palliative) care, secondary prevention, the prevention and management of complications, communication with people with stroke and their family/careers and discharge planning.

2.3.11 Acute stroke services should have an education programme for all staff providing acute stroke care (including ambulance services and the emergency department as appropriate) and should provide training for healthcare professionals in the specialty of stroke.

Resources

2A.1A People with stroke should be treated on a specialist stroke unit throughout their hospital stay unless their stroke is not the predominant clinical problem.

2A.1J A stroke rehabilitation unit should have a single multi-disciplinary team including specialists in:

- > medicine;
- > nursing;
- > physiotherapy;

- > occupational therapy;
- > speech and language therapy;
- > dietetics;
- > clinical psychology/neuropsychology;
- > social work;
- > orthoptics;
- > with easy access to pharmacy, orthotics, specialist seating, assistive technology and information, advice and support for people with stroke and their family/careers.

Transfers of care - discharge from hospital

2.21K People with stroke, including those living in care homes, should continue to have access to specialist services after leaving hospital, and should be provided with information about how to contact them.

Rehabilitation approach - goal setting

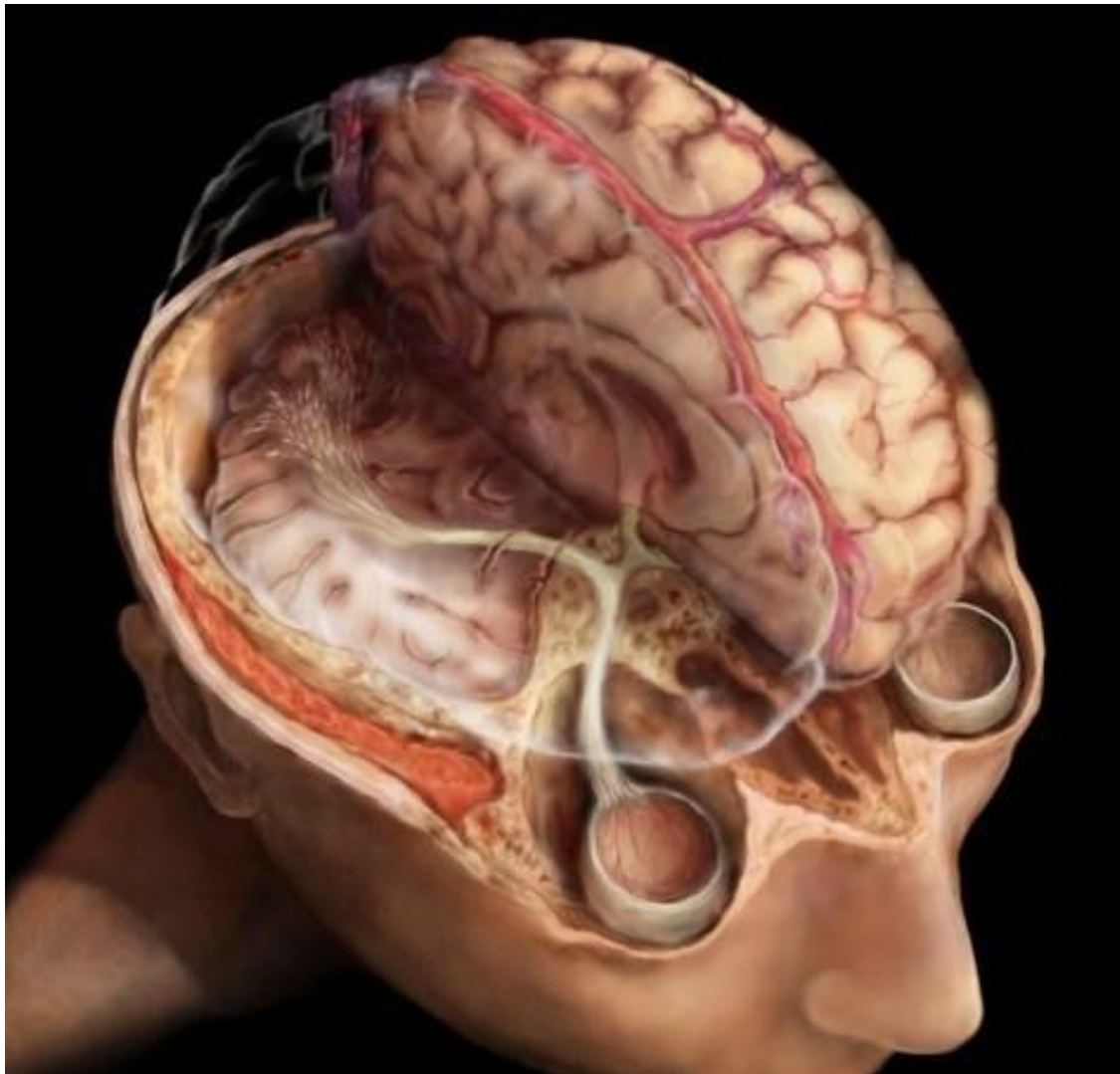
2.10.1A People with stroke should be actively involved in their rehabilitation through:

- > having their feelings, wishes and expectations for recovery understood and acknowledged;
- > participating in the process of goal setting unless they choose not to, or are unable to because of the severity of their cognitive or linguistic impairments;
- > being given help to understand the process of goal setting, and to define and articulate their personal goals.

Orthoptics concise guide for stroke 2016



Neuro rehab



VISA Audit 2022

C2 - hyper-acute
L1 - acute / rehab



Sensory-Motor Assessment

Hearing impairment Yes No Not assessed Communication impairment Yes No Not assessed

VISA Screening Tool

Vision Impairment Screening Assessment (VISA) - copyright to VISION Research Unit, University of Liverpool.
This screening tool should be completed for all patients with neurological brain conditions, regardless of symptoms.

History of eye care

Glasses broken or lost Yes No

Visual symptoms

Any visual symptoms Yes (Specify) No Any family concerns Yes (Specify) No

Visual observation

Any visual observations Yes (Specify) No Any family concerns Yes (Specify) No

Visual acuity

Distance visual acuity worse than 0.2: cannot see one or both lower lines Right eye N/A Yes No Left eye N/A Yes No

Near visual acuity worse than N6: cannot see one or both upper lines Right eye N/A Yes No Left eye N/A Yes No

If unable to read letters, grating acuity only large size seen N/A Yes No

Eye alignment

Eye turns in Yes No Eye turns out Yes No Eye turns up Yes No Eye turns down Yes No

Eye movement

One or both eyes do not move fully to right side Yes No One or both eyes do not move fully to left side Yes No

12 weeks

1/7/22 -20/9/22

C2 VISA Audit

- 4/15 VISA performed (27%)

Reason for no screen	Numbers
No reason specified	4
Cognition	3
No vision concerns	2
Lack of engagement	2

N = 15

FAIL

100%

L1 VISA Audit

- 7/18 VISA performed (39%)

Reason for no screen	Numbers
Spinal injury only	6
Cognition	2
No vision concerns	1
Seen elsewhere (MREH)	1
Lack of engagement	1

N = 18

FAIL

100%

Overall VISA Audit

- 11/33 VISA performed (33%)

Reason for no screen	Numbers
Spinal injury only	6
Cognition	5
No vision concerns	3
Lack of engagement	3
Seen elsewhere (MREH)	1

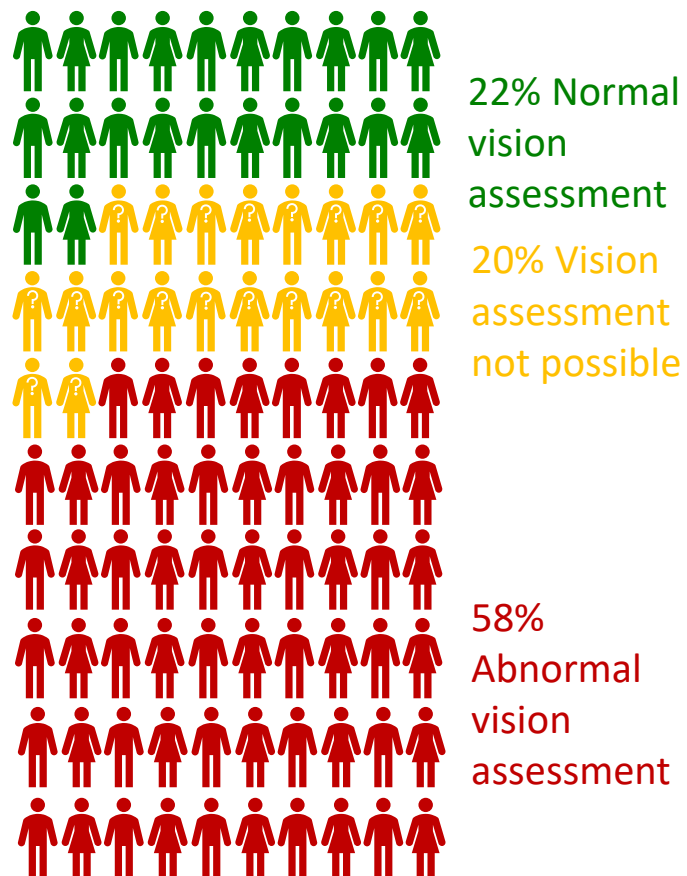
N = 33

FAIL

100%

VISA Audit 2022 - Key points

Stroke

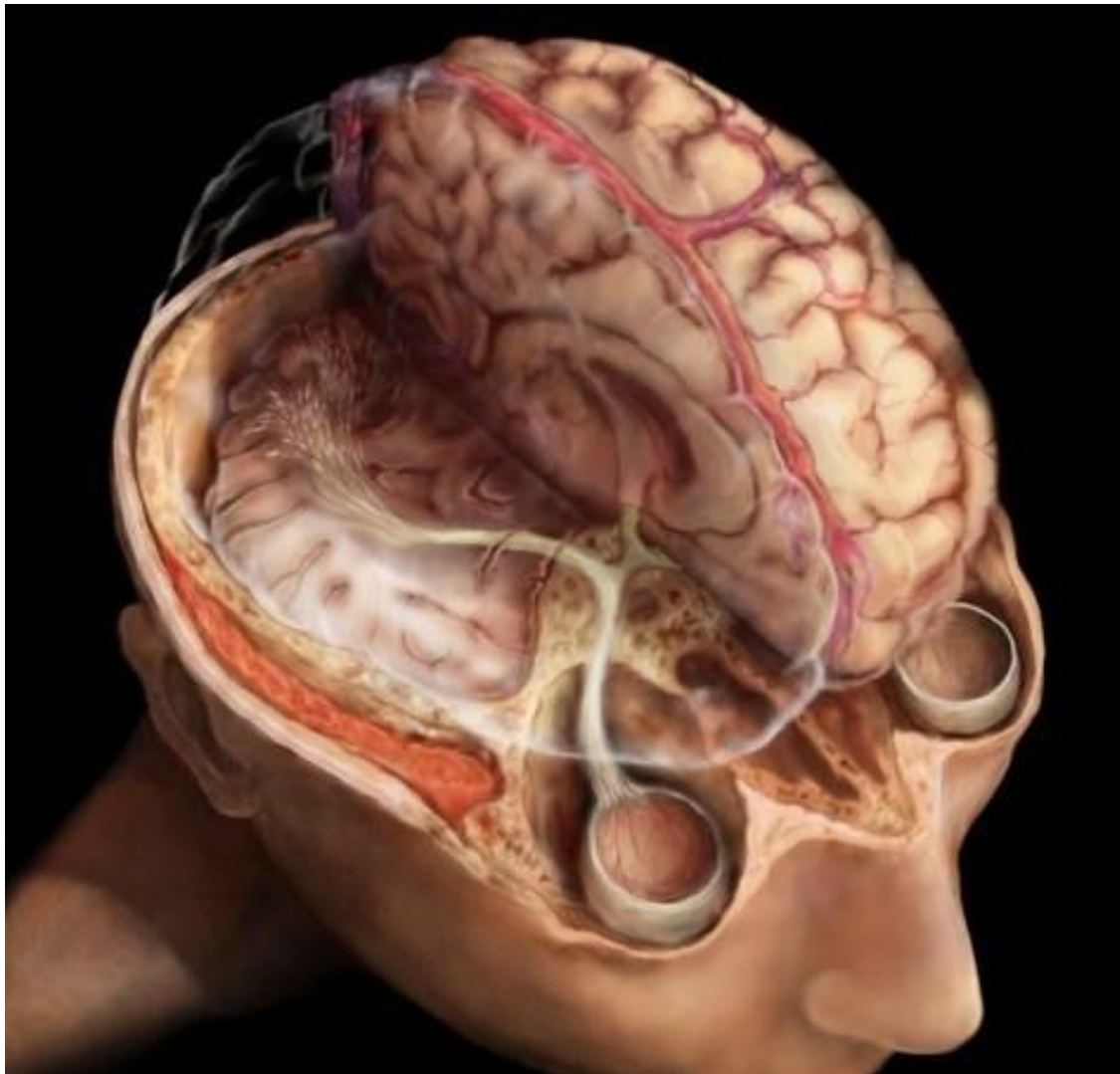


20% v 67%

NOT TESTED



Neuro rehab



Research support



Royal College
of Nursing
The voice of nursing



Health
Innovation
Manchester

NIHR | Applied Research Collaboration
Greater Manchester

Neuro rehab research support



the brain injury association



Geoffrey Jefferson Brain Research Centre



Neuro rehab research support



James
Lind
Alliance

Priority Setting Partnerships



**British Society of
Rehabilitation Medicine**

Promoting quality through
education and standards

Research experience



NIHR | National Institute
for Health Research

**Associate
Principal
Investigator
Scheme
explained**

The illustration shows three healthcare professionals in a clinical setting. On the left, a woman with dark hair and glasses, wearing a green scrub top, holds a clipboard. In the center, a man with dark hair, wearing a light blue scrub top, holds a black clipboard. On the right, a woman with dark hair, wearing a dark blue scrub top, stands with her arms crossed. The background is a light blue wall.

Research opportunities



ARC-GM Research Internship Programme

Our Internship Programme is an introduction to research for registered health and care professionals (excluding doctors and dentists) in Greater Manchester.

The banner features a decorative graphic of yellow and white squares and rectangles on a dark blue background.

Applications currently open

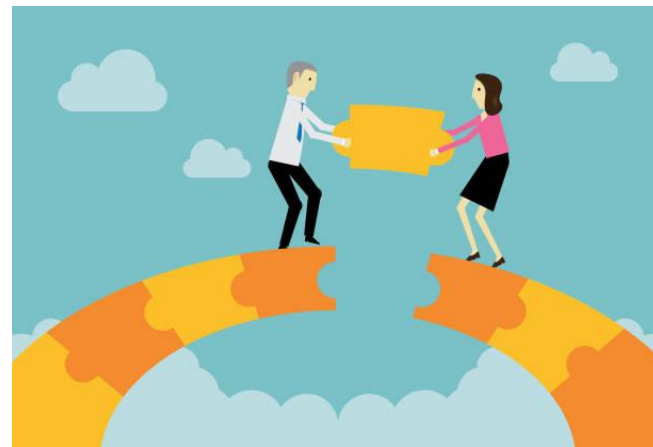
Key Dates:

Online Question & Answer Sessions for applicants: 31st October at 13:00 (Email: arc-gm@nihr.ac.uk to book on)

Deadline for applications: 11th November 2022 at 5pm

Start date: January 2023

My next steps



Special thanks to....



The rehabilitation team



Greater Manchester
Neurorehabilitation & Integrated
Stroke Delivery Network