

Robot assisted training for the upper limb after stroke

Submission date 04/10/2013	Recruitment status No longer recruiting	<input checked="" type="checkbox"/> Prospectively registered <input checked="" type="checkbox"/> Protocol
Registration date 04/10/2013	Overall study status Completed	<input type="checkbox"/> Statistical analysis plan <input checked="" type="checkbox"/> Results
Last Edited 27/05/2021	Condition category Circulatory System	<input type="checkbox"/> Individual participant data

Plain English summary of protocol

Background and study aims

Loss of the ability to use the arm is a common and distressing consequence of stroke. Currently it is unclear how best to provide therapy to improve arm recovery and function. Research suggests that robot-assisted training may be beneficial but this is not yet proven and further research is needed. Robot-assisted training consists of the use of a machine or 'robot' to exercise the arm. The aim of this study is to find out whether robot-assisted training improves arm function after stroke. Robot assisted training is compared to an enhanced upper limb therapy programme consisting of repeated practice of everyday activities using the arm and usual NHS rehabilitation.

Who can participate?

Adults aged over 18 who have had a stroke which has resulted in difficulty using the arm.

What does the study involve?

Participants are randomly allocated to either robot-assisted training, enhanced upper limb therapy or usual NHS rehabilitation. Robot-assisted training and enhanced upper limb therapy are provided for 45 minutes, 3 times per week for 12 weeks. Robot-assisted training uses a machine to exercise the shoulder/elbow, wrist and hand. Enhanced upper limb therapy involves practicing everyday activities. Usual NHS rehabilitation may involve a range of rehabilitation treatments according to individual clinical need. The effects of the treatments are evaluated by comparing the arm function of patients in each group.

What are the possible benefits and risks of participating?

It is not known whether robot assisted training or enhanced upper limb therapy are effective for improving arm function after stroke. However, research has suggested that increasing therapy, in particular repetitive exercise therapy which is used in both robot-assisted training and enhanced upper limb therapy may improve arm function. It is thought that increasing repetitive exercise in rehabilitation may be beneficial, but this is not yet proven.

Where is the study run from?

The study is being run from Newcastle University, Newcastle upon Tyne, UK. Stroke patients from four areas of the UK are invited to take part (Newcastle/Northumbria, Romford, Glasgow and Cambridge).

When is the study starting and how long is it expected to run for?

April 2014 to January 2018

Who is funding the study?

National Institute for Health Research (NIHR) (UK)

Who is the main contact?

Dr Helen Bosomworth

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Contact information

Type(s)

Scientific

Contact name

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Contact details

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Additional identifiers

Protocol serial number

15309; HTA 11/26/05

Study information

Scientific Title

Robot Assisted Training for the Upper Limb after Stroke (RATULS): a randomised interventional phase III study

Acronym

RATULS

Study objectives

To determine whether robot-assisted training with the InMotion robotic gym system (In Motion commercial version) improves upper limb function post stroke.

Ethics approval required

Old ethics approval format

Ethics approval(s)

National Research Ethics Service Committee North East - Sunderland, 05/11/2013, ref: 13/NE/0274

Study design

Randomised interventional phase III study

Primary study design

Interventional

Study type(s)

Treatment

Health condition(s) or problem(s) studied

Stroke rehabilitation

Interventions

This is a three-group randomised controlled trial.

Group 1: Robot-assisted training

Robot-assisted training will use the InMotion robotic gym system which comprises three modules to exercise the shoulder/elbow, wrist and hand. Treatment will be provided for 45 minutes, 3 times per week for 12 weeks.

Group 2: Enhanced upper limb therapy

Enhanced upper limb therapy will consist of upper limb rehabilitation goal setting followed by practice of everyday activities to work towards the goals. Treatment will be provided for 45 minutes, 3 times per week for 12 weeks

Group 3: Usual NHS rehabilitation

This group will continue with usual NHS rehabilitation in accordance with local clinical practice.

Intervention Type

Other

Phase

Phase III

Primary outcome(s)

Upper limb function measured using the Action Research Arm Test (ARAT) at 3 months post randomisation

Key secondary outcome(s)

1. Upper limb impairment, measured using the Fugl-Meyer Test (motor and sensory arm sections)
2. Activities of daily living (measured using the Barthel ADL Index), quality of life (measured using EQ-5D-5L)
3. Upper limb pain, measured using a numerical rating scale

4. Resource use, measured using an adaption of the Client Services Receipt Inventory
5. Adverse events, measured at 3 and 6 months post randomisation

Completion date

31/08/2019

Eligibility

Key inclusion criteria

Adults with a first ever stroke who fulfil the following criteria are eligible:

1. Age 18 years and over
2. Clinical diagnosis of stroke (cerebral infarction, primary intracerebral haemorrhage, subarachnoid haemorrhage)
3. Between one week and five years since stroke
4. Moderate to severe upper limb functional limitation (Action Research Arm Test (ARAT) score 0-39) due to stroke
5. Able to provide consent to take part in the study and to comply with the requirements of the protocol

Participant type(s)

Patient

Healthy volunteers allowed

No

Age group

Adult

Lower age limit

18 years

Sex

All

Total final enrolment

770

Key exclusion criteria

1. More than one stroke (patients with previous transient ischaemic attack (TIA) may be invited to participate)
2. Other current significant impairment of the upper limb affected by stroke e.g. fixed contracture, frozen shoulder, severe arthritis, recent fracture
3. Diagnosis likely to interfere with rehabilitation or outcome assessments e.g. registered blind
4. Previous use of the InMotion robotic gym system or other arm rehabilitation robot
5. Current participation in a rehabilitation trial evaluating upper limb rehabilitation after stroke
6. Previous enrolment in this study

Date of first enrolment

01/04/2014

Date of final enrolment

31/07/2017

Locations

Countries of recruitment

United Kingdom

England

Study participating centre

Newcastle University

Newcastle Upon Tyne

United Kingdom

NE2 4AE

Sponsor information

Organisation

Newcastle upon Tyne Hospitals NHS Foundation Trust (UK)

ROR

<https://ror.org/05p40t847>

Funder(s)

Funder type

Government

Funder Name

Health Technology Assessment Programme

Alternative Name(s)

NIHR Health Technology Assessment Programme, Health Technology Assessment (HTA), HTA

Funding Body Type

Government organisation

Funding Body Subtype

National government

Location

United Kingdom

Results and Publications

Individual participant data (IPD) sharing plan

IPD sharing plan summary

Study outputs

Output type	Details	Date created	Date added	Peer reviewed?	Patient-facing?
Results article	results	06/07/2019	29/05/2019	Yes	No
Results article	economic evaluation results	25/05/2021	27/05/2021	Yes	No
Protocol article	protocol	20/07/2017		Yes	No
HRA research summary			28/06/2023	No	No