

## MARMA THERAPY IN LATE STROKE REHABILITATION

Stroke is a major cause of morbidity in the elderly. Many old people who have a stroke remain severely dependent and require long term institutional care despite conventional rehabilitation. Indeed, although there is some evidence to suggest that specialized stroke units improve acute stroke outcome, the effectiveness of conventional physiotherapy, occupational therapy and other rehabilitative interventions remains uncertain. A major reason for this uncertainty is the lack of good trial methodology in rehabilitation. The situation in late stroke is even less clear. Work in Oxford suggested that the timing of physiotherapy was unimportant, whilst other investigators failed to show any difference between conventional physiotherapy and placebo (in the form of "friendly visits"). Nevertheless, because stroke is often such a devastating illness, not only physically but also psychologically and socially, these unproven therapies are often tried for the lack of anything better to offer.

In this setting, we considered that it was important to search for effective alternative therapies which might make an impact on the lives of many elderly people. One possibility was to integrate non-Western treatments into our conventional approach. We were encouraged by successful reports of acupuncture in acute stroke. We obtained initial funding from the Foundation for Integrated Medicine for an uncontrolled study of Marma therapy in late stroke. The ancient practice of kalaripayattu, the martial tradition of Kerala, South India, includes Marma, the

knowledge of vital points useful in treating injuries. Marma therapy uses massage of these points to promote healing in related parts of the body. It can be thought of as a dynamic equivalent of acupuncture.

This is the report of a pilot study of Marma therapy completed by the RPMS Geriatric Unit, in the long stay geriatric wards at Acton Hospital. This is an annexe of the Geriatric Unit at Hammersmith Hospital.

The protocol was designed by Dr Richard Petty in collaboration with Dr Mario Impallomeni after consultation with Dr Mosaraf Ali. As it was thought highly possible that most patients would greatly improve on this treatment, the following instruments were included in the assessment protocol: walking scale, Barthel index, Frenchay arm test, MRC muscle power scale, as well as Minimental State, and Bodily Symptoms and Mood Scale (all enclosed).

It was envisaged to study 12 patients who had suffered at least one CVA not less than twelve months before the beginning of the study; who had not recovered enough function to return to live independently in the community, and who could give informed consent.

Two treatment sessions per week of half an hour each for a total of 20 treatments were planned. It was hoped that the ward nurses could exercise the patients in the wards in between treatments, if their busy schedule allowed it. The patients were to be

assessed and scored before and after the twenty treatments were completed.

The Hammersmith Hospital Ethics Committee approved this protocol on 16th February 1994. I prepared a list of 14 long stay geriatric patients in Acton Hospital who fulfilled the inclusion criteria: out of this list Dr Ali and Mr D Purkitt from the Hale Clinic selected 10 suitable candidates. I therefore recruited two more candidates from local old peoples homes which were accepted by Dr Ali. Most patients started the treatments on 14th March 1994, the last entered the study on the 25th April 1994.

Of the twelve patients, eleven were female, their average age was 80.9 years, range 73-91. Eight had a unilateral cerebral lesion; four bilateral lesions; five a moderate degree of dementia. Only one could walk a short distance, albeit slowly, unsteadily, with a quadripod stick and a lot of supervision. The remainder were profoundly incapacitated, chairbound and unable to transfer from bed to chair by themselves. One patient was on large doses of psychotropic and muscle relaxant drugs: lofepramine 210 mg/day, baclofen 15 mg tds.

It gradually became clear that although most patients improved, none did so to a degree large enough to be measurable by the scales we had chosen for this study. This was borne out by inconclusive changes in the scores recorded at the end of the twenty treatments. One major change which was observed but not formally scored by any of the scales was a marked decrease in the hemiplegic limbs' spasticity. This aided the handling of

patients by nurses.

It was thought likely that this could have been due to the more advanced age of the patients, compared to those seen more often by the therapists in the Hale Clinic: and therefore a longer course of treatments might have been required: we agreed to continue for 10 more treatments. Also the ward nurses had been so stretched that their contribution had not been as intensive as previously hoped. It was however obvious to all concerned including the ward nurses that the patients had benefited from this treatment. The patient on psychotropic drugs had already improved to such an extent that all drugs had been gradually discontinued without adversely affecting his condition. During these five weeks foot calipers were ordered for five patients. Since they had generally improved and had markedly reduced spasticity.

After negotiations with the Foundation for Integrated Medicine it was agreed to continue the pilot study for a total of fifty treatments; to have a single therapist, Mr Purkitt, rather than two; to recruit the services of a physical fitness trainer to exercise the patients daily in between Marma treatments; and to use a different set of measurement scales, called FIM (Functional Independence Measure, enclosed), capable of measuring smaller but functionally important changes in the patients' conditions. By this time the patients in the study had decreased to ten on account of a withdrawal and of a sudden death.

Dr John Starr, my Senior Registrar, undertook to perform the

patients assessments, before treatment number 30 and at the end of the study. All treatments were then to stop and measurements repeated three months later. These changes to the protocol were approved by the Hospital ethics committee. The study was finally completed at the beginning of October.

The FIM for brain injury, developed by the State University of New York at Buffalo, was adopted as a composite scale which includes psychosocial items as well as those on physical function. Subjects are scored between one and seven for:

Eating	Grooming	Bathing
Dressing upper body		Dressing lower body
Toileting	Bladder management	Bowel management
Bed, Chair, Wheelchair transfer	Toilet transfer	Tub & Shower transfer
Walking/wheelchair locomotion	Stairs	
Comprehension	Expression	Social interaction
Problem solving	Memory	

Each subject is assessed with the aid of a nurse/carer who regularly looks after the subject. Scores reflect usual function over the preceding period. Minimum score is therefore 18, maximum score 126.

The FIM assessment was introduced after four months therapy (approximately 30 treatments). Two subjects were resident in a nursing home so no carer was available at the initial FIM assessment. Mean scores for the sample rose from 68.9 at four months to 70.8 at five months and 72.1 at the end of treatment.

This increase reached significance ( $p < 0.05$  Page's L-trend test). Most subjects showed a modest but definite improvement (Figure 1). The greatest increases were in those scales which related to transfers.

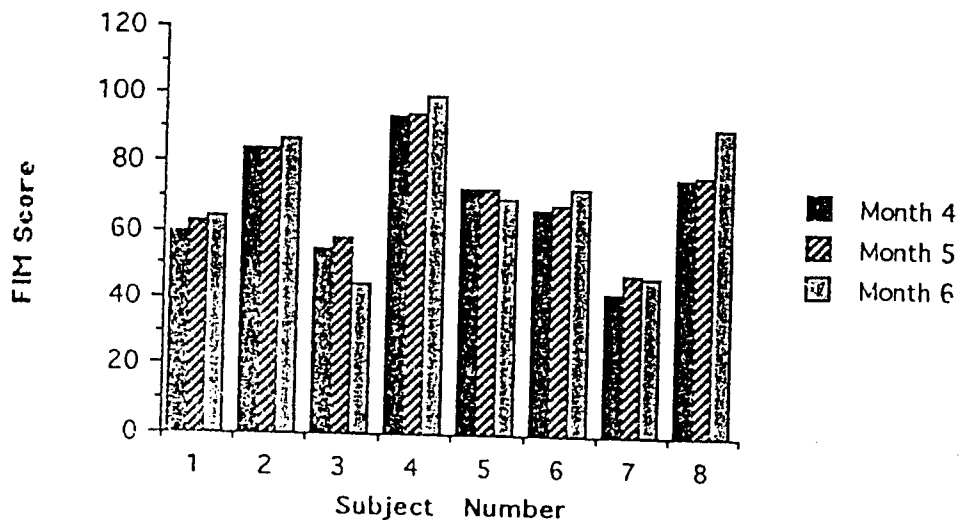
The results suggest that the FIM is a suitable instrument for evaluating the effects of Marma therapy in late stroke patients. Scores fell in the mid-range of the instrument, which facilitates measurement of both improvement and deterioration. It is worth noting that in the last two months of the study the patients' gait improved more rapidly than in the previous period. Of the 10 patients, only one (Mrs Hudson) had become capable of walking unaided with a quadripod stick, but still required supervision, all others were chairbound. At the end of the study, this patient could easily walk the length of the ward twice over with a single stick and minimal supervision; four more patients had become capable of walking on their own unsupported, albeit with a foot caliper and a Zimmer walking frame, and for only 4-5 yards.

In summary, Marma therapy appears very promising in improving the function of severely dependent patients with late stroke. Further research is now indicated in the form of a controlled trial, and we are currently preparing a suitable application for funding by a major grant giving body. In view of the results in late stroke, a pilot study in acute stroke should also be pursued.



10.11.84

Figure 1 Individual FIM scores



# STROKE REHABILITATION PROJECT

(PROJECT REGISTRATION NO: 94/4259)

Patient Name \_\_\_\_\_

Study Number \_\_\_\_\_

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## **INCLUSION CRITERION**

Dense hemiplegia secondary to a first cerebrovascular accident more than one year previously

## **EXCLUSION CRITERIA**

1. More than one cerebrovascular accident
2. Deep vein thrombosis within the last three months
3. Intercurrent illness precluding treatment for more than three consecutive weeks

## PATIENT FLOW CHART

<b>ACTION</b>	<b>ENTRY</b>	<b>3 MONTHS</b>	<b>6 MONTHS</b>
<b>Inclusion &amp; exclusion check list</b>	*		
<b>Consent Form</b>	*		
<b>Barthel Scale</b>	*	*	*
<b>Frenchay Arm Test</b>	*	*	*
<b>MRC Muscle Power Scale</b>	*	*	*
<b>Walking Scale</b>	*	*	*
<b>Mini-Mental State</b>	*	*	*
<b>Bodily Symptoms and Mood Scale</b>	*	*	*

# STROKE REHABILITATION TRIAL

## PATIENT CONSENT FORM

I \_\_\_\_\_ of \_\_\_\_\_

\_\_\_\_\_

understand that I have been asked to take part in a study of a new and unproven technique of manipulation to establish whether it might benefit my physical condition. The nature of the study has been explained to me by Dr. \_\_\_\_\_

I understand that I am free to withdraw from the study at any time, and if I decide to withdraw, it will not in any way stop me from getting all the care which I do normally.

Patient's (or next of kin's) signature (specify which)

\_\_\_\_\_

Name \_\_\_\_\_

I certify that I have explained the nature and purpose of the study to the best of my ability

\_\_\_\_\_

Name \_\_\_\_\_

Witness

\_\_\_\_\_

Name \_\_\_\_\_

# THE BARTHEL SCALE (ASSESSMENT OF DAILY LIVING SKILLS)

Item

Feeding	<p>2= Independent: reasonable speed 1= Needs help; eg cutting, spreading butter 0= Unable</p>
Bathing	<p>1=Independent 0=Dependent</p>
Grooming	<p>1=face/hair/teeth/shaves all alone 0=Dependent</p>
Dressing	<p>2=Independent; ties shoes, copes with zips etc. 1=Needs help, but does half in reasonable time 0=Dependent</p>
Bowels	<p>2=No accident 1=Occasional accidents/need help with enemas etc 0=Incontinent</p>
Bladder	<p>2=No accidents. Manages catheter alone, if used 1=Occasional accidents, or needs help with catheter 0=Incontinent</p>
Toilet	<p>2=Independent 1=Needs help 0=Unable</p>
Bed/chair transfer	<p>3=Totally independent 2=Minimal help needs- verbal/physical 1=Able to sit, but needs major help 0=Unable-lifted bodily</p>
Ambulation	<p>3=Independent for 50m- may use aid 2=50m but with help of person - verbal/physical 1=Wheelchair, but independent - 50m 0=Immobile</p>
Stairs	<p>2=Independent 1=Needs help- verbal/physical 0=Unable</p>

TOTAL

Barthel Score \_\_\_\_\_  
(Max 20)

## **Frenchay Arm Test**

1. Use both hands to open a jam jar
2. Use both hands to rule a line
3. Use affected hand to pick up and release a 2" cylinder (jar)
4. Use affected hand to pick up and release a 1/2" cylinder (jar)
5. Use affected hand to drink from a glass of water
6. Use affected hand to comb hair
7. Use affected hand to open and close a clothes peg

Score 1 for each one passed

## MRC Muscle Power Scale

### Right

<b>Biceps</b>	<b>0</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
<b>Triceps</b>	<b>0</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
<b>Wrist flexion</b>	<b>0</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
<b>Wrist extension</b>	<b>0</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
<b>Hand grip</b>	<b>0</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>

<b>Hip flexion</b>	<b>0</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
<b>Knee flexion</b>	<b>0</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
<b>Knee extension</b>	<b>0</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
<b>Plantar flexion</b>	<b>0</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
<b>Dorsiflexion</b>	<b>0</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>

### Left

<b>Biceps</b>	<b>0</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
<b>Triceps</b>	<b>0</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
<b>Wrist flexion</b>	<b>0</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
<b>Wrist extension</b>	<b>0</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
<b>Hand grip</b>	<b>0</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>

<b>Hip flexion</b>	<b>0</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
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<b>Plantar flexion</b>	<b>0</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
<b>Dorsiflexion</b>	<b>0</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>

For each movement or individual muscle rate on the scale 0 (no power) to 5 (full power). Circle one only.

## WALKING

Assess only if patient is able to walk aided only by a walking stick or Zimmer frame. Yes/No

If answer is no, proceed to next section

Walking assessed using a measured 6 meter walkway, then assess turning:

Time to complete (seconds) \_\_\_\_\_

Velocity (m/s) \_\_\_\_\_

Mean stride length (m) \_\_\_\_\_

Frequency (steps/s) \_\_\_\_\_

Turning time (s) \_\_\_\_\_



Subject's Name: ..... Number: ..... Time: ..... am/pm  
 Test Day: .....

**BODILY SYMPTOMS SCALE**

1. Please rate the way you feel in terms of the dimensions given below.
2. Regard the line as representing the full range of each dimension.
3. Rate your feelings as they have been over the last 12 hours.
4. Mark clearly and perpendicularly across each line.
5. On the left side write the time of your most severe feelings for each dimension. If no problem write "None".

_____ (am/pm)	_____	very severe anxiety
_____	No anxiety	_____
_____	No sweating	_____
_____	No shaking or trembling	very severe shaking or trembling
_____	No palpitations or heart beating	very severe palpitations or heart beating fast
_____	No nausea or sickness	very severe nausea or sickness
_____	No dizziness	very severe dizziness
_____	No irritability	very severe irritability
_____	No loss of appetite	very severe loss of appetite
_____	No muscular tension or aches	very severe muscular tension or aches
_____	No indigestion or stomach trouble	very severe indigestion or stomach trouble
_____	No physical tiredness	very severe tiredness
_____	No headache	very severe headache
_____	No loss of concentration	very severe loss of concentration
_____	_____	.....

Hospital No.: .....

Patient Study No.: .....

Name: .....

Date: .....

## THE MINI-MENTAL STATE EXAMINATION

### ORIENTATION

1. What is the

Year?

Season?

Date?

Day?

Month?

2. Where are we?

Country?

County?

Town?

Hospital?

Floor?

Score Points

- 1

- 1

- 1

- 1

- 1

- 1

- 1

- 1

- 1

- 1

### REGISTRATION

3. Name three objects, taking one second to say each. Then ask the patient all three after you have said them. Give one point for each correct answer. Repeat the answers until the patient learns all three.

- 3

### ATTENTION & CALCULATION

4. Serial sevens. Give one point for each correct answer. Stop after five answers. Alternative: Spell 'WORLD' backwards.

- 5

### RECALL

5. Ask for names of three objects learned in Question 3. Give one point for each correct answer.

- 3

### LANGUAGE

6. Point to a pencil and a watch. Have the patient name them as you point.

- 2

7. Have the patient repeat "No ifs, ands, or buts."

- 1

8. Have the patient follow a 3-stage command: "Take the paper in your right hand. Fold the paper in half. Put the paper on the floor."

- 3

9. Have the patient read and obey the following: "CLOSE YOUR EYES."  
(Write it in large letters)

- 1

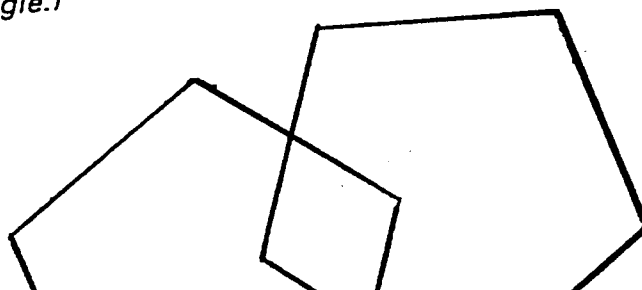
10. Have the patient write a sentence of his or her own choice. (The sentence should contain a subject and an object and should make sense. Ignore spelling errors when scoring.)

- 1

11. the design printed below to 1.5cm per side and have the patient copy it. Give one point if all sides and angles are preserved and if the intersecting sides form a quadrangle.)

- 1

= Total 3'



BODILY SYMPTOMS SCALE

pm) -----	No constipation	-----	very severe constipation
-----	No diarrhoea	-----	very severe diarrhoea
-----	No unusual urination	-----	very unusual urination
-----	No double vision	-----	very severe double vision
-----	No dry mouth	-----	very severe dry mouth

Subject's Name:..... Number:.....

Date:..... Day:..... Time:.....am/pm

1. Please rate the way you feel in terms of the dimensions given below.
2. Regard the line as representing the full range of each dimension.
3. Rate your feelings as they are at the moment.
4. Mark clearly and perpendicularly across each line.

Alert	_____	Drowsy
Calm	_____	Excited
Strong	_____	Feeble
Muzzy	_____	Clear-headed
Well-coordinated	_____	Clumsy
Lethargic	_____	Energetic
Contented	_____	Discontented
Troubled	_____	Tranquil
Mentally slow	_____	Quick-witted
Sense	_____	Relaxed
Attentive	_____	Dreamy
Incompetent	_____	Proficient
Happy	_____	Sad
Antagonistic	_____	Amicable
Interested	_____	Bored
Withdrawn	_____	Gregarious

Subject's Name: ..... Number: .....  
 ..... Test Day: ..... Time: ..... am/pm

**BODILY SYMPTOMS SCALE**

1. Please rate the way you feel in terms of the dimensions given below.
2. Regard the line as representing the full range of each dimension.
3. Rate your feelings as they have been over the last 12 hours.
4. Mark clearly and perpendicularly across each line.
5. On the left side write the time of your most severe feelings for each dimension.  
 If no problem write "None".

(am/pm)	_____	very severe anxiety
---	No anxiety	
---	_____	very severe sweating
---	No sweating	
---	_____	very severe shaking or trembling
---	No shaking or trembling	
---	_____	very severe palpitations or heart beating fast
---	No palpitations or heart beating	
---	_____	very severe nausea or sickness
---	No nausea or sickness	
---	_____	very severe dizziness
---	No dizziness	
---	_____	very severe irritability
---	No irritability	
---	_____	very severe loss of appetite
---	No loss of appetite	
---	_____	very severe muscular tension or aches
---	No muscular tension or aches	
---	_____	very severe indigestion or stomach trouble
---	No indigestion or stomach trouble	
---	_____	very severe tiredness
---	No physical tiredness	
---	_____	very severe headache
---	No headache	
---	_____	very severe loss of concentration
---	No loss of concentration	

BODILY SYMPTOMS SCALE

pm) -----	No constipation	-----	very severe constipation
-----	No diarrhoea	-----	very severe diarrhoea
-----	No unusual urination	-----	very unusual urination
-----	No double vision	-----	very severe double vision
-----	No dry mouth	-----	very severe dry mouth

MOOD RATING SCALE

Subject's Name:..... Number:.....

Date:..... Day:..... Time:.....am/pm

1. Please rate the way you feel in terms of the dimensions given below.
2. Regard the line as representing the full range of each dimension.
3. Rate your feelings as they are at the moment.
4. Mark clearly and perpendicularly across each line.

Alert	_____	Drowsy
Calm	_____	Excited
Strong	_____	Feeble
Muzzy	_____	Clear-headed
Well-coordinated	_____	Clumsy
Lethargic	_____	Energetic
Contented	_____	Discontented
Troubled	_____	Tranquil
Mentally slow	_____	Quick-witted
Tense	_____	Relaxed
Attentive	_____	Dreamy
Incompetent	_____	Proficient
Happy	_____	Sad
Antagonistic	_____	Amicable
Interested	_____	Bored
Withdrawn	_____	Gregarious