

# National clinical guideline for stroke

Third edition

**Incorporating the recommendations from  
*Stroke: national clinical guideline for diagnosis and  
initial management of acute stroke and transient ischaemic attack (TIA)*  
by the National Institute for Health and Clinical Excellence**

Prepared by the Intercollegiate Stroke Working Party

July 2008

CLINICAL  
EFFECTIVENESS &  
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# Contents

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The Intercollegiate Stroke Working Party	viii
Conflicts of interest	x
Preface	xi
Key recommendations	xii
Acknowledgements	xv
Acronyms and abbreviations	xvi
Glossary	xvii

## INTRODUCTION

I	Introduction	3
1.1	Changes from the second edition	3
1.2	Scope	3
1.3	The conditions covered	4
1.3.1	Duration of cerebrovascular events	4
1.3.2	Resolved neurovascular events	5
1.3.3	This guideline's approach	5
1.4	Aims of guideline	6
1.5	Context and use	7
1.6	Methodology of guideline development	7
1.6.1	Intercollegiate Stroke Working Party	7
1.6.2	Searching the scientific literature	8
1.6.3	Assessing the quality of research	8
1.6.4	Identification and selection of articles for inclusion	9
1.6.5	From evidence to recommendation	9
1.6.6	Strength of recommendation	10
1.6.7	Peer review	10
1.7	Format of each chapter	11
1.7.1	Structure of each part	11
1.8	Models underlying guideline development	12
1.8.1	Structure, process, outcome	12
1.8.2	Patient interactions – WHO ICF	13
1.8.3	Timescales	14
1.9	Document structure	14
1.9.1	Chapter 2 – commissioning	14
1.9.2	Chapter 3 – systems underlying stroke management	15
1.9.3	Chapter 4 – acute-phase care	15
1.9.4	Chapter 5 – secondary prevention	15
1.9.5	Chapter 6 – recovery phase: rehabilitation	15
1.9.6	Chapter 7 – long-term management, after recovery	16

- 1.10 National Institute for Health and Clinical Excellence guideline 16
- 1.11 Participation in clinical research 17
- 1.12 Cost of stroke care 17
- 1.13 Terminology 17
- 1.14 Licensing of drugs 17
- 1.15 Updating the guidelines 18
- 1.16 Funding and conflicts of interest 18

## SERVICE PROVISION AND ORGANISATION

- 2 Commissioning 21**
  - 2.1 Structure – whole pathway 21
  - 2.2 Commissioning acute stroke services 23
  - 2.3 Secondary prevention 24
  - 2.4 Commissioning rehabilitation services 24
  - 2.5 Commissioning in relation to the long-term consequences of stroke 25
- 3 Systems underlying stroke management 27**
  - 3.1 Overall organisation 27
  - 3.2 Specialist stroke services 28
  - 3.3 Resources 29
  - 3.4 Location of service delivery 31
  - 3.5 Stroke services for younger adults 32
  - 3.6 Transfers of care – general 32
  - 3.7 Transfers of care – discharge from hospital 33
  - 3.8 Quality improvement (governance, audit) 34
  - 3.9 Service development 35
  - 3.10 Use of assessments/measures 36
  - 3.11 Goal setting 37
  - 3.12 Rehabilitation treatment approach 38
  - 3.13 Rehabilitation treatment quantity (intensity of therapy) 38
  - 3.14 End-of-life (palliative) care 39
  - 3.15 Medicines management 40
  - 3.16 Treatments not mentioned in the guideline 41

## CLINICAL CARE

- 4 Acute-phase care 45**
  - 4.1 Pre-admission diagnosis 45
  - 4.2 Initial diagnosis of acute transient event (TIA) 46
  - 4.3 Specialist diagnosis of acute transient event (TIA) 47
  - 4.4 Management of confirmed transient ischaemic attacks 48
  - 4.5 Diagnosis of acute persistent event 49
  - 4.6 Immediate specific management of non-haemorrhagic stroke 50

4.7	Immediate specific management of intracerebral haemorrhage	53
4.8	Subarachnoid haemorrhage: immediate specific diagnosis and management	54
4.9	Acute arterial dissection	55
4.10	Management of specific cardiovascular causes of stroke	55
4.11	Cerebral venous thrombosis	56
4.12	Early-phase medical care of stroke – physiological monitoring	56
4.13	Early-phase medical management – homeostasis (oxygen, glucose, blood pressure)	57
4.14	Deep vein thrombosis and pulmonary embolism	58
4.15	Early positioning and mobilisation	58
4.16	Feeding: swallowing, hydration and nutrition	59
4.17	Bowel and bladder	60
4.18	Initial, early rehabilitation assessment	61
4.19	Addendum – other NICE recommendations	61
<b>5</b>	<b>Secondary prevention</b>	<b>63</b>
5.1	Identifying risk factors	63
5.2	A personalised, comprehensive approach	64
5.3	Lifestyle measures	65
5.4	Blood pressure	66
5.5	Anti-thrombotic treatment	67
5.6	Lipid-lowering therapy	68
5.7	Carotid stenosis	69
5.8	Oral contraception	70
5.9	Hormone replacement therapy	70
<b>6</b>	<b>Recovery phase from impairments and limited activities: rehabilitation</b>	<b>71</b>
6.1	General principles of rehabilitation	71
6.2	Evaluating and stopping treatments	72
6.3	Acupuncture	72
6.4	Aerobic (fitness) training	73
6.5	Arm re-education	73
6.6	Biofeedback	74
6.7	Functional electrical stimulation	74
6.8	Gait retraining, treadmill retraining, and walking aids	75
6.9	Mental practice	76
6.10	Orthoses	76
6.11	Positioning	76
6.12	Robotics	77
6.13	Self-efficacy training	77
6.14	Splinting and stretching (to prevent and treat contractures)	78
6.15	Strength training – resisted exercise	78
6.16	Task-specific training	79
6.17	Miscellaneous other specific treatments	79

6.18	Balance impairment	79
6.19	Impaired motor control – reduced movement, weakness and clumsiness	80
6.20	Impaired tone – spasticity and spasms	81
6.21	Impaired sensation	82
6.22	Shoulder pain and subluxation	82
6.23	Neuropathic pain (central post-stroke pain)	83
6.24	Musculo-skeletal pain	84
6.25	Depression	84
6.26	Anxiety	86
6.27	Emotionalism	86
6.28	Cognitive impairments – general	87
6.29	Attention and concentration	88
6.30	Memory	88
6.31	Spatial awareness (eg neglect)	89
6.32	Perception – visual agnosia	89
6.33	Apraxia	90
6.34	Executive functioning	90
6.35	Mental capacity (decision making by the patient) and advance care plans	91
6.36	Aphasia (dysphasia; impairment of language)	93
6.37	Dysarthria	94
6.38	Apraxia of speech	95
6.39	Visual impairments and hemianopia	95
6.40	Bowel and bladder impairment	96
6.41	Swallowing problems: assessment and management	97
6.42	Oral health	98
6.43	Nutrition	99
6.44	Sexual dysfunction	100
6.45	Drugs affecting recovery/reduction of impairment	100
6.46	Personal activities of daily living (dressing, washing etc)	101
6.47	Extended activities of daily living (domestic and community)	101
6.48	Driving	102
6.49	Vocational activities	103
6.50	Social interaction – interpersonal relationships	104
6.51	Personal equipment and adaptations	104
6.52	Environmental equipment and adaptations	105
<b>7</b>	<b>Long-term management, after recovery</b>	<b>107</b>
7.1	Further rehabilitation	107
7.2	Social participation	107
7.3	Support (practical and emotional)	108
7.4	Patients in residential care homes (including nursing homes)	109
7.5	Carers (informal, unpaid)	110

## PROFESSION-SPECIFIC CONCISE GUIDELINES

- Nursing concise guide 112
- Nutrition and dietetics concise guide 121
- Occupational therapy concise guide 125
- Physiotherapy concise guide 134
- Speech and language therapy concise guide 140

## APPENDICES

- 1 Peer reviewers 147
- 2 Evidence table reviewers 149
- 3 Van Tulder's quality assessment system 150
- 4 Checklist for systematic reviews 153
- 5 RATS qualitative checklist 154
- 6 National Stroke Strategy Quality Markers 157

## REFERENCES 161

## INDEX 173

## TABLES OF EVIDENCE *available online at [www.rcplondon.ac.uk/pubs/brochure.aspx?e=250](http://www.rcplondon.ac.uk/pubs/brochure.aspx?e=250)*

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# Conflicts of interest

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All working party members signed a form to declare any potential conflicts of interest with the guidelines.

Nearly all professionals worked for an organisation whose work is related in some way to the guidelines. Details of appointments and affiliations are therefore listed. Financial interest information can be obtained on request from the Royal College of Physicians.

Ten members of the working party declared interests with potential to affect the guidelines. These include the organisations listed below.

On the rare occasion that a potential conflict of interest arose for individuals, they were excluded from the final decision on a recommendation, unless supported by others (eg a patient's organisation would find support from several quarters). The published evidence base and majority opinion (consensus) were deciding factors for the wording and content of recommendations.

## Commercial companies

Five members had undertaken consultancy, lecturing and research work for companies including Boehringer Ingelheim, Ipsen, GlaxoSmithKline, Norwich Eaton Pharmaceuticals, GW Pharmaceuticals, Micrus Inc, Microvention Terumo, Sanofi-Aventis, and Boston Scientific. No members had any personal commercial interest (eg shares) with companies that could benefit from the guidelines.

## Charities

Eleven members held posts within charities including the Alliance for Europe (Stroke), Neurological Alliance, Association of Medical Research Charities (AMRC), Chest, Heart and Stroke Scotland (CHSS), Northern Ireland Chest, Heart and Stroke Association, Health Foundation, Stepping out, Welsh Stroke Alliance, Alzheimer's Society, Stroke Association, MS Trust, MS Society, Parkinson's Disease Society, and the Stanley Thomas Johnson Foundation.

## Other organisations

National Institute for Health and Clinical Excellence (NICE), Welsh Stroke Physicians Group (WASP), Department of Health (DH), Older People & Aging Research and Development Network (OPAN).

# Preface

---

This is the third edition of the UK *National clinical guideline for stroke*. It is an integral part of the broader goal of the Intercollegiate Stroke Working Party to improve the care of people who have had a stroke in the UK. The guideline and evidence tables also form the evidence base for much other work undertaken by the group, and by other organisations.

The guideline has seven chapters:

- Chapter 1 Introduction. This gives much background and general information for those interested, but is not essential reading.
- Chapter 2 Commissioning. This puts together a set of recommendations to organisations and people who are responsible for commissioning services for the whole population.
- Chapter 3 Structure. This chapter considers the organisation of stroke services.
- Chapter 4 Acute care. This chapter contains the recommendations from *Stroke: national clinical guideline for diagnosis and initial management of acute stroke and transient ischaemic attack (TIA)* (2008), commissioned by the National Institute for Health and Clinical Excellence (NICE), and covers interventions in the acute stage of stroke or TIA over the first 48 hours and in some instances up to two weeks.
- Chapter 5 Secondary prevention. The guideline does not consider primary prevention, but does cover secondary prevention.
- Chapter 6 Recovery and rehabilitation. This chapter covers the management of the longer-lasting problems after stroke: symptoms and disabilities and their assessment and treatment.
- Chapter 7 Long-term care. This chapter covers the continuing needs of people after stroke, including further rehabilitation and the needs of carers.

Profession-specific concise guides have been compiled by extracting recommendations from the guidelines.

## Key recommendations

The guideline contains over 300 specific recommendations covering almost every aspect of stroke management. No one can expect to know them all, and no single person or organisation will need to use them all.

Everyone, however, should be aware of the most important recommendations. The group identified 21 key recommendations which, if followed, will greatly enhance stroke care in the UK. These recommendations are given overleaf, with their numbers, so that they can be found in the main guideline. They are also reproduced as a separate laminated concise guide in the guideline pack.

## Team work

This guideline is the culmination of several years' work by a very large number of people (well over 100), most of whom worked freely in their own time. We are extremely grateful to each and every person who has helped and supported this work and we hope that the final guideline reflects their commitment and expertise well.

Derick Wade

Tony Rudd

Co-chairmen of the Intercollegiate Stroke Working Party

# Key recommendations

Recommendations below that are taken from *Stroke: national clinical guideline for diagnosis and initial management of acute stroke and transient ischaemic attack (TIA)* (2008), commissioned by NICE, have a background tint.

Number	Recommendation
2.1.1 A	Commissioning organisations should ensure that their commissioning portfolio encompasses the whole stroke pathway from prevention through acute care, early rehabilitation and initiation of secondary prevention on to palliation, later rehabilitation in the community and long-term support.
2.1.1 C	The commissioning of acute services should: <ul style="list-style-type: none"><li>• ensure active involvement of specialist rehabilitation services with patients from the time of admission, wherever they are admitted, <i>and</i></li><li>• require that patients are seen by at least one member of the specialist rehabilitation team within 24 hours for assessment and by the team within five days for treatment.</li></ul>
3.1.1 B	All patients seen within three hours of an acute neurological syndrome suspected to be a stroke should be transferred directly to a specialised hyperacute stroke unit that will assess for thrombolysis and deliver it if clinically indicated.
3.1.1 C	All hospitals receiving acute medical admissions that include patients with potential stroke should have a specialist acute stroke unit to monitor and regulate basic physiological functions such as blood glucose, oxygenation, and blood pressure.
3.2.1 B	All patients not suitable for transfer home after completion of their acute diagnosis and treatment should be treated in a specialist stroke rehabilitation unit which should fulfil the following criteria: <ul style="list-style-type: none"><li>• it should be a geographically identified unit</li><li>• it should have a coordinated multidisciplinary team that meets at least once a week for the interchange of information about individual patients</li><li>• staff should have specialist expertise in stroke and rehabilitation</li><li>• educational programmes and information are provided for staff, patients and carers.</li></ul>
3.2.1 C	All patients discharged home directly after acute treatment but with residual problems should be followed up by specialist stroke rehabilitation services.
3.3.1 A	Each acute stroke unit should have immediate access to: <ul style="list-style-type: none"><li>• medical staff specially trained in the delivery of acute medical care to stroke patients, including the delivery of thrombolysis and the diagnostic and administration procedures needed for safe and effective delivery of thrombolysis.</li><li>• nursing staff specifically trained and competent in the management of acute stroke, covering both its neurological and its general medical aspects</li><li>• imaging and laboratory services</li><li>• rehabilitation specialist staff.</li></ul>
3.4.1 B	Any patient with a stroke who cannot be admitted to hospital and who is not receiving palliative care should be seen by the specialist teams at home or on an outpatient basis as soon as possible for diagnosis, treatment, rehabilitation, and risk factor reduction at a standard comparable to other patients.

3.7.1 A	<p>Hospital services should have a locally negotiated protocol to ensure that before the discharge occurs:</p> <ul style="list-style-type: none"> <li>• patients and families are fully prepared, and have been fully involved in planning discharge</li> <li>• general practitioners, primary healthcare teams and social services departments (adult services) are all informed before or at the time of discharge</li> <li>• all equipment and support services necessary for a safe discharge are in place</li> <li>• any continuing treatment required will be provided without delay by an appropriate specialist service</li> <li>• patients and families are given information about and offered contact with appropriate statutory and voluntary agencies.</li> </ul>
3.13.1 A	<p>Patients should undergo as much therapy appropriate to their needs as they are willing and able to tolerate, and in the early stages they should receive a minimum of 45 minutes daily of each therapy that is required.</p>
4.2.1 C	<p>People who have had a suspected TIA who are at high risk of stroke (that is, with an ABCD<sup>2</sup> score of 4 or above) should have:</p> <ul style="list-style-type: none"> <li>• aspirin (300 mg daily) started immediately</li> <li>• specialist assessment* and investigation within 24 hours of onset of symptoms</li> <li>• measures for secondary prevention introduced as soon as the diagnosis is confirmed, including discussion of individual risk factors.</li> </ul>
4.4.1 E	<p>People with stable neurological symptoms from acute non-disabling stroke or TIA who have symptomatic carotid stenosis of 50–99% according to the North American Symptomatic Carotid Endarterectomy Trial (NASCET) criteria, or 70–99% according to the European Carotid Surgery Trialists' Collaborative Group (ECST) criteria, should:</p> <ul style="list-style-type: none"> <li>• be assessed and referred for carotid endarterectomy within one week of onset of stroke or TIA symptoms</li> <li>• undergo surgery within a maximum of two weeks of onset of stroke or TIA symptoms</li> <li>• receive best medical treatment (control of blood pressure, antiplatelet agents, cholesterol lowering through diet and drugs, lifestyle advice).</li> </ul>
4.6.1 A	<p>Any patient seen within three hours of starting symptoms and who has been shown not to have an intracerebral haemorrhage should be treated using alteplase as recommended in the NICE recommendations.</p>
4.16.1 A	<p>On admission, people with acute stroke should have their swallowing screened by an appropriately trained healthcare professional before being given any oral food, fluid or medication.</p>
4.18.1 B	<p>All patients with any impairment at 24 hours should receive a full multidisciplinary assessment using an agreed procedure or protocol within five working days, and this should be documented in the notes.</p>
5.1.1 A	<p>Every patient who has had a stroke (including TIA and subarachnoid haemorrhage), and in whom preventative interventions would be appropriate, should be investigated for risk factors as soon as possible, certainly within one week of onset. At a minimum this includes checking for:</p> <ul style="list-style-type: none"> <li>• raised blood pressure (sustained over 130/90 mmHg)</li> <li>• hyperlipidaemia</li> <li>• diabetes mellitus.</li> </ul>

\* Specialist assessment includes exclusion of stroke mimics, identification of vascular territory, identification of likely causes, and appropriate investigation and treatment.

- |          |  |
|----------|--|
| 5.2.1 A  | <p>For each patient, an individualised and comprehensive strategy for stroke prevention should:</p> <ul style="list-style-type: none"> <li>• be implemented as soon as possible following a TIA or stroke</li> <li>• continue in the long term.</li> </ul>   |
| <hr/>    |  |
| 5.4.1 A  | <p>All patients should have their blood pressure (BP) checked, and should be treated in keeping with national guidelines:</p> <ul style="list-style-type: none"> <li>• an optimal target BP for patients with established cardiovascular disease is 130/80 mmHg</li> <li>• for patients known to have bilateral severe (&gt;70%) internal carotid artery stenosis a slightly higher target (eg systolic BP of 150 mmHg) may be appropriate.</li> </ul>   |
| <hr/>    |  |
| 6.46.1 A | <p>Every patient who has had a stroke should be assessed formally for their safety and independence in all personal activities of daily living by a therapist or nurse, with the results recorded using a standardised assessment tool, preferably the Barthel Activities of Daily Living (ADL) Index.</p>   |
| <hr/>    |  |
| 7.1.1 B  | <p>Any patient with residual impairment after the end of initial rehabilitation should be offered a formal review at least every six months, to consider whether further interventions are warranted, and should be referred for specialist assessment if:</p> <ul style="list-style-type: none"> <li>• new problems, not present when last seen by the specialist service, are present</li> <li>• the patient's physical or social environment has changed.</li> </ul>                                |
| <hr/>    |  |
| 7.5.1 B  | <p>The carer(s) of every patient with a stroke should be involved with the management process from the outset, specifically:</p> <ul style="list-style-type: none"> <li>• as an additional source of important information about the patient both clinically and socially</li> <li>• by being given accurate information about the stroke, its nature and prognosis, and what to do in the event of a further stroke</li> <li>• by being given emotional and practical support as required.</li> </ul> |
| <hr/>    |  |

# Acknowledgements

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# Acronyms and abbreviations

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ACE	Angiotensin-converting enzyme	INR	International normalised ratio
ACP	Advanced Care Plan	IV	Internal validity
ADL	Activities of Daily Living	MCA	Middle cerebral artery
ADRT	Advance decision to refuse treatment	MR	Magnetic resonance
A&E	Accident and emergency department	MRA	Magnetic resonance angiography
AFO	Ankle-foot orthosis	MRI	Magnetic resonance imaging
AMED	Allied and Complementary Medicine Database – bibliographic database	MUST	Malnutrition Universal Screening Tool
BADS	Behavioural Assessment of the Dysexecutive Syndrome	MHRA	Medicines and Healthcare products Regulatory Agency
BD	Bi diem (twice daily)	NASCET	North American Symptomatic Carotid Endarterectomy Trial
BMI	Body mass index	NHS	National Health Service
BP	Blood pressure	NICE	National Institute for Health and Clinical Excellence
CCT	Controlled clinical trial	NIHSS	National Institutes of Health Stroke Scale
CEEU	Clinical Effectiveness and Evaluation Unit	NSAS-2006	National Sentinel Audit for Stroke 2006
CINAHL	Registered name of a bibliographic database	PCT	Primary care trust
CIMT	Constraint-induced movement therapy	PHQ-9	Patient Healthcare Questionnaire (9 criteria)
COT	College of Occupational Therapists	QUOROM	Quality of Reporting of Meta-Analyses
CT scan	Computerised tomography scan	RATS	Relevance, Appropriateness, Transparency, Soundness
DC	Descriptive criteria	RCP	Royal College of Physicians
DVLA	Driver and Vehicle Licensing Agency	RCT	Randomised controlled trial
DVT	Deep vein thrombosis	ROSIER	Recognition of Stroke in the Emergency Room test
DWI	Diffusion weighted imaging	SAH	Subarachnoid haemorrhage
ECST	European Carotid Surgery Trialists	SC	Statistical criteria
EMG	Electromyography (recording of electrical potential from contracting muscle)	SIGN	Scottish Intercollegiate Guidelines Network
ESPRIT	European/Australasian Stroke Prevention in Reversible Ischaemia Trial	SPARCL	Stroke Prevention by Aggressive Reduction in Cholesterol Levels Investigators
FAST	Face Arm and Speech Test	TIA	Transient ischaemic attack
FES	Functional electrical stimulation	UK NHS	United Kingdom's National Health Service
GHQ-12	General Health Questionnaire (12-item)	WHO ICF	World Health Organization's International Classification of Functioning
GP	General practitioner (family doctor)		
HGV	Heavy goods vehicle		
HRT	Hormone replacement therapy		
HTA	Health Technology Appraisal		
ICSWP	Intercollegiate Stroke Working Party		
IMCA	Independent mental capacity advocate		



# Glossary

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<b>ABCD<sup>2</sup></b>	Prognostic scores to identify people at high risk of stroke after a transient ischaemic attack. It is calculated based on: A – age ( $\geq 60$ years, 1 point) B – blood pressure at presentation ( $\geq 140/90$ mmHg, 1 point) C – clinical features (unilateral weakness, 2 points, or speech disturbance without weakness, 1 point) D – Duration of symptoms ( $\geq 60$ minutes, 2 points, or 10–59 minutes, 1 point). The calculation of ABCD <sup>2</sup> also includes the presence of diabetes (1 point). Total scores range from 0 (low risk) to 7 (high risk).
<b>Alteplase</b>	A drug used for thrombolysis.
<b>Anticoagulants</b>	A group of drugs used to reduce the risk of clots forming by thinning the blood.
<b>Antiphospholipid syndrome</b>	Sometimes called ‘sticky blood syndrome’ because the blood clots too quickly due to antibodies that form against the body’s phospholipids.
<b>Antiplatelets</b>	A group of drugs used to prevent the formation of clots by stopping platelets in the blood sticking together.
<b>Arterial dissection</b>	This is caused as a result of a small tear forming in the lining of the arterial wall which results in a blood clot forming in the artery.
<b>Barthel Index</b>	Scale measuring daily functioning specifically relating to the activities of daily living or mobility. Scores range from 0 to 100.
<b>BMI</b>	Body mass index – a measurement of body weight corrected for height.
<b>Carotid artery</b>	Main arteries in the neck supplying oxygenated blood to the brain.
<b>Carotid endarterectomy (CEA)</b>	A surgical procedure used to clear the inside of the carotid artery of atheroma.
<b>Carotid stenosis</b>	The narrowing of the carotid arteries in the neck.
<b>CCT</b>	Controlled clinical trial.
<b>Confidence interval (CI)</b>	The probability of the observed data (or data showing a departure more extreme from the null hypothesis) when the null hypothesis is accepted.
<b>Cochrane review</b>	The Cochrane Library consists of a regularly updated collection of evidence-based medicine databases including the Cochrane Database of Systematic Reviews (reviews of randomised controlled trials prepared by the Cochrane Collaboration).
<b>CT</b>	Computed tomography – an X-ray technique used to examine the brain.
<b>Cost-effectiveness analysis</b>	An economic study design in which consequences of different interventions are measured using a single outcome, usually in natural units (for example, life-years gained, deaths avoided, heart attacks avoided, cases detected). Alternative interventions are then compared in terms of cost per unit of effectiveness.

<b>Decompressive hemicraniectomy</b>	A surgical procedure for the treatment of raised intracranial pressure. A piece of the skull is removed to allow the swelling brain to expand.
<b>DVT</b>	Deep vein thrombosis.
<b>Diagnostic accuracy</b>	The degree to which a diagnostic (or screening) tool or procedure is able to distinguish between cases and non-cases. See also 'sensitivity', 'specificity', 'negative predictive value' and 'positive predictive value'.
<b>Dysphagic</b>	Difficulty in swallowing.
<b>Endarterectomy</b>	The surgical removal of plaque from a blocked artery to restore blood flow.
<b>FAST</b>	Face Arm Speech Test used to screen for the diagnosis of stroke or TIA.
<b>Haemorrhage</b>	Bleeding caused by blood escaping into the tissues.
<b>Hydrocephalus</b>	Raised pressure within the skull.
<b>HTA</b>	Health Technology Appraisal, funded by the NHS Research and Development Directorate.
<b>Infarct</b>	An area of cell death due to the result of a deprived blood supply.
<b>INR</b>	International normalised ratio. A measure of the clotting ability of blood, usually following use of anticoagulant drugs. It is calculated as the ratio of the length of time it takes blood to clot over the time it would take the blood of a normal subject to clot.
<b>MCA</b>	Middle cerebral artery.
<b>Meta-analysis</b>	A statistical technique for combining (pooling) the results of a number of studies that address the same question and report on the same outcomes to produce a summary result.
<b>MRI</b>	Magnetic resonance imaging – a non-invasive imaging technique allowing detailed examination of the brain.
<b>MRI with DWI</b>	Magnetic resonance imaging with diffusion weighted imaging.
<b>MUST</b>	Malnutrition Universal Screening Tool. A screening tool comprising five steps which help identify which adults are malnourished or at risk of malnourishment.
<b>National Service Framework</b>	A nationwide initiative designed to improve delivery of care for a related group of conditions.
<b>NHS</b>	National Health Service. This guideline is written for the NHS in England and Wales.
<b>NICE</b>	National Institute for Health and Clinical Excellence – a special health authority set up within the NHS to develop appropriate and consistent advice on healthcare technologies, and to commission evidence-based guidelines.
<b>Observational group study</b>	Retrospective or prospective study in which the investigator observes the natural course of events with control groups, for example cohort studies and case-control studies.
<b>Pulmonary embolism</b>	A blood clot in the lungs.
<b>Quality of life</b>	Refers to the level of comfort, enjoyment, and ability to pursue daily activities.
<b>RCT</b>	Randomised control trial. A trial in which people are randomly assigned to two (or more) groups: one (the experimental group) receiving the

	treatment that is being tested, and the other (the comparison or control group) receiving an alternative treatment, a placebo (dummy treatment), or no treatment. The two groups are followed up to compare differences in outcomes to see how effective the experimental treatment was. Such trial designs help minimise experimental bias.
<b>ROSIER</b>	Recognition of Stroke in the Emergency Room test used to establish the diagnosis of stroke or TIA.
<b>Side effect</b>	An adverse event that occurs because of a therapeutic intervention.
<b>Specialist</b>	A clinician whose practice is limited to a particular branch of medicine or surgery, especially one who is certified by a higher medical educational organisation.
<b>Stenosis</b>	Abnormal narrowing of a blood vessel.
<b>Stenting</b>	A metal mesh tube is placed in an artery or blood vessel to increase blood flow to an area blocked by stenosis.
<b>Stroke</b>	The damaging or killing of brains cells starved of oxygen as a result of the blood supply to part of the brain being cut off. Types of stroke include ischaemic stroke caused by blood clots to the brain, and haemorrhagic stroke caused by bleeding into/of the brain.
<b>Systematic review</b>	Research that summarises the evidence on a clearly formulated question according to a pre-defined protocol using systematic and explicit methods to identify, select and appraise relevant studies, and to extract, collate and report their findings. It may or may not use statistical meta-analysis.
<b>TIA</b>	Transient ischaemic attack – a stroke which recovers within 24 hours of onset of symptoms.
<b>Thrombosis</b>	A formation of a blood clot.
<b>Thrombolysis</b>	The use of drugs to break up a blood clot. Two examples of thrombolysis drugs are tPA and alteplase.
<b>Videofluoroscopy</b>	Videofluoroscopy is a test for assessing the integrity of the oral and pharyngeal stages of the swallowing process. It involves videotaping fluoroscopic images as the patient swallows a bolus of barium.
<b>WHO</b>	World Health Organization.

# Introduction

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# I Introduction

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## I.1 Changes from the second edition

This is the third edition of the UK national clinical guideline on the management of stroke. Significant changes from the first two editions include:

- ▶ the use of evidence published since 2002
- ▶ incorporation of the recommendations made in the guideline on acute stroke and transient ischaemic attack by the National Institute for Health and Clinical Excellence (NICE) (2008) concerning the acute phase of management (see 1.10)
- ▶ an increase in scope to cover recommendations on resources needed
- ▶ inclusion of specific recommendations for those who commission (purchase) services for people with stroke
- ▶ consideration of when actions may reasonably **not** be undertaken, or may be limited or stopped
- ▶ use of qualitative evidence where appropriate
- ▶ rewriting of almost all the text, with removal of the 'local guideline' sections, which have been replaced by 'implications' sections
- ▶ reference to and incorporation of relevant UK national documents including the Department of Health National Stroke Strategy (2007) and the National Service Framework for Long Term Conditions (2005).

## I.2 Scope

This guideline covers:

- ▶ the management of acute cerebrovascular events (transient ischaemic attack (TIA), stroke and subarachnoid haemorrhage (SAH))
- ▶ primarily in adults aged over 16 years
- ▶ from onset to long-term including death.

For these conditions the guideline covers:

- ▶ acute diagnosis and treatments (mainly through the NICE guideline process)
- ▶ all aspects of rehabilitation
- ▶ long-term care and support
- ▶ secondary prevention
- ▶ prevention of complications.

The guideline does not cover:

- ▶ primary prevention of stroke (other guidelines concerning prevention of vascular disease should be used)
- ▶ detailed recommendations on (neuro)surgical techniques, but the role of surgery is considered
- ▶ management of children with stroke; guidelines concerning children are published separately (Paediatric Stroke Working Group 2004)
- ▶ general aspects of healthcare, unless there are very specific issues relating to stroke.

### 1.3 The conditions covered

This guideline concerns the management of people who fulfil the most widely used definition of stroke (World Health Organization 1978), namely people who:

- ▶ present with an acute, sudden onset of a focal neurological loss (to include gross alteration in conscious level)
- ▶ where the cause is assumed to be vascular (until and unless proven otherwise).

The conditions are traditionally referred to as stroke, transient ischaemic attack and subarachnoid haemorrhage and are briefly described below.

*Stroke* is defined as a clinical syndrome, of presumed vascular origin, typified by rapidly developing signs of focal or global disturbance of cerebral functions lasting more than 24 hours or leading to death (World Health Organization 1978).

It affects between 174 and 216 people per 100,000 population in the UK each year (Mant *et al* 2004), and accounts for 11% of all deaths in England and Wales. Sixty-nine per cent of strokes are due to cerebral infarction, 13% to primary haemorrhage, 6% to subarachnoid haemorrhage, and 12% are of uncertain type (Wolfe *et al* 2002). The risk of recurrent stroke within five years of a first stroke is between 30% and 43% (Mant *et al* 2004).

*Transient ischaemic attack* (TIA) is traditionally defined as an acute loss of focal cerebral or ocular function with symptoms lasting less than 24 hours and which is thought to be due to inadequate cerebral or ocular blood supply as a result of low blood flow, thrombosis, or embolism associated with diseases of the blood vessels, heart, or blood (Hankey and Warlow 1994). A more recent suggested definition is ‘an event lasting less than one hour without cerebral infarction on magnetic resonance imaging brain scan’, but this requires early scanning.

In practice the distinction between stroke with rapid recovery and transient ischaemic attacks can only be made retrospectively and is probably of little importance.

Transient ischaemic attacks affect 35 people per 100,000 of the population each year and are associated with a very high risk of stroke in the first month of the event and up to one year afterwards (Rothwell *et al* 2007).

*Subarachnoid haemorrhage* (SAH) is a haemorrhage from a cerebral blood vessel, aneurysm or vascular malformation into the subarachnoid space (ie the space surrounding the brain where blood vessels lie between the arachnoid and pial layers) and is characterised by sudden onset of headache, and vomiting, with or without loss of consciousness.

It affects 6–12 people in each 100,000 of the population per year and constitutes about 5% of incident first strokes. Approximately 85% of patients bleed from an intracranial aneurysm, 10% from a non-aneurysmal peri-mesencephalic haemorrhage and 5% from other vascular abnormalities including arteriovenous malformation (Van Gijn *et al* 2001). Clinically the acute presentation is usually different from the presentation of other strokes, specifically because it presents with sudden onset of severe headache, and non-focal neurological symptoms which may include loss of consciousness.

#### 1.3.1 Duration of cerebrovascular events

The distinction between stroke and transient ischaemic attack is based simply on the duration of symptoms. However, epidemiological studies have shown that the distinction between stroke,

where symptoms last longer than 24 hours and transient ischaemic attack, where all symptoms and signs are completely resolved by 24 hours, is not a useful or sustainable distinction.

The reasons for not distinguishing stroke from traditionally defined transient ischaemic attacks include:

- ▶ evidence that some people with transient symptoms nonetheless have cerebral infarction or haemorrhage
- ▶ a similar natural history in terms of further episodes of cerebral and non-cerebral vascular events
- ▶ a similar clinical need for people with mild and short-lived stroke as for people with TIA
- ▶ clinical failure to make the distinction accurately (or according to the definition), with people acquiring the label of TIA despite prolonged symptoms
- ▶ the logical impossibility of knowing the distinction within the first few hours, the precise time when decisions on acute treatment need to be made.

There are two possible reasons for maintaining the distinction:

- ▶ The differential diagnosis of a transient ischaemic attack (completely and rapidly resolved) is different than that for a stroke (continuing neurological loss).
- ▶ The distinction emphasises that transient events are also important and have their own specific management.

### 1.3.2 Resolved neurovascular events

Nonetheless three facts must be recognised.

First, there are patients who have neurological symptoms secondary to vascular disease lasting only a very short time. Clinically most recover in about one hour or less.

Second, there will inevitably be patients who first present to health services later after onset (within a few days) and have few or no residual symptoms. They have events that recover quickly if not completely but the events still need diagnosis and management.

Last, there will be patients who recover more or less completely from their stroke within a few days without any specific treatment. They may have a few symptoms, but have no appreciable limitation on normal daily activities.

All of these patients have had *resolved neurovascular events* and all remain at risk of further vascular episodes, and should be managed in a similar way.

### 1.3.3 This guideline's approach

Consequently this guideline will recognise and discuss acute cerebrovascular *events* which will include, pathologically, cerebral infarction (both thrombotic and embolic), intracerebral haemorrhage, and subarachnoid haemorrhage.

This guideline will also recognise that there are two important clinical groups of patients: those who have had a neurovascular event leaving residual problems, and those who have a neurovascular event from which they make a more-or-less full recovery.

Nevertheless the word 'stroke' will be used to refer to all conditions where distinctions are not appropriate, necessary or possible. As far as possible, subtypes will be defined clinically at the relevant points in the guideline.

## I.4 Aims of the guideline

This guideline's goal is to improve the quality of care delivered to everyone who has a stroke in the UK regardless of age, gender, type of stroke, location or any other feature. Since 1997 the *National clinical guidelines for stroke* (2004), coupled with the National Sentinel Stroke Audit (Rudd *et al* 1999) has led to some improvement both directly and through its influence on other organisations (eg the National Audit Office 2005) and policies (eg the National Service Framework for Older People (Department of Health 2001), the National Stroke Strategy (Department of Health 2007). Although there are different regional strategies across the UK, when using the term 'National Stroke Strategy' in this document it will be referring to the National Stroke Strategy from the Department of Health in England 2007. This third edition aims to continue and increase the improvement in service quality.

The guideline will achieve its aim through influencing various groups of people, and it has been written with several specific audiences in mind:

- ▶ clinical staff who are involved with patients with stroke
- ▶ commissioners involved in purchasing services for people with stroke
- ▶ managers involved in providing services for people with stroke
- ▶ patients with stroke, and their relatives and friends. A version is available for non-healthcare staff but we hope that the main document may also be useful to the lay public.

The guideline is primarily developed for use in the UK, but many of the recommendations will be applicable in other countries and settings.

The guideline also aims to be a working document, seen and used widely rather than simply exhorting people. Our second edition has been the most popular internet download on the website of the Royal College of Physicians (RCP) since it was launched, averaging 3,123 hits each month over three years. In order to achieve and maintain such high levels of use we have used the following principles.

The guideline should:

- ▶ be comprehensive, covering all the major questions likely to be asked by those reading it
- ▶ be coherent, being obviously logical in its layout and content
- ▶ be relevant to all users:
  - all clinicians involved with stroke patients at any stage of their illness
  - managers responsible for developing or managing stroke services
  - commissioners responsible for purchasing high-quality stroke services
  - patients, families, carers and others
- ▶ be easily used (important given its size and comprehensive coverage)
- ▶ provide explicit recommendations
  - based on evidence wherever possible, but using consensus where necessary
  - covering all important clinical and organisational problems
- ▶ justify its recommendations:
  - referring to the main evidence
  - showing the evidence (Tables of evidence are available on the RCP website at [www.rcplondon.ac.uk/pubs/brochure.aspx?e=250](http://www.rcplondon.ac.uk/pubs/brochure.aspx?e=250))
- ▶ make recommendations concerning stopping or limiting the use of resources wherever possible
- ▶ acknowledge that recommendations may have implications for other parts of the health services, without curtailing the recommendations made



- ▶ focus on the needs of the patient, not the roles of particular professions
- ▶ try to indicate the most important recommendations.

## 1.5 Context and use

A guideline cannot cover every eventuality, and new evidence is published every day so parts of the guideline will become out of date sooner or later. Thus the recommendations should be taken as statements that inform the clinician, not as rigid rules. The clinician (or other user) is responsible for interpreting recommendations, taking into account the specific circumstances being considered, and for considering whether new evidence might exist that would radically alter the recommendation.

This guideline relates to the aspects of management that are specific to stroke; it does not specifically cover areas of routine good clinical practice such as courtesy, managing associated illness, and making notes. It is assumed that this guideline will be used within the context of the services available in the UK, and that clinicians and others will be operating within professionally recognised standards of practice.

The guideline is set within the context of the current legal framework within the UK governing the provision of services, for example concerning community care or social services care management. This guideline is not intended to overrule such regulations. It should be considered in conjunction with them. Hopefully it will facilitate practice not only in health services but also in social services and other organisations. (*Social services* are currently termed '*adult services*' in much of the UK.)

Feedback is always welcome. This guideline is only as good as it is because hundreds of people have contributed their comments to drafts and editions since 1997. Thank you.

## 1.6 Methodology of guideline development

The work underlying this guideline has always been subject to constraints. The field of stroke research is huge, and rigorous searching for all relevant evidence on every single question and for every recommendation would be impossible within any realistic resource. Thus the working party has always taken a pragmatic approach to searching for and evaluating evidence, balancing time and other resources against the importance of the topic and perceived likelihood of changing existing recommendations if one previously unknown study is found.

However, the methodology has one overwhelming strength: it has always been open and collaborative, accepting help from anyone willing and competent to do so. Furthermore, it has had extensive input from a wide range of invited peer reviewers and from many other interested individuals and users. We are extremely grateful to each and every one of these people.

### 1.6.1 Intercollegiate Stroke Working Party

The guideline was developed by the Intercollegiate Stroke Working Party (ICSWP), coordinated by the Clinical Effectiveness and Evaluation Unit (CEEU) of the Royal College of Physicians in London. The current members of the working party, listed on pages viii–ix, were nominated by professional organisations and societies to give wide representation from all disciplines, including the views of patients and their families. Members were required to liaise with their own professional bodies and with other experts in the field as they felt appropriate throughout the process. Most members had a longstanding personal interest and expertise in the field of stroke management.

### 1.6.2 *Searching the scientific literature*

For the first edition (Intercollegiate Stroke Working Party, 2000) a relatively informal search strategy was used for literature up to 1999. For the second edition an information scientist conducted formal searches of the literature for areas covered by the first edition for the period from 1999. For areas that were new to the second edition (ie subarachnoid haemorrhage, transient ischaemic attack, concordance with medication, therapy for cognitive disorders and paediatric stroke) the searches included the period from 1966 onwards.

The searches consisted of systematic searching of available computerised databases including: Medline, AMED, CINAHL, Psycinfo and Embase. The Cochrane Collaboration database was used extensively, and other national guidelines were reviewed including those of the Scottish Intercollegiate Guidelines Network (SIGN), and National Institute for Clinical Excellence (NICE). Health Technology Appraisal (HTA) reports were used, and members of the working party brought their own expertise and information from their organisations and professional bodies.

For this third edition we have also considered qualitative research literature where that methodology was more appropriate and/or gave more relevant information.

However, the great increase in the numbers of randomised trials, and in other evidence has necessarily required compromise. For example, if a Cochrane systematic review and meta-analysis relevant to a topic have been published within the last 1–2 years, further searches were not undertaken and the papers were not themselves reviewed. If there was already substantial evidence available and it was strong, additional new small trials were generally not reviewed.

### 1.6.3 *Assessing the quality of research*

The guidelines are derived primarily from published material, interpreted in the light of the knowledge and experience of the members of the working party, peer reviewers and others who have commented. Nonetheless they depend greatly on the quality of the published evidence and this was evaluated.

In the second edition of this guideline, the Scottish Intercollegiate Guidelines Network (SIGN) SIGN 50 guidelines appraisal checklists were used by the members of the working party to assess the quality of published articles. However, using these was effortful, and tended to duplicate work because material also had to be abstracted into evidence tables. Furthermore they still relied on judgement to a great extent.

For the third edition a set of criteria developed by van Tulder and colleagues (van Tulder 2003) that have been widely applied in systematic reviews was used (see Appendix 3). These give a quality score. We report this score where studies have been newly reviewed (studies used in previous editions have not been reassessed using these criteria). A higher score indicates a better quality. Results of the quality assessments were presented to the working party for discussion and approval. About 10% of the articles were double marked to check for consistency.

The quality of systematic reviews was also rated on this occasion. The criteria that we put forward for a tool to rate quality were that it should:

- ▶ be relatively short, not taking undue time or effort
- ▶ be based on observable features and not on the reviewer's judgement
- ▶ give a score.

In the absence of any known system that fulfilled these criteria, we developed a simple questionnaire (shown in Appendix 4) derived from the widely used QUOROM statement, giving

a list of features that should be fulfilled by a good systematic review ([www.consort-statement.org/QUOROM.pdf](http://www.consort-statement.org/QUOROM.pdf))

In addition this guideline has incorporated some evidence from qualitative studies. Again, there are no standardised short objective measures of the quality of qualitative research. A sub-committee of the working party took on the role of reviewing all qualitative studies identified, and used a tool to measure quality called RATS (Appendix 5).

#### ***1.6.4 Identification and selection of articles for inclusion***

Evidence was obtained from published material using the following principles.

Where sufficient evidence specifically relating to stroke was available, this alone was used. In areas where limited research specific to stroke was available, then studies including patients with other appropriate, usually neurological, diseases were used.

Evidence from all relevant randomised controlled trials (RCTs) available was used.

Where systematic reviews (with or without meta-analysis of data) were available and were considered to provide adequate evidence, then they were used. The individual studies within the review were not individually studied (unless in relation to another question). However, RCTs relevant to the question but not included in the systematic review were separately reviewed by our group.

Evidence from observational group studies or small-group studies was only used when there was limited or no evidence from RCTs. In general, evidence from single-case studies was not used, primarily because it is usually difficult to draw general conclusions from them.

Evidence from qualitative studies was also sought and used where either qualitative research was the most appropriate method to investigate a question or it was the only useful evidence available.

Searches, selection of studies, and reviews of studies were undertaken by a very large number of people. We are extremely grateful to each and every one of them and the guideline would not exist without their hard work. Many are acknowledged in Appendix 1, but we would especially like to thank the Stroke Therapy Evaluation Programme (STEP; [www.effectivestroke.org](http://www.effectivestroke.org)) for their contribution, particularly as they are in Scotland and thus strictly do not have any direct interest!

#### ***1.6.5 From evidence to recommendation***

Published evidence rarely gives answers that can be translated directly into clinical practice or into recommendations; interpretation is always essential, taking into account many contextual factors.

In this guideline the initial reviewer sometimes suggested how evidence might lead to a recommendation, but the primary responsibility for interpretation was with the members of the working party who discussed and reviewed all recommendations in the light of the available evidence. This guideline document includes a necessarily brief summary of how the evidence and the associated recommendations were linked for a minority of the recommendations; many and/or long justifications would lengthen the document considerably.

In the many areas of important clinical practice where evidence was not available, we made consensus recommendations based on our collective views, but also drawing on any other relevant consensus statements or recommendations and evidence from qualitative studies which were often powerful and informative.

It is important to note that the evidence relating to specific individual interventions, usually drugs, is generally stronger, because it is methodologically easier to study them in contrast to investigating multifaceted interventions over longer periods of time. This does not necessarily mean that interventions with so-called strong evidence are more important than those where the evidence is weak.

It is also important to note that some recommendations are based on the logical consequences of other recommendations; their strength depends upon the evidence underlying the base recommendation. For example, there is strong evidence that thrombolysis is cost effective if delivered within three hours of stroke onset. It therefore follows that all processes preceding this must be undertaken urgently, including transfer into an appropriate setting and preparatory investigations. Therefore recommendations on ambulance transfer and radiology are logical sequelae of the recommendation on thrombolysis rather than based on independent evidence.

### 1.6.6 *Strength of recommendation*

Traditionally recommendations have been given a strength which derived entirely from the *design* of the studies providing evidence.

This system has several flaws. Strong evidence for an unimportant recommendation gives it an apparent higher priority than a vital recommendation where the evidence is weaker. The strength depends solely upon study design and ignores other important features of the evidence such as its plausibility, selection bias, and sample size. It fails to give readers guidance on what is important; it only gives information on *evidence*, and even that is limited information.

For this guideline we chose an alternative approach.

First the nature and strength of the evidence behind each recommendation is summarised; the actual evidence itself is in tables that are available on the web. This statement is brief, but should justify the recommendation and explain the link.

Second, once all the recommendations were made, a formal consensus approach was used. All members of the working party, and peer reviewers, and people with stroke and their representatives were asked to identify their 'top 20' recommendations. All recommendations given four or more votes were then discussed, and a final 21 were agreed by the working party as being the most important recommendations.

Finally, to assist the interested reader, the actual evidence used is given in tables available on the web (see [www.rcplondon.ac.uk/pubs/brochure.aspx?e=250](http://www.rcplondon.ac.uk/pubs/brochure.aspx?e=250)). These tables have a consistent structure, and include both a description of the quality of a study, and a brief comment on the study agreed by the whole working party.

### 1.6.7 *Peer review*

Following review of the literature and initial agreement of the guideline by the working party there was a period of peer review during which experts in all disciplines, including patients' organisations, were asked to review the guideline. Changes were made to the guideline accordingly. Thanks are due to the reviewers (listed in Appendix 1) who took so much time and trouble to give the benefit of their knowledge and expertise.

## 1.7 Format of each chapter

Each chapter will have a similar format. After a brief introduction the contents of the chapter will be laid out, in order. Thereafter each chapter is divided into numbered parts, each part covering a specific aspect of stroke management.

### 1.7.1 Structure of each part

Each part has a similar general structure:

- ▶ **Introduction**, defining the domain and giving a very brief background on its relevance
- ▶ **Recommendations**, given as a structured set (see below)
- ▶ **Evidence**, giving a few major references for each identified recommendation or stating that the recommendation was arrived at by consensus
- ▶ **Implications**, discussing any broader implications including cost and what local teams need to do. Every recommendation is likely to have some implication, but a comment will only be added when there are significant consequences to be considered; many sets of recommendations will have no stated implications.

Recommendations are laid out in sets of closely related suggestions. The general structure of a set is framed around the clinical process so that a clinician should start with the first and will generally find that the order reflects clinical priorities and practice. Generally assessment/diagnosis will precede intervention, and common, simple and safe actions will precede complex, expensive and rarely needed actions.

The layout in any specific set of recommendations will usually be:

- ▶ assessment: identifying or selecting patients for the subsequent recommendations
- ▶ action; giving the actions needed
- ▶ identification of patients needing further action
- ▶ further action
- ▶ and so on.

As far as possible the guideline will use recommendations that have the following structure:

- ▶ **The target**. This identifies which patients, or people, or staff are the subject of the recommendation. It should be as specific as possible.
- ▶ **‘Should’**. Recommendations are just that, indicating what **should** happen.
- ▶ **The action**. This should specify what is expected.
- ▶ **Qualifiers**. Sometimes additional qualifying comments are needed, usually to specify the particular goal of the action recommended.

However, sometimes an alternative structure will be used, specifying when a particular intervention should be used. This approach has generally been avoided because it focuses on the ‘solution’ and not the clinical problem. However, we recognise that sometimes clinicians may want to know when a particular action should be undertaken.

In this circumstance the layout will be:

- ▶ **The intervention** (treatment, investigation etc) that is being considered
- ▶ **‘Should’**, indicating what should happen
- ▶ **Be used with** (given to, used with, applied), specifying the action
- ▶ **The patient group**, giving as accurately as possible a clinical definition of the **target** patients
- ▶ **Qualifiers**. If needed, usually to specify the particular goal of the action recommended.

## 1.8 Models underlying guideline development

The guideline used several models or frameworks to structure its work and layout. In summary these were:

- ▶ the Donabedian model (Donabedian 1978) for considering healthcare: structure, process, and outcome
- ▶ the healthcare process: diagnosis/assessment, goal setting, intervention (treatment and support), and re-evaluation
- ▶ the World Health Organization's International Classification of Functioning (WHO ICF) (World Health Organization 2001) model (Wade & Halligan, 2004)
- ▶ time: prevention, acute, subacute (recovery) and long-term.

### 1.8.1 Structure, process, outcome

Guidelines are intended to lead to the delivery of the best (most effective) care to individual patients, also considering efficiency wherever possible. Consequently they primarily apply to individual interactions between the (healthcare) team and the patient. The success of the guideline depends upon influencing actions made by and decisions taken by individual clinicians and teams in single patient–team interactions. These interactions are the process of healthcare.

The fundamental processes in healthcare are similar whether considered as 'medical' or 'rehabilitation'. Both are problem-solving processes that encompass:

- ▶ data collection and interpretation (ie 'assessment' or 'diagnosis', both of which include drawing conclusions from the data)
- ▶ goal setting
- ▶ intervention (support *and* treatment; see below)
- ▶ evaluation and reiterate, or stop.

In this guideline, the healthcare process itself is considered at two levels:

- ▶ **System level** characteristics; applying to the team(s) within any particular locality. This primarily refers to the use of **protocols** that guide the overall management.
- ▶ **Person–patient interactions**; applying to individuals treating patients.

In this guideline interventions are divided into two classes, each subdivided into two:

- ▶ **Support**: actions needed to sustain the patient safely. They may have two goals:
  - maintaining or sustaining; positively keeping the patient stable
  - preserving or preventing; actions that avoid adverse outcome happening.
- ▶ **Treatments**: actions that are expected to lead to a sustainable change in outcome. These may have two goals:
  - **restorative**; aiming to reverse to a greater or lesser extent a loss or deficit
  - **adaptive (or compensatory)**; aiming to manage the continuing consequences of a persisting loss or deficit.

These individual patient–team interactions are only possible within a structure. This refers to the resources (staff and equipment including buildings) and the organisation needed to allow them to occur. Structure also encompasses any general protocols or systematic approaches used.

In this guideline three important aspects of structure will be considered:

- ▶ **organisation** (eg specialist vs non-specialist), including relationships between different organisations (ie transfers of patients)

- ▶ **resources** (eg who, how many, etc)
- ▶ **location** of delivery of service(s).

The **outcome** of the healthcare process refers to the actual state of the patient at the end of the process. It should also refer to the intended changes or goals of the process.

In this guideline this covers:

- ▶ audit of the whole system
- ▶ evaluation of individual patient interaction.

### 1.8.2 Patient interactions – WHO ICF

The document uses the WHO ICF model (see Table 1.1) especially as a basis for recommendations that relate to direct patient interactions. Thus we consider:

- ▶ pathology (disease); (eg cerebral infarction, intracerebral haemorrhage, hypertension)
- ▶ impairment (symptoms/signs)
- ▶ activities (disability)
- ▶ participation (handicap)
- ▶ context:
  - physical
  - social
  - personal.

**Table 1.1** Stroke management: ICF framework and terminology

<b>Illness of person</b>	<b>Synonym</b>	<b>Level of description</b>
Pathology	Disease/diagnosis	Organ/organ system
Impairment	Symptoms/signs	Body
Activity (was <i>disability</i> )	Function/observed behaviour	Interaction of person and environment
Participation (was <i>handicap</i> )	Social positions/roles	Person in their social context
<b>Contextual factors</b>	<b>Examples</b>	<b>Comment</b>
Personal experiences	Previous illness	May affect response to this stroke
Physical environment	House, local shops	May affect need for equipment etc
Social environment	Laws, friends	May affect motivation, support etc
<b>Rehabilitation</b>		
<b>Aims</b>	<b>Synonym</b>	<b>Comment</b>
Maximise patient's social rehabilitation	Minimise handicap/maximise participation	Takes matters well outside health; personalises position and roles; rehabilitation process
Maximise patient's sense of well-being (quality of life)	Minimise somatic and emotional pain and maximise satisfaction with life	Helps people come to terms with the effects of their stroke
Minimise stress on and distress of the family	Provide emotional and practical help	Takes matters well outside health; also takes much effort and time unrelated to 'objective' losses
<b>Processes</b>	<b>Explanation</b>	<b>Comment</b>
Assessment	Collection and interpretation of data	Only as much as is needed to take action, setting goals and intervening
Setting goals	Considering both long-term aims and short-term methods	Should be multiprofessional goals as well as unprofessional goals

*continued*



**Table 1.1** Stroke management: ICF framework and terminology – *continued*

<b>Intervention</b>		
Giving/organising care	Intervention needed to maintain life and safety	Major resource use, proportional to dependence/disability
Giving/organising treatment	Intervention presumed to affect process of change	Usually referred to as 'therapy'; not necessarily face-to-face interaction
Re-evaluation	Checking effects of intervention	Reiterative until no further goals remain
<b>Other terminology</b>		
<b>Term/word</b>	<b>Definition</b>	<b>Comment</b>
Outcomes	Result of intervention (or disease course over time)	Depends upon level being monitored, but for service should be at level of activity
Measurement	Comparison of data against a standard or 'metric'	Quantifies data (NB Data still need interpretation)
Audit	Comparison of observed performance against agreed standards followed by change	With the aim of improving service quality on a continuing basis. Interpretation should take into account case-mix and context
Goals (in rehabilitation)	Any defined change in state over time and/or future state	Generic term, no implications as to level, time frame etc
Long-term goals		Usually refers to (social) situation after discharge
Medium-term goals		Usually multiprofessional, in weeks/months, at level of disability/activity
Short-term, specific goals		Usually named person and set time/place

ICF = *International classification of functioning, disability and health: ICF* (World Health Organization 2001).

### 1.8.3 Time

The nature of the problems faced changes over time. Again this factor concerns primarily direct interactions with the patient. We consider:

- ▶ prevention (potentially at all four levels of the WHO ICF)
- ▶ acute phase (0–7 days), usually dominated by medical diagnosis and treatments
- ▶ sub-acute or recovery phase (1–26 weeks), usually dominated by rehabilitation
- ▶ long-term (over six months), usually dominated by support and care.

## 1.9 Document structure

The guideline is centred on the patient, not on the role of individual organisations, professions, or other groups. Thus recommendations concern the response to a particular patient problem, not the actions of particular professions. Because stroke management is complex, these guidelines necessarily cover many aspects of care. While it is unlikely that any individual person or profession will wish to use or know all the specific recommendations, each person does need to have some idea about their role in the whole team and whole process. Thus scattered parts of the whole document may be relevant to every reader.

To aid readers there is an index. In addition we hope that the structure of the document helps.

### 1.9.1 Chapter 2 – commissioning

This chapter covers the main principles and aspects that commissioners need to take into account when purchasing or commissioning stroke services.

It is written from the perspective of the United Kingdom's National Health Service (UK NHS), especially as it applies in England and Wales where primary care trusts (England) and local health boards (Wales) are responsible for purchasing comprehensive healthcare services for



their population. In practice these are small organisations and rarely include experts in all the myriad of services they purchase.

Therefore we felt it might be helpful to pull together the purchasing implications of the recommendations made. Commissioning is undertaken at a population level, and rarely at an individual patient level. We have therefore drawn up recommendations that concentrate upon the structure (organisation and size) of services. If commissioners need to know about individual patient treatments, they should look within the other chapters.

The recommendations made are not based upon primary evidence (ie there are no formal studies comparing different commissioning policies). However, the recommendations follow from other recommendations that are supported by evidence, and the link is logical: effective treatment will only occur if it is paid for.

However, commissioners do have a particularly important role in ensuring that services are appropriately organised. Many of the problems reported by patients concern transfers of care and absence of services that should be present. And some of the efficiencies that can be achieved arise from altering where and how services are delivered.

### ***1.9.2 Chapter 3 – systems underlying stroke management***

This chapter covers matters which apply to a greater or lesser extent across all settings and to all phases of stroke care. Much of this section will be of great importance to people who manage or commission healthcare services, but some will apply directly to clinical staff involved in service delivery. The content covers organisation of services, resources needed, and some general principles that apply across the whole patient pathway, for example on transfers of care and on management of individual patients.

### ***1.9.3 Chapter 4 – acute-phase care***

The fourth chapter covers primarily the first 48 hours, focusing on the diagnosis and treatment of acute pathology and impairments. It is largely concerned with process as applied to individual patients and their families. The need to start managing activity limitation (ie rehabilitation) is acknowledged but details are given later. It also covers prevention of some specific complications.

### ***1.9.4 Chapter 5 – secondary prevention***

In the first two editions, secondary prevention was placed in the chapter on long-term management because the interventions continue into the long term. However, they should start immediately, and in this edition a specific new chapter on secondary prevention has been added immediately after the acute care chapter.

### ***1.9.5 Chapter 6 – recovery phase: rehabilitation***

The next chapter is the largest, and it focuses on the recovery (rehabilitation) phase which may be as short as a few days or as long as six months. It largely concerns the process of care as applied to individual patients and their families, and it focuses on impairments, activity limitations and contexts.

### 1.9.6 Chapter 7 – long-term management, after recovery

The last chapter focuses on the longer-term management of patients after stroke, but only in relation to the stroke-specific issues. Again it is concerned with the process of care as applied to patients and their families, but focuses on social participation and social context but with additional consideration of returning into rehabilitation. The management of comorbidities and underlying causes are not covered.

### 1.10 National Institute for Health and Clinical Excellence guideline

In 2006 the National Institute for Health and Clinical Excellence (NICE) commissioned a set of guidelines to cover the acute phase of stroke (National Institute of Health and Clinical Excellence 2008).

The scope defined the patients covered as being:

*Patients with transient ischaemic attacks (TIAs) or completed strokes, that is, an acute neurological event presumed to be vascular in origin and causing cerebral ischaemia, cerebral infarction or cerebral haemorrhage. This includes:*

- ▶ *first and recurrent events*
- ▶ *thrombotic and embolic events*
- ▶ *primary intracerebral haemorrhage of any cause, including venous thrombosis.*

The scope defined the **procedures covered** as being:

- ▶ *Diagnostic procedures and treatment interventions aimed to delineate the nature and location of the pathology*
- ▶ *Treatment interventions that aim to minimise the pathology*
- ▶ *The rapid recognition of symptoms and diagnosis*
- ▶ *Initial and early management of stroke and TIA*
- ▶ *Initial and early pharmacotherapy including thrombolysis. (Note that guideline recommendations will normally fall within licensed indications; exceptionally, and only where clearly supported by evidence, use outside a licensed indication may be recommended. The guideline will assume that prescribers will use the Summary of Product Characteristics to inform their decisions for individual patients.)*
- ▶ *Management and maintenance of homeostasis (including fluids, nutrition and oxygen therapy)*
- ▶ *Indications for referral for specific interventions (for example, carotid angioplasty, carotid endarterectomy)*
- ▶ *Management of complications where these are likely to affect the area of brain damage (for example the early use of anticoagulants for venous thrombo-embolism in acute stroke)*
- ▶ *Identification of people who need continuing or early anticoagulation*
- ▶ *Non-pharmacological management including role of early mobilisation and positioning.*

This commission coincided with starting work on the third edition of the Intercollegiate Stroke Working Party (ICSWP) national guideline. Consequently we agreed with NICE that we would provide recommendations on all areas not included within their guideline, but that we would not consider any questions that they were considering. Further we agreed that we would include verbatim the specific recommendations made by NICE. They are identified in the document by a background tint.

There was a close working relationship between the two groups at all stages to ensure that a comprehensive and coherent set of recommendations ensued.

## 1.11 Participation in clinical research

There are many areas in stroke medicine where the evidence base is weak. Thus it is quite acceptable to enter patients into clinical trials which may lead to contravention of the recommendations in this document, where such research has received ethical approval and been subjected to peer review. Stroke teams should be encouraged to participate in well-conducted multi-centre trials and other good-quality research projects, in particular projects supported by the UK Stroke Research Network ([www.uksrn.uk](http://www.uksrn.uk)). Involvement in research not only advances scientific knowledge but also helps improve the quality of care, levels of staff satisfaction and retention. It is the responsibility of health services to support high-quality research.

We have specifically made some recommendations that patients should **not** be given a treatment 'except in the context of research'. This has been done when there is already some research which leaves uncertainty about the benefit or harm, but there is sufficient doubt either due to the resource implications or due to the potential harms to advise at least some caution.

## 1.12 Cost of stroke care

Although implementation of these guidelines may have cost implications, this document does not undertake a full cost-benefit analysis. Where we recognise that guidelines have significant resource implications, we have suggested that this needs to be considered locally.

## 1.13 Terminology

The literature on stroke is bedevilled by variation and poor definition of terms used. This hinders research, and the interpretation of research. It may also complicate the use of this guideline and its recommendations.

As far as possible we have used plain English words, but inevitably there are specialist terms. In addition there are terms that are 'plain English' but still have no clear meaning in the context of healthcare; words such as 'stroke unit', specialist, expert and so on are all open to interpretation.

We have tried to be consistent in our use of words. We have also tried to define all ambiguous terms or unusual words in the text. In addition there is a glossary of terms.

## 1.14 Licensing of drugs

Recommendations about the use of specific drugs do not take into account whether the drug is licensed by the Medicines and Healthcare products Regulatory Agency (MHRA) for that particular use. It is up to the individual physician and their trust to decide whether to permit the unlicensed use of drugs in their formulary.

There are many situations where it is entirely appropriate to use medication which has not been licensed for specific situations (eg aspirin in acute ischaemic stroke). There are others where the rules of the licence are so strong that if broken it may result in the use of the therapy being legally withdrawn or funding withdrawn if NICE guidance restricts its use.

### **I.15 Updating the guidelines**

It is recognised that research evidence changes continuously. The Intercollegiate Stroke Working Party, co-ordinated by the CEEU at the Royal College of Physicians (RCP), London, will be reviewing the evidence on an ongoing basis for the next publication in 2012.

### **I.16 Funding and conflicts of interest**

The guidelines were developed as part of the stroke programme at the Clinical Effectiveness and Evaluation Unit, RCP. Funding for the guidelines was provided by the RCP Trusts Funds, the Stroke Association and the British Association of Stroke Physicians. Details of this are available on the RCP website [www.rcplondon.ac.uk/college/ceeu/index.htm](http://www.rcplondon.ac.uk/college/ceeu/index.htm). Competing interests of the working party members were fully declared and are listed on page x.

# Service provision and organisation

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## 2 Commissioning

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### 2.0 Introduction

Guideline documents usually focus on how an individual patient should be treated, and draw upon evidence concerning the effectiveness, risks and costs of specific interventions. From the beginning, the national stroke guideline has also included recommendations on the organisation of stroke services, primarily because there is overwhelming evidence that the use of specialist stroke units, which is an organisational or structural matter, has the biggest influence upon overall mortality and morbidity.

Clinical teams can only provide services that are paid for. Clinical and organisational recommendations are of little benefit to patients if the organisation that pays for or commissions healthcare does not support the provision of the recommendation.

In the context of the UK healthcare system, services are commissioned (purchased) by specific organisations, currently primary care trusts and local health boards in England and Wales, respectively. However, the recommendations made here could be used in many other countries where healthcare is funded through organisations that are responsible for ensuring that a reasonable standard of healthcare is available to the population covered.

In practice, commissioning organisations often do not include people with expertise in specific areas of clinical practice, such as stroke care. Therefore they find it difficult to commission in detail or to know what they should or should not purchase. They often rely on the provider organisation to give advice.

Consequently in this edition of the national stroke guideline we have given, for the first time, some specific guidance on commissioning stroke services. We have had to steer a course between simply repeating the many specific recommendations made later and making such bland and general recommendations that they are unhelpful.

The recommendations given in this chapter are derived from and based on more specific clinical and organisational recommendations made in the remainder of the guideline. Unless services are commissioned as recommended, it will not be possible to implement the remaining recommendations.

The evidence behind the other recommendations is given in the relevant parts of this guideline and in the tables of evidence. Hence we have not given any evidence in this chapter.

### 2.1 Structure – whole pathway

Patients who have a stroke present health services with a large number of problems to be resolved, covering all illness domains over a prolonged time. There is no single clinical pathway, or even small number of pathways. Consequently it is vital to have an organised service that can respond in a timely, appropriate and effective way to each person's unique needs as they arise. The challenge to commissioners is to achieve this.

### 2.1.1 Recommendations

- A Commissioning organisations should ensure that their commissioning portfolio encompasses the whole stroke pathway from prevention through acute care, early rehabilitation and initiation of secondary prevention on to palliation, later rehabilitation in the community and long-term support.
- B The quantity of stroke services commissioned should be based upon an estimate of the needs of the population covered, derived from the best available evidence.
- C The following specialist inpatient stroke services should be specifically commissioned across the health economy (various provider organisations covering the relevant population):
  - an acute service delivering thrombolysis
  - an acute service delivering close monitoring and control of physiological factors
  - an inpatient specialist stroke rehabilitation service with characteristics recommended in this guideline (a stroke unit)
  - a rehabilitation service capable of meeting the specific health and social needs of people with active lifestyles, including work.
- D Domiciliary rehabilitation services should be commissioned as part of an 'early supported discharge' scheme to deliver specialist rehabilitation at home in liaison with inpatient services, as well as in the long-term.
- E An acute neurovascular service should be commissioned to assess and manage any patient presenting with a transient neurovascular episode in accordance with the recommendations made by NICE.
- F The following additional specialist services should be commissioned to meet recommendations made by NICE:
  - an acute vascular surgical service to investigate and manage people with neurovascular episodes in ways and in timescales recommended in this guideline
  - a neuroscience service to admit, investigate and manage all patients referred with potential subarachnoid haemorrhage, both surgically and with interventional radiology
  - a neuroscience service delivering neurosurgical interventions as recommended for major intracerebral haemorrhage, malignant cerebral oedema, and hydrocephalus
- G Commissioners should also commission to ensure that:
  - people dying with stroke receive palliative care from the acute stroke service
  - people with stroke who are in care homes or are unable to leave their own home have full access to specialist stroke services after discharge from hospital
  - adequate support services are available to patients with long-term disability covering the full spectrum of needs (eg nursing, therapy, emotional support, practical support, carer support)
  - patients can re-access specialist services long after stroke.
- H A public education and professional training strategy should be commissioned to ensure that the public and emergency contact healthcare professionals (eg in emergency call centres) can recognise when someone has a potential stroke and knows how to respond.
- I Commissioners should require or commission the following from services:
  - participation of acute stroke admission wards and all inpatient services for stroke in the National Sentinel Clinical Stroke Audit
  - auditing of practice against some of the specific recommendations made here.

- J Health commissioners should ensure that there are:
- formal protocols between health organisations and social services that facilitate seamless and safe transfers of care at the appropriate time
  - protocols in place that facilitate rapid assessment for and provision of all equipment, aids (including communication aids), and structural adaptations needed by patients with a disability, especially but not restricted to patients in hospital awaiting discharge and those in residential care.

### 2.1.2 *Implications*

These recommendations should result in a stroke service that is more cost efficient than any other. In many instances there will be potential costs associated with start-up or with changes in practice, but the evidence suggests that well-organised services generally deliver an equal or better outcome at about the same cost. The recommendations concerning acute services are less well explored in terms of cost consequences but it has been suggested that they are also cost efficient once set up.

In addition to any initial resources needed, achieving change consistent with these recommendations will require considerable initial effort and commitment, involving discussions and negotiations with many parties.

## 2.2 Commissioning acute stroke services

This part covers some specific aspects of acute care that might be of particular relevance to commissioners of healthcare. Many of the important points were covered in 2.1.1. A few more specific recommendations are made here.

### 2.2.1 *Recommendations*

- A Ambulance services, including call handlers, should be commissioned to respond immediately to every patient presenting with a possible acute stroke.
- B Acute services should be commissioned to provide:
- imaging of all patients in the next slot or within one hour if required to plan urgent treatment (eg thrombolysis), and always within 24 hours
  - thrombolysis in accordance with recommendations made by NICE
  - active management of physiological status and homeostasis
  - completion of all investigations and treatments (to reduce risk) for transient ischaemic attacks and minor strokes within two weeks.
- C The commissioning of acute services should:
- ensure active involvement of specialist rehabilitation services with patients from the time of admission, wherever they are admitted, and
  - require that patients are seen by at least one member of the specialist rehabilitation team within 24 hours for assessment and by all team members within five days for treatment.

### 2.2.2 *Implications*

At present it is unlikely that commissioners specifically consider commissioning public education, and they probably simply commission ambulance services, vascular services and



neurosurgical services on a block basis. These recommendations suggest that these matters need specific discussion and agreement with the service providers; a separate contract is probably not necessary.

## 2.3 Secondary prevention

Secondary prevention is essential to reduce the burden of stroke, and commissioners should have a great interest in ensuring that services are effective in this sphere. It is a matter that concerns all parts of the stroke care system, and cannot easily be commissioned from any single provider.

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### 2.3.1 Recommendations

- A Commissioners should ensure that every provider specifically enacts all the secondary prevention measures recommended, and this should be the subject of regular audit or monitoring by commissioners.
- B Commissioners should commission acute hospital health services to:
  - identify and initiate treatment for all treatable risk factors as soon as possible
  - give all patients written information and advice on lifestyle changes that reduce the risk of stroke, tailored to the needs of the individual person
  - liaise with general practitioners about the long-term management of any identified risk factors for each patient.
- C Commissioners should facilitate the lifestyle recommendations made through:
  - supporting smoking cessation
  - working with other organisations to make it easier for people with disability to participate in exercise.

### 2.3.2 Implications

Commissioners have an active role to play in secondary prevention which is a matter for the population as well as being relevant to individual people. Environmental changes are likely to be effective in reducing the risk of recurrent stroke.

## 2.4 Commissioning rehabilitation services

Rehabilitation services are best delivered as close to the patient's own environment as is compatible with ensuring the patient's care and well-being, and taking into account the cost consequences of the pattern of service delivery. Commissioners have a pre-eminent role in determining the overall organisation of stroke rehabilitation services, but must exercise this power taking into account evidence and maintenance of core services.

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### 2.4.1 Recommendations

- A Commissioning organisations should commission:
  - an inpatient rehabilitation service capable of delivering specialist rehabilitation as recommended in this guideline (a stroke unit)
  - an inpatient (and outpatient) rehabilitation service capable of meeting the specific health and social needs of people of working age

- a service capable of delivering specialist rehabilitation at home in liaison with inpatient services, as recommended in this guideline.
- B In addition to commissioning an overall stroke rehabilitation service, commissioners should ensure that they specify within it, or commission separately, services:
- to assess and manage all aspects of therapy for people with severe spasticity including the use of botulinum toxin, baclofen pumps and specialist seating
  - to manage urinary (in)continence
  - to assess and treat patients with pain, especially neuropathic pain, where the stroke services have not been able to achieve effective pain control
  - to meet the needs of stroke patients for expert orthoptics, orthotics, podiatry, dietetics and other specialist services
  - to assess and manage the impairments of language, swallowing, speech, emotional state, communication, and cognition that arise after stroke.
- C Commissioners should ensure that patients who have had a stroke can gain specialist advice and treatments in relation to:
- driving
  - work
  - independent mental capacity advocacy if needed.

### 2.4.2 Implications

These recommendations highlight the need for commissioners to consider the overall organisation of services delivered to their population. They also highlight the obvious fact that services and commissions rarely actually relate to a single disease. In this case several of the recommendations apply to the generality of disabling neurological diseases.

Commissioners will need to consider the commissioning of specialist services in relation to the overall population need, rather than specifically in relation to stroke (or multiple sclerosis, or any other single diagnosis).

## 2.5 Commissioning in relation to the long-term consequences of stroke

Stroke is simply one cause of long-term disability. Many of the needs in the long term will be shared with patients with other conditions such as head injury and multiple sclerosis. Furthermore, many of the needs will relate to other conditions experienced by the patient, such as osteoarthritis. The recommendations will cover general needs to an extent, but will focus on the specific needs of stroke patients.

### 2.5.1 Recommendations

- A Healthcare commissioners should commission specifically a system that allows:
- patients to make contact directly with specialist stroke rehabilitation services if problems arise or recur
  - rapid access back to specialist rehabilitation for patients no longer under planned rehabilitation care after self referral or on referral by any other person including social services (adult services) care managers.

- B Healthcare commissioners should ensure that, between health and social services and other agencies:
- carers are able to access the support and help they need, and are aware that their needs can also be assessed
  - patients receive the practical (eg housing, employment) and emotional support they need
  - patients at home can access suitable social opportunities outside their homes if they want, usually through voluntary organisations
  - patients receive ongoing maintenance interventions (eg stretching) needed to maintain well-being.

### 2.5.2 *Implications*

In this context, commissioners will be concerned with the wider population of people with long-term disability from many causes.

## 3 Systems underlying stroke management

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### 3.0 Introduction

This chapter considers stroke management from a population perspective, ensuring that the whole population receives the highest quality stroke care possible. This depends primarily upon the structures and processes that exist locally: how stroke services are organised, what resources are available and how the clinical teams undertake their work.

The standard of care delivered to each and every patient and their family will be determined by the recommendations given in this chapter. If the organisation of stroke care is poor or if there are inadequate resources, then the recommendations given in the other chapters of this guideline cannot be delivered to most people. Further, if the clinical teams do not have sufficient knowledge and skills, and are not consistent in their clinical practice, then again many patients may receive sub-optimal care.

Thus this chapter is or should be of great concern to all parties – patients and their families, individual clinical staff, hospital and community managers, and service commissioners. The recommendations made here are among the most important ones made in this guideline and, interestingly, many of them have a strong evidence base to support them.

### 3.1 Overall organisation

Effective stroke care will only occur if overall organisation allows and facilitates the delivery of the best treatments at the correct time to the correct patients. This part makes recommendations that are primarily derived through logic and not directly from evidence; for example, thrombolytic treatment (a recommended treatment) can only be given within three hours (as recommended) if patients arrive in the appropriate setting within that time. These recommendations apply to the whole stroke pathway.

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#### 3.1.1 Recommendations

- A All community medical services and ambulance services (including call handlers) should be trained so that they treat patients with symptoms suggestive of an acute stroke as an emergency requiring urgent transfer to a centre with specialised hyperacute stroke services.
- B All patients seen within three hours of an acute neurological syndrome suspected to be a stroke should be transferred directly to a specialised hyperacute stroke unit that will assess for thrombolysis and deliver it if clinically indicated.
- C All hospitals receiving acute medical admissions that include patients with potential stroke should have a specialist acute stroke unit to monitor and regulate basic physiological functions such as blood glucose, oxygenation, and blood pressure.
- D All hospitals admitting stroke patients should have a specialist stroke rehabilitation ward, or should have immediate access to one.
- E All 'health economies' (geographic areas or populations covered by an integrated group of health commissioners and providers) should have a specialist neurovascular service able to assess and initiate management of patients within 24 hours of transient cerebrovascular symptoms.

- F There should be public and professional education programmes to increase awareness of stroke and the need for urgent diagnosis and treatment.

### 3.1.2 Evidence

- A Follows on from evidence concerning thrombolysis (4.6.1 A–E)
- B Follows on from evidence concerning thrombolysis (4.6.1 A–E)
- C Follows on from evidence and recommendations concerning physiological management (4.12.1 A, B)
- D Follows on from evidence concerning stroke units (3.2.1 B)
- E Follows on from evidence concerning transient ischaemic attacks (4.2.1 C)
- F Follows on from evidence concerning immediate treatments (eg 4.6.1 A–D) and the first quality marker given in the National Stroke Strategy (Department of Health 2007): ‘Members of the public and health and care staff are able to recognise and identify the main symptoms of stroke and know it needs to be treated as an emergency’.

### 3.1.3 Implications

These recommendations have major implications for the organisation of acute medical services within any ‘health economy’ (locality). In principle the cost consequences should be positive because more effective stroke care will reduce long-term rehabilitation and care costs. However, it will be important to maintain the effectiveness of other acute services when improving stroke services.

## 3.2 Specialist stroke services

Patients who have a stroke present as medical emergencies but for most of the last century were managed as low priority cases in general non-specialist services. Two factors have made this approach unacceptable in the 21st century: the strong evidence in favour of specialised stroke unit care, and the emergence of an effective acute treatment that reduces long-term brain damage and disability if given within a few hours.

In this context:

- ▶ A **specialist** is defined as a healthcare professional with the necessary knowledge and skills in managing people with the problem concerned, usually evidenced by having a relevant further qualification and keeping up-to-date through continuing professional development. It will usually also require good knowledge of stroke, especially in acute care settings. It does not **require** the person exclusively to see people with stroke, but does require them to have specific knowledge and experience of stroke.
- ▶ A **specialist team or service** is defined as a group of specialists who work together regularly managing people with a particular group of problems (for these guidelines stroke) and who between them have the knowledge and skills to assess and resolve the majority of problems. At a minimum any specialist unit (team, service) must be able to fulfil all the relevant recommendations made in this guideline. As above, the team does not have to manage stroke exclusively, but the team should have specific experience of and knowledge about people with stroke.

### 3.2.1 Recommendations

- A All patients with suspected stroke should be admitted directly to a specialist acute stroke unit following initial assessment either from the community or from the A&E department.
- B All patients not suitable for transfer home after completion of their acute diagnosis and treatment should be treated in a specialist stroke rehabilitation unit which should fulfil the following criteria:
  - it should be a geographically identified unit
  - it should have a coordinated multidisciplinary team that meets at least once a week for the interchange of information about individual patients
  - the staff should have specialist expertise in stroke and rehabilitation
  - educational programmes and information are provided for staff, patients and carers
  - it has agreed management for problems, based on evidence wherever available.
- C All patients discharged home directly after acute treatment but with residual problems should be followed up by specialist stroke rehabilitation services.
- D All patients whose acute symptoms remit within 24 hours (ie TIA) should be seen by a specialised physician (eg in a specialist neurovascular clinic or an acute stroke unit) within the time determined by their clinical features (see 4.3.1).

### 3.2.2 Evidence

- A National Institute for Health and Clinical Excellence 2008  
Quality markers seven and nine of the National Stroke Strategy (see Appendix 6)
- B Stroke Unit Trialists' Collaboration 2007  
Quality markers nine and ten of the National Stroke Strategy (Department of Health 2007)
- C Follows on from evidence concerning domiciliary rehabilitation services (3.7.1 E, G)
- D Follows on from evidence concerning management of transient ischaemic attacks (4.2.1 C, D, E)

### 3.2.3 Implications

These recommendations have major implications for the organisation of acute medical services within hospitals. Systems need to be adapted to ensure both rapid transport into the acute unit and also rapid discharge from the acute unit once acute management is complete (to allow further admissions).

## 3.3 Resources

The last two sections (3.1, 3.2) have been concerned with organisational structure. However, it is equally important to have appropriate physical structures available: staff, buildings, technological support and so on. Again, evidence on the appropriate amount of different resources is difficult to accumulate. Trials have not been undertaken comparing different levels or distributions of resources, and many structures (eg radiology) will be shared with other services managing patients with other problems. Nonetheless most service providers want guidance.

### 3.3.1 *Recommendations*

- A Each acute stroke unit should have immediate access to:
- medical staff specially trained in the delivery of acute medical care to stroke patients, including the delivery of thrombolysis and the diagnostic and administration procedures needed for safe effective delivery of thrombolysis
  - nursing staff specifically trained and competent in the management of acute stroke, covering both its neurological and its general medical aspects
  - imaging and laboratory services
  - rehabilitation specialist staff.
- B Each stroke rehabilitation unit and service should be organised as a single team of staff with specialist knowledge and experience of stroke and neurological rehabilitation including:
- consultant physician(s)
  - nurses
  - physiotherapists
  - occupational therapists
  - speech and language therapists
  - dietitians
  - clinical psychologists
  - social workers.
- C Each specialist stroke rehabilitation service should in addition:
- have an education programme for all staff providing the stroke service
  - offer training for junior professionals in the specialty of stroke
  - have easy access to services supplying: pharmacy; orthotics; orthoptists; specialist seating; patient information, advice and support; and assistive devices.

### 3.3.2 *Evidence*

- A Follows on from evidence and recommendations concerning acute stroke care (4.5 and 4.6)
- B Follows on from evidence concerning stroke rehabilitation units (3.2.1 B) and Langhorne 1998
- C Follows on from stroke rehabilitation unit evidence and many recommendations made in chapter 6

There is no strong evidence concerning either what types of resource are needed (eg what professions in the team, what specific equipment) or the quantity of any resource (eg how many beds, number of physiotherapists). Further, it is likely that there is some equivalence between resources; for example, the current lack of social workers in most hospitals means that nurses and occupational therapists have taken on the role. Unfortunately there is also no evidence on the amount of resource needed on a role or functional basis.

The English Department of Health has undertaken some work in this area and it is in the process of publishing its recommendations concerning staffing and staffing levels, largely based on consensus ([www.dh.gov/en/Healthcare/NationalServiceFrameworks/Stroke/DH\\_081389](http://www.dh.gov/en/Healthcare/NationalServiceFrameworks/Stroke/DH_081389))

### 3.3.3 *Implications*

The recommendations will require a considerable increase in the provision of some specialties in stroke services, especially clinical psychology and social workers. Social work provision will require collaborative funding with social services.

## 3.4 *Location of service delivery*

For patients to access appropriate expertise they should be seen by services that manage sufficient numbers of patients to gain and sustain expertise; it often also requires access to specialist equipment (eg treadmills). However, patients prefer local services, especially for rehabilitation because local delivery facilitates relevant rehabilitation. This section gives recommendations on the location of delivery of services, aiming for an appropriate balance between care in hospital, on an outpatient basis and at home.

### 3.4.1 *Recommendations*

- A Once a patient is medically investigated, treated and stable, rehabilitation should be delivered by a specialist stroke service (in an inpatient unit, or a day-hospital unit, or at home) provided that:
  - the service structure and personnel fulfil recommendations 3.3.1 B, C
  - adequate and flexible care support is made available within 24 hours.
- B Any patient with a stroke who cannot be admitted to hospital and who is not receiving palliative care should be seen by the specialist teams at home or on an outpatient basis as soon as possible for diagnosis, treatment, rehabilitation, and risk factor reduction at a standard comparable to other patients.

### 3.4.2 *Evidence*

- A Follows on from evidence given elsewhere (3.7.1 B, C, E).
- B Consensus (and ensuring equity in service provision).

The second recommendation **does not support care at home**; it is to ensure that anyone who is not admitted nonetheless receives the best care possible even if less than ideal.

### 3.4.3 *Implications*

These recommendations do not specify the balance between home and hospital care; they simply specify the quality requirements for services. Given services of appropriate quality, the patient outcomes are similar. Services have been set up successfully in urban and rural areas. Therefore, with commitment and effort it should be possible to set up high-quality services in whatever way a local area chooses.



### 3.5 Stroke services for younger adults

Stroke occurs at all ages and a significant number (about 25%) are aged under 65 years. Some younger adults feel that general stroke services, of which the majority of users are older adults, do not meet their needs. For example, younger adults are more likely to have a specific and unusual cause for their stroke, prognosis may be different, rehabilitation may require specific and specialised attention to work prospects and bringing up young children, and social needs may be different.

Thus, although *all stroke services* should respond to the *particular needs of each individual patient*, regardless of age or other factors, it seems appropriate to draw attention to this group of patients. A separate set of guidelines covering stroke in children has been produced (Paediatric Stroke Working Group 2004).

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#### 3.5.1 Recommendations

- A Younger adults who have had a stroke should be managed within specialist medical and rehabilitation services that:
- recognise and manage the particular physical, psychological and social needs of younger patients with stroke (eg vocational rehabilitation, child care activities)
  - are provided in an environment suited to their specific social needs.
- B People who had a stroke in childhood and require healthcare supervision on reaching adulthood should have their care transferred in a planned manner to appropriate adult services.

#### 3.5.2 Evidence

- A Consensus  
B Consensus; Department of Health policy

#### 3.5.3 Implications

These recommendations can most easily be fulfilled by a specialist neurological rehabilitation service as such services generally focus on people of working age (though not exclusively). Each locality (health economy) should already have a specialist neurological rehabilitation service (for example to comply with the NICE guidance on services for people with multiple sclerosis (National Institute for Health and Clinical Excellence 2003) and the National Service Framework for Long-term (neurological) Conditions (Department of Health 2005)).

Thus there are two consequences. First, all health districts without specialist neurological rehabilitation services specifically able to manage younger people will need to develop them. Second, there needs to be a close link between neurological and stroke rehabilitation services.

### 3.6 Transfers of care – general

Most patients surviving a stroke will need to interact with several if not many different services over the first six months: general practice, specialist acute stroke services, specialist rehabilitation services, social services, housing, community-based services etc. This section will cover general principles. Discharge from hospital care is covered in the next section.

### 3.6.1 Recommendations

- A All transfers between different teams and between different organisations should:
  - occur at the appropriate time, without delay
  - not require the patient to provide again complex information already given
  - ensure that all relevant information is transferred, especially concerning medication
  - maintain a common set of patient-centred goals.
- B All organisations and teams regularly involved in seeing patients after stroke should use:
  - a common, agreed set of data collection tools (measures and assessments)
  - a common, agreed terminology
  - a common, agreed document layout (structure) and content.
- C Patients should be:
  - involved in making decisions about transfer
  - offered copies of transfer documents.

### 3.6.2 Evidence

- A Consensus
- B Consensus
- C Consensus

### 3.6.3 Implications

These recommendations require all parties, including service commissioners, to discuss the current situation and how it might be improved locally. They should lead to the development of stroke and/or rehabilitation networks.

## 3.7 Transfers of care – discharge from hospital

The most common transfer, and the most stressful to patients, is that from hospital inpatient care back to their home. Many patients feel afraid and unsupported. Families feel that health services have ‘given up hope’. Communication between services is often poor with inadequate information being delivered too late. The terminology used below for different services may change (eg social services may now be termed ‘adult services’).

### 3.7.1 Recommendations

- A Hospital services should have a locally negotiated protocol to ensure that before discharge occurs:
  - patients and families are fully prepared, and have been fully involved in planning discharge
  - general practitioners, primary healthcare teams and social services departments (adult services) are all informed before or at the time of discharge
  - all equipment and support services necessary for a safe discharge are in place
  - any continuing specialist treatment required will be provided without delay by an appropriate specialist service
  - patients and families are given information about and offered contact with appropriate statutory and voluntary agencies.
- B Patients should only be discharged early (before the end of acute rehabilitation) from

hospital if there is a specialist stroke rehabilitation team able to continue rehabilitation in the community from the day of transfer and if the patient is able to transfer safely from bed to chair, and if other problems can be safely managed at home.

- C Patients being discharged who remain dependent in some personal activities (eg dressing, toileting) should be offered a transition package of:
  - pre-discharge visits (eg at weekends)
  - individual training and education for their carers/family
  - telephone counselling support for three months.
- D Before discharge of a patient who remains dependent in some activities, the patient's home environment should be assessed and optimised, usually by a home visit by an occupational therapist.
- E Patients should not be discharged early from hospital to generic (non-specialist) community services (including both home, and community hospitals) unless there is continuing active involvement by the specialist stroke service.
- F Carers of patients unable to transfer independently should receive training in moving and handling and the use of any equipment provided until they are demonstrably able to transfer and position the patient safely in the home environment.
- G All patients should continue to have access to specialist stroke services after leaving hospital, and should know how to make contact.

### 3.7.2 Evidence

- A Consensus
- B Langhorne *et al* 2005; Larsen *et al* 2006; Brady *et al* 2005
- C Lannin *et al* 2007; Grasel *et al* 2006
- D Consensus
- E Langhorne *et al* 2005
- F Consensus
- G Consensus

## 3.8 Quality improvement (governance, audit)

Stroke services require quality improvement, and attention to governance is essential. The primary needs are to collect appropriate data in a timely manner, to analyse the data and then to act upon the findings. The process of clinical governance is embedded within all healthcare organisations, and this section only considers the stroke-specific aspects.

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### 3.8.1 Recommendations

- A Clinical services should take responsibility for all aspects of data collection:
  - keeping a stroke register of all patients admitted to their organisation with a stroke
  - providing leadership in clinical audit.
- B Clinicians in all settings should participate in national audit so that they can compare the clinical and organisational quality of their services against national data.
- C Service providers should use a specific, structured set of documents to follow the patient throughout his/her illness, but not necessarily extending to integrated care pathways.

- D All clinicians should be involved in audit of stroke care and should use the results to plan and execute service improvements.
- E General practitioners should maintain a stroke register to enable them to audit routinely both primary and secondary prevention of stroke.

### 3.8.2 Evidence

- A Consensus (second edition)
- B Consensus
- C Sulch *et al* 2000; consensus
- D Consensus
- E Consensus; part of Department of Health's Quality and Outcome Framework requirement for UK general practices ([www.dh.gov.uk/en/Healthcare/Primarycare/Primarycarecontracting/QOF/index.htm](http://www.dh.gov.uk/en/Healthcare/Primarycare/Primarycarecontracting/QOF/index.htm))

### 3.8.3 Implications

Data collection and handling and quality control procedures require specific resources, including much staff time and unfortunately these are often not available, certainly for continuous audit. They also require commitment to the process by all staff.

## 3.9 Service development

Quality improvement often requires relatively small-scale changes at the level of individual clinicians. However, sometimes it will require broader service change or development. The NHS already has regulations and guidance concerning the process of service change and development which should be considered. Stroke-specific matters are considered here.

Service users can offer considerable help in evaluating and improving service delivery, as demonstrated in the report by the College of Health (Kelson *et al* 1998) on the views of patients and their carers for the development of these guidelines. However, it is important to recognise that stroke can greatly affect the ability of an individual to give feedback. Carers' views should not necessarily be taken to reflect those of patients who are unable to communicate or participate easily in opinion gathering exercises (Low *et al* 1999; Sneeuw *et al* 1999). Furthermore it is important to recognise that patient satisfaction questionnaires are not a good way to measure dissatisfaction with services.

### 3.9.1 Recommendations

- A The views of stroke patients and their carers should be considered when evaluating a service; one method that should be used is to ask about their experiences and what specific aspects of a service need improvement.
- B The planning process for any service development should include active involvement of patients and carers, with particular consideration of the views of patients who are unable to participate in the planning process directly.
- C Patients should be offered any support needed to enable participation.

### 3.9.2 Evidence

- A Consensus, and quality marker four of the National Stroke Strategy (Department of Health 2007): 'People who have had a stroke and their carers are meaningfully involved in the planning, development, delivery and monitoring of services. People are regularly informed about how their views have influenced services.'
- B Consensus, and quality marker four of the National Stroke Strategy (Department of Health 2007).
- C Consensus

### 3.9.3 Implications

These recommendations have two consequences. Some resources need to be allocated to facilitate active involvement of service users especially those who have limitations on mobility or communication. The recommendations also require organisations to be supportive and engaging in their attitude; it is not adequate to consult but then to carry on, ignoring the opinions of service users. The Picker Institute currently conducts surveys of NHS patients under the auspices of the Commission for Health Audit and Inspection ([www.pickereurope.org](http://www.pickereurope.org)).

## 3.10 Use of assessments/measures

Measurement of function is central to rehabilitation. Many valid tools exist and although these guidelines do not specify which ones should be used, some suggestions are made in the appropriate parts of the document. It is important that staff are trained in the use of whichever scales are chosen to ensure consistency of their use within the team and an understanding of their purposes and limitations. This section only considers general principles.

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### 3.10.1 Recommendations

A stroke rehabilitation service should:

- A agree on standard sets of data that should be collected and recorded routinely
- B use data collection tools that fulfil the following criteria as much as possible:
  - collect relevant data covering the required range (ie are valid and fulfil a need)
  - have sufficient sensitivity to detect change expected in one patient or difference expected between groups of patients
  - are of known repeatability when used by different people on different occasions
  - are simple to use under a variety of circumstances
  - have easily understood scores
- C have protocols determining the routine collection and use of data in their service
  - determining reason for and proposed use of each item
  - allowing individual clinicians choice from two or three tools where no measure is obviously superior
  - reviewing the utility of each item regularly
- D train all staff in the recognition and management of emotional, communicative and cognitive problems
- E have protocols to guide the use of more complex assessment tools, describing:
  - when it is appropriate or necessary to consider their use

- what tool or tools should be used
  - what specific training or experience is needed to use the tool(s)
- F measure (change in) function at appropriate intervals.

### 3.10.2 Evidence

- A Consensus
- B Consensus
- C Consensus (Wade 1998; Wikander *et al* 1998)
- D Consensus
- E Consensus
- F Consensus

### 3.10.3 Implications

In the absence of any national guidance or requirement, this will require individual services to undertake some work on making choices and developing protocols. However, this process is likely to lead to the selected tools and developed protocols being used, whereas imposed guidance rarely succeeds. Appropriate use should improve effectiveness and efficiency, covering the costs of additional training of staff that may be needed. Unfortunately it is unlikely that the NHS computerised record system will be sufficiently flexible or adaptable to allow clinicians to choose their tools, and thus paper versions will be needed.

## 3.11 Goal setting

Goal setting can be defined as the identification of and agreement on a behavioural target which the patient, therapist or team will work towards over a specified period of time. The setting of goals is central to effective and efficient rehabilitation. The evidence that setting goals alters behaviour and performance is overwhelming, but most of it relates to healthy people in sport and in business. This section focuses on goal setting in stroke rehabilitation.

### 3.11.1 Recommendations

Every patient involved in the rehabilitation process should:

- A have their wishes and expectations established and acknowledged
- B participate in the process of setting goals unless they choose not to or are unable to participate because of the severity of their cognitive and linguistic impairments
- C be given help to understand the nature and process of goal setting, and be given help (eg using established tools) to define and articulate their personal goals
- D have goals that:
  - are meaningful and relevant to the patient
  - are challenging but achievable
  - include both short-term (days/weeks) and long-term (weeks/months) targets
  - include both single clinicians and also the whole team
  - are documented, with specified, time-bound measurable outcomes
  - have achievement evaluated using goal attainment
  - include family members where appropriate
  - are used to guide and inform therapy and treatment.

### 3.11.2 Evidence

- A Consensus
- B Consensus
- C Holliday *et al* 2007 a, b; Wressle *et al* 2002
- D Hurn *et al* 2006; Levack *et al* 2006; Holliday *et al* 2007a, b; Stein *et al* 2003; Malec *et al* 1991

### 3.11.3 Implications

Goal setting takes time because a team needs to meet to agree and set goals. There is no evidence yet on the balance between this cost and the achievement of a better outcome and/or a more efficient use of resources.

## 3.12 Rehabilitation treatment approach

Rehabilitation uses a wide variety of treatments and techniques to reduce activity limitation, often through improving motor control. It is important for all team members to implement a consistent approach to rehabilitation and to maximise the carry-over outside of formal therapy by giving patients opportunities for informal practice.

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### 3.12.1 Recommendations

All members of a stroke service should:

- A use an agreed consistent approach for each problem faced by a patient, ensuring the patient is given the same advice and taught the same technique to ameliorate or overcome it
- B give as much opportunity as possible for a patient to practise repeatedly and in different settings any tasks or activities that are affected
- C work within their own knowledge, skills, competence and limits in handling patients and using equipment, being taught safe and appropriate ways to move and handle specific patients if necessary.

### 3.12.2 Evidence

- A Consensus
- B French 2007; follows on from later evidence (3.13)
- C Consensus

## 3.13 Rehabilitation treatment quantity (intensity of therapy)

There is much debate about the amount of therapy that is needed. One important but unanswered question asks whether there is a minimum threshold, below which there is no benefit at all. Studies on well-organised services show that it is rare for patients to receive more than two hours therapy each day. Comparative studies in Europe suggest that in the UK face-to-face therapist–patient contact time is shorter than in other countries.

### 3.13.1 Recommendations

- A Patients should undergo as much therapy appropriate to their needs as they are willing and able to tolerate and in the early stages they should receive a minimum of 45 minutes daily of each therapy that is required.
- B The team should promote the practice of skills gained in therapy into the patient's daily routine in a consistent manner and patients should be enabled and encouraged to practise that activity as much as possible.
- C Therapy assistants may facilitate practice but should work under the guidance of a qualified therapist.

### 3.13.2 Evidence

There are few trials, and interpretation is confounded because services giving more therapy were usually also well organised and expert, in comparison with the control group.

- A Langhorne *et al* 1996; Kwakkel *et al* 1997; Partridge *et al* 2000; Slade *et al* 2002; Bhogal *et al* 2003. National Stroke Strategy (Department of Health 2007): 'patients should receive as much therapy as they need for as long as they need it'.
- B Smith *et al* 1981; Langhorne *et al* 1996; Kwakkel *et al* 1999, 2004; Kwakkel and Wagenaar 2002; Lincoln *et al* 1999.
- C Consensus

### 3.13.3 Implications

If it is accepted that face-to-face contact time should be increased then there are various ways of achieving this. First, the number of available therapists could be increased. Alternatively rehabilitation services could re-organise to increase the proportion of time each therapist spends on face-to-face contact. This might mean reducing bureaucratic demands and/or employing other staff with less training to undertake bureaucratic tasks, so as to allow more treatment time. Third, nurses could take on an increased role in facilitating practice; more nursing resource might be needed to achieve this.

## 3.14 End-of-life (palliative) care

There is evidence that the process of dying is poorly managed for patients who die predictably but over the first few weeks after stroke. Stroke may cause a range of distressing symptoms that need to be managed, even if it is felt that death is inevitable. These may include pain, depression, confusion and agitation and problems with nutrition and hydration.

### 3.14.1 Recommendations

- A Teams providing care for patients after stroke should be taught how to recognise patients who might benefit from palliative care.
- B All staff caring for people dying with a stroke should be trained in the principles and practice of palliative care.
- C All patients who are dying should have access to specialist palliative care expertise when needed.



- D After stroke all end-of-life decisions to withhold or withdraw life-prolonging treatments (including artificial nutrition and hydration) should be in the best interests of the patient (see 6.35).

### 3.14.2 Evidence

- A Consensus
- B Extrapolation from NICE guidelines (2004) for people with cancer: Part A and Part B (National Institute for Clinical Excellence 2004).
- C Extrapolation from NICE guidelines (2004) on supportive and palliative care for people with cancer: Part A and Part B (National Institute for Clinical Excellence 2004)
- D British Medical Association (2002) *Withholding and withdrawing life-prolonging medical treatment: guidance for decision-making*

### 3.14.3 Implications

The main consequence of these recommendations is that the personnel in stroke teams will need both to increase their awareness of positive end-of-life palliative care, and to accept that this is part of a comprehensive stroke service's work.

## 3.15 Medicines management

It is becoming clear that errors and inconsistencies in the prescription and use of medications (all drugs by any route) are the cause of much iatrogenic or avoidable illness. Many of the recommendations given here apply to all patients and are not specific to stroke but the issue is so important that we have decided to give them.

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### 3.15.1 Recommendations

- A For every patient admitted to hospital, the clinical team should:
  - obtain and confirm information about the patient's pre-existing medicine schedule (drug name, doses, timing/frequency, reason for taking)
  - continue all necessary drugs and dosage regimens unless contraindicated.
- B At all times, all patients should have existing and newly prescribed medication monitored for effectiveness and adverse effects.
- C On discharge from hospital:
  - a patient should have adequate supplies of medication to last until community services can supply them
  - the general practitioner (or other doctor taking on responsibility) should be given a comprehensive list of all medications to be continued on the day of discharge
  - the patient's ability to take full responsibility for self-medication should be assessed, to include cognition, understanding, manual dexterity and ability to swallow.
- D Any patient prescribed a drug (new or continuation) should be given for each medication:
  - information on the reasons for and adverse effects of the medication
  - information on how and when to take medication, including information about any specific interactions they should be aware of
  - information on what to do if a dose is missed

- compliance aids, as needed or requested, taking into account factors such as cognitive ability, manual dexterity, personal preference and the home environment and safety concerns
- information on whether a further prescription will be needed and, if so, on when and how to obtain it.

### 3.15.2 Evidence

- A Consensus
- B Consensus
- C Consensus
- D Consensus

## 3.16 Treatments not mentioned in the guideline

This guideline was completed in February 2008, based on evidence and perceived current practice in the UK at that time. It has covered, as far as possible, all specific interventions where evidence from randomised trials is available, and many other interventions that are used reasonably commonly. However, it has obviously not made recommendations concerning new and emerging therapies. Because we are frequently asked about these, we have put together the recommendations below, which reflect good clinical practice.

### 3.16.1 Recommendations

- A Any clinician wishing to use an intervention not considered within this guideline should:
  - investigate and review the available evidence, especially the risks and disadvantages
  - investigate whether there are any relevant clinical trials available to take part in locally
  - offer the patient (or his or her representative if unable to participate in decision making) information about any research study available, and refer on if the patient agrees
  - discuss with the patient (or his or her representative if unable to participate in decision making) the risks and benefits of the intervention so that an informed choice can be made.
- B Interventions not considered within this guideline may be used provided that:
  - any available opportunity for participation in evaluative research has been considered
  - the clinician or clinical team have the appropriate knowledge and skill
  - the patient (or his or her representative if unable to participate in decision making) is aware of the lack of evidence, and the perceived risks and benefits.

### 3.16.2 Evidence

- A Consensus
- B Consensus

# Clinical care

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## 4 Acute-phase care

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### 4.0 Introduction

This chapter covers the acute phase of stroke or TIA, starting when the first symptoms suggesting a possible acute cerebrovascular event occur. It considers all actions that relate to the diagnosis and specific management of the underlying disease (pathology). It extends over the first 24 hours and up to about seven days depending upon the severity and complexity of the underlying disease process; in most people this phase is complete within three days.

This chapter also considers:

- a immediate complications, such as deep venous thrombosis
- b the beginning of rehabilitation – the next phase of stroke care which is covered in more detail in Chapter 6.

The majority of the evidence for this chapter was reviewed by the National Institute for Health and Clinical Excellence (NICE) Stroke Guideline Development Group (GDG), and the recommendations from that group have been incorporated into this guideline; the order of the sections may be different from that in the NICE guideline to maintain consistency of style in this guideline. The evidence is alluded to briefly here, but further detail can be found in the NICE guideline (National Institute for Health and Clinical Excellence, 2008). Recommendations from the NICE guideline have a background tint.

### 4.1 Pre-admission diagnosis

Most (95%) people will have their first symptoms outside hospital. It is vital that members of the general public (as patients or as the first person in contact with them) and healthcare professionals (eg GPs and their receptionists, telephone advice line nurses, emergency care paramedics, A&E staff) can recognise stroke as accurately as possible to facilitate appropriate emergency care.

#### 4.1.1 Recommendations

- A In people with sudden onset of neurological symptoms, a validated tool such as Face Arm Speech Test (FAST) should be used outside hospital to screen for a diagnosis of stroke or TIA.
- B In people with sudden onset of neurological symptoms, hypoglycaemia should be excluded as the cause of these symptoms.
- C People who are admitted to accident and emergency (A&E) with a suspected stroke or TIA should have the diagnosis established rapidly using a validated tool, such as Recognition of Stroke in the Emergency Room (ROSIER).

#### 4.1.2 Evidence

- A National Institute for Health and Clinical Excellence 2008
- B Consensus
- C National Institute for Health and Clinical Excellence 2008

### 4.1.3 Implications

The tools themselves have no immediate resource consequence. There are obvious consequences for the training of emergency paramedic staff and accident and emergency staff. In the context of a system set up to manage stroke as an emergency this will not have direct resource consequences, but the system needs to be adapted to ensure both rapid transport into the acute unit and also rapid discharge from the acute unit once acute management is complete (to allow further admissions).

## 4.2 Initial diagnosis of acute transient event (TIA)

Any person who is seen in hospital or in the community after a short-lived acute onset neurological syndrome, fully resolved or resolving rapidly when first seen by a doctor and that might be due to cerebrovascular disturbance, needs diagnosis to determine whether in fact the cause is vascular (about 50% are not), and then to identify treatable causes that can reduce the risk. This process has to recognise that the risk of stroke is greatest in the first seven to 14 days; speed is of the essence.

### 4.2.1 Recommendations

- A Any patient who presents with transient neurological symptoms suggestive of a cerebrovascular event should be considered to have had a transient ischaemic attack (TIA).
- B People who have had a suspected TIA, that is, they have no neurological symptoms at the time of assessment (within 24 hours), should be assessed as soon as possible for their risk of subsequent stroke using a validated scoring system,\* such as ABCD<sup>2</sup>.
- C People who have had a suspected TIA who are at high risk of stroke (that is, with an ABCD<sup>2</sup> score of 4 or above) should have:
  - aspirin (300 mg daily) started immediately
  - specialist assessment<sup>†</sup> and investigation within 24 hours of onset of symptoms
  - measures for secondary prevention introduced as soon as the diagnosis is confirmed, including discussion of individual risk factors.
- D People with crescendo TIA (two or more TIAs in a week) should be treated as being at high risk of stroke (as described in recommendation 4.2.1C), even though they may have an ABCD<sup>2</sup> score of 3 or below.
- E People who have had a suspected TIA who are at lower risk of stroke (that is, an ABCD<sup>2</sup> score of 3 or below) should have:
  - aspirin (300 mg daily) started immediately
  - specialist assessment<sup>†</sup> and investigation as soon as possible, but definitely within one week of onset of symptoms
  - measures for secondary prevention introduced as soon as the diagnosis is confirmed, including discussion of individual risk factors.
- F People who have had a TIA but who present late (more than one week after their last symptom has resolved) should be treated as though they are at lower risk of stroke (see recommendation 4.2.1E).

\* These scoring systems exclude certain populations who may be at particularly high risk of stroke such as those with recurrent events and those on anticoagulation who also need urgent evaluation. They also may not be relevant to patients who present late.

<sup>†</sup> Specialist assessment includes exclusion of stroke mimics, identification of vascular territory, identification of likely causes, and appropriate investigation and treatment.

### 4.2.2 Evidence

- A Consensus and quality marker five of National Stroke Strategy (Department of Health 2007): 'Immediate referral for appropriately urgent specialist assessment and investigation is considered in all patients presenting with a recent TIA or minor stroke.'
- B National Institute for Health and Clinical Excellence 2008
- C National Institute for Health and Clinical Excellence 2008
- D National Institute for Health and Clinical Excellence 2008
- E National Institute for Health and Clinical Excellence 2008
- F National Institute for Health and Clinical Excellence 2008

### 4.2.3 Implications

To achieve these recommendations will require additional training of medical staff to be able to assess immediate risk in people presenting with a possible TIA, and significant streamlining of the process of investigation which may require additional resources to respond to the need.

## 4.3 Specialist diagnosis of acute transient event (TIA)

Following the recommendations above, all patients identified as having a potential transient ischaemic event should arrive at a specialist clinic either immediately or within one week. This section describes the further diagnostic process which has two goals: alternative diagnoses for the transient event must be ruled out as far as possible, which is largely a clinical process; and the vascular territory affected must be determined which again is largely a clinical process.

### 4.3.1 Recommendations

- A People who have had a suspected TIA (that is, whose symptoms and signs have completely resolved within 24 hours) should be assessed by a specialist (within one week of onset of symptoms) before a decision on brain imaging is made.
- B People who have had a suspected TIA who need brain imaging (that is, those in whom vascular territory or pathology is uncertain)\* should undergo diffusion-weighted magnetic resonance imaging (MRI) except where contraindicated,<sup>†</sup> in which case computed tomography (CT) scanning should be used.
- C People who have had a suspected TIA who are at high risk of stroke (for example, with an ABCD<sup>2</sup> score of 4 or above, or with crescendo TIA) in whom the vascular territory or pathology is uncertain\* should undergo urgent brain imaging<sup>‡</sup> (preferably diffusion-weighted MRI).
- D People who have had a suspected TIA who are at lower risk of stroke (for example, an ABCD<sup>2</sup> score of less than 4) in whom the vascular territory or pathology is uncertain should undergo brain imaging<sup>§</sup> (preferably diffusion-weighted MRI).

\* Cases where brain imaging is helpful in the management of TIA:

- people being considered for carotid endarterectomy where it is uncertain whether the stroke is in the anterior or posterior circulation
- people with TIA where haemorrhage needs to be excluded, for example long duration symptoms or people on anticoagulants
- where alternative diagnosis (for example migraine, epilepsy or tumour) is being considered.

<sup>†</sup> Contraindications to MRI include people who have any of the following: a pacemaker, shrapnel, some brain aneurysm clips and heart valves, metal fragments in eyes, severe claustrophobia.

<sup>‡</sup> The GDG felt that urgent brain imaging is defined as 'within 24 hours of onset of symptoms'. This is in line with the National Stroke Strategy.

<sup>§</sup> The GDG felt that brain imaging is defined as 'within one week of onset of symptoms'. This is in line with the National Stroke Strategy.

### 4.3.2 Evidence

- A Consensus
- B National Institute for Health and Clinical Excellence 2008
- C As for B; quality marker five of the National Stroke Strategy: 'A system which identifies as urgent those with early risk of potentially preventable full stroke – to be assessed within 24 hours in high-risk cases; all other cases are assessed within seven days.'
- D As for B

### 4.3.3 Implications

These recommendations will require much quicker access to specialist neuro-radiological resources (scanners, and radiologists) than is currently available. This in turn has great implications for the purchase and running of MRI brain scanners and associated specialist staff.

## 4.4 Management of confirmed transient ischaemic attacks

Patients who have short-lived symptoms due to cerebrovascular events remain at high risk of further events, and this risk is highest in the first few weeks. Consequently their management is urgent. The diagnostic process has been outlined, and this section covers subsequent medical and surgical management.

### 4.4.1 Recommendations

- A All patients with a TIA should be investigated for vascular risk factors, and any identified should be treated in accordance with other published guidelines.
- B All patients with a TIA should be started on aspirin 300 mg daily unless there are contraindications when alternative antiplatelet drugs such as clopidogrel should be started.
- C All people with suspected non-disabling stroke or TIA who after specialist assessment are considered as candidates for carotid endarterectomy should have carotid imaging within one week of onset of symptoms. People who present more than one week after their last symptom of TIA has resolved should be managed using the lower risk pathway.
- D All patients with a TIA or stroke that resolves completely affecting the carotid circulation should have investigation for carotid stenosis as soon as possible and no later than seven days after the event by:
  - screening using Doppler ultrasound or other non-invasive test
  - confirmation by a second investigation.
- E People with stable neurological symptoms from acute non-disabling stroke or TIA who have symptomatic carotid stenosis of 50–99% according to the North American Symptomatic Carotid Endarterectomy Trial (NASCET) criteria, or 70–99% according to the European Carotid Surgery Trialists' (ECST) Collaborative Group criteria should:
  - be assessed and referred for carotid endarterectomy within one week of onset of stroke or TIA symptoms
  - undergo surgery within a maximum of two weeks of onset of stroke or TIA symptoms
  - receive best medical treatment (control of blood pressure, antiplatelet agents, cholesterol lowering through diet and drugs, lifestyle advice).

- F People with stable neurological symptoms from acute non-disabling stroke or TIA who have symptomatic carotid stenosis of less than 50% according to the NASCET criteria, or less than 70% according to the ECST criteria) should:
- not undergo surgery
  - receive best medical treatment (eg control of blood pressure, antiplatelet agents, cholesterol lowering through diet and drugs, lifestyle advice).
- G Carotid imaging reports should clearly state which criteria (ECST or NASCET) were used when measuring the extent of carotid stenosis.

#### 4.4.2 Evidence

- A Consensus
- B Rothwell *et al* 2007
- C National Institute for Health and Clinical Excellence 2008
- D Follows on from evidence of benefit from carotid surgery (4.4.2 E)
- E National Institute for Health and Clinical Excellence 2008
- F National Institute for Health and Clinical Excellence 2008; consensus; follows on from evidence concerning effectiveness of medical treatment.
- G National Institute for Health and Clinical Excellence 2008

#### 4.4.3 Implications

These recommendations will require significant streamlining of many clinical pathways. They are also likely to increase the total number of carotid endarterectomies undertaken, from the current figure in the UK, and they imply the provision of an ongoing surgical audit (eg National Carotid Endarterectomy Audit: [www.rcplondon.ac.uk](http://www.rcplondon.ac.uk)) of surgical morbidity which will also require resources.

### 4.5 Diagnosis of acute persistent event

Any person who arrives at hospital with an acute onset neurological syndrome with persisting symptoms and signs (ie potential stroke) needs full diagnosis to separate out acute cerebrovascular causes from other causes, especially those such as hypoglycaemia needing specific other treatments. It is also necessary to delineate the type of vascular event because management and prognosis are determined by type. Finally, any underlying causes such as heart disease, diabetes and hypertension need diagnosis and management in their own right. (These are not discussed further here.)

#### 4.5.1 Recommendations

- A Brain imaging should be performed immediately\* for people with acute stroke if any of the following apply:
- indications for thrombolysis or early anticoagulation treatment
  - on anticoagulant treatment
  - a known bleeding tendency
  - a depressed level of consciousness (Glasgow Coma Score below 13)

\* The GDG felt that 'immediately' was defined as 'ideally the next slot and definitely within one hour, whichever is sooner' in line with the National Stroke Strategy.



- unexplained progressive or fluctuating symptoms
- papilloedema, neck stiffness or fever
- severe headache at onset of stroke symptoms.

B For all people with acute stroke without indications for immediate brain imaging, scanning should be performed as soon as possible.\*

C All patients should be reviewed immediately by an expert in stroke to determine and record:

- identification of possible underlying cardiovascular causes
- localisation of the cerebral area likely to have been affected
- treatable risk factors.

D All patients should have their clinical course monitored and any patient whose clinical course is unusual for or inconsistent with the initial diagnosis of stroke should be fully reassessed and investigated as appropriate for possible alternative diagnoses.

#### 4.5.2 Evidence

- A Consensus; and follows on from recommendations about thrombolysis (4.6.1 B). Also quality marker eight of National Stroke Strategy: 'Patients requiring urgent brain imaging are scanned in the next scan slot within usual working hours, and within 60 minutes of request out-of-hours with skilled radiological and clinical interpretation being available 24 hours a day.'
- B National Institute for Health and Clinical Excellence 2008; quality marker eight of National Stroke Strategy.
- C Consensus; quality marker eight of National Stroke Strategy: 'Patients with suspected acute stroke receive an immediate structured clinical assessment from the right people.'
- D Consensus

#### 4.5.3 Implications

These recommendations will require major reallocation of neuro-radiological resources. However, there should be sufficient CT and magnetic resonance imaging (MRI) scanners available to satisfy these requirements, and it is primarily a matter of scheduling scans and running a service out of hours for emergencies.

### 4.6 Immediate specific management of non-haemorrhagic stroke

Once a person has been diagnosed as having had a stroke, it is important to consider what immediate actions can be taken to reverse or at least limit brain damage. The process of diagnosis will have established, inter alia, whether or not the stroke is due to an intracerebral haemorrhage. This section covers the management of ischaemic (non-haemorrhagic) stroke.

\* The GDG felt that as soon as possible was defined as within a maximum of 24 hours after onset of symptoms.

### 4.6.1 Recommendations

- A Any patient seen within three hours of starting symptoms and who has been shown not to have an intracerebral haemorrhage (or other contraindications) should be treated using alteplase as recommended in the next three NICE recommendations.
- B Alteplase is recommended for the treatment of acute ischaemic stroke when used by physicians trained and experienced in the management of acute stroke. It should only be administered in centres with facilities that enable it to be used in full accordance with its marketing authorisation.\*
- C Alteplase should only be administered within a well organised stroke service with:
- staff trained in delivering thrombolysis and in monitoring for any associated complications
  - care up to level 1 and level 2 nursing staff trained in acute stroke and thrombolysis ([www.datadictionary.nhs.uk/data](http://www.datadictionary.nhs.uk/data))
  - immediate access to imaging and re-imaging, and staff appropriately trained to interpret the images.
- D Protocols should be in place for the delivery and management of thrombolysis, including post-thrombolysis complications.
- E Staff in A&E departments, if appropriately trained and supported, can administer alteplase<sup>†</sup> for the treatment of acute ischaemic stroke provided that patients can be managed within an acute stroke service with appropriate neuroradiological and stroke physician support.
- F Every patient treated with alteplase should be started on aspirin 300 mg daily after 24 hours, unless aspirin is contraindicated.
- G All people presenting with acute stroke who have had a diagnosis of primary intracerebral haemorrhage excluded by brain imaging should, as soon as possible but certainly within 24 hours, be given:
- aspirin 300 mg orally if they are not dysphagic *or*
  - aspirin 300 mg rectally or by enteral tube if they are dysphagic.
- Thereafter aspirin 300 mg should be continued until two weeks after the onset of stroke symptoms, at which time definitive long-term anti-thrombotic treatment should be initiated. People being discharged before two weeks can be started on long-term treatments earlier.
- H Any person with acute ischaemic stroke for whom previous dyspepsia associated with aspirin is reported should be given a proton pump inhibitor in addition to aspirin.
- I Any person with acute ischaemic stroke who is allergic to or genuinely intolerant of aspirin should be given an alternative antiplatelet agent.<sup>‡</sup>

\* This recommendation is from *Alteplase for the treatment of acute ischaemic stroke*, NICE Technology Appraisal Guidance 122. [www.nice.org.uk/TA122](http://www.nice.org.uk/TA122).

<sup>†</sup> In accordance with its marketing authorisation.

<sup>‡</sup> Aspirin intolerance is defined in NICE Technology Appraisal Guidance 90 (*Clopidogrel and modified-release dipyridamole in the prevention of occlusive vascular events*; see [www.nice.org.uk/TA090](http://www.nice.org.uk/TA090)) as either of the following:

- proven hypersensitivity to aspirin-containing medicines
- history of severe dyspepsia induced by low-dose aspirin.

- J Anticoagulation treatment should not be used routinely\* for the treatment of acute stroke.
- K People with middle cerebral artery (MCA) infarction who meet all of the criteria below should be considered for decompressive hemicraniectomy. They should be referred within 24 hours of onset of symptoms and treated within a maximum of 48 hours:
  - aged 60 years or under
  - clinical deficits suggestive of infarction in the territory of the middle cerebral artery with a score on the National Institute of Health Stroke Scale (NIHSS) of above 15
  - decrease in the level of consciousness to give a score of 1 or more on item 1a of the NIHSS
  - signs on CT of an infarct of at least 50% of the MCA territory, with or without additional infarction in the territory of the anterior or posterior cerebral artery on the same side, or infarct volume greater than 145 cm<sup>3</sup> as shown on diffusion-weighted MRI.
- L People who are referred for decompressive hemicraniectomy should be monitored by appropriately trained professionals skilled in neurological assessment.
- M Stroke services should agree protocols for the monitoring, referral and transfer of people to regional neurosurgical centres for the management of symptomatic hydrocephalus.
- N Patients should not be started:
  - on a statin within the first 48 hours after stroke, but can be thereafter
  - on other treatments aimed at reducing the extent of brain damage except in the context of a clinical trial.
- O People with antiphospholipid syndrome who have an acute ischaemic stroke should be managed in the same way as people with acute ischaemic stroke without antiphospholipid syndrome.<sup>†</sup>

#### 4.6.2 Evidence

- A Consensus
- B National Institute for Health and Clinical Excellence 2008
- C Consensus
- D Consensus
- E National Institute for Health and Clinical Excellence 2008
- F Consensus; National Institute for Health and Clinical Excellence 2008
- G National Institute for Health and Clinical Excellence 2008
- H Consensus
- I National Institute for Health and Clinical Excellence 2008
- J As for F
- K National Institute for Health and Clinical Excellence 2008
- L Consensus
- M Consensus
- N Consensus
- O Consensus

\* There may be a subgroup of people for whom the risk of venous thromboembolism outweighs the risk of haemorrhagic transformation. People considered to be at particularly high risk of venous thromboembolism include anyone with complete paralysis of the leg, a previous history of venous thromboembolism, dehydration or comorbidities (such as malignant disease), or who is a current or recent smoker. Such people should be kept under regular review if they are given prophylactic anticoagulation. Further details will be included in the forthcoming NICE clinical guideline, *The prevention of venous thromboembolism in all hospital patients* (publication expected in September 2009).

<sup>†</sup> There was insufficient evidence to support any recommendation regarding the safety and efficacy of anticoagulants versus antiplatelets for the treatment of antiphospholipid syndrome in people with acute ischaemic stroke.

### 4.6.3 Implications

These recommendations underlie the earlier recommendations concerning the organisation of acute stroke care. The evidence suggests that alteplase is cost effective in itself (NICE technology appraisal 122), not taking into account any costs associated with ensuring a high standard of care and the associated organisation. Although craniotomies are likely to be required in only about 1% of all incident stroke (equivalent to about 1/100,000 population/year), the number may impose some stress on neurosurgical services. The National Stroke Strategy quality markers seven and nine require this approach.

## 4.7 Immediate specific management of intracerebral haemorrhage

About 11% of all patients presenting with acute stroke have an underlying primary intracerebral haemorrhage. The immediate management of this group is now considered separately (in contrast to previous editions) both because the evidence supports specific treatment for infarction that is contraindicated in people with haemorrhage and because there are some specific interventions available.

### 4.7.1 Recommendations

- A Clotting levels in people with a primary intracerebral haemorrhage who were receiving anticoagulation treatment before their stroke (and have elevated INR) should be returned to normal as soon as possible, by reversing the effects of the anticoagulation treatment using a combination of prothrombin complex concentrate and intravenous vitamin K.
- B People with intracerebral haemorrhage should be monitored by specialists in neurosurgical or stroke care for deterioration in function and referred immediately for brain imaging when necessary.
- C Previously fit people should be considered for surgical intervention following primary intracranial haemorrhage if they have hydrocephalus.
- D People with any of the following rarely require surgical intervention and should receive medical treatment initially:
  - small deep haemorrhages
  - lobar haemorrhage without either hydrocephalus or rapid neurological deterioration
  - a large haemorrhage and significant prior comorbidities before the stroke
  - a Glasgow Coma Scale of below 8 unless this is because of hydrocephalus
  - posterior fossa haemorrhage.

### 4.7.2 Evidence

- A National Institute for Health and Clinical Excellence 2008
- B Consensus
- C National Institute for Health and Clinical Excellence 2008
- D As for C

### 4.7.3 Implications

These recommendations should rationalise management, but will not have any major resource or organisational consequences. However, they do depend absolutely upon the patient having imaging undertaken, because accurate clinical distinction of haemorrhage is not possible.

## 4.8 Subarachnoid haemorrhage: immediate specific diagnosis and management

Subarachnoid haemorrhage (SAH) accounts for approximately 5% of all acute strokes. About half of people die in the first few hours and the overall survival is about 40%, half of whom will have residual disability and most of whom will experience long-term symptoms, especially fatigue and cognitive symptoms.

### 4.8.1 Recommendations

- A Every patient presenting with sudden severe headache and an altered neurological state should have the diagnosis of subarachnoid haemorrhage investigated by:
  - immediate CT brain scan (followed by CT angiogram if acute SAH is confirmed)
  - lumbar puncture if the CT brain scan is negative and does not show any contraindication
  - spectrophotometry of the cerebrospinal fluid, for xanthochromia.
- B Every patient diagnosed as having a subarachnoid haemorrhage should:
  - be started on oral nimodipine 60 mg four hourly unless there are specific contraindications
  - not be given anti-fibrinolytic agents or steroids
  - be referred to a specialist service, usually neurosurgical, for further investigation and, if appropriate, definitive treatment
  - be transferred to the specialist neuroscience service within 24 hours, if appropriate
  - be provided with all supportive care needed.
- C In the specialist service the patient should have:
  - imaging of all cerebral arteries (unless they have already had a CT angiogram)
  - specific treatment of any aneurysm related to the haemorrhage by endovascular embolisation or surgical clipping if appropriate.
- D After any immediate treatment, all patients should be observed for the development of treatable complications, especially hydrocephalus.
- E Every patient who survives should be assessed for treatable risk factors, and have these treated.
- F Every patient who survives and has any residual symptoms or disability should be referred for and transferred to specialist rehabilitation as soon as possible after definitive treatment.
- G Every patient with a strong family history (one other affected first-degree relative and/or a history of polycystic renal disease) should:
  - be advised that their family may be at increased risk of subarachnoid haemorrhage
  - be considered for a referral to a neurovascular and/or neurogenetic specialist for up-to-date information and advice.

### 4.8.2 Evidence

- A There is much evidence from trials about ineffective or harmful treatments. CT scans are the most sensitive non-invasive way to detect subarachnoid blood (recommendation A) reducing the need for lumbar puncture. There is reasonably strong evidence in support of using nimodipine and avoiding other drugs (recommendation B), and the equivalence of surgical clipping and endovascular embolisation as preventative treatments (recommendation C) has been well established. Recommendations D and E are arrived at from first principles and consensus. Specific evidence for recommendation F is absent, but it follows from the evidence supporting rehabilitation after stroke. Recommendation G follows from studies on genetic linkage, though the benefits and harms associated with acquiring information about risk have not been studied.

### 4.8.3 Implications

The recommendations concerning acute treatment are probably already largely enacted. However, the recommendation concerning timely transfer to specialist rehabilitation requires the wider development of such services.

## 4.9 Acute arterial dissection

A small proportion of patients with acute ischaemic stroke will have a dissection of a carotid or vertebral artery as the underlying specific cause. This group of patients tend to be younger, and may have experienced preceding neck trauma.

### 4.9.1 Recommendations

A Any patient suspected of having arterial dissection should be investigated with appropriate imaging (eg cross-sectional MRI and MR angiography).

B People with stroke secondary to acute arterial dissection should be treated with either anticoagulants or antiplatelet agents, preferably as part of a randomised controlled clinical trial to compare the effects of the two treatments.

### 4.9.2 Evidence

A Consensus

B National Institute for Health and Clinical Excellence 2008

The general absence of evidence supports recommendation B; the treatment recommendations made reflect current consensus and practice.

### 4.9.3 Implications

The main consequences of this set of recommendations will be to improve the evidence base on the effectiveness of specific treatments if more patients are entered into trials. At present management is haphazard.

## 4.10 Management of specific cardiovascular causes of stroke

About one quarter of all people presenting with stroke are in atrial fibrillation. It is probable that any stroke occurring in a person with any arrhythmia has had an embolic stroke from a thrombus within the heart. A small number of patients presenting with stroke have known cardiac valvular disease or prosthetic heart valves; the risk is high but the total number of patients small.

### 4.10.1 Recommendations

A People with disabling ischaemic stroke who are in atrial fibrillation should be treated with aspirin 300 mg for the first two weeks before considering anticoagulation treatment.

B In people with prosthetic valves who have disabling cerebral infarction and who are at significant risk of haemorrhagic transformation, anticoagulation treatment should be stopped for one week and aspirin 300 mg substituted.

C Any patient who has had a stroke and is in atrial fibrillation should be started on anticoagulation two weeks after stroke onset, unless otherwise contraindicated.

#### 4.10.2 Evidence

- A National Institute for Health and Clinical Excellence 2008
- B As for A
- C Aguilar *et al* 2007

### 4.11 Cerebral venous thrombosis

One rare specific cause of the acute stroke syndrome is thrombosis of the cerebral venous system. This is more likely in patients who have a prothrombotic tendency (eg around the time of pregnancy), who have local infection, who are dehydrated, or who have widespread malignancy. Headache and seizures are common.

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#### 4.11.1 Recommendations

- A Any patients suspected of having cerebral venous thrombosis should be investigated by appropriate cross-sectional imaging techniques (eg MRI, CT or MR venography) if not diagnosed by CT scan.
- B People diagnosed with cerebral venous sinus thrombosis (including those with secondary cerebral haemorrhage) should be given full-dose anticoagulation treatment (initially full-dose heparin and then warfarin (INR 2–3)) unless there are comorbidities that preclude its use.

#### 4.11.2 Evidence

- A Consensus
- B National Institute for Health and Clinical Excellence 2008

### 4.12 Early-phase medical care of stroke – physiological monitoring

Many patients presenting with a stroke secondary to vascular disease will have other problems requiring attention during and after initial diagnosis and specific (disease-focused) treatments. They will need care focused initially on preserving life, preventing complications and starting rehabilitation.

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#### 4.12.1 Recommendations

- A Any patient who has residual symptoms or disability once immediate diagnostic and treatment procedures are completed should be transferred to a unit that provides specialised management of any potential problems (ie an acute stroke unit, or high dependency unit), if not already there.
- B The patient's physiological state should be monitored closely to include:
  - blood glucose
  - blood pressure
  - oxygenation
  - nourishment and hydration
  - temperature.

### 4.12.2 Evidence

- A National Institute for Health and Clinical Excellence 2008
- B Consensus; follows from 4.13

### 4.12.3 Implications

It is preferable that all hospitals admitting people with acute cerebrovascular events have an acute stroke unit able to provide specialised high-dependency nursing and medical care. Before this situation occurs, patients with stroke should be admitted to well-staffed high-dependency areas able to monitor and respond to changes in physiological status.

## 4.13 Early-phase medical management – homeostasis (oxygen, glucose, blood pressure)

People who have had a stroke often have significant disturbance of physiological homeostasis with raised temperature, raised blood glucose, hypoxia etc. Changes are probably more common in people with larger (more severe) stroke, but generally the significance and importance of these changes is poorly researched.

### 4.13.1 Recommendations

- A People who have had a stroke should receive supplemental oxygen only if their oxygen saturation drops below 95%. The routine use of supplemental oxygen is not recommended in people with acute stroke who are not hypoxic.
- B People with acute stroke should be treated to maintain a blood glucose concentration between 4 and 11 mmol/L.
- C Optimal insulin therapy, which can be achieved by the use of intravenous insulin and glucose, should be provided to all adults with diabetes who have threatened or actual myocardial infarction or stroke. Critical care and emergency departments should have a protocol for such management.
- D Anti-hypertensive treatment in people with acute stroke is recommended only if there is a hypertensive emergency or one or more of the following serious concomitant medical issues:
  - hypertensive encephalopathy
  - hypertensive nephropathy
  - hypertensive cardiac failure/myocardial infarction
  - aortic dissection
  - pre-eclampsia/eclampsia
  - intracerebral haemorrhage with systolic blood pressure over 200 mmHg.
- E Blood pressure reduction to 185/110 mmHg or lower should be considered in people who are candidates for thrombolysis.

### 4.13.2 Evidence

- A National Institute for Health and Clinical Excellence 2008
- B National Institute for Health and Clinical Excellence 2008
- C National Institute for Health and Clinical Excellence 2008
- D National Institute for Health and Clinical Excellence 2008
- E National Institute for Health and Clinical Excellence 2008



### 4.13.3 Implications

The main consequence of these recommendations is that patients need admission to a unit that can both monitor homeostasis and intervene to restore homeostasis.

## 4.14 Deep vein thrombosis and pulmonary embolism

Patients who have had a stroke leaving them with weakness in the leg or reduced mobility for other reasons are at risk of developing a deep vein thrombosis (DVT), and hence of having a pulmonary embolism. The rate of DVT after stroke may be as high as 50%, but the rate of symptomatic pulmonary embolism is low. The long-term mortality and morbidity associated with either is unknown, but is probably low.

### 4.14.1 Recommendations

- A People with ischaemic stroke and symptomatic proximal deep vein thrombosis (DVT) or pulmonary embolism should receive anticoagulation treatment in preference to treatment with aspirin unless there are other contraindications to anticoagulation.
- B People with haemorrhagic stroke and symptomatic deep vein thrombosis or pulmonary embolism should have treatment to prevent the development of further pulmonary emboli using either anticoagulation or caval filter.

### 4.14.2 Evidence

- A National Institute for Health and Clinical Excellence 2008
- B As for A

## 4.15 Early positioning and mobilisation

A stroke often imposes immobility upon a patient, secondary to motor or other impairments. However, the care environment and process may also impose immobility. The deleterious consequences of even brief periods of immobility in older people are well established. The question arises as to whether rapid mobilisation after stroke (ie being got out of bed and encouraged to move) is beneficial or harmful, or whether speed of mobilisation is unimportant. A large trial in Australia is investigating this. (See also 6.11 and 6.14.)

### 4.15.1 Recommendations

- A People with acute stroke should be mobilised as soon as possible (when their clinical condition permits) as part of an active management programme of a specialist stroke unit.
- B Every patient with mobility limitation should be assessed by a specialist to determine the most appropriate and safe methods of transfer and mobilisation.
- C People with acute stroke should be helped to sit up as soon as possible (when their condition permits).

### 4.15.2 Evidence

- A National Institute for Health and Clinical Excellence 2008
- B Consensus
- C National Institute for Health and Clinical Excellence 2008

### 4.15.3 Implications

The two main consequences are for staff, and the care environment. There will need to be a rapid assessment of the safest and most appropriate way to transfer and mobilise all patients, and staff (primarily nurses) will need to be trained to undertake passive and active movements. Second, the environment will need to be adapted to allow and facilitate early mobilisation, for example by having wheelchairs and hoists instantly available.

## 4.16 Feeding: swallowing, hydration and nutrition

Swallowing difficulties affect at least 40% of patients after stroke, and in principle increase the risk of aspiration and pneumonia. The detection and management of dysphagia remains controversial, and lacks good evidence in relation to outcome. Malnutrition is common in hospital inpatients and hinders recovery. Dehydration is unpleasant and clinically unacceptable. NICE made recommendations on swallowing, and reproduced recommendations from another guideline (*Nutrition support in adults: oral nutrition support, enteral tube feeding and parenteral nutrition*); these reproduced recommendations are shown at the end of this chapter (4.19).

Some stroke-specific recommendations on swallowing, feeding, nutrition and oral health are made in Chapter 6.

### 4.16.1 Recommendations

- A On admission, people with acute stroke should have their swallowing screened by an appropriately trained healthcare professional before being given any oral food, fluid or medication.
- B If the admission screen indicates problems with swallowing, the person should have a specialist assessment of swallowing, preferably within 24 hours of admission and not more than 72 hours afterwards.
- C People with suspected aspiration on specialist assessment or who require tube feeding or dietary modification for three days should be:
  - reassessed and considered for instrumental examination
  - referred for dietary advice.
- D People with acute stroke who are unable to take adequate nutrition and fluids orally should:
  - receive tube feeding with a nasogastric tube within 24 hours of admission
  - be considered for a nasal bridge tube or gastrostomy if they are unable to tolerate a nasogastric tube
  - be referred to an appropriately trained healthcare professional for detailed nutritional assessment, individualised advice and monitoring.
- E Nutrition support should be initiated for people with stroke who are at risk of malnutrition. This may include oral nutritional supplements, specialist dietary advice and/or tube feeding.

- F All people with acute stroke should have their hydration assessed on admission, reviewed regularly and managed so that normal hydration is maintained.
- G In people with dysphagia, food and fluids should be given in a form that can be swallowed without aspiration, following specialist assessment of swallowing.
- H Routine nutritional supplementation is not recommended for people with acute stroke who are adequately nourished on admission.

#### 4.16.2 Evidence

- A National Institute for Health and Clinical Excellence 2008
- B As for A
- C Consensus
- D National Institute for Health and Clinical Excellence 2008
- E National Institute for Health and Clinical Excellence 2008
- F National Institute for Health and Clinical Excellence 2008
- G National Institute for Health and Clinical Excellence 2008
- H National Institute for Health and Clinical Excellence 2008

### 4.17 Bowel and bladder

Disturbance of bowel and bladder control is common immediately after stroke. Urinary incontinence is one of the best clinical markers of prognosis. This section covers only the immediate, acute-phase management of bladder function.

#### 4.17.1 Recommendations

- A The acute admitting ward should have a documented policy on detection and management of bowel and bladder function in the acute phase.
- B Patients should not have an indwelling (urethral) catheter inserted in the first 48 hours unless indicated to relieve urinary retention.
- C Urinary and faecal incontinence should be managed by high levels of nursing care in the acute phase.

#### 4.17.2 Evidence

- A Consensus
- B Consensus
- C Consensus

### 4.18 Initial, early rehabilitation assessment

A majority of patients will have a mixture of specific impairments and some disability after stroke. Some problems are common, others less so; some problems are obvious, others less so. The clinical question is to what extent should one screen for impairments: are some too rare to be worth screening for, and are other too obvious to be worth screening for?

This set of recommendations concerns the initial assessment undertaken while the patient is still in the acute phase, often quite ill. Further assessments can and should be undertaken later, and this set of recommendations focuses on those that are important in the first 48 hours.

The goals of the early rehabilitation assessment are to:

- ▶ identify major impairments that may not be obvious but that may
  - have an influence on early management
  - guide prognosis
- ▶ draw attention to immediate rehabilitation needs.

#### 4.18.1 Recommendations

- A All patients should be assessed within a few hours of admission for their:
  - ability to swallow, using a validated swallow screening test (eg 50-ml water swallow) administered by an appropriately trained person
  - immediate needs in relation to positioning, mobilisation, moving and handling
  - bladder control
  - risk of developing skin pressure ulcers
  - capacity to understand and follow instructions
  - capacity to communicate their needs and wishes
  - nutritional status
  - ability to hear, and need for hearing aids
  - ability to see, and need for glasses.
- B All patients with any impairment at 24 hours should receive a full multidisciplinary assessment using an agreed procedure or protocol within five working days, and this should be documented in the notes.

#### 4.18.2 Evidence

- A Consensus; National Stroke Strategy quality marker eight: ‘Patients with suspected acute stroke receive an immediate structured clinical assessment from the right people.’
- B Consensus; National Stroke Strategy quality marker eight: ‘Patients diagnosed with stroke receive early multidisciplinary assessment – to include swallow screening (within 24 hours) and identification of cognitive and perceptive problems.’

### 4.19 Addendum – other NICE recommendations

This chapter on acute care has drawn largely on the NICE stroke guideline and its recommendations (National Institute for Health and Clinical Excellence, 2008). The NICE guideline does not cover later phases separately and so, necessarily, has included some important recommendations that are better considered in the rehabilitation chapter. It has also included some recommendations that are best considered as part of secondary prevention which is covered separately in the next chapter.

This chapter has included verbatim the great majority of the NICE recommendations. In order to ensure that this chapter includes all the NICE recommendations, we have added, in this addendum, the remaining recommendations.

#### 4.19.1 *Statin treatment in people with acute stroke*

- A Immediate initiation of statin treatment is not recommended in people with acute stroke.\*
- B People with acute stroke who are already receiving statins should continue their statin treatment.

\* The consensus of the GDG is that it would be safe to start statins after 48 hours.

#### 4.19.2 Oral nutritional supplementation

The recommendations below are from *Nutrition support in adults: oral nutrition support, enteral tube feeding and parenteral nutrition* (National Institute for Health and Clinical Excellence, 2006).

- A All hospital inpatients on admission should be screened for malnutrition and the risk of malnutrition. Screening should be repeated weekly for inpatients.
- B Screening should assess body mass index (BMI) and percentage unintentional weight loss and should also consider the time over which nutrient intake has been unintentionally reduced and/or the likelihood of future impaired nutrient intake. The Malnutrition Universal Screening Tool (MUST), for example, may be used to do this.
- C When screening for malnutrition and the risk of malnutrition, healthcare professionals should be aware that dysphagia, poor oral health and reduced ability to self-feed will affect nutrition in people with stroke.
- D Screening for malnutrition and the risk of malnutrition should be carried out by healthcare professionals with appropriate skills and training.

## 5 Secondary prevention

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### 5.0 Introduction

This chapter covers secondary prevention. From the moment a person has an acute cerebrovascular event (of any sort), that person is at an increased risk of further events. The risk is substantial, being between 30% and 43% for recurrent stroke over the next five years (Mant *et al* 2004); there are additional risks of about the same magnitude for other vascular events (eg myocardial infarction). There are few exceptions; patients who have stroke secondary to trauma are one obvious exception.

The risk of further stroke is highest early after stroke or TIA and may be as high as 20% within the first month and 10% within the first week. Appropriate secondary prevention should therefore be commenced **as soon as possible**, usually in the acute phase provided it is safe to do so. However, it is also vital that attention to secondary prevention should be continued throughout the recovery and rehabilitation phase and for the rest of the patient's life.

Some of the recommendations in the acute phase, such as starting aspirin immediately after ischaemic stroke, are part of secondary prevention. This chapter assumes that all the recommendations made in Chapter 4 (Acute-phase care) have been implemented. **The recommendations concerning the early reduction of risk are not repeated here, but it is essential that immediate treatments are carried out as part of secondary prevention.**

### 5.1 Identifying risk factors

The risk of recurrent vascular events may vary significantly between individuals according to underlying pathology, comorbidities and lifestyle factors. These guidelines apply to the vast majority of patients with TIA and stroke, including those not admitted to hospital, although some of the recommendations may not be appropriate for the small minority of patients with unusual stroke pathologies.

#### 5.1.1 Recommendations

- A Every patient who has had a stroke (including TIA and SAH) and in whom preventative interventions would be appropriate should be investigated for risk factors as soon as possible, certainly within one week of onset. At a minimum this includes checking for:
  - raised blood pressure (sustained over 130/90 mmHg)
  - hyperlipidaemia
  - diabetes mellitus.
- B For patients who have had an ischaemic stroke or TIA the following risk factors should also be checked for:
  - atrial fibrillation and other arrhythmias
  - structural cardiac disease
  - carotid artery stenosis (only for individuals with a non-disabling carotid territory event likely to benefit from surgery for stenosis).
- C In any patient where no common cause is identified, fuller investigation for other rare causes should be undertaken.

### 5.1.2 Evidence

Some of the evidence has already been reviewed in Chapter 4. The specific evidence here is:

- A Lovett *et al* 2003; Coull *et al* 2004; Koton *et al* 2007
- B Johnston *et al* 2007
- C Consensus.

## 5.2 A personalised, comprehensive approach

There are many potential interventions available to reduce risk. Ensuring identification and intervention for all risk factors in a patient, including aspects of lifestyle, will lead to more effective secondary prevention of further stroke and other vascular events. Specific interventions are covered in subsequent sections. This section covers advice and general aspects of management

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### 5.2.1 Recommendations

- A For each patient, an individualised and comprehensive strategy for stroke prevention should
  - be implemented as soon as possible following a TIA or stroke
  - continue long term.
- B For each patient, information about stroke and risk factors should be:
  - given first in the hospital setting
  - reinforced at every opportunity by all health professionals involved in the care of the patient
  - provided in an appropriate format for the patient, taking into account both their stroke-specific impairments and their personal situation.
- C Patients should have their risk factors reviewed and monitored regularly in primary care, at a minimum on a yearly basis.
- D All patients receiving medication for secondary prevention should:
  - be given information about the reason for the medication, how and when to take it and any possible common side effects
  - receive verbal and written information about their medicines in a format appropriate to their needs and abilities
  - have compliance aids such as large-print labels and non-childproof tops provided, according to their level of manual dexterity, cognitive impairment and personal preference and compatible with safety in the home environment
  - be aware how to obtain further supplies of medication
  - have a regular review of their medication.

### 5.2.2 Evidence

- A Saxena 2004
- B Ovbiagele *et al* 2004; Maasland *et al* 2007; Sit *et al* 2007
- C Consensus; UK General Practice Quality and Outcomes Framework; National Stroke Strategy quality marker two: *Assessment and review*: 'This is followed by an annual health and social care check, which facilitates a clear pathway back to further specialist review, advice, information, support and rehabilitation where required.'
- D Consensus

### 5.2.3 Implications

Identification of risk factors for stroke should be part of the assessment during the acute phase. Regular review of risk factors and secondary prevention in general practice may require additional resources.

## 5.3 Lifestyle measures

Changes in lifestyle are as important in secondary prevention as they are in primary prevention. This requires changes in behaviour by the patient in areas such as smoking, exercise, eating and alcohol intake. Although it is the responsibility of the person to change his or her own behaviour, the health system has the responsibility of giving accurate advice and information and providing support for patients to make and maintain lifestyle changes. Wider society also has some responsibility in enabling behaviour change.

### 5.3.1 Recommendations

- A All patients who smoke should be advised to stop smoking:
  - Smoking cessation should be promoted at every opportunity using individualised strategies which may include pharmacological agents and/or psychological support.
- B All patients should be advised to take regular exercise as far as they are able:
  - The aim should be to achieve moderate physical activity (sufficient to become slightly breathless) for 20–30 minutes each day.
  - Exercise programmes should be considered, and tailored to the individual following appropriate assessment, starting with low-intensity physical activity and gradually increasing to moderate levels.
- C All patients should be advised to eat the optimum diet:
  - eating five or more portions of fruit and vegetables per day
  - eating two portions of fish per week, one of which should be oily (salmon, trout, herring, pilchards, sardines, fresh tuna).
- D All patients should be advised to reduce and replace saturated fats in their diet with polyunsaturated or monounsaturated fats by:
  - using low-fat dairy products
  - replacing butter and lard with products based on vegetable and plant oils
  - reducing meat intake.
- E Patients who are overweight or obese (as determined by body mass index (BMI) or waist:hip measurement ratio) should be offered:
  - advice and support to aid weight loss, which may include diet, behavioural therapy and physical activity
  - medication to aid weight loss only after dietary advice and exercise has been started and evaluated.
- F All patients, but especially patients with hypertension, should be advised to reduce their salt intake by:
  - not adding salt to food
  - using as little as possible in cooking
  - choosing lower sodium/salt foods.
- G Patients who drink alcohol should be advised to keep within recognised safe drinking limits of no more than three units per day for men and two units per day for women



- H Patients should be advised that there is no evidence that oral vitamin supplementation will reduce the risk of stroke or other vascular events.

### 5.3.2 Evidence

The evidence behind almost all these recommendations relates to primary prevention of vascular events, and little research has concentrated specifically upon secondary prevention. The sources of evidence are for recommendation:

- A Silagy *et al* 2002; *et al* 2004; Lancaster *et al* 2003, 2004; Rice *et al* 2004
- B Consensus of working party; National Institute for Health and Clinical Excellence 2007.
- C National Institute for Health and Clinical Excellence clinical guideline 48; Brunner *et al* 2007; Wang *et al* 2006; He *et al* 2006
- D Hooper *et al* 2004; Brunner *et al* 2007
- E National Institute for Health and Clinical Excellence 2006 clinical guideline 43; Suk *et al*, 2003
- F He *et al* 2004, 2005; Jürgens *et al* 2004
- G Consensus
- H Toole 2007

### 5.3.3 Implications

Most of these lifestyle changes will require resources and changes at a societal level.

## 5.4 Blood pressure

The risk of first stroke is more-or-less directly related to the actual blood pressure, with no obvious threshold values in population studies. There is little research into the relationship after stroke, but there is research into lowering blood pressure and the effect on risk of further strokes and other acute vascular events. Some have advocated a ‘the lower the better’ approach.

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### 5.4.1 Recommendations

- A All patients should have their blood pressure checked, and should be treated in keeping with national guidelines:
  - an optimal target BP for patients with established cardiovascular disease is 130/80 mmHg
  - for patients known to have bilateral severe (>70%) internal carotid artery stenosis a slightly higher target (eg systolic BP of 150 mmHg) may be appropriate.
- B Blood pressure reduction should be undertaken using one or more of the following agents:
  - In hypertensive patients aged 55 or older or black patients of any age, the first choice for initial therapy should be either a calcium-channel blocker or a thiazide-type diuretic. (For this recommendation, black patients are considered to be those of African or Caribbean descent, not mixed-race, Asian or Chinese.)
  - In hypertensive patients younger than 55, the first choice for initial therapy should be an angiotensin-converting enzyme (ACE) inhibitor (or an angiotensin-II receptor antagonist if an ACE inhibitor is not tolerated).
  - An ACE inhibitor, calcium-channel blocker or a thiazide-type diuretic should be added if target BP is not achieved with the initial choice.
- C Beta-blockers should not usually be initiated as first- or second-line for the prevention of recurrent stroke (unless there are other specific clinical indications).

### 5.4.2 Evidence

- A Rothwell *et al* 2003
- B Blood Pressure Lowering Treatment Trialists' Collaboration 2003; [www.bhsoc.org/pdfs/BHS\\_IV\\_Guidelines.pdf](http://www.bhsoc.org/pdfs/BHS_IV_Guidelines.pdf)
- C Blood Pressure Lowering Treatment Trialists' Collaboration 2003

## 5.5 Anti-thrombotic treatment

Most stroke involves arterial thrombosis, and anti-thrombotic treatments have been used for many decades, initially with little evidence. As with other aspects of secondary prevention, much of the evidence is derived from high-risk cardiovascular disease populations rather than the more specific stroke or TIA population. These recommendations should be read alongside those in Chapter 4 covering the acute phase.

### 5.5.1 Recommendations

- A Aspirin and dipyridamole should be the standard secondary prevention treatment following ischaemic stroke:
  - The daily dose of aspirin should be between 50 mg and 300 mg aspirin and dipyridamole MR 200 mg bd.
  - For patients who are unable to tolerate dipyridamole, aspirin alone is appropriate.
  - For patients who are intolerant of aspirin, clopidogrel 75 mg once daily is a suitable alternative.
- B Addition of a proton pump inhibitor should only be considered when there is dyspepsia or other significant risk of gastrointestinal bleeding associated with aspirin, to allow aspirin medication to continue.
- C Anticoagulation:
  - should be recommended in every patient with persistent or paroxysmal atrial fibrillation (valvular and non-valvular) unless contraindicated
  - should not be started (after cerebral events) until brain imaging has excluded haemorrhage, and not usually until 14 days have passed from the onset of disabling ischaemic stroke
  - should not be used for patients in sinus rhythm unless a major cardiac source of embolism has been identified.
- D Those with recurrent TIA or stroke should be managed in the same way as those who have had a single event. More intensive antiplatelet therapy or anticoagulation should only be given as part of a clinical trial or in exceptional clinical circumstances.
- E People diagnosed with cerebral venous sinus thrombosis (including those with secondary cerebral haemorrhage) should be given full-dose anticoagulation (initially full-dose heparin and then warfarin (INR 2–3)) unless there are comorbidities that preclude its use.
- F People with stroke secondary to acute arterial dissection should be treated with either anticoagulants or antiplatelet agents, preferably as part of a randomised controlled clinical trial to compare the effects of the two treatments.
- G People with antiphospholipid syndrome who have an acute ischaemic stroke should be managed in the same way as people with acute ischaemic stroke without antiphospholipid syndrome.\*

\* There was insufficient evidence to support any recommendation regarding the safety and efficacy of anticoagulants versus antiplatelets for the treatment of antiphospholipid syndrome in people with acute ischaemic stroke.

### 5.5.2 Evidence

- A National Institute for Health and Clinical Excellence 2006; ESPRIT Study Group 2006; Antithrombotic Trialists' Collaboration 2002; Saxena *et al*; De Schryver *et al* 2007; Hankey *et al* 2000
- B Consensus
- C National Institute for Health and Clinical Excellence 2008; Algra *et al*, 2006; Saxena *et al* 2004
- D Consensus
- E National Institute for Health and Clinical Excellence 2008
- F National Institute for Health and Clinical Excellence 2008
- G Consensus; De Schryver *et al* 2007; Ringleb *et al* 2004

### 5.5.3 Implications

The Quality and Outcomes Framework of the contract for general practice includes ensuring that those who have had a stroke are on an appropriate anti-platelet or anticoagulant regimen. Provision of community-based anticoagulation services, particularly for those with mobility problems will need consideration and may require additional resource.

## 5.6 Lipid-lowering therapy

Raised lipid levels, especially hypercholesterolaemia are a well-known risk factor for atherosclerotic or atherothrombotic diseases, especially myocardial infarction. Lowering lipid levels is an effective primary and secondary prevention treatment for vascular events, including stroke.

### 5.6.1 Recommendations

- A All patients who have had an ischaemic stroke or transient ischaemic attack should be treated with a statin drug unless contraindicated, according to the following criteria:
  - a total cholesterol of >3.5 mmol/L, *or*
  - LDL cholesterol >2.5 mmol/L.
- B The treatment goals should be:
  - total cholesterol <4.0 mmol/L *and* LDL cholesterol <2.0 mmol/L, *or*
  - a 25% reduction in total cholesterol *and* a 30% reduction in LDL cholesterol, whichever achieves the lowest absolute value.
- C Treatment with statin therapy should be avoided or used with caution (if required for other indications) in individuals with a history of haemorrhagic stroke, particularly those with inadequately controlled hypertension.

### 5.6.2 Evidence

- A Stroke Prevention by Aggressive Reduction in Cholesterol Levels (SPARCL) Investigators, 2006; Heart Protection Study Collaborative Group 2002; Amarenco *et al* 2007. The recommendation is supported by the Joint British Societies' *Guidelines on prevention of cardiovascular disease in clinical practice* 2005. The Quality and Outcomes Framework of the contract for general practice also includes indicators for the management of cholesterol.
- B As for A
- C As for A

## 5.7 Carotid stenosis

Narrowing of the carotid arteries is commonly associated with stroke and transient ischaemic attack, and surgical intervention (including radiologically guided surgery and stenting) has been used in attempts to reduce both initial stroke and further stroke. The NICE guideline on stroke (2008) has specific recommendations (see 4.4.1). The recommendations below contain more detail but are consistent with those in the NICE guidelines (see 4.4.1).

### 5.7.1 Recommendations

- A Any patient with a carotid artery territory TIA or stroke but without severe disability should be considered for carotid endarterectomy, and if the patient agrees:
  - S/he should have a carotid duplex ultrasound performed urgently to estimate the degree of stenosis.
  - S/he should have a second urgent non-invasive imaging investigation (such as magnetic resonance angiography (MRA) or a second ultrasound) to confirm the degree of stenosis. The confirmatory test should also be carried out urgently so as to avoid introducing delay.
- B Carotid endarterectomy should be considered when carotid stenosis is measured at greater than:
  - 70% as measured using the ECST methods, or
  - 50% as measured using the NASCET methods.
- C Final decisions should be made on the basis of individualised risk estimates, particularly if patients are being considered for endarterectomy some weeks after their presenting symptoms.
- D Surgical carotid endarterectomy should:
  - be undertaken in patients fit for surgery within two weeks of symptoms
  - only be undertaken by a specialist surgeon in centres where outcomes of carotid surgery are routinely audited.
- E Carotid angioplasty or stenting should only be carried out in specialist centres where outcomes of these techniques are routinely audited and preferably as part of a randomised clinical trial.
- F People with carotid stenosis less than the criteria in B should not have surgical interventions (unless as part of a randomised trial).
- G All those with carotid stenosis should receive full medical preventative measures as detailed in this chapter, whether or not they receive surgical intervention.

### 5.7.2 Evidence

- A Wardlaw *et al* 2006, 2001; Westwood *et al* 2002
- B Rothwell *et al* 2003; North American Symptomatic Carotid Endarterectomy Trial Collaborators (NASCET) 1998; European Carotid Surgery Trialists (ECST) 1998; Cina *et al* 2004
- C Rothwell *et al* 2005
- D Rothwell *et al* 2004; Moore *et al* 1996; consensus
- E Ederle *et al* 2007
- F Cina *et al* 2004

## 5.8 Oral contraception

Primary prevention studies indicate that there may be an approximate doubling of the relative risk of ischaemic stroke in women using combined (low-dose) oestrogen oral contraception. This equates to a very small increase in the absolute risk of ischaemic stroke per year per 20,000 women using low-dose oestrogen oral contraception. It is unclear how this risk is influenced by a prior history of TIA or stroke.

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### 5.8.1 Recommendations

A The combined oral contraceptive pill should not be routinely prescribed following ischaemic stroke.

### 5.8.2 Evidence

A Baillargeon *et al*, 2005; The Faculty of Family Planning and Reproductive Healthcare Clinical Effectiveness Unit, 2007

## 5.9 Hormone replacement therapy

Some women who have had a stroke may wish to continue with hormone replacement therapy (HRT) for control of symptoms and an enhanced quality of life.

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### 5.9.1 Recommendation

A The decision whether to start or continue hormone replacement therapy should be discussed with the individual patient and based on an overall assessment of risk and benefit. Consideration should be given to the dosage and formulation (eg oral or transdermal preparations).

### 5.9.2 Evidence

A Magliano *et al* 2006.

## 6 Recovery phase from impairments and limited activities: rehabilitation

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### 6.0 Introduction

This chapter covers a range of general and specific recommendations on the management of specific losses and limitations that arise following the brain damage which occurs with stroke. Problems in these areas are present from the beginning. There is no absolute end to recovery, but most improvement occurs within six months and so the content of this chapter is relevant from stroke onset until the patient's functioning level has returned to pre-stroke levels, or is stable, or until six months, whichever is the shorter. Rehabilitation after six months should still be considered (patients may benefit); this is considered in Chapter 7.

The chapter starts with some general topics. It then covers a host of specific treatments. Next it covers a large number of the more common impairments seen after stroke. Then it covers activity limitations before finally covering the environment – equipment and adaptations.

### 6.1 General principles of rehabilitation

This guideline generally only focuses on stroke-specific matters. However, because rehabilitation is central to a high-quality, effective service and because rehabilitation services are often not well organised, some recommendations based on general principles are given.

#### 6.1.1 Recommendations

- A All patients entering a period of active rehabilitation should be screened for common impairments using locally agreed tools and protocols.
- B Patients should always be informed of realistic prospects of recovery or success and should always have realistic goals set.
- C Specific treatments should only be undertaken in the context of and after considering the overall goals of rehabilitation and potential interaction with other treatments.
- D For any treatments that involve significant risk/discomfort to the patient and/or resource use, specific goals should be set and monitored using appropriate clinical measures such as numerical rating scales, visual analogue scales, goal attainment rating or a standardised measure appropriate for the impairment.
- E The nature and consequences of a patient's impairments should always be explained to the patient (and to the family), and if necessary and possible they should be taught strategies or offered treatments to overcome or compensate for any impairment affecting activities or safety, or causing distress.

#### 6.1.2 Evidence

All the recommendations (A–E) are by consensus; these are general principles that should apply to all healthcare but are especially important for patients with complex and multifactorial problems.

## 6.2 Evaluating and stopping treatments

The rehabilitation process is a reiterative cycle, starting with problem identification, analysis and understanding (ie diagnosis of the problems) and ending with comparison of the end state against goals set. While the cycle may reiterate several times, as existing problems are resolved and as new problems are identified, it is appropriate for the cycle to end when all achievable goals have been achieved and no new attainable goals can be set.

### 6.2.1 Recommendations

- A Every patient should have their progress measured against goals set at regular intervals determined by the patient's rate of change, for example using goal attainment scaling.
- B When a patient's goal is not achieved, the reason(s) should be established and:
  - the goal should be adjusted, *or*
  - the intervention should be adjusted, *or*
  - no further intervention should be given towards that goal.
- C When a therapist or team stops giving rehabilitation, the therapist or service should:
  - discuss the reasons for this decision with the patient
  - ensure that any continuing support that the patient needs to maintain and/or improve health is provided
  - teach the patient and, if necessary, carers and family how to maintain health
  - provide clear instructions on how to contact the service for reassessment
  - outline what specific events or changes should trigger further contact.

### 6.2.2 Evidence

- A Consensus; see 3.11
- B Consensus; see 3.11
- C Consensus

### 6.2.3 Implications

If a reasonable process can be developed for stopping treatment when it is no longer beneficial, it should save significant resources. Because no process can be certain and circumstances may alter, it is essential to have a simple method whereby the patient can return, at least for reassessment. The existence of such a system will facilitate the stopping of therapy but it has implications for the commissioning of services because the patient (or their family) may directly initiate contact with specialist services. However, the NICE multiple sclerosis guideline (National Institute for Health and Clinical Excellence 2003) has a similar recommendation that does not appear to have caused any difficulties.

## 6.3 Acupuncture

Acupuncture has been used as a treatment for several impairments seen after stroke such as loss of motor control, pain and sensory loss, and also in a more generic manner to improve function and well-being. This section considers the role of acupuncture as a treatment, whatever the immediate goal of treatment.

### 6.3.1 Recommendation

A Acupuncture should only be used in the context of ongoing clinical trials.

### 6.3.2 Evidence

A Wu *et al* 2006; Zhang *et al* 2005

## 6.4 Aerobic (fitness) training

Stroke patients have vascular disease, and generally aerobic exercise is thought to benefit patients with vascular disease. Traditionally, recommending exercise after stroke has been avoided on the grounds that it might have adverse neurological effects, such as increasing tone.

### 6.4.1 Recommendation

A After stroke all patients should participate in aerobic training unless there are contraindications unrelated to stroke.

### 6.4.2 Evidence

A Pang *et al* 2006; Saunders *et al* 2004; Meek *et al* 2003

## 6.5 Arm re-education

About 70% of patients will experience altered arm function after a stroke, and about 40% of survivors will be left with a non-functional arm that is often spastic, and held in a flexed and pronated position with some pain in the muscles and joints. Much therapy time and effort is attributable to attempts to rehabilitate arm function. Patients are also very focused on recovery of arm function once they have regained some mobility.

This section specifically covers some treatments (constraint-induced motor therapy and bilateral training) that have as their specific goal the maximisation of arm function. Other relevant sections include shoulder problems (6.22) and robotic treatment (6.12).

### 6.5.1 Recommendations

- A Patients who have some arm movement should be given every opportunity to practise activities within their capacity.
- B Constraint-induced movement therapy (CIMT) aimed at improving arm function should only be offered to patients after stroke who:
  - had their stroke at least two weeks before it is offered
  - have at least 10 degrees of voluntary finger extension
  - have intact cognition
  - are able to walk independently.
- C Bilateral arm training involving functional tasks and repetitive arm movement to improve dexterity and grip strength should be tried in any patient with continuing limitation on arm function after four weeks post stroke.



### 6.5.2 Evidence

- A Hirako 2001; Winstein *et al* 2004
- B Wolf *et al* 2006
- C Stewart *et al* 2006

### 6.5.3 Implications

Constraint-induced motor therapy (CIMT) requires great commitment from the patient and considerable health resource. Consequently it should only be used when the selection criteria are met, and the patient agrees to be committed.

## 6.6 Biofeedback

One key aspect of any therapist's work is to provide the patient with feedback on their performance of an activity or exercise. One method of enhancing feedback is to use technology which can often also provide more consistent, detailed and sometimes individually adapted feedback. Performance measures monitored for feedback include muscle activity (EMG) and balance (force platform), and the feedback may be auditory or visual. Many biofeedback machines are promoted for use after stroke.

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### 6.6.1 Recommendations

- A Biofeedback should not be used on a routine basis outside the context of clinical trials.

### 6.6.2 Evidence

- A Woodford *et al* 2007; Van *et al* 2005

## 6.7 Functional electrical stimulation

Functional electrical stimulation (FES) has been used as a treatment after stroke for many years in many forms. The principle is simple: if the brain cannot control muscles, electrical stimulation of the relevant nerve (or, rarely, muscle) might be able to increase function. This has been applied to both legs and arms, and it has been used both on its own with external events initiating stimulation and in association with feedback utilising minor muscle contraction as the initiator of the stimulus (thus adding biofeedback). Many functional electrical stimulation systems are promoted for use after stroke.

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### 6.7.1 Recommendations

- A Functional electrical stimulation of the arm or leg should not be used on a routine basis outside the context of clinical trials.
- B Functional electrical stimulation of the leg should **only** be considered and used for individual patients who:
  - have footdrop impeding gait not satisfactorily controlled using ankle–foot orthoses *and*
  - have demonstrable gait improvement from its use.
- C In patients with persistent shoulder pain **and** shoulder subluxation, functional electrical stimulation should be tried for reducing pain.

### 6.7.2 Evidence

- A Handy *et al* 2003; De Kroon *et al* 2002
- B Kottink *et al* 2004; Robbins *et al* 2006
- C Ada *et al* 2002

### 6.7.3 Implications

The primary implication is that FES should only be prescribed by a specialist team familiar with its use and evaluation and able to confirm that it offers a specific benefit not achievable in other ways.

## 6.8 Gait retraining, treadmill retraining, and walking aids

Almost all patients with limited mobility choose a return of independent mobility as their highest priority. This should not be surprising because almost all other activities and many social roles are predicated upon adequate mobility. Mobility encompasses a wide range of activities, but this part focuses on treatments aiming to improve walking. Other aspects of mobility are covered elsewhere.

### 6.8.1 Recommendations

- A Every patient who has limited mobility following stroke should be assessed by a specialist neurological physiotherapist to guide management.
- B Patients with limited mobility should be assessed for, provided with and taught how to use any mobility aids, including a wheelchair, needed to facilitate safe independent mobility outside therapy sessions.
- C Patients should be taught and encouraged to practise as much as possible any aspects of mobility judged to be within their safe capability, such as:
  - moving around the bed *and/or*
  - transfers from bed to chair and from chair to chair (or toilet) *and/or*
  - walking, indoors and then outdoors *and/or*
  - using stairs.
- D Patients whose recovery is slow or limited should be offered more intense therapy which should include one or more of the following:
  - specific additional therapy allowing increased practice (any mobility problem)
  - treadmill retraining with partial body support given in the first three months for patients with some ability to walk independently.

### 6.8.2 Evidence

- A Consensus
- B Laufer *et al* 2002; Singh *et al* 2006
- C Van Peppen *et al* 2004
- D Moseley *et al* 2005; Kwakkel *et al* 2004

### 6.8.3 Implications

The last recommendation requires each stroke rehabilitation service to have or to have easy access to a treadmill able to give partial body weight support. These are moderately expensive

and take up space, but the benefits of improved mobility are great and the investment should be worthwhile even in direct health costs.

## 6.9 Mental practice

Although the practising of movements and activities ‘in the mind’ has been used in sport for many years, it has only recently been explored as a potential treatment after stroke. Mental practice includes, in this context, mental imagery (imagining the visual aspects of movements) and other related cognitively based treatments.

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### 6.9.1 Recommendations

A Patients should be taught and encouraged to use mental practice of an activity as an adjunct to conventional therapy, to improve arm function.

### 6.9.2 Evidence

A Braun *et al* 2006

## 6.10 Orthoses

An orthosis is an external device that supports or enhances an impaired body part. The most common ones used after stroke are probably ankle–foot orthoses (to support a dropped foot) and wrist splints (to reduce the development of a flexion contracture). Wrist splints are discussed in 6.14 (Splinting and stretching).

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### 6.10.1 Recommendations

A An ankle–foot orthosis should only be used to improve walking and/or balance, and should be:

- tried in patients with foot drop (reduced ability to dorsiflex the foot during walking) that impedes safe and efficient walking
- evaluated on an individual patient basis before long-term use
- individually fitted.

### 6.10.2 Evidence

A Pohl *et al* 2006; de Wit *et al* 2004

## 6.11 Positioning

Impairment of motor control naturally reduces the ability of a patient to change their position and posture, and in the early stages this can be quite severe. The consequent risks include skin pressure ulceration, limb swelling, subluxation or other damage to joints, the development of contractures and pain (quite apart from the unpleasant body image projected). Patients need careful handling and positioning to reduce harm. The importance of positioning in the early phase has already been noted (4.15).

### 6.11.1 Recommendations

- A Nurses and care staff should be given training on how to position patients who cannot position themselves after stroke.
- B When lying and when sitting, patients should be put in positions that minimise the risk of complications such as aspiration and other respiratory complications, shoulder pain, contractures, and skin pressure ulceration.
- C Intermittent compression should not be used to treat a swollen hand.

### 6.11.2 Evidence

- A Consensus
- B Consensus; National Institute for Health and Clinical Excellence 2008
- C Roper *et al* 1999

## 6.12 Robotics

Automated devices controlled by microprocessors that can move a limb (or more) are an attractive treatment method because they could, potentially, allow both extended periods of treatment and treatments that are responsive to the particular needs of an individual patient (through using patient movement as feedback) as ability changes over time. They are referred to as robotic treatments.

### 6.12.1 Recommendations

- A Robot-assisted movement therapy should only be used as an adjunct to conventional therapy when the goal is to reduce arm impairment.

### 6.12.2 Evidence

- A Kwakkel *et al* 2008; Masiero *et al* 2007

## 6.13 Self-efficacy training

More attention has been paid recently to non-motor aspects of rehabilitation, and one particular area is that of self-efficacy, the extent to which a person believes that they can control their activities. The concept of self-efficacy is closely related to other concepts such as locus of control and self-confidence. There are relationships between self-efficacy and emotional states (depression, anxiety), and both are related to levels of independence but little is known about the utility of manipulating self-efficacy in attempts to increase independence. This part should be read in conjunction with the parts on depression and anxiety.

### 6.13.1 Recommendations

- A All patients should be offered training in self-management skills, to include active problem-solving and individual goal-setting.
- B Any patient whose recovery appears delayed or limited should be assessed for changes in self-identity, self-esteem and self-efficacy (as well as changes in mood; see 6.25).

- C Any patient with significant changes in self-esteem, self-efficacy or identity should be offered additional (to A) interventions that may reduce these impairments such as motivational interviewing and positive therapeutic feedback.

### 6.13.2 Evidence

- A Consensus
- B Consensus
- C Kendall *et al*, 2007; Watkins *et al*, 2007a, b

## 6.14 Splinting and stretching (to prevent and treat contractures)

Any joint that does not move regularly is at risk of developing shortening of surrounding tissues, eventually restricting movement. This is referred to as a contracture, and is not uncommon in limbs affected by high muscle tone (spasticity). Contractures can impede care, for example cleaning skin or putting on clothes. They may also be uncomfortable or painful. They may limit seating or mobility. (See also 6.20.)

A splint is a form of orthosis; splinting refers to the process of making or moulding some firm material to hold a joint or limb in a certain position. Splinting after stroke is usually concerned with maintaining or extending the range of movement around a joint; it is an intervention designed to prevent or reduce contractures.

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### 6.14.1 Recommendations

- A Any patient who has increased tone sufficient to reduce passive or active movement around a joint should have their range of passive joint movement assessed as a prelude to starting preventative actions.
- B Any patient whose range of movement at a joint is reduced or at risk of becoming reduced should have a programme of passive stretching of all affected joints on a daily basis and the programme should be taught to the patient and/or carers.
- C Inflatable arm splints enveloping the hand, forearm and elbow, and resting wrist and hand splints should not be used routinely.
- D If stretching alone does not control contractures, serial casting around a joint should be considered as a treatment for reducing contractures.

### 6.14.2 Evidence

- A Consensus
- B Consensus; Bovend'Eerd *et al* 2008
- C Poole *et al* 1990; Lannin *et al* 2007, 2003
- D Consensus

## 6.15 Strength training – resisted exercise

Training strength seems a logical treatment for patients with weakness of voluntary muscle contraction. Fears that this treatment would worsen increased tone limited its use in the past, but the evidence available now shows this fear to be unfounded.

### 6.15.1 Recommendations

- A Resisted exercise should be used:
- to improve strength in targeted muscles
  - to improve gait speed and endurance.

### 6.15.2 Evidence

A Ada *et al* 2006; Morris *et al* 2004

## 6.16 Task-specific training

Ultimately much treatment aims to increase ability at a task or activity, and consequently one approach to treatment is simply to practise the task itself; this is task-specific training. In the past the focus of treatment was on reducing impairments in the expectation that activities would naturally improve.

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### 6.16.1 Recommendations

- A Task-specific training should be used to improve activities of daily living and mobility:
- standing up and sitting down
  - gait speed and gait endurance.

### 6.16.2 Evidence

A French *et al* 2007; Walker *et al* 2004

## 6.17 Miscellaneous other specific treatments

There are many other specific treatments that have been proposed and subjected to some research evaluation, often either uncontrolled or in small pilot studies. This section considers those where there is at least a little evidence.

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### 6.17.1 Recommendations

- A The following treatments have been subject to some evaluation and should not be used routinely or outside the context of prospective research:
- virtual reality technologies
  - standing in an Oswestry standing frame
  - whole body vibration
  - weighted garments.

### 6.17.2 Evidence

A Crosbie *et al* 2007; Bagley *et al* 2005; van Nes *et al* 2006; Pomeroy *et al* 2001

## 6.18 Balance impairment

Many patients experience reduced balance control after stroke, usually due to a combination of reduced limb and trunk motor control, altered sensation of one side and, sometimes, centrally determined alteration in body representation such that the person misperceives their posture in

relation to upright. This latter problem is commonly associated with left visuo-spatial neglect and may be referred to as the 'pusher syndrome'. Whatever its cause, impaired balance is important because it reduces confidence and increases the risk of falls. This section covers interventions other than biofeedback which is covered in 6.6.

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### 6.18.1 Recommendations

- A Any patient with significant impairment in maintaining their balance should be given intensive progressive balance training.
- B Any patient with moderate to severe limitation of their walking ability should be given a walking aid to improve their stability.

### 6.18.2 Evidence

- A Marigold *et al* 2005; Duncan *et al* 2003
- B See 6.8.2

## 6.19 Impaired motor control – reduced movement, weakness and clumsiness

Impaired motor control after stroke encompasses phenomena such as *lack of coordination in movement, loss of selective movement, and lack of motor control*. Weakness (impaired motor control) on one side (hemiparesis) is the hallmark of stroke, but in fact only affects 80% of patients, and there are many other causes of hemiparesis. Nonetheless it is probably the single most disabling factor, certainly in terms of limiting mobility. Traditionally physiotherapists (physical therapists) have concentrated upon the direct diagnosis and treatment of motor impairments including weakness.

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### 6.19.1 Recommendations

- A All patients should be assessed for motor impairment, and a standardised approach to quantify the impairment should be used (eg the Motricity Index).
- B All patients with significant loss of motor control (ie sufficient to limit an activity) should be assessed by a therapist with experience in neurodisability.
- C Any patient with persistent motor impairment should be taught exercises or activities that will increase voluntary motor control and strength, including resisted exercise.
- D Any patient with significant limitation in balance or mobility should be given intensive progressive exercise.

### 6.19.2 Evidence

- A Consensus
- B Consensus
- C Consensus
- D See 6.8.2 and 6.18.2

## 6.20 Impaired tone – spasticity and spasms

There is considerable debate on the definition, physiological nature and importance of spasticity. Increased tone, abnormal posturing and involuntary spasms may cause discomfort for the patient and difficulties for carers, and they are associated with increased activity limitation. Their close association with other impairments of motor control makes it difficult to determine the extent to which spasticity is a specific cause of disability. Spasticity is common, especially in the non-functional arm.

### 6.20.1 Recommendations

- A Any patient with motor weakness should be assessed for the presence of spasticity as a cause of pain, as a factor limiting activities or care, and as a risk factor for the development of contractures.
- B In any patient with spasticity, local and general factors that may cause increased tone (eg pain) should be identified and alleviated.
- C In any patient where spasticity is causing concern, simple procedures to reduce spasticity should be used, including exercise and stretching.
- D For the more active treatments given below, specific goals should be set and monitored using appropriate clinical measures (eg numerical rating scales, the Ashworth scale).
- E In patients with persistent troublesome focal spasticity affecting one or two joints then intramuscular botulinum toxin should be used to alleviate the problem. This should be given in the context of an expert service and accompanied by rehabilitation therapy input over the next 2–8 weeks.
- F For patients experiencing troublesome general spasticity after initial treatment, anti-spastic drugs should be tried unless contraindicated. One of baclofen, gabapentin or tizanidine should be tried first; other drugs and combinations of drugs should only be started by people with specific expertise in managing spasticity.
- G *Intrathecal* baclofen, intraneural phenol and other rare procedures should only be used in the context of an expert service or a research protocol.

### 6.20.2 Evidence

- A Consensus
- B Consensus
- C Consensus
- D Consensus
- E Cardoso *et al* 2005
- F Montane *et al* 2004
- G Sampson *et al* 2002

The evidence base concerning the management of spasticity in general, and in stroke in particular is weak. Further evidence is available in the NICE guideline on the management of multiple sclerosis (National Institute for Health and Clinical Excellence 2003).

### 6.20.3 Implications

There are two implications. First, every health economy (geographical area) should have a service specialised in assessing and managing patients with more severe spasticity. The second main



area of concern is financial. At present the overall cost-consequences of spasticity are unknown; the costs of botulinum toxin injections and the necessary staff time are reasonably large health costs, but it is probable that the cost of managing people with poorly controlled spasticity is also very large in total, though many of the costs fall on to other budgets. The primary practical concern should be to restrict repeated injections to patients who have significant ongoing problems that cannot be controlled in any other way.

## 6.21 Impaired sensation

Patients may have loss or alteration in various somatic sensations – touch, position sense, pain etc. There is little research into sensory loss after stroke. It is probably present in at least 50% of people. The severity of sensory loss is probably associated with the extent of motor loss, and so the independent importance of sensory loss is unknown.

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### 6.21.1 Recommendations

- A All patients should be asked about altered or lost sensation on the affected side. If necessary, a more formal assessment of sensory loss should be undertaken (eg using the Nottingham Sensory Assessment, Erasmus MC version).
- B Any patient who has marked sensory loss in the presence of good motor function should be taught how to take care of the limb and how to avoid accidental injury.
- C Intense sensory retraining should only be undertaken in the context of research.

### 6.21.2 Evidence

There is no strong evidence in support of any of the recommendations which arise through consensus.

- A Consensus; see Stolk-Hornsveld *et al* 2006 for Nottingham Sensory Assessment
- B Consensus
- C Carey *et al* 2005

## 6.22 Shoulder pain and subluxation

Pain in the shoulder of the weak arm is reported to occur in somewhere between 5% and 80% of patients, but much of this variability arises from varying definitions. Severe persistent shoulder pain is probably present in about 5% of people after stroke. Its exact aetiology is unknown, but it is often associated with initial subluxation of the joint and, in the later stages, increased spasticity.

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### 6.22.1 Recommendations

- A Every patient with significant functional loss in their arm should have the risk of developing shoulder pain reduced by:
  - ensuring that everybody handles the weak arm correctly, avoiding mechanical stress (excessive range of movement, tension)
  - avoiding the use of overhead arm slings
  - correct positioning of the arm, using foam arm supports if necessary.
- B Every patient with arm weakness should be asked about shoulder pain, initially on most days and then less frequently.

- C Every patient who develops shoulder pain should:
  - have its severity assessed, recorded and monitored regularly
  - have preventative measures put in place
  - be offered regular simple analgesia (eg paracetamol, non-steroidal anti-inflammatory drugs).
- D Any patient with persistent more troublesome shoulder pain should be considered for one or more of:
  - treatment with high-intensity transcutaneous nerve stimulation
  - shoulder strapping
  - functional electrical stimulation but **only** if they also have significant subluxation.
- E In the absence of further evidence, patients with shoulder pain should not be offered the following except in the context of research:
  - shoulder supports and slings
  - intra-articular steroid injections.

### 6.22.2 Evidence

- A Consensus
- B Consensus
- C Consensus
- D Ada *et al* 2002; Griffin *et al* 2006; Hanger *et al* 2000
- E Ada *et al* 2005; Kalita *et al* 2006

## 6.23 Neuropathic pain (central post-stroke pain)

Stroke is one cause of pain generated following damage to neural tissues (so-called neuropathic pain, or central post-stroke pain). The frequency is uncertain, with estimates varying between 5% and 20%. However, if present it is certainly unpleasant and warrants attention. There may be some overlap with both spasticity which can cause pain, and with sensory loss which can be associated with unpleasant sensory phenomena. It is, in principle, separate from musculo-skeletal pain which is considered in the next section (6.24).

### 6.23.1 Recommendations

- A Every patient should be asked whether they are experiencing pain as a result of the stroke, and this question should be asked again after a few weeks.
- B All patients complaining of or experiencing pain should have the cause of the pain diagnosed by someone who can distinguish the various specific, treatable causes.
- C Any patient with neuropathic pain should receive pharmacological treatment with one or more of:
  - antidepressants (tricyclic, or other)
  - anticonvulsants, usually starting with carbamazepine or gabapentin.
- D Any patient whose neuropathic pain is not adequately controlled within a few weeks should be referred to a specialist in pain management.

### 6.23.2 Evidence

- A Consensus
- B Consensus
- C Saarto *et al* 2007
- D Consensus

## 6.24 Musculo-skeletal pain

Musculo-skeletal pain is not uncommon in people with stroke. Many patients will have pre-existing osteoarthritis or other painful arthritic conditions. Immobility and abnormal posture can cause pain. The most important specific musculo-skeletal pain problem after stroke, post-stroke shoulder pain, has already been considered (6.23).

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### 6.24.1 Recommendations

- A Every patient with significant motor loss after stroke should be asked whether they have any musculo-skeletal pain.
- B All patients complaining of or experiencing pain should have the cause of the pain diagnosed by someone who can distinguish the various specific, treatable causes.
- C Any patient with musculo-skeletal pain should be assessed to determine whether improvement in movement, posture or moving and handling techniques can reduce the pain.
- D Any patient continuing to experience pain should be offered pharmacological treatment with simple analgesic drugs taken regularly:
  - paracetamol, up to 1 g four times daily
  - non-steroidal anti-inflammatory drugs (with gastric protection only if needed)
  - codeine and similar morphine derivatives.
- E Any patient whose pain is still not adequately controlled should be referred to a specialist in pain management.

### 6.24.2 Evidence

- A Consensus
- B Consensus
- C Consensus
- D Consensus
- E Consensus

## 6.25 Depression

Mood disturbance is common after stroke and may present as depression or anxiety, both of which may be part of a single emotional response to stroke, and one that varies in its presentation from patient to patient. The severity of mood disturbance is associated with the severity of both cognitive and motor impairments and with the severity of activity limitation. Furthermore it may exacerbate other impairments and limit functional recovery. Although they are closely linked, depression and anxiety are usually considered separately, and they will be considered separately here.

Depression is common but often short-lasting and it often remits as the patient recovers function (House *et al* 1991; Hackett *et al* 2006).

### 6.25.1 Recommendations

- A Every patient entering rehabilitation should be screened for depression using a validated simple screening test (eg asking ‘Do you feel depressed?’ or the GHQ-12 or PHQ-9 questionnaire). In addition:
  - mood should also be assessed at later times, especially after stopping active rehabilitation or if depression is suspected
  - screening tests such as ‘smiley faces’ or observational criteria alone should not be relied upon as the sole means of initial diagnosis
  - questionnaires may be simplified to a *yes/no* format for people with communication difficulties
  - the patient’s past should be investigated for any history of mood disturbance.
- B In people with aphasia and other impairments complicating assessment of mood, careful observations over time (including response to a trial of antidepressant medication if considered necessary) should be used.
- C Any patient with depressed mood should be provided with appropriate information and advice.
- D Any patient who has depression sufficient to cause distress and/or to impede rehabilitation should be assessed clinically for further treatment by an expert (eg clinical psychologist, appropriately trained stroke physician, psychiatrist).
- E Any patient considered to have depression should be screened for anxiety and emotionalism.
- F Patients with minor depression should be monitored for progression and worsening and should be especially involved in one or more of:
  - increased social interaction
  - increased exercise
  - goal setting
  - other psychosocial interventions (eg using voluntary sector resources).
- G Patients whose depression is more severe or persistent should be offered one or more of:
  - antidepressant drug treatment
  - psychological therapy given by an appropriately trained and supervised practitioner
  - interventions to reduce any contributory factors such as pain and social isolation (eg attending voluntary sector stroke groups).
- H Antidepressant treatment should:
  - not be used routinely to prevent depression developing or to improve other outcomes
  - be monitored, and continued for at least six months if a benefit is achieved.

### 6.25.2 Evidence

- A Watkins *et al* 2007b; Laska *et al* 2007; Lee *et al* 2007; Bennett *et al* 2006
- B Consensus
- C Consensus
- D Consensus
- E Consensus
- F Consensus; National Institute for Clinical Excellence 2004b
- G Hackett *et al* 2004; Watkins *et al* 2007a; Williams *et al* 2007
- H Anderson *et al* 2004

### 6.25.3 Implications (6.26, 6.27, 6.28)

These recommendations and **the recommendations concerning anxiety and emotionalism** have some implication for the provision of specialist psychological and psychiatric input into services; at present most UK services do not have much specialist input.

All staff will need to be taught that depression, anxiety and emotionalism may impede a patient's participation in therapy and their ability to perform activities safely and independently. Some nurses and therapists (those undertaking formal assessment of patients) will need to be taught how to use standardised questionnaires.

Clinical staff with special expertise in assessing, treating and monitoring people with emotional disturbance (clinical psychologists, psychiatrists, primary care mental health workers) will need to be part of each stroke rehabilitation service, or will need to be easily and quickly available. Some patients will need continuing involvement of the mental health specialist. It is also vital that patients who have returned to the community have access to clinical experts able to assess mood disturbance in people who have had a stroke both to monitor people after discharge and to diagnose newly arising mood disturbance which is not uncommon.

## 6.26 Anxiety

After stroke, anxiety is almost as common as depression, although it is frequently not recognised. It is often focused on matters such as fear of falling and the risk of recurrence. It has not been well researched.

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### 6.26.1 Recommendations

- A Every patient entering the rehabilitation phase should be screened for anxiety, usually simply by asking about the patient's concerns or by asking family members.
- B Any patient with anxiety should have the cause(s) established, and should be provided with appropriate information and advice.
- C Any patient whose anxiety is impeding their recovery and rehabilitation or causing distress should be:
  - assessed and considered for psychological treatment, for example desensitisation or cognitive behavioural therapy
  - screened for emotionalism and depression.

### 6.26.2 Evidence

- A Consensus; National Institute for Clinical Excellence 2004a
- B Consensus; National Institute for Clinical Excellence 2004a
- C Gould *et al* 1997; Westen *et al* 2001

## 6.27 Emotionalism

Emotionalism refers to the phenomenon of crying (or, less commonly, laughing) in an overly emotional way, or after what appears to be minimal provoking stimuli. The crying or laughing is usually uncontrolled and may be disruptive but it often resolves spontaneously. It may also be referred to as emotional lability and, in the past, as a part of 'pseudo-bulbar palsy'.

### 6.27.1 Recommendations

- A Any patient who cries or laughs in unexpected situations or who is upset by their fluctuating emotional state should be assessed by a specialist able to diagnose emotionalism.
- B Patients with severe, persistent or troublesome tearfulness (emotionalism) should be given antidepressant drug treatment, monitoring the frequency of crying to check effectiveness.

### 6.27.2 Evidence

- A Consensus
- B House *et al* 2004

## 6.28 Cognitive impairments – general

Stroke is characteristically considered to be a condition causing weakness and paralysis. In fact up to 20% of people have no weakness, and a further unknown number of people have clinically silent stroke. More importantly, all patients with cerebrovascular disease are at risk of cognitive loss and some cognitive loss is probably present in almost all patients. This section covers some general principles; specific aspects are covered in the subsequent sections and mental capacity is covered separately (6.36).

### 6.28.1 Recommendations

- A Every patient seen after a stroke or transient ischaemic episode should be considered to have at least some cognitive losses in the early phase.
  - Routine screening should be undertaken to identify the range of cognitive impairments that may occur, using simple standardised measures (eg mini-mental state examination or short orientation–memory–concentration test).
- B Any patient not progressing as expected in rehabilitation should have a more detailed cognitive assessment to determine whether cognitive losses are causing specific problems or hindering progress.
- C The patient's cognitive status should be taken into account by all members of the multidisciplinary team when planning and delivering treatment.
- D Planning for discharge from hospital should include an assessment of any safety risks from persisting cognitive impairments.
- E People returning to cognitively demanding activities (eg some work, driving) should have their cognition assessed formally prior to returning to the activity.

### 6.28.2 Evidence

- A Consensus, based on evidence of high frequency of cognitive loss after stroke.
- B Consensus
- C Consensus
- D Consensus
- E Consensus

## 6.29 Attention and concentration

Attention is a prerequisite for almost all cognitive functions. Disturbed alertness is common after stroke especially in the first few days and weeks, and more so with right hemisphere stroke where it can be asymmetrical, affecting the left side particularly.

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### 6.29.1 Recommendations

- A Any person after stroke who appears easily distracted or unable to concentrate should have their abilities to focus, sustain and divide their attention formally assessed.
- B Any person with impaired attention should have cognitive demands reduced through:
  - having shorter treatment sessions
  - taking planned rests
  - reducing background distractions
  - avoiding work when tired.
- C Any person with impaired attention should:
  - be taught strategies to compensate for reduced attention
  - receive repeated practice of activities they are learning.

### 6.29.2 Evidence

- A Consensus
- B Consensus
- C Michel 2006; Lincoln *et al* 2000

## 6.30 Memory

Subjective problems with memory are almost universal after stroke, and on formal testing reduced memory is quite common. There is a close association between cerebrovascular disease and dementia, including Alzheimer's disease, and about 20% of people who survive for six months are said to have 'dementia', with memory loss being a characteristic feature. This part is primarily concerned with cognitive losses seen in people with stroke in the first six months, and is not directly concerned with the losses associated with diffuse cerebrovascular disease.

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### 6.30.1 Recommendations

- A Patients who complain of marked memory impairment and patients clinically considered to have difficulty in learning and remembering should have their memory assessed formally using a standardised measure such as the Rivermead Behavioural Memory Test.
- B Any patient found to have memory impairment causing difficulties in rehabilitation or undertaking activities should:
  - be assessed medically to check that there is not another treatable cause or contributing factor (eg hypothyroidism)
  - have their profile of impaired and preserved memory abilities determined
  - have their nursing and therapy sessions altered to use techniques which capitalise on preserved abilities
  - be taught compensatory techniques to reduce their disabilities, such as using notebooks, diaries, audiotapes and electronic organisers and audio alarms
  - be taught approaches aimed at directly improving their memory
  - have therapy delivered in an environment that is as like the usual environment for that patient as possible.

### 6.30.2 Evidence

- A Consensus
- B Consensus; Hildebrandt *et al* 2006; Nair 2007; Lincoln *et al* 2000

## 6.31 Spatial awareness (eg neglect)

Disturbance of spatial awareness refers to a group of behaviours where the patient acts as if they have reduced or absent knowledge about (awareness of) some part of their environment, usually the left. Other terms used include neglect, visuo-spatial neglect, and sensory inattention. It is more common in people with right hemisphere brain damage, and is usually associated with hemianopia.

### 6.31.1 Recommendations

- A Any patient with a stroke affecting the right hemisphere should be considered at risk of reduced awareness on the left, and should be tested formally if this is suspected clinically.
- B Any patient with suspected or actual impairment of spatial awareness should have their profile of impaired and preserved abilities evaluated using a standardised test battery such as the Behavioural Inattention Test. The diagnosis should not be excluded on the basis of a single test.
- C Any patient shown to have impaired attention to one side should be:
  - given cues to draw attention to the affected side during therapy and nursing procedures
  - monitored to ensure that they do not eat too little through missing food on one side
  - given a trial of visual scanning training
  - given trials of mental imagery training, structured feedback or using prisms if the unawareness is severe and persistent.

### 6.31.2 Evidence

- A Consensus
- B Jehkonen 2006
- C Consensus; Bowen *et al* 2002

## 6.32 Perception – visual agnosia

Some patients with brain damage from stroke have a specific difficulty in recognising objects, especially those seen (other agnosias are very rare). The behaviour may be mistakenly attributed to impaired memory or language, or to refractory problems, or sometimes to deliberate pretence.

### 6.32.1 Recommendations

- A Any person who appears to have difficulty in recognising people or objects should be assessed formally for visual agnosia.
- B Any person found to have agnosia should:
  - have the impairment explained to them, their family and their treating team
  - be taught strategies to compensate for the specific agnosia(s) as far as possible.



### 6.32.2 Evidence

- A Consensus
- B Consensus

## 6.33 Apraxia

Apraxia refers to the loss or disturbance of the conceptual ability to organise actions to achieve a goal, and people with motor apraxia often have difficulty carrying out everyday activities such as making a hot drink despite adequate muscle strength and sensation; they may also have difficulties in selecting the right object at the right time and/or in using objects (such as a spoon) correctly. It is usually associated with damage to the left cerebral hemisphere, although it can arise after right hemisphere damage. (See also 6.38 concerning oral apraxia.)

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### 6.33.1 Recommendations

- A Any person who has difficulties in executing tasks despite apparently adequate limb movement should be assessed formally for the presence of apraxia.
- B Any person found to have apraxia should:
  - have their profile of impaired and preserved action abilities determined as part of their assessment after their stroke using a standardised approach such as the Naturalistic Action Test or the Apraxia Test.
  - be given therapies and/or taught compensatory strategies specific to the deficits identified
  - have the impairment explained to them, their family, and their treating team.

### 6.33.2 Evidence

- A Consensus
- B West 2008; Schwartz *et al* 2002 (Naturalistic Action Test); van Heugten *et al* 1999 (Apraxia Test)

## 6.34 Executive functioning

Executive functioning refers to the ability to plan and execute a series of tasks, and also to the ability to foresee the (social) consequences of actions. The 'dysexecutive syndrome' encompasses several impairments including difficulties with planning, organising, initiating, and monitoring behaviour and adapting it as circumstances change. In the context of stroke it is relatively rare, but it is seen more commonly after subarachnoid haemorrhage with secondary frontal lobe infarction.

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### 6.34.1 Recommendations

- A Any person who appears to have adequate skills to perform complex activities but who fails to organise the tasks needed should be formally assessed for the dysexecutive syndrome, for example using the Behavioural Assessment of the Dysexecutive Syndrome (BADS).
- B Any person with an executive disorder and activity limitation should be taught compensatory techniques (eg use of electronic organisers or pagers, or use of written checklists).
- C When a patient's activities are affected by an executive disorder, the nature and effects of the impairment and ways of supporting and helping the patient should be discussed with others involved (eg family, staff).

### 6.34.2 Evidence

- A Consensus
- B Consensus
- C Consensus

## 6.35 Mental capacity (decision making by the patient) and advance care plans

This part covers two related issues: the ability to make decisions about and participate in health management, and the making of advance care plans (ACPs) that may help identify a patient's wishes when or if they lose their capacity to decide.

### Mental capacity

A patient should consent to all actions undertaken by healthcare professionals; this requirement is central to all healthcare legally, morally and practically (because participation by the patient is central to the success of most treatments). In England and Wales a law has recently been enacted – the Mental Capacity Act 2005 – and this regulates healthcare. The tenets of this act are derived from and reflect good clinical practice. This section is compliant with the Act but it should also be clinically relevant in other jurisdictions (eg in Scotland). In specific cases if there is any doubt then the Act should be consulted directly.

In relation to this Act, the following two specific items should be noted:

- ▶ An **advance decision to refuse treatment** (ADRT) is a clear set of instructions, usually in writing, on the declining of treatment in the future, given whilst an adult has capacity and is aware of the implications of the decision. The decision should be the individual's own views without influence of others. Where valid and applicable, advance decisions must be followed.
- ▶ An **advance statement** is an instrument, usually in writing, by which an individual with capacity can describe, in general terms, the type of medical care they would want to receive should they lose capacity in the future. It is not legally binding but should be considered by the doctors treating the patient.

### 6.35.1 Recommendations

- A All patients should be assumed to have the capacity to make decisions on their own care unless demonstrated otherwise.
- B The patient's mental capacity should specifically be considered and documented when they are being asked to agree to a procedure that involves significant risk, noting that **judgments on capacity must relate to the specific decision being made**.
- C In cases of doubt the clinician should determine that the answer to all four of the questions below is positive before concluding that the patient has competence:
  - Does the patient understand the information relevant to the decision?
  - Has the patient retained the information relevant to the decision?
  - Can the patient use, or weigh up the information when making a decision?
  - Can the patient communicate their decision by some reliable means?
- D In patients where the answer to one or more of the above questions is negative or uncertain:
  - all attempts should be made to overcome the lack of capacity (eg asking a speech therapist to help with communication)
  - a second opinion should be sought if there is doubt or if assistance is needed.

- E For any patient judged not to have capacity any decision that can be postponed until the patient might have regained capacity should be postponed.
- F If the patient does not have capacity **and** if the decision cannot be postponed, then the clinical team should act in the patient's best interests.
- G To establish a patient's best interests the clinical team should take the following steps:
  - Do whatever is possible to permit and encourage the person to take part, or to improve their ability to take part, in making the decision ('participatory consent').
  - Try to identify all the factors that the person who lacks capacity would take into account if they were making the decision or acting for themselves, including:
    - the person's past and present wishes and feelings – these may have been expressed verbally, in writing or through behaviour or habits (**see above for advance decisions to refuse treatment**)
    - any beliefs and values (eg religious, cultural, moral or political) that would be likely to influence the decision in question
    - any other factors the person themselves would be likely to consider if they were making the decision or acting for themselves
  - but **specifically noting that**:
    - no assumptions should be made about someone's best interests simply on the basis of the person's age, appearance, condition or behaviour
    - no assumptions should be made about the person's quality of life
    - decisions should not be motivated in any way by a desire to bring about the person's death
    - if it is practical and appropriate to do so, other people should be consulted for their views about the person's best interests. This might include:
      - next of kin
      - carers
      - a lasting power of attorney
      - an independent mental capacity advocate (IMCA – see section 10 of the Mental Capacity Act 2005), or ultimately
      - the Court of Protection.
- H The capacity of the patient to make decisions should be reviewed at an appropriate interval which will be dependent upon the clinical situation.
- I People who lack capacity should nonetheless be considered for involvement in research provided that:
  - the study has been approved by a research ethics committee
  - the patient has a chance of benefitting or the research may gain information relevant to people in the patient's situation
  - the risks and discomforts are proportionate to the potential benefits
  - someone else has been consulted (usually relatives or close friends, but otherwise an appointed representative).

### 6.35.2 Evidence

There is much published and easily available guidance on mental capacity:

- ▶ [www.bma.org.uk/ap.nsf/Content/mencapact05?OpenDocument&Highlight=2,mental,capacity](http://www.bma.org.uk/ap.nsf/Content/mencapact05?OpenDocument&Highlight=2,mental,capacity)
- ▶ [www.dca.gov.uk/legal-policy/mental-capacity/mca-cp.pdf](http://www.dca.gov.uk/legal-policy/mental-capacity/mca-cp.pdf)

- ▶ [http://opsi.gov.uk/acts/acts2005/ukpga\\_20050009\\_en\\_10#sch4-pt6](http://opsi.gov.uk/acts/acts2005/ukpga_20050009_en_10#sch4-pt6) (the Act itself)
- ▶ [www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH\\_074491](http://www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH_074491)
- ▶ [www.bmj.com/cgi/content/full/336/7639/322](http://www.bmj.com/cgi/content/full/336/7639/322)
- ▶ <http://learning.bmj.com/learning/search-result.html?moduleId=6056672>

### 6.35.3 Making advance care plans

Advance care planning (ACP) discussions with patients with long-term conditions or as part of a broad end-of-life care management programme can increase patient satisfaction. Whilst most professionals and patients (>80%) agree that ACP discussions should take place around the time of diagnosis of a life-threatening illness, some patients with terminal disease welcome the opportunity to discuss end-of-life care, others may not feel ready or able to do so, and some seriously ill hospitalised individuals do not wish to discuss life-saving interventions. There is no good evidence that the completion of an advance decision leads to the denial of appropriate healthcare (clinically indicated and desired by the individual) and long-term mortality is not affected by the completion of an advance decision.

### 6.35.4 Recommendations

- A Professionals should be encouraged to initiate advance care plan discussions in patients with long-term conditions or receiving end-of-life care.
- B Professionals should not avoid advance care plan discussions because of fears of increasing patient mortality or denying care.
- C Discussions should be routine questions asked of all individuals, some of whom may not wish to take the discussion any further.
- D Professionals should be especially sensitive about initiating such discussions in sick, hospitalised individuals; appropriately trained nurses are well placed to initiate these discussions.

### 6.35.5 Evidence

The evidence is not stroke specific. A list of relevant references is given in the Evidence tables ([www.rcplondon.ac.uk/pubs/brochure.aspx?e=250](http://www.rcplondon.ac.uk/pubs/brochure.aspx?e=250)).

## 6.36 Aphasia (dysphasia; impairment of language)

Aphasia refers to the specific impairment of language functions – the ability to form and understand words whether communicated orally or in writing. It is sometimes referred to as dysphasia. It is associated with damage to the dominant (usually left) cerebral hemisphere. Aphasia can have a significant impact on all aspects of an individual's life, often affecting self-image and well-being. In addition, subtle difficulties with communication can also occur with damage to the non-dominant hemisphere.

### 6.36.1 Recommendations

- A Any patient with left hemisphere cerebral damage should be screened for aphasia using a formal screening tool such as the Frenchay Aphasia Screening Test or Sheffield Aphasia Screening Test.

- B Any patient found to have aphasia on screening or suspected to have it on clinical grounds should have a full formal assessment of language and communication by a speech and language therapist.
- C When a patient has been found to have aphasia, a speech and language therapist should:
  - explain the nature of the impairment to the patient, family and treating team
  - establish the most appropriate method of communication and then inform (and if necessary train) the family and treating team
  - re-assess the nature and severity of the loss at appropriate intervals.
- D Any patient with aphasia persisting for more than two weeks should:
  - be given treatment aimed at reducing identified specific language impairments while continuing to progress towards goals
  - be considered for early intensive (2–8 hours/week) speech and language therapy if they can tolerate it
  - be assessed for alternative means of communication (eg gesture, drawing, writing, use of communication aids) and taught how to use any that are effective.
- E While a patient has difficulties with communication:
  - all people interacting regularly with a person who has aphasia should be taught the most effective communication techniques for that person.
  - their mood should be assessed using whatever method seems most appropriate (eg direct questioning using adapted techniques, behavioural observation).
- F Any patient with aphasia persisting at six months should:
  - be considered for and if appropriate referred for a further episode of specific treatment (in a group setting or one-to-one)
  - have their need and the need of their family for social support and stimulation assessed formally, and met if possible (eg by referral to voluntary sector groups).

### 6.36.2 Evidence

- A Consensus
- B Consensus
- C Kagan *et al* 2001; David *et al* 1982; Maneta 2001; consensus
- D Bakheit 2007; Hickin *et al* 2002; Robson *et al* 2001; Robey 1998
- E Kagan *et al* 2001; consensus
- F Hilari 2003; consensus

A Cochrane review is currently in progress and may report in 2008.

## 6.37 Dysarthria

Dysarthria refers to the vocal consequences of impaired control over the muscles responsible for producing intelligible speech and one definition is 'neurologic motor speech impairment that is characterised by slow, weak, imprecise, and/or uncoordinated movements of the speech musculature and may involve respiration, phonation, resonance, and/or oral articulation (Yorkston, 1996). Speech is usually described as slurred or blurred. It is common in the early stages of stroke, and is often associated with dysphagia (swallowing difficulties).

### 6.37.1 Recommendations

- A Any patient whose speech is unclear or unintelligible so that communication is limited or unreliable should be assessed by a speech and language therapist to determine the nature and cause of the speech impairment.
- B Any person who has dysarthria following stroke sufficiently severe to limit communication should:
  - be taught techniques to improve the clarity of their speech
  - be assessed for compensatory alternative and augmentative communication techniques (eg letter board, communication aids) if speech remains unintelligible.
- C The communication partners (eg family, staff) of a person with severe dysarthria should be taught how to assist the person in their communication.

### 6.37.2 Evidence

Treatment of dysarthria specifically due to stroke has not been subject to much research, and indeed treatment of dysarthria in general is poorly researched.

- A Consensus
- B Palmer *et al* 2007; Mackenzie *et al* 2007
- C King *et al*, 1999

## 6.38 Apraxia of speech

A few patients have specific and relatively isolated impairment of the ability to plan and execute the multiple skilled motor tasks that underlie successful talking; this is apraxia of speech. It is usually associated with left hemisphere damage, and hence requires careful separation from aphasia as well as from dysarthria. Speech and language therapists are consistent in their diagnosis of apraxia of speech despite these difficulties.

### 6.38.1 Recommendations

- A Any patient who has marked difficulty articulating words should be formally assessed for apraxia of speech and treated to maximise intelligibility.
- B Any patient with severe communication difficulties but reasonable cognition and language function should be assessed for and provided with appropriate alternative or augmentative communication aids.

### 6.38.2 Evidence

- A Consensus.
- B Consensus; West *et al* 2005

## 6.39 Visual impairments and hemianopia

Patients who have had a stroke often have visual problems including disruption of eye movement control causing diplopia, nystagmus, blurred vision and loss of depth perception. Visual field loss such as hemianopia is also common. Other age-related visual problems may also be present, such as cataract, macular degeneration, glaucoma and uncorrected refractive errors. Visual perception disorders such as visual agnosia and visuo-spatial neglect are associated cognitive losses.

### 6.39.1 Recommendations

- A Every patient should have:
  - practical assessment of visual acuity **wearing their appropriate glasses**, checking their ability to see newspaper text and distant objects clearly
  - examination for the presence of hemianopia (visual field deficit).
- B Any patient who has a visual field deficit should be informed and, if a car driver, should specifically be informed about the consequences for driving (see 6.48).
- C Any patient whose visual field defect causes practical problems should be taught compensatory techniques.
- D Treatment for hemianopia using prisms should only be provided if:
  - the treatment is supervised by someone with expertise in this treatment
  - the effects are evaluated
  - the patient is aware that it may not have any benefit for them.

### 6.39.2 Evidence

- A Consensus
- B Consensus
- C Consensus; Poggell *et al* 2004; Riggs *et al* 2007
- D Consensus

## 6.40 Bowel and bladder impairment

Disturbance of control of excretion is common in the acute phase of stroke; it remains a problem for a significant minority of patients. Incontinence has many consequences: it is a major stress factor for carers; it greatly increases the risk of skin pressure ulceration; and most importantly it is demeaning to the patient.

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### 6.40.1 Recommendation

- A All wards and stroke units should have established assessment and management protocols for both urinary and faecal incontinence, and for constipation.
- B All patients with loss of control of the bladder at two weeks should:
  - be reassessed for other causes of incontinence, which should be treated if identified
  - have an active plan of management documented
  - be offered simple treatments such as bladder retraining, pelvic floor exercises and external equipment first
  - only be given an indwelling urethral catheter after other methods of management have failed
  - only be discharged home with continuing incontinence after the carer (family member) or patient has been fully trained and adequate arrangements for continuing supply of continence aids and services are confirmed and in place.
- C All patients with a loss of control over their bowels at two weeks should:
  - be assessed for other causes of incontinence, which should be treated if identified
  - have a documented, active plan of management
  - be referred for specialist treatments if the patient is able to participate in treatments

- only being discharged home with continuing incontinence after the carer (family member) or patient has been fully trained and adequate arrangements for continuing supply of continence aids and services are confirmed and in place.
- D Patients with troublesome constipation should:
- have a prescribed drug review to minimise use of constipating drugs
  - be given advice on diet, fluid intake and exercise
  - be offered oral laxatives
  - be offered rectal laxatives only if severe problems remain.

### 6.40.2 Evidence

- A Consensus
- B Consensus; Thomas *et al* 2008
- C Consensus; National Institute for Health and Clinical Excellence 2007; Coggrave *et al* 2006
- D Consensus; [www.cks.library.nhs.uk/Constipation/in\\_summary/scenario\\_adults](http://www.cks.library.nhs.uk/Constipation/in_summary/scenario_adults)

## 6.41 Swallowing problems: assessment and management

Swallowing difficulty (dysphagia) is common in stroke and can lead to food and/or fluid and/or saliva entering the airway (aspiration). This, in principle at least, increases the risk of aspiration pneumonia. Patients with swallowing problems may also have a reduced intake of fluid and food, and therefore are also at an increased risk of malnutrition. Lastly, patients with swallowing problems may avoid eating in social settings, and thus lose the physical and social pleasures normally associated with food. (See also 4.16.)

### 6.41.1 Recommendations

- A Every patient should have their ability to swallow screened and documented as soon as practical after stroke onset by a person with appropriate training using (if appropriate) a recognised, standard screening assessment (eg swallowing 50 mL of water).
- B Until a safe swallowing method has been established, all patients with identified swallowing difficulties should:
- receive hydration (and nutrition after 24–48 hours) by alternative means
  - be given their medication by the most appropriate route and in an appropriate form
  - have a comprehensive assessment of their swallowing function undertaken by a speech and language therapist or other appropriately trained professional with specialism in dysphagia
  - be considered for nasogastric tube feeding
  - be considered for the additional use of a nasal bridle if the nasogastric tube needs frequent replacement
  - have written guidance for all staff/carers to use when feeding or providing liquid.
- C Patients with difficulties in swallowing should be assessed by a speech and language therapist or other appropriately trained professional with specialism in dysphagia for active management of oral feeding by:
- sensory modification, such as altering taste and temperature of foods or carbonation of fluids
  - texture modification of solids and/or liquids.



- D Every patient who requires food or fluid of a modified consistency should:
  - be referred to a dietician or multidisciplinary nutrition team
  - have texture of modified food or liquids described using national agreed descriptors
  - have both fluid balance and nutrition monitored.
- E Patients with difficulties in self-feeding should be assessed and provided with the appropriate equipment to enable them to feed independently and safely.
- F Gastrostomy feeding should be considered for patients who:
  - need but are unable to tolerate nasogastric tube feeding within the first four weeks
  - are unable to swallow adequate amounts of food and fluid orally at four weeks
  - are at long-term high risk of malnutrition.
- G Instrumental direct investigation of oropharyngeal swallowing mechanisms (eg by video-fluoroscopy or flexible endoscopic evaluation of swallowing) should only be undertaken:
  - in conjunction with a speech and language therapist with specialism in dysphagia
  - if needed to direct an active treatment/rehabilitation technique for their swallowing difficulties, *or*
  - to investigate the nature and causes of aspiration.
- H Any patient unable to swallow food safely at one week after stroke should be considered for an oropharyngeal swallowing rehabilitation programme designed and monitored by a speech and language therapist with specialism in dysphagia. This should include one or more of:
  - compensatory strategies such as postural changes (eg chin tuck) or different swallowing manoeuvres (eg supraglottic swallow)
  - restorative strategies to improve oropharyngeal motor function (eg Shaker head lifting exercises)
- I Any patient discharged from specialist care services with continuing problems with swallowing food or liquid safely should:
  - be trained, or have carers trained, in the identification and management of swallowing difficulties
  - receive planned follow-up and reassessment of the swallowing difficulty.

### 6.41.2 Evidence

- A Hinchey 2005; Martino *et al* 2005; National Institute for Health and Clinical Excellence 2008
- B Dennis *et al* 2005; Koretz *et al* 2007; Royal College of Speech and Language Therapists 2006
- C Carnaby *et al* 2006
- D Royal College of Speech and Language Therapists and British Dietetic Association 2003; Consensus
- E Consensus
- F National Institute for Health and Clinical Excellence 2006; Dennis *et al* 2005
- G Royal College of Speech and Language Therapists 2007, 2008; Martino *et al* 2005; Carnaby *et al* 2006
- I Consensus

## 6.42 Oral health

Oral health refers to the promotion and maintenance of healthy teeth and gums, and a clean oral cavity. Oral health is important. Hospitalised patients with poor oral hygiene, decayed teeth

and feeding dependency are significantly more likely to develop chest infection. Poor oral health may increase the risk of poor nutrition. It is also likely to affect self-esteem. Poor oral health may follow from an inability to undertake mouth and dental cleaning, due to cognitive impairment, visuo-spatial neglect or upper limb weakness. It may be exacerbated by medication side-effects such as dry mouth, inadequate salivary control, and poor oral hygiene.

#### 6.42.1 Recommendations

- A All patients who are not swallowing, including those with tube feeding, should have oral and dental hygiene maintained (by the patient or carers) through regular (four hourly):
  - brushing of teeth, dentures and gums with a suitable cleaning agent (toothpaste or chlorhexidine gluconate dental gel)
  - removal of secretions.
- B All patients with dentures should have their dentures:
  - put in appropriately during the day
  - cleaned regularly
  - checked and if necessary replaced by a dentist if ill-fitting, damaged or lost.
- C All patients with swallowing difficulties and/or facial weakness who are taking food orally should be taught or helped to clean their teeth or dentures after each meal.
- D Staff or carers responsible for the care of patients disabled by stroke (in hospital, in residential and in home care settings) should be trained in:
  - assessment of oral hygiene
  - in selection and use of appropriate oral hygiene equipment and cleaning agents
  - provision of oral hygiene routines
  - recognition and management of swallowing difficulties.

#### 6.42.2 Evidence

- A (Brady *et al* 2006)
- B Consensus
- C Consensus
- D Consensus

### 6.43 Nutrition

Malnutrition, poor nutrition and dehydration are common after stroke, being present in up to 30% of patients. The risk of malnutrition increases with increasing hospital stay. Malnutrition and dehydration are associated with a worse outcome and a slower rate of recovery and stroke patients with dysphagia are more at risk due to the multiple impairments associated with difficulty/inability to eat and drink normally.

#### 6.43.1 Recommendations

- A All patients, when first assessed, should be screened for malnutrition and the risk of malnutrition by a trained person using a validated procedure (eg clinical judgement, the Malnutrition Universal Screening Tool (MUST)).
- B Screening for malnutrition should be repeated
  - weekly for hospital inpatients

- when there is clinical concern in all other patients.
- C Fluid balance should be monitored carefully when modified consistency drinks and enteral input are given.

### 6.43.2 Evidence

- A National Institute for Health and Clinical Excellence 2006; Mead *et al* 2006 (clinical assessment)
- B National Institute for Health and Clinical Excellence 2006
- C Consensus

## 6.44 Sexual dysfunction

Sexual dysfunction is common after stroke for many reasons: altered sensation, limited mobility, effect of drugs, mood changes etc. It can affect both men and women. It is often not considered in clinical practice.

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### 6.44.1 Recommendations

- A Every patient should be asked, at a time that seems appropriate, whether they have any concerns about their sexual functioning, and this discussion should be documented.
- B Any patient who has a limitation on sexual functioning and who wants further help should:
- be assessed for treatable causes
  - be assessed for the use of sildenafil or an equivalent drug, if suffering from erectile dysfunction
  - be advised about ways to overcome practical problems
  - be referred to a person with expertise in psychosexual problems.

### 6.44.2 Evidence

- A Consensus
- B Consensus; Melnik *et al* 2007

## 6.45 Drugs affecting recovery/reduction of impairment

After stroke, patients are often taking a wide variety of drugs for many and varied reasons such as controlling blood pressure, reducing pain, controlling blood glucose etc. Some of these drugs could potentially limit recovery or performance. Some drugs have been proposed as enhancing recovery. This section gives recommendations based on the evidence available. It only mentions drugs where some evidence is available, and inclusion or failure to be mentioned in the recommendations carries no implications concerning safety.

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### 6.45.1 Recommendations

- A The following drugs should not be given **with the goal of enhancing recovery** outside the context of clinical trials:
- amphetamines
  - bromocriptine and other dopamine agonists
  - piracetam

- meprobamate
  - fluoxetine and other selective serotonin reuptake inhibitor (SSRI) antidepressants (they may be given to treat other problems)
  - benzodiazepines
  - chlormethiazole.
- B Benzodiazepines and other minor tranquillisers, and other drugs with effects on the central nervous system, should be prescribed with caution.

#### 6.45.2 Evidence

- A Greener *et al* 2001, and many others in the evidence tables
- B Goldstein 1998; Paolucci *et al* 2006

### 6.46 Personal activities of daily living (dressing, washing etc)

This refers to a range of activities that usually depend on or involve mobility and manual dexterity – activities such as dressing, washing and feeding as well as using a toilet and bath or shower. In essence it refers to basic activities that would allow someone to live alone provided that more complex activities such as cooking and housework were undertaken by someone else during the day as needed.

#### 6.46.1 Recommendations

- A Every patient who has had a stroke should be assessed formally for their safety and independence in all personal activities of daily living by a therapist or nurse with the results recorded using a standardised assessment tool, preferably the Barthel Activities of Daily Living (ADL) Index.
- B Any person who has limitations on any aspect of personal activities, especially but not only if acquired as a result of this stroke, should:
- be referred to an occupational therapist with experience in neurological disability, *and*
  - be seen for further assessment within four working days of admission, *and*
  - have treatment of identified problems from the occupational therapist who should also guide and involve other members of a specialist multidisciplinary team.
- C Specific treatments that should be offered (according to need) include:
- the opportunity to practise activities in the most natural (home-like) setting possible
  - assessment for and provision of and training in the use of equipment and adaptations that increase safe independence
  - training of family and carers in helping the patient.

#### 6.46.2 Evidence

- A Consensus
- B Legg *et al* 2006; consensus

### 6.47 Extended activities of daily living (domestic and community)

The phrase ‘extended activities of daily living’ encompasses two domains: domestic activities and community activities. It refers to activities that allow complete independence socially, such as shopping, cooking and housework.

### 6.47.1 Recommendations

- A Any patient who has had a stroke should be asked to what extent previous extended activities have been limited by the stroke.
- B Any patient whose activities have been limited should be:
  - assessed by an occupational therapist with expertise in neurological disability
  - taught how to achieve activities safely and given opportunities to practise under supervision, if activities are potentially achievable
  - assessed for, provided with and taught how to use any adaptations or equipment needed to achieve safe activities.
- C Where a patient cannot undertake a necessary activity safely themselves, then alternative means of achieving the goal must be put in place to ensure safety and well-being.

### 6.47.2 Evidence

- A Consensus
- B Legg 2004; Logan *et al* 2004; Logan 2007
- C Consensus

## 6.48 Driving

Being able to drive is often essential to patients, both for practical reasons and because it influences self-esteem and mood. However, there are significant potential risks associated with driving after stroke. There is evidence that healthcare professionals often do not even discuss or give advice on driving and that, when they do, it is incorrect.

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### 6.48.1 Recommendations

- A Before they leave hospital (or the specialist outpatient clinic if not admitted), every person who has had a stroke or transient ischaemic attack should be asked whether they drive or wish to drive.
- B The person or team responsible for any patient who wishes to drive should:
  - ask about and identify any absolute bars to driving
  - consider the patient's capacity to drive safely
  - discuss driving and give advice to the patient
  - document the findings and conclusions, informing the GP and giving a written record to the patient.
- C Every healthcare professional giving advice on driving should ensure that it is accurate and up to date, and should consult the Driver and Vehicle Licensing Agency (DVLA) regulations ([www.dvla.gov.uk/media/pdf/medical/aagv1.pdf](http://www.dvla.gov.uk/media/pdf/medical/aagv1.pdf)).
- D Every person who has a stroke or transient ischaemic attack and who has a group 2 licence (eg heavy goods vehicle (HGV)) should be told that they must inform the DVLA and that they will not be allowed to drive under this licence for at least 12 months.
- E Every person who has a stroke or transient ischaemic attack and who has a group 1 licence (ie ordinary licence) should be told that they must not drive for a minimum of four weeks, and that a return to driving is dependent on satisfactory recovery.
- F Every person who has a stroke leaving them with a neurological deficit of any type (eg visual and cognitive impairments) should be told that they must inform the DVLA.

- G Any person who wishes to return to driving should be assessed for factors that preclude safe driving and disbar them, at least at the time, for example:
  - significant visual field defect or reduction in visual acuity (further specialist assessment should be sought if necessary)
  - any epileptic seizure within the last 12 months, excluding a seizure within the first 24 hours after stroke onset
  - disorders of focused attention, especially hemi-spatial neglect.
- H Any person who wishes to return to driving should be advised that:
  - they will need sufficient muscle control to control the car, with or without adaptations
  - they will also need sufficient cognitive ability to drive safely on a busy road
  - clinic-based assessments of cognitive skills may predict failure of an on-the-road assessment, but are of low predictive accuracy
  - advice on mechanical adaptations can be obtained from various sources
  - on-the-road assessments are the best way to assess ability if there is any doubt
  - they should inform their insurance company before returning to driving.
- I Any person who needs rehabilitation of driving skills should be offered driving-specific computer-based training.

#### 6.48.2 Evidence

- A Consensus
- B Consensus
- C [www.dvla.gov.uk/media/pdf/medical/aagv1.pdf](http://www.dvla.gov.uk/media/pdf/medical/aagv1.pdf)
- D [www.dvla.gov.uk/media/pdf/medical/aagv1.pdf](http://www.dvla.gov.uk/media/pdf/medical/aagv1.pdf)
- E [www.dvla.gov.uk/media/pdf/medical/aagv1.pdf](http://www.dvla.gov.uk/media/pdf/medical/aagv1.pdf)
- F [www.direct.gov.uk/en/Motoring/DriverLicensing/MedicalRulesForDrivers/DG\\_4022415](http://www.direct.gov.uk/en/Motoring/DriverLicensing/MedicalRulesForDrivers/DG_4022415)
- G [www.dvla.gov.uk/media/pdf/medical/aagv1.pdf](http://www.dvla.gov.uk/media/pdf/medical/aagv1.pdf)
- H Consensus
- I Mazer *et al* 2003; Akinwuntan *et al* 2005

### 6.49 Vocational activities

This refers to two related but often different classes of activity: productive work (paid or voluntary) and leisure activities (many of which are also productive). People who have a stroke are likely to have at least some and often many vocational activities.

#### 6.49.1 Recommendations

- A Every person should be asked about the vocational activities they undertook before the stroke.
- B Patients who wish to return to work (paid or unpaid employment) should:
  - have their work requirements established with their employer (provided the patient agrees)
  - be assessed cognitively, linguistically and practically to establish their potential
  - be advised on the most suitable time and way to return to work, if this is practical
  - be referred to a specialist in employment for people with disability if extra assistance or advice is needed (a disability employment advisor, in England).

- C Patients who wish to return to or take up a leisure activity should have their cognitive and practical skills assessed, and should be given advice and help in pursuing their activity if appropriate.

### 6.49.2 Evidence

- A Consensus; National Stroke Strategy Quality Markers 15 and 16
- B Consensus; National Stroke Strategy Quality Marker 16: 'People who have had a stroke and their carers are enabled to participate in paid, supported and voluntary employment.'
- C Consensus; National Stroke Strategy Quality Marker 15: 'People who have had a stroke, and their carers, are enabled to live a full life in the community.'

## 6.50 Social interaction – interpersonal relationships

This refers to interpersonal behaviour, and encompasses all aspects of communication (eg verbal, non-verbal etc) and also includes the style and consequences for others, for example dis-inhibited behaviour and aggressive behaviour. Though not commonly associated with stroke, it does occur and is more common after subarachnoid haemorrhage.

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### 6.50.1 Recommendations

- A Any patient whose style of social interaction after stroke is causing stress or distress to others should be assessed by a clinical psychologist and, if necessary, by others (eg a psychiatrist or a speech and language therapist) to determine the underlying causes.
- B Following the assessment:
  - the nature of the problems and their causes should be explained to the family, to other people in social contact and to the rehabilitation team
  - the patient should be helped to learn the best way to interact successfully without causing distress
  - all those involved in social interactions should be taught how best to respond to inappropriate or distressing behaviour
  - if any specific treatable cause is found, the treatment should be given (eg an antidepressant or an antipsychotic).

### 6.50.2 Evidence

- A Consensus
- B Consensus

## 6.51 Personal equipment and adaptations

Everyone uses objects during daily life – clothes, cutlery, cars, stairs etc. People with a disability may have specific difficulties in using objects or in moving around their environment. Sometimes special equipment or adaptations may enable them to have more autonomy, and/or to be safer. Often specialist equipment may become more widely used (eg remote controls for televisions) and the distinction between health-related equipment and normal choice is not always clear. This section refers to changes that are small and can move with the patient.

### 6.51.1 Recommendations

- A Every patient should have their need for specialist equipment assessed individually in relation to their particular limitations and environment, the need being judged against its effects on:
  - safety of the patient or other person during activity, *and/or*
  - independence of the patient undertaking activity, *and/or*
  - speed, ease or quality of activity being undertaken.
- B All aids, adaptations and equipment should be:
  - as appropriate as possible for the patient's physical and social context
  - of known safety and reliability
  - provided as soon as possible.
- C All people (patient or carers) using any equipment or aids should be:
  - trained in its safe and effective use
  - given details on who to contact, and how, in case problems arise.
- D The equipment should be reassessed regularly to check:
  - it is being used safely and effectively
  - it is still needed
  - it is still safe.
- E Equipment and aids for communication should be considered by an appropriate specialist.

### 6.51.2 Evidence

- A Consensus; Mann *et al* 1999; Logan *et al* 2004; Sackley *et al* 2006
- B Consensus; [www.audit-commission.gov.uk/Products/NATIONAL-REPORT/2103ACC1-7512-46a0-B74C-3D28724585FE/upequip02.pdf](http://www.audit-commission.gov.uk/Products/NATIONAL-REPORT/2103ACC1-7512-46a0-B74C-3D28724585FE/upequip02.pdf)
- C Consensus
- D Consensus; legal requirement
- E Consensus

## 6.52 Environmental equipment and adaptations

This refers primarily to larger-scale equipment or adaptations, such as providing specialist hoists, or adapting kitchens. The items are not likely to move with the patient.

### 6.52.1 Recommendations

- A Every patient leaving hospital (or who is at home and was not admitted) should be assessed and should have their home assessed to determine whether equipment or adaptations can increase safety or independence.
- B Prescription and provision of equipment should be based on a careful assessment of:
  - the patient and their particular impairments, *and*
  - the physical environment it is to be used in, *and*
  - the social environment it is to be used in.
- C All equipment supplied should be:
  - of known (certified) reliability and safety
  - checked at appropriate intervals.
- D The patient and/or carer(s) should be:



- trained in the safe and effective use of any equipment provided
  - given a contact point for future advice about or help with any equipment provided.
- E The clinical suitability and use of equipment provided should be reviewed at intervals.

### **6.52.2 Evidence**

- A Consensus; and as in 6.51.2A
- B Consensus; and as in 6.51.2B
- C Consensus
- D Consensus
- E Consensus

## 7 Long-term management, after recovery

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### 7.0 Introduction

This chapter covers matters that concern the long-term management of people after the active recovery phase is complete. This division between the recovery and long-term phases is based on the observation that in general recovery of independence is at its maximum at about six months. It must be stressed that this is not an absolute rule; some people, especially but not only younger people, may continue to improve after that time. In contrast, it must also be recognised that many people enter a stage of increasing dependence either due to recurrent stroke, or possibly due to aging and/or development of other disorders.

This chapter covers:

- ▶ monitoring disability and episodes of further rehabilitation
- ▶ long-term support/care at home
- ▶ patients in nursing homes/residential care
- ▶ carer support.

### 7.1 Further rehabilitation

Many patients wish to have rehabilitation therapy in the long term, either continuously or intermittently. However, it is neither practical nor best practice to continue therapy unless there is benefit to be gained; it wastes resources and maintains unrealistic expectations.

#### 7.1.1 Recommendations

- A Any patient whose situation changes (eg new problems or changed environment) should be offered further assessment by the specialist stroke rehabilitation service.
- B Any patient with residual impairment after the end of initial rehabilitation should be offered a formal review at least every six months, to consider whether further interventions are warranted, and should be referred for specialist assessment if:
  - new problems, not present when last seen by the specialist service, are present
  - the patient's physical state or social environment has changed.
- C Further therapy should only be given if clear goals are identified.

#### 7.1.2 Evidence

- A Consensus; National Stroke Strategy Quality Marker 14: 'This is followed by an annual health and social care check, which facilitates a clear pathway back to further specialist review, advice, information, support and rehabilitation where required.'
- B Consensus
- C Consensus; French *et al* 2007

### 7.2 Social participation

The ultimate goal of all healthcare is to help a person achieve the social participation that they want. Most healthcare focuses on improving a person's capacity to undertake activities, and

achieving wanted social roles also depends upon many other factors such as the availability of appropriate and accessible social settings, and people able and willing to interact. The greatest barrier is usually transport; after stroke many people have great difficulty in getting around outside their home.

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### 7.2.1 *Recommendation*

- A The rehabilitation service should establish with each patient specific social activities that they would like to undertake and should:
- advise the patient on the potential to undertake the necessary activities
  - identify any barriers to succeeding in the role, and advise the patient how to overcome those barriers
  - where appropriate make referral to community organisations (statutory and non-statutory) that can support the patient in fulfilling their wanted roles.
- B Local services should facilitate social participation by disabled people through:
- ensuring a suitable community transport system
  - organising or supporting venues for social activities able to accommodate disabled people, especially people with communication problems
  - organising or supporting social networks to support disabled people (eg through voluntary groups).

### 7.2.2 *Evidence*

- A Consensus; National Stroke Strategy Quality Marker 15: 'People who have had a stroke, and their carers, are enabled to live a full life in the community' and Quality Marker 13: 'A range of services are in place and easily accessible to support the individual long-term needs of individuals and their carers'.
- B Consensus; National Stroke Strategy as in A

## 7.3 **Support (practical and emotional)**

Many people need considerable care (support with activities) from other people after stroke, both for personal activities such as washing and dressing, and more so for domestic and community activities. Provision of this support is rarely the responsibility of the healthcare system, but healthcare teams do have a responsibility to identify and specify the support needs of each patient, and to help organise this support from the responsible organisations.

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### 7.3.1 *Recommendations*

- A Patients and their carers should have their individual practical and emotional support needs identified:
- when they leave hospital
  - when rehabilitation ends
  - at regular intervals thereafter.
- B Health and social services personnel should ensure that:
- any identified support needs are met somehow if at all possible
  - support services appropriate to the needs of the patient and carers are provided if they are the responsibility of statutory services

- patients are informed about organisations able to provide other needed services, and how to contact them
  - patients and carers receive all the financial and practical support that they are entitled to.
- C Health and social service organisations should ensure that accessing support and advice by and for disabled people is easy (eg through single points of access to all organisations).

### 7.3.2 Evidence

- A Consensus; National Stroke Strategy Quality Marker 13: 'A range of services are in place and easily accessible to support the individual long-term needs of individuals and their carers'.
- B Consensus; National Stroke Strategy
- C Consensus; National Stroke Strategy

## 7.4 Patients in residential care homes (including nursing homes)

Somewhere between 5% and 15% of patients are discharged into residential or nursing home care and, conversely, about 25% of nursing home residents have had a stroke. At present these patients rarely receive any attention from rehabilitation services; indeed, nursing home residents are not even provided with standard wheelchairs by the NHS.

### 7.4.1 Recommendations

- A All patients in nursing homes, care homes and residential homes should be able to receive assessment and treatment from specialist rehabilitation services.
- B All staff in nursing homes, care homes and residential homes should be familiar with the common clinical features of stroke and the optimal management of common impairments and activity limitations.

### 7.4.2 Evidence

- A Consensus; Sackley *et al*, 2006
- B Consensus; National Stroke Strategy Quality Markers 18 and 19: 'All people with stroke, and at risk of stroke, receive care from staff with the skills, competence and experience appropriate to meet their needs', and 'Commissioners and employers undertake a review of the current workforce and develop a plan supporting development and training to create a stroke-skilled workforce'.

### 7.4.3 Implications

The extent of unmet need in the nursing home population is unknown, but resource implications are likely. First, the need may be considerable, and not easily met within existing resources. Second, it will usually be more appropriate for staff from the service to visit the nursing home which has implications for travel and use of time. Third, in practice it would be difficult within a single home, both morally and practically, to restrict input to patients who have had a stroke when it is probable that many other patients would also need and benefit from expert rehabilitation assessment, advice and interventions.

## 7.5 Carers (informal, unpaid)

The word ‘carers’ can refer both to formal, paid carers (people with professional training) and to informal and unpaid carers – people such as family and friends who undertake care for a variety of reasons. This section is relevant to **informal (unpaid) carers**. Their role and their involvement with the person with a stroke is vital from the outset. However, the section on these carers is placed at the end because carers usually have the longest and the only constant and continuing relationship with the patient, long after most other services have stopped.

### 7.5.1 Recommendations

- A At all times the patient’s views on the involvement of their family and other carers should be sought, to establish if possible the extent to which the patient wants family members involved.
- B The carer(s) of every patient with a stroke should be involved with the management process from the outset, specifically:
  - as an additional source of important information about the patient both clinically and socially
  - being given accurate information about the stroke, its nature and prognosis and what to do in the event of a further stroke
  - being given emotional and practical support as required.
- C With the patient’s agreement, family carers should be involved in all important decisions, as the patient’s advocate if necessary.
- D During the rehabilitation phase, carers should be encouraged to participate in an educational programme that:
  - explains the nature of stroke and its consequences
  - teaches them how to provide care and support
  - gives them opportunities to practise care with the patient
  - emphasises and reiterates all advice on secondary prevention, especially lifestyle changes.
- E At the time of transfer of care to the home setting, the carer should:
  - be offered an assessment of their own support needs by social services
  - be offered the support identified as necessary
  - be given clear guidance on how to seek help if problems develop.
- F After the patient has returned to the home (or residential care) setting, the carer should:
  - have their need for information and support reassessed whenever there is a significant change in circumstances (eg if the health of either the patient or the carer deteriorates)
  - be reminded on a regular but not frequent basis of how they may seek further help and support.

### 7.5.2 Evidence

- A Consensus
- B Consensus
- C Consensus
- D Smith *et al* 2008
- E Consensus; National Stroke Strategy Quality Marker 12: ‘A workable, clear discharge plan that has fully involved the individual (and their family where appropriate) and responded to the individual’s particular circumstances and aspirations is developed by health and social care services, together with other services such as transport and housing’.
- F Consensus

# Profession-specific concise guidelines

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# Nursing Concise Guide for Stroke 2008

This concise guide contains recommendations extracted from the *National clinical guideline for stroke*, 3rd edition,<sup>1</sup> which contains over 300 recommendations covering almost every aspect of stroke management. The recommendations below, compiled by members of the National Stroke Nursing Forum, have direct implications for nursing practice and aim to provide nurses with ready access to the latest guidance.

Recommendations are given below with their number, so that they can be found in the main guideline. Recommendations that are taken from the National Institute for Health and Clinical Excellence (NICE) guideline<sup>2</sup> have a background tint.

## Overall organisation (3.1.1)

- C All hospitals receiving acute medical admissions that include patients with potential stroke should have a specialist acute stroke unit to monitor and regulate basic physiological functions such as blood glucose, oxygenation, and blood pressure.
- F There should be public and professional education programmes to increase awareness of stroke and the need for urgent diagnosis and treatment.

## Specialist stroke services (3.2.1)

- B All patients not suitable for transfer home after completion of their acute diagnosis and treatment should be treated in a specialist stroke rehabilitation unit which should fulfil the following criteria:
  - it should be a geographically identified unit
  - it should have a coordinated multidisciplinary team that meets at least once a week for the interchange of information about individual patients
  - the staff should have specialist expertise in stroke and rehabilitation
  - educational programmes and information are provided for staff, patients and carers.
- C All patients discharged home directly after acute treatment but with residual problems should be followed up by specialist stroke rehabilitation services at home.

## Resources (3.3.1)

- A Each acute stroke unit should have immediate access to:
  - nursing staff specifically trained and competent in the management of acute stroke, covering both its neurological and its general medical aspects.
- B Each stroke rehabilitation unit and service should be organised as a single team of staff with specialist knowledge and experience of stroke and neurological rehabilitation including:
  - consultant physician(s)
  - nurses
  - physiotherapists
  - occupational therapists
  - speech and language therapists
  - dietitians
  - clinical psychologists
  - social workers.
- C Each specialist stroke rehabilitation service should in addition:
  - have an education programme for all staff providing the stroke service
  - offer training for junior professionals in the specialty of stroke
  - have easy access to services supplying: pharmacy; orthotics; orthoptists, specialist seating; patient information, advice and support; and assistive devices.

**Transfers of care – general (3.6.1)**

- A All transfers between different teams and between different organisations should:
- occur at the appropriate time, without delay
  - not require the patient to provide again complex information already given
  - ensure that all relevant information is transferred, especially concerning medication
  - maintain a common set of patient-centred goals.

**Transfers of care – discharge from hospital (3.7.1)**

- A Hospital services should have a protocol, locally negotiated, to ensure that before discharge occurs:
- patients and families are fully prepared, and have been fully involved in planning discharge
  - patients and families are given information about and offered contact with appropriate statutory and voluntary agencies.
- G All patients should continue to have access to specialist stroke services after leaving hospital, and should know how to make contact.

**Quality improvement (governance, audit) (3.8.1)**

- D All clinicians should be involved in audit of stroke care and should use the results to plan and execute service improvements.

**Use of assessments/measures (3.10.1)**

A stroke rehabilitation service should:

- A agree on standard sets of data that should be collected and recorded routinely
- D train all staff in the recognition and management of emotional, communicative and cognitive problems
- F measure (change in) function at appropriate intervals.

**Goal setting (3.11.1)**

Every patient involved in the rehabilitation process should:

- A have their wishes and expectations established and acknowledged
- B participate in the process of setting goals unless they choose not to or are unable to participate because of the severity of their cognitive and linguistic impairments
- C be given help to understand the nature and process of goal setting, and be given help (eg using established tools) to define and articulate their personal goals.

**Rehabilitation treatment approach (3.12.1)**

All members of a stroke service should:

- A use an agreed consistent approach for each problem faced by a patient, ensuring the patient is given the same advice and taught the same technique to ameliorate or overcome it
- B give as much opportunity as possible for a patient to practise repeatedly and in different settings any tasks or activities that are affected
- C work within their own knowledge, skills, competence and limits in handling patients and using equipment, being taught safe and appropriate ways to move and handle specific patients if necessary.

**Rehabilitation treatment quantity (intensity of therapy) (3.13.1)**

- B The team should promote the practice of skills gained in therapy into the patient's daily routine in a consistent manner and patients should be enabled and encouraged to practise that activity as much as possible.

**End-of-life (palliative) care (3.14.1)**

- A Teams providing care for patients after stroke should be taught how to recognise patients who might benefit from palliative care.
- B All staff caring for people dying with a stroke should be trained in the principles and practice of palliative care.



**Medicines management (3.15.1)**

- A For every patient admitted to hospital, the clinical team should:
- obtain and confirm information about the patient's pre-existing medicine schedule (drug name, doses, timing/frequency, reason for taking)
  - continue all necessary drugs and dosage regimes unless contraindicated.
- B At all times, all patients should have existing and newly prescribed medication monitored for effectiveness and adverse effects.
- C On discharge from hospital:
- the patient's ability to take full responsibility for self-medication should be assessed, to include cognition, understanding, manual dexterity and ability to swallow.
- D Any patient prescribed a drug (new or continuation) should be given for each medication:
- information on the reasons for and adverse effects of the medication
  - information on how and when to take medication, including information about any specific interactions they should be aware of
  - information on what to do if a dose is missed
  - compliance aids, as needed or requested, taking into account factors such as cognitive ability, manual dexterity, personal preference and the home environment and safety concerns
  - information on whether a further prescription will be needed and, if so, on when and how to obtain it.

**Pre-admission diagnosis (4.1.1)**

- A In people with sudden onset of neurological symptoms a validated tool such as Face Arm Speech Test (FAST) should be used outside hospital to screen for a diagnosis of stroke or TIA.
- B In people with sudden onset of neurological symptoms, hypoglycaemia should be excluded as the cause of these symptoms.

- C People who are admitted to accident & emergency (A&E) with a suspected stroke or TIA should have the diagnosis established rapidly using a validated tool such as Recognition of Stroke in the Emergency Room (ROSIER).

**Initial diagnosis of acute transient event (4.2.1)**

- B People who have had a suspected TIA, that is, they have no neurological symptoms at the time of the assessment (within 24 hours), should be assessed as soon as possible for their risk of subsequent stroke using a scoring systems such as ABCD<sup>2</sup>.

**Immediate specific management of non-haemorrhagic stroke (4.6.1)**

- D Protocols should be in place for the delivery and management of thrombolysis, including post-thrombolysis complications.

**Immediate specific diagnosis and management of subarachnoid haemorrhage (4.8.1)**

- D After any immediate treatment, all patients should be observed for the development of treatable complications, especially hydrocephalus.

**Early phase medical care of stroke – physiological monitoring (4.12.1)**

- B The patient's physiological state should be monitored closely to include:
- blood glucose
  - blood pressure
  - oxygenation
  - nourishment and hydration
  - temperature.

**Early phase medical management – homeostasis (oxygen, glucose, blood pressure) (4.13.1)**

- A People who have had a stroke should receive supplemental oxygen only if their oxygen saturation drops below 95%. The routine use of supplemental oxygen is not recommended in people with acute stroke who are not hypoxic.

- B People with acute stroke should be treated to maintain a blood glucose concentration between 4 and 11 mmol/L.

#### Early positioning and mobilisation (4.15.1)

- A People with acute stroke should be mobilised as soon as possible (when their clinical condition permits) as part of an active management programme of a specialist stroke unit.
- B Every patient with mobility limitation should be assessed by a specialist to determine the most appropriate and safe methods of transfer and mobilisation.
- C People with acute stroke should be helped to sit up as soon as possible (when their condition permits).

#### Feeding: swallowing, hydration and nutrition (4.16.1)

- A On admission, people with acute stroke should have their swallowing screened by an appropriately trained healthcare professional before being given any oral food, fluid or medication.
- B If the admission screen indicates problems with swallowing, the person should have a specialist assessment of swallowing, preferably within 24 hours of admission and not more than 72 hours afterwards.
- D People with acute stroke who are unable to take adequate nutrition and fluids orally should:
  - receive tube feeding with a nasogastric tube within 24 hours of admission
  - be considered for a nasal bridge tube or gastrostomy if they are unable to tolerate a nasogastric tube
  - be referred to an appropriately trained healthcare professional for detailed nutritional assessment, individualised advice and monitoring.

#### Bowel and bladder (4.17.1)

- A The acute admitting ward should have a documented policy on detection and management of bowel and bladder function in the acute phase.
- B Patients should not have an indwelling (urethral) catheter inserted in the first 48 hours unless indicated to relieve urinary retention.

- C Urinary and faecal incontinence should be managed by high levels of nursing care in the acute phase.

#### Initial, early rehabilitation assessment (4.18.1)

- A All patients should be assessed within a few hours of admission for their:
  - ability to swallow, using a validated swallow screening test (eg 50-mL water swallow) administered by an appropriately trained person
  - immediate needs in relation to mobilisation, moving and handling
  - bladder control
  - risk of developing skin pressure ulcers
  - capacity to understand and follow instructions
  - nutritional status
  - ability to hear, and need for hearing aids
  - ability to see, and need for glasses.

#### Oral nutritional supplementation (4.19.1)\*

- A All hospital inpatients on admission should be screened for malnutrition and the risk of malnutrition. Screening should be repeated weekly for inpatients.

#### A personalised, comprehensive approach (5.2.1)

- A For each patient, an individualised and comprehensive strategy for stroke prevention should:
  - be implemented as soon as possible following a TIA or stroke
  - continue long term.
- B For each patient, information about stroke and risk factors should be:
  - given first in the hospital setting
  - reinforced at every opportunity by all health professionals involved in the care of the patient
  - provided in an appropriate format for the patient, taking into account both their stroke-specific impairments and their personal situation.

\*This recommendation is taken from a NICE guideline on nutrition.<sup>3</sup>

- C Patients should have their risk factors reviewed and monitored regularly in primary care, at a minimum on a yearly basis.
- D All patients receiving medication for secondary prevention should:
- be given information about the reason for the medication, how and when to take it and any possible common side effects
  - receive verbal and written information about their medicines in a format appropriate to their needs and abilities
  - have compliance aids such as large-print labels and non-childproof tops provided, according to their level of manual dexterity, cognitive impairment and personal preference and compatible with safety in the home environment
  - be aware how to obtain further supplies of medication
  - have a regular review of their medication.
- D All patients should be advised to reduce and replace saturated fats in their diet with polyunsaturated or monounsaturated fats by:
- using low-fat dairy products
  - replacing butter and lard with products based on vegetable and plant oils
  - reducing meat intake.
- E Patients who are overweight or obese (as determined by body mass index (BMI) or waist:hip measurement ratio) should be offered:
- advice and support to aid weight loss, which may include diet, behavioural therapy and physical activity
  - medication to aid weight loss only after dietary advice and exercise has been started and evaluated.
- F All patients, but especially patients with hypertension, should be advised to reduce their salt intake by:
- not adding salt to food
  - using as little as possible in cooking
  - choosing lower sodium/salt foods.

### Lifestyle measures (5.3.1)

- A All patients who smoke should be advised to stop smoking:
- Smoking cessation should be promoted at every opportunity using individualised strategies which may include pharmacological agents and/or psychological support.
- B All patients should be advised to take regular exercise as far as they are able:
- The aim should be to achieve moderate physical activity (sufficient to become slightly breathless) for 20–30 minutes each day.
  - Exercise programmes should be considered, and tailored to the individual following appropriate assessment, starting with low intensity physical activity and gradually increasing to moderate levels.
- C All patients should be advised to eat the optimum diet:
- eating five or more portions of fruit and vegetables per day
  - eating two portions of fish per week, one of which should be oily (salmon, trout, herring, pilchards, sardines, fresh tuna).
- G Patients who drink alcohol should be advised to keep within recognised safe drinking limits of no more than three units per day for men and two units per day for women.
- H Patients should be advised that there is no evidence that oral vitamin supplementation will reduce the risk of stroke or other vascular events.

### Blood pressure (5.4.1)

- A All patients should have their blood pressure checked, and should be treated in keeping with national guidelines:
- an optimal target blood pressure (BP) for patients with established cardiovascular disease is 130/80 mmHg
  - for patients known to have bilateral severe (>70%) internal carotid artery stenosis a slightly higher target (eg systolic BP of 150 mmHg) may be appropriate.

**General principles of rehabilitation (6.1.1)**

- A All patients entering a period of active rehabilitation should be screened for common impairments using locally agreed tools and protocols.
- B Patients should always be informed of realistic prospects of recovery or success and should always have realistic goals set.

**Evaluating and stopping treatments (6.2.1)**

- A Every patient should have their progress measured against goals set at regular intervals determined by the patient's rate of change, for example using goal attainment scaling.

**Positioning (6.11.1)**

- A Nurses and care staff should be given training on how to position patients who cannot position themselves after stroke.
- B When lying and when sitting, patients should be put in positions that minimise the risk of complications such as aspiration and other respiratory complications, shoulder pain, contractures, and skin pressure ulceration.

**Shoulder pain and subluxation (6.22.1)**

- A Every patient with significant functional loss in their arm should have the risk of developing shoulder pain reduced by:
  - ensuring that everybody handles the weak arm correctly, avoiding mechanical stress (excessive range of movement, tension).
- B Every patient with arm weakness should be asked about shoulder pain, initially on most days and then less frequently.
- C Every patient who develops shoulder pain should:
  - be offered regular simple analgesia (eg paracetamol, non-steroidal anti-inflammatory drugs).

**Neuropathic pain (central post-stroke pain) (6.23.1)**

- A Every patient should be asked whether they are experiencing pain as a result of the stroke, and this question should be asked again after a few weeks.

**Musculo-skeletal pain (6.24.1)**

- D Any patient continuing to experience pain should be offered pharmacological treatment with simple analgesic drugs taken regularly:
  - paracetamol, up to 1 g four times daily
  - non-steroidal anti-inflammatory drugs (with gastric protection only if needed)
  - codeine and similar morphine derivatives.
- E Any patient whose pain is still not adequately controlled should be referred to a specialist in pain management.

**Depression (6.25.1)**

- A Every patient entering rehabilitation should be screened for depression using a validated simple screening test (eg asking 'Do you feel depressed?' or the GHQ-12 or PHQ-9 questionnaire). In addition:
  - mood should also be assessed at later times, especially after stopping active rehabilitation or if depression is suspected
  - screening tests such as 'smiley faces' or observational criteria alone should not be relied upon as the sole means of initial diagnosis
  - questionnaires may be simplified to a *yes/no* format for people with communication difficulties
  - the patient's past should be investigated for any history of mood disturbance.
- C Any patient with depressed mood should be provided with appropriate information and advice.

**Anxiety (6.26.1)**

- A Every patient entering the rehabilitation phase should be screened for anxiety, usually simply

by asking about the patient's concerns or asking family members.

### Mental capacity (decision making by the patient) (6.35.1)

- A All patients should be assumed to have the capacity to make decisions on their own care unless demonstrated otherwise.
- B The patient's mental capacity should specifically be considered and documented when they are being asked to agree to a procedure that involves significant risk, noting that **judgements on capacity must relate to the specific decision being made.**

### Bowel and bladder impairment (6.40.1)

- A All wards and stroke units should have established assessment and management protocols for both urinary and faecal incontinence, and for constipation.
- B All patients with loss of control of the bladder at two weeks should:
  - be reassessed for other causes of incontinence, which should be treated if identified
  - have an active plan of management documented
  - be offered simple treatments such as bladder retraining, pelvic floor exercises and external equipment first
  - only be given an indwelling urethral catheter after other methods of management have failed
  - only be discharged home with continuing incontinence after the carer (family member) or patient has been fully trained and adequate arrangements for continuing supply of continence aids and services are confirmed and in place.
- C All patients with a loss of control over their bowels at two weeks should:
  - be assessed for other causes of incontinence, which should be treated if identified
  - have a documented, active plan of management

- be referred for specialist treatments if the patient is able to participate in treatments
- only be discharged home with continuing incontinence after the carer (family member) or patient has been fully trained and adequate arrangements for continuing supply of continence aids and services are confirmed and in place.

- D Patients with troublesome constipation should:
  - have a prescribed drug review to minimise use of constipating drugs
  - be given general advice on diet, fluid intake and exercise
  - be offered oral laxatives
  - be offered rectal laxatives only if severe problems remain.

### Swallowing problems: assessment and management (6.41.1)

- A Every patient should have their ability to swallow screened and documented as soon as is practical after stroke onset by a person with appropriate training using (if appropriate) a recognised, standard screening assessment (eg swallowing 50 mL of water).
- B Until a safe swallowing method has been established, all patients with identified swallowing difficulties should:
  - receive hydration (and nutrition after 24–48 hours) by alternative means
  - be given their medication by the most appropriate route and in an appropriate form
  - be considered for nasogastric tube feeding,

### Oral health (6.42.1)

- A All patients who are not swallowing, including those with tube feeding, should have oral and dental hygiene maintained (by the patient or carers) through regular (four-hourly):
  - brushing of teeth, dentures and gums with a suitable cleaning agent (toothpaste or chlorhexidene gluconate dental gel)
  - removal of secretions.



- B All patients with dentures should have their dentures:
- put in appropriately during the day
  - cleaned regularly
  - checked and if necessary replaced by a dentist if they are ill-fitting, damaged or lost.
- C All patients with swallowing difficulties and/or facial weakness who are taking food orally should be taught or helped to clean their teeth or dentures after each meal.
- D Staff or carers responsible for the care of patients disabled by stroke anywhere (in hospital, in residential and in home care settings) should be trained in:
- assessment of oral hygiene
  - in selection and use of appropriate oral hygiene equipment and cleaning agents
  - recognition and management of swallowing difficulties.

### Nutrition (6.43.1)

- A All patients, when first assessed, should be screened for malnutrition and the risk of malnutrition by a trained person using a validated procedure (eg clinical judgement, the Malnutrition Universal Screening Tool (MUST)).
- B Screening for malnutrition should be repeated
- weekly for hospital inpatients
  - when there is clinical concern in all other patients.
- C Fluid balance should be monitored carefully when modified consistency drinks and enteral input are given.

### Sexual dysfunction (6.44.1)

- A Every patient should be asked, at a time that seems appropriate, whether they have any concerns about their sexual functioning, and this should be documented.
- B Any patient who has a limitation on sexual functioning and who wants further help should:
- be assessed for treatable causes

- be assessed for the use of sildenafil or an equivalent drug, if suffering from erectile dysfunction
- be advised about ways to overcome practical problems
- be referred to a person with expertise in psychosexual problems.

### Personal activities of daily living (dressing, washing etc) (6.46.1)

- A Every patient who has had a stroke should be assessed formally for their safety and independence in all personal activities of daily living by a therapist or nurse with the results recorded using a standardised assessment tool, preferably the Barthel Activities of Daily Living (ADL) index.

### Extended activities of daily living (domestic and community) (6.47.1)

- A Any patient who has had a stroke should be asked to what extent previous extended activities have been limited by the stroke.

### Driving (6.48.1)

- A Before they leave hospital (or the specialist outpatient clinic if not admitted), every person who has had a stroke or transient ischaemic attack should be asked whether they drive or wish to drive.

### Vocational activities (6.49.1)

- A Every person should be asked about the vocational activities they undertook before the stroke.

### Further rehabilitation (7.1.1)

- A Any patient whose situation changes (eg new problems or changed environment) should be offered further assessment by the specialist stroke rehabilitation service.

### Patients in residential care homes (including nursing homes) (7.4.1)

- A All patients in nursing homes, care home and residential homes should be able to receive

assessment and treatment from specialist rehabilitation services.

- B All staff in nursing homes, care homes and residential homes should be familiar with the common clinical features of stroke and the optimal management of common impairments and activity limitations.

### Carers (informal, unpaid) (7.5.1)

- A At all times the patient's views on the involvement of their family and other carers should be sought, to establish if possible the extent to which the patient wants family members involved.
- F After the patient has returned to the home (or residential care) setting, the carer should:
- have their need for information and support reassessed whenever there is a significant change in circumstances (eg if the health of either the patient or the carer deteriorates)
  - be reminded of how they may seek further help and support on a regular but not frequent basis.

### References

- 1 Intercollegiate Stroke Working Party. *National clinical guideline for stroke*, 3rd edition. London: Royal College of Physicians, 2008.
- 2 National Collaborating Centre for Chronic Conditions (funded by the National Institute for Health and Clinical Excellence (NICE) to produce guidelines for the NHS). *Stroke: national clinical guideline for diagnosis and initial management of acute stroke and transient ischaemic attack (TIA)*. London: Royal College of Physicians, 2008.
- 3 National Institute for Health and Clinical Excellence. *Nutrition support in adults: oral nutrition support, enteral tube feeding and parenteral nutrition*, NICE clinical guideline no 32. London: NICE, 2008.

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# Nutrition and Dietetics Concise Guide for Stroke 2008

This concise guide contains recommendations extracted from the *National clinical guideline for stroke*, 3rd edition,<sup>1</sup> which contains over 300 recommendations covering almost every aspect of stroke management. The recommendations below have direct implications for dietitians and aim to provide them with ready access to the latest guidance.

Recommendations are given below with their number, so that they can be found in the main guideline. Recommendations that are taken from the National Institute for Health and Clinical Excellence (NICE) guideline<sup>2</sup> have a background tint.

## Quality improvement (governance, audit) (3.8.1)

- D All clinicians should be involved in audit of stroke care and should use the results to plan and execute service improvements.

## Service development (3.9.1)

- A The views of stroke patients and their carers should be considered when evaluating a service; one method that should be used is to ask about their experiences and what specific aspects of a service need improvement.

## Feeding: swallowing, hydration and nutrition (4.16.1)\*

- A On admission, people with acute stroke should have their swallowing screened by an appropriately trained healthcare professional before being given any oral food, fluid or medication.
- B If the admission screen indicates problems with swallowing, the person should have a specialist assessment of swallowing, preferably within 24 hours of admission and not more than 72 hours afterwards.
- C People with suspected aspiration on specialist assessment or who require tube feeding or dietary modification for three days should be:

- reassessed and considered for instrumental examination
- referred for dietary advice.

- D People with acute stroke who are unable to take adequate nutrition and fluids orally should:
- receive tube feeding with a nasogastric tube within 24 hours of admission
  - be considered for a nasal bridge tube or gastrostomy if they are unable to tolerate a nasogastric tube
  - be referred to an appropriately trained healthcare professional for detailed nutritional assessment, individualised advice and monitoring.
- E Nutrition support should be initiated for people with stroke who are at risk of malnutrition. This may include oral nutrition supplements, specialist dietary advice and/or tube feeding.
- F All people with acute stroke should have their hydration assessed on admission, reviewed regularly and managed so that normal hydration is maintained.
- G In people with dysphagia, food and fluids should be given in a form that can be swallowed without aspiration following specialist assessment of swallowing.

\* These recommendations are in the NICE stroke guideline<sup>2</sup> and in the NICE guideline on nutrition support in adults.<sup>3</sup>



**Initial, early rehabilitation assessment (4.18.1)**

- A All patients should be assessed within a few hours of admission for their:
- ability to swallow, using a validated swallow screening test (eg 50-ml water swallow) administered by an appropriately trained person
  - immediate needs in relation to mobilisation, moving and handling
  - bladder control
  - risk of developing skin pressure ulcers
  - capacity to understand and follow instructions
  - nutritional status
  - ability to hear, and need for hearing aids
  - ability to see, and need for glasses.
- B All patients with any impairment at 24 hours should receive a full multidisciplinary assessment using an agreed procedure or protocol within five working days, and this should be documented in the notes.

**Oral nutritional supplementation (4.19.2)\***

- A All hospital inpatients on admission should be screened for malnutrition and the risk of malnutrition. Screening should be repeated weekly for inpatients.
- B Screening should assess body mass index (BMI) and percentage unintentional weight loss and should also consider the time over which nutrient intake has been unintentionally reduced and/or the likelihood of future impaired nutrient intake. The Malnutrition Universal Screening Tool (MUST; Malnutrition Advisory Group 2003),<sup>4</sup> for example, may be used to do this.
- C When screening for malnutrition and the risk of malnutrition, healthcare professionals should be aware that dysphagia, poor oral health and reduced ability to self-feed will affect nutrition in people with stroke.
- D Screening for malnutrition and the risk of malnutrition should be carried out by healthcare professionals with appropriate skills and training.

\* These recommendations are in the NICE stroke guideline<sup>2</sup> and the NICE guideline on nutrition support in adults.<sup>3</sup>

**Lifestyle measures (5.3.1)**

- C All patients should be advised to eat the optimum diet:
- eating five or more portions of fruit and vegetables per day
  - eating two portions of fish per week, one of which should be oily (salmon, trout, herring, pilchards, sardines, fresh tuna).
- D All patients should be advised to reduce and replace saturated fats in their diet with polyunsaturated or monounsaturated fats by:
- using low-fat dairy products
  - replacing butter and lard with products based on vegetable and plant oils
  - reducing meat intake.
- E Patients who are overweight or obese (as determined by body mass index (BMI) or waist:hip measurement ratio) should be offered:
- advice and support to aid weight loss, which may include diet, behavioural therapy and physical activity
  - medication to aid weight loss only after dietary advice and exercise has been started and evaluated.
- F All patients, but especially patients with hypertension, should be advised to reduce their salt intake by:
- not adding salt to food
  - using as little as possible in cooking
  - choosing lower sodium/salt foods.
- G Patients who drink alcohol should be advised to keep within recognised safe drinking limits of no more than three units per day for men and two units per day for women.
- H All patients should be advised that there is no evidence that oral vitamin supplementation will reduce the risk of stroke or other vascular events.

**Mental capacity (decision making by the patient) (6.35.1)**

- A All patients should be assumed to have the capacity to make decisions on their own care unless demonstrated otherwise.

- B The patient's mental capacity should specifically be considered and documented when they are being asked to agree to a procedure that involves significant risk, noting that **judgements on capacity must relate to the specific decision being made.**
- C In cases of doubt the clinician should determine that the answer to all four of the questions below is positive before concluding that the patient has competence:
- Does the patient understand the information relevant to the decision?
  - Has the patient retained the information relevant to the decision?
  - Can the patient use, or weigh up the information when making a decision?
  - Can the patient communicate their decision by some reliable means?
- D In patients where the answer to one or more of the above questions is negative or uncertain:
- all attempts should be made to overcome the lack of capacity (eg asking a speech therapist to help with communication)
  - a second opinion should be sought if there is doubt or if assistance is needed.
- E For any patient judged not to have capacity any decision that can be postponed until the patient might have regained capacity should be postponed.
- F If the patient does not have capacity **and** if the decision cannot be postponed, then the clinical team should act in the patient's best interests.
- G The capacity of the patient to make decisions should be reviewed at an appropriate interval which will be dependent on the clinical situation.
- be given their medication by the most appropriate route and in an appropriate form
  - have a comprehensive assessment of their swallowing function undertaken by a speech and language therapist or other appropriately trained professional with specialism in dysphagia
  - be considered for nasogastric tube feeding
  - be considered for the additional use of a nasal bridle if the nasogastric tube needs frequent replacement
  - have written guidance for all staff/carers to use when feeding or providing liquid.
- C Patients with difficulties in swallowing their normal diet should be assessed by a speech and language therapist or other appropriately trained professional with specialism in dysphagia for active management of oral feeding by:
- sensory modification, such as altering taste and temperature of foods or carbonation of fluids
  - texture modification of solids and/or liquids.
- D Every patient who requires food or fluid of a modified consistency should:
- be referred to a dietician or multidisciplinary nutrition team
  - have texture of modified food or liquids described using nationally agreed descriptors
  - have fluid balance and nutrition monitored.
- E Patients with difficulties in self-feeding should be assessed and provided with the appropriate equipment to enable them to feed independently and safely.
- F Gastrostomy feeding should be considered for patients who:
- need but are unable to tolerate nasogastric tube feeding within the first four weeks
  - are unable to swallow adequate food and fluid orally at 4 weeks
  - are at long-term high risk of malnutrition.
- G Instrumental direct investigation of oropharyngeal swallowing mechanisms (eg by videofluoroscopy or flexible endoscopic

### Swallowing problems: assessment and management (6.41.1)

- B Until a safe swallowing method has been established, all patients with identified swallowing difficulties should:
- receive hydration (and nutrition after 24–48 hours) by alternative means

evaluation of swallowing) should only be undertaken:

- in conjunction with a speech and language therapist with a specialism in dysphagia
- if needed to direct an active treatment/rehabilitation technique for their swallowing difficulties, *or*
- to investigate the nature and causes of aspiration.

- I Any patient discharged from specialist care services with continuing problems with swallowing food or liquid safely should:
- be trained, or have carers trained, in the identification and management of swallowing difficulties
  - receive planned follow-up and reassessment of the swallowing difficulty

### Oral health (6.42.1)

- A All patients who are not swallowing, including those with tube feeding, should have oral and dental hygiene maintained (by the patient or carers) through regular (4-hourly):
- brushing of teeth, dentures and gums with a suitable cleaning agent (toothpaste or chlorhexidine gluconate dental gel)
  - removal of secretions.
- B All patients with dentures should have their dentures:
- put in appropriately during the day
  - cleaned regularly
  - checked and if necessary replaced by a dentist if ill-fitting, damaged or lost.

### Nutrition (6.43.1)

- C Fluid balance should be monitored carefully when modified consistency drinks and enteral input are given.

### References

- 1 Intercollegiate Stroke Working Party. *National clinical guideline for stroke*, 3rd edition. London: Royal College of Physicians, 2008.
- 2 National Collaborating Centre for Chronic Conditions (funded by the National Institute for Health and Clinical Excellence (NICE) to produce guidelines for the NHS). *Stroke: national clinical*

*guideline for diagnosis and initial management of acute stroke and transient ischaemic attack (TIA)*. London: Royal College of Physicians, 2008.

- 3 National Institute for Health and Clinical Excellence. *Nutrition support in adults: oral nutrition support, enteral tube feeding and parenteral nutrition*, NICE clinical guideline no 32. London: NICE, 2008.
- 4 Malnutrition Advisory Group. *The MUST report: nutritional screening of adults: a multidisciplinary responsibility*. [www.bapen.org.uk/must\\_tool.html](http://www.bapen.org.uk/must_tool.html)

### Contact

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# Occupational Therapy Concise Guide for Stroke 2008

This concise guide contains recommendations extracted from the *National clinical guideline for stroke*, 3rd edition,<sup>1</sup> which contains over 300 recommendations covering almost every aspect of stroke management. The recommendations in this document have direct implications for occupational therapy and aim to provide occupational therapists with ready access to the latest guidance. They are given below with their number, so that they can be found in the main guideline.

This concise guide was compiled by Dr Judi Edmans and Dr Avril Drummond who represent the College of Occupational Therapists (COT) and the COT specialist section Neurological Practice.

## Transfers of care – general (3.6.1)

- A All transfers between different teams and organisations should:
- occur at the appropriate time, without delay
  - not require the patient to again provide complex information already given
  - ensure that all relevant information is transferred, especially concerning medication
  - maintain a common set of patient-centred goals.
- B All organisations and teams regularly involved in seeing patients after stroke should use:
- a common, agreed set of data collection tools (measures and assessments)
  - a common, agreed terminology
  - a common, agreed document layout (structure) and content.
- C Patients should be
- involved in making decisions about their transfer
  - offered copies of transfer documents.
- patients and families are fully prepared, and have been fully involved in planning discharge
  - general practitioners, primary healthcare teams and social services departments (adult services) are all informed before or at the time of discharge
  - all equipment and support services necessary for a safe discharge are in place
  - any continuing treatment required will be provided without delay by an appropriate specialist service
  - patients and families are given information about and offered contact with appropriate statutory and voluntary agencies.
- B Patients should only be discharged early (before the end of acute rehabilitation) from hospital if there is a specialist stroke rehabilitation team able to continue rehabilitation in the community from the day of transfer and if the patient is able to transfer safely from bed to chair and if other problems can be safely managed at home.
- C Patients being discharged who remain dependent in some personal activities (eg dressing, toileting) should be offered a transition package of:

## Transfers of care – discharge from hospital (3.7.1)

- A Hospital services should have a protocol, locally negotiated, to ensure that before discharge occurs:
- pre-discharge visits (eg at weekends)
  - individual training and education for their carers/family
  - telephone counselling support for three months.

- D Before discharge of a patient who remains dependent in some activities, the patient's home environment should be assessed and optimised, usually by a home visit with an occupational therapist.
- E Patients should not be discharged early from hospital to generic (non-specialist) community services (including both home and community hospitals) unless there is continuing active involvement by the specialist stroke service.
- F Carers of patients unable to transfer independently should receive training in moving and handling and the use of any equipment provided until they are demonstrably able to transfer and position the patient safely in the home environment.
- G All patients should continue to have access to specialist stroke services after leaving hospital, and should know how to make contact.

### Rehabilitation treatment approach (3.12.1)

All members of a stroke service should:

- A use an agreed consistent approach for each problem faced by a patient, ensuring the patient is given the same advice and taught the same technique to ameliorate or overcome it
- B give as much opportunity as possible for a patient to practise repeatedly and in different settings any tasks or activities that are affected
- C work within their own knowledge, skills, competence and limits in handling patients and using equipment, being taught safe and appropriate ways to move and handle specific patients if necessary.

### Rehabilitation treatment quantity (intensity of therapy) (3.13.1)

- A Patients should undergo as much therapy appropriate to their needs as they are willing and able to tolerate and in the early stages they should receive a minimum of 45 minutes daily of any therapy that is required.
- B The team should promote the practice of skills gained in therapy into the patient's daily routine in a consistent manner and patients

should be enabled and encouraged to practise that activity as much as possible.

- C Therapy assistants may facilitate practice but should work under the guidance of a qualified therapist.

### General principles of rehabilitation (6.1.1)

- A All patients entering a period of active rehabilitation should be screened for common impairments using locally agreed tools and protocols.
- B Patients should always be informed of realistic prospects of recovery or success and should always have realistic goals set.
- C Specific treatments should only be undertaken in the context of and after considering the overall goals of rehabilitation and potential interaction with other treatments.
- D For any treatments that involve significant risk/discomfort to the patient and/or resource use, specific goals should be set and monitored using appropriate clinical measures such as numerical rating scales, visual analogue scales, goal attainment scaling or a standardised measure appropriate for the impairment.
- E The nature and consequences of a patient's impairment should always be explained to the patient (and to their family), and if necessary and possible they should be taught strategies or offered treatments to overcome or compensate for any impairment affecting activities or safety, or causing distress.

### Evaluating and stopping treatments (6.2.1)

- A Every patient should have their progress measured against goals set at regular intervals determined by the patient's rate of change, for example using goal attainment scaling.
- B When a patient's goal is not achieved, the reason(s) should be established and:
  - the goal should be adjusted, *or*
  - the intervention should be adjusted, *or*
  - no further intervention should be given towards that goal.
- C When a therapist or team stops giving rehabilitation, the therapist or service should:



- discuss the reasons for this decision with the patient
- ensure that any continuing support the patient needs to maintain and/or improve health is provided
- teach the patient and, if necessary, carers and family how to maintain health
- provide clear instructions on how to contact the service for reassessment, and
- outline what specific events or changes should trigger further contact.

### Splinting and stretching (to prevent and treat contractures) (6.14.1)

- A Any patient who has increased tone sufficient to reduce passive or active movement around a joint should have their range of passive joint movement assessed as a prelude to starting preventative actions.
- B Any patient whose range of movement at a joint is reduced or at risk of becoming reduced should have a programme of passive stretching of all affected joints on a daily basis and the programme should be taught to the patient and/or carers.
- C Inflatable arm splints enveloping the hand, forearm and elbow, and resting wrist and hand splints should not be used routinely.
- D If stretching alone does not control contractures, serial casting around a joint should be considered as a treatment for reducing contractures.

### Task-specific training (6.16.1)

- A Task-specific training should be used to improve aspects of activities of daily living and mobility:
- standing up and sitting down
  - gait speed and gait endurance.

### Depression (6.25.1)

- A Every patient entering rehabilitation should be screened for depression using a validated simple screening test (eg asking 'Do you feel depressed?' or the General Health Questionnaire (GHQ-12 or PHQ-9).

In addition:

- mood should also be assessed at later times, especially after stopping active rehabilitation or if depression is suspected
- screening tests such as 'smiley faces' or observational criteria alone should not be relied upon as the sole means of initial diagnosis
- questionnaires may be simplified to a *yes/no* format for people with communication difficulties
- the patient's past should be investigated for any history of mood disturbance.

- B In people with aphasia and other impairments complicating assessment of mood, careful observations over time (including response to a trial of antidepressant medication if considered necessary) should be used.
- C Any patient with depressed mood should be provided with appropriate information and advice.
- D Any patient who has depression sufficient to cause distress and/or to impede rehabilitation should be assessed clinically for further treatment by an expert (eg clinical psychologist, appropriately trained physician, psychiatrist).
- E Any patient considered to have depression should be screened for anxiety and emotionalism.
- F Patients with minor depression should be monitored for progression and worsening and should be especially involved in one or more of:
- increased social interaction
  - increased exercise
  - goal setting
  - other psychosocial interventions (eg using voluntary sector resources).
- G Patients whose depression is more severe or persistent should be offered one or more of:
- antidepressant drug treatment
  - psychological therapy given by an appropriately trained and supervised practitioner
  - interventions to reduce any contributory factors such as pain and social isolation (eg attending voluntary sector stroke groups).

**Anxiety (6.26.1)**

- A Every patient entering the rehabilitation phase should be screened for anxiety, usually simply by asking about the patient's concerns or asking family members.
- B Any patient with anxiety should have the cause(s) established, and should be provided with appropriate information and advice.
- C Any patient whose anxiety is impeding their recovery and rehabilitation or causing distress should be:
  - assessed and considered for psychological treatment, for example desensitisation or cognitive behavioural therapy
  - screened for emotionalism and depression.

**Cognitive impairments – general (6.28.1)**

- A Routine screening should be undertaken to identify the range of cognitive impairments that may occur.
- B Any patient not progressing as expected in rehabilitation should have a more detailed cognitive assessment to determine whether cognitive losses are causing specific problems or hindering progress.
- C The patient's cognitive status should be taken into account by all members of the multidisciplinary team when planning and delivering treatment.
- D Planning for discharge from hospital should include an assessment of any safety risks from persisting cognitive impairments.
- E People returning to cognitively demanding activities (eg some work, driving) should have their cognition assessed formally prior to returning to the activity.

**Attention and concentration (6.29.1)**

- A Any person after stroke who appears easily distracted or unable to concentrate should have their abilities to focus, sustain and divide their attention formally assessed.
- B Any person with impaired attention should have cognitive demands reduced through:
  - having shorter treatment sessions
  - taking planned rests
  - reducing background distractions
  - avoiding work when tired.

- C Any person with impaired attention should:
  - be taught strategies to compensate for reduced attention
  - receive repeated practice of activities they are learning.

**Memory (6.30.1)**

- A Patients who complain of marked memory impairment and patients clinically considered to have difficulty in learning and remembering should have their memory assessed formally using a standardised measure such as the Rivermead Behavioural Memory Test.
- B Any patient found to have memory impairment causing difficulties in rehabilitation or undertaking activities should:
  - be assessed medically to check that there is not another treatable cause or contributing factor (eg hypothyroidism)
  - have their profile of impaired and preserved memory abilities determined
  - have their nursing and therapy sessions altered to use techniques which capitalise on preserved abilities
  - be taught compensatory techniques to reduce their disabilities, such as using notebooks, diaries, audiotapes and electronic organisers and audio alarms
  - be taught approaches aimed at directly improving their memory
  - have therapy delivered in an environment that is as like the usual environment for that patient as possible.

**Spatial awareness (eg neglect) (6.31.1)**

- A Any patient with a stroke affecting the right hemisphere should be considered at risk of reduced awareness on the left, and should be tested formally if this is suspected clinically.
- B Any patient with suspected or actual impairment of spatial awareness should have

their profile of impaired and preserved abilities evaluated using a standardised test battery such as the Behavioural Inattention Test. The diagnosis should not be excluded on the basis of a single test.

- C Any patient shown to have impaired attention to one side should be:
- given cues to draw attention to the affected side during therapy and nursing procedures
  - monitored to ensure that they do not eat too little through missing food on one side
  - given a trial of visual scanning training
  - given trials of mental imagery training, structured feedback or using prisms if the unawareness is severe and persistent.

### Perception – visual agnosia (6.32.1)

- A Any person who appears to have difficulty in recognising people or objects should be assessed formally for visual agnosia.
- B Any person found to have agnosia should:
- have the impairment explained to them, their family and their treating team
  - be taught strategies to compensate for the specific agnosia(s) as far as possible.

### Apraxia (6.33.1)

- A Any person who has difficulties in executing tasks despite apparently adequate limb movement should be assessed formally for the presence of apraxia.
- B Any person found to have apraxia should:
- be given therapies and/or taught compensatory strategies specific to the deficits identified
  - have the impairment explained to them, their family, and their treating team.

### Executive functioning (6.34.1)

- A Any person who appears to have adequate skills to perform complex activities but who fails to organise the tasks needed should be formally assessed for the dysexecutive syndrome, for example using the Behavioural Assessment of the Dysexecutive Syndrome (BADS).

- B Any person with an executive disorder and activity limitation should be taught compensatory techniques (eg use of electronic organisers or pagers, or use of written checklists).
- C When a patient's activities are affected by an executive disorder, the nature and effects of the impairment and ways of supporting and helping the patient should be discussed with others involved (eg family, staff).

### Visual impairments and hemianopia (6.39.1)

- A Every patient should have:
- practical assessment of visual acuity **wearing their appropriate glasses**, checking their ability to see newspaper text and distant objects clearly
  - examination for the presence of hemianopia (visual field deficit).
- B Any patient who has a visual field deficit should be informed and, if a car driver, should specifically be informed about the consequences for driving (see 6.48.1).
- C Any patient whose visual field defect causes practical problems should be taught compensatory techniques.
- D Treatment for hemianopia using prisms should only be provided if:
- the treatment is supervised by someone with expertise in this treatment
  - the effects are evaluated
  - the patient is aware that it may not have any benefit for them.

### Personal activities of daily living (dressing, washing etc) (6.46.1)

- A Every patient who has had a stroke should be assessed formally for their safety and independence in all personal activities of daily living by a therapist or nurse with the results recorded using a standardised assessment tool, preferably the Barthel Activities of Daily Living (ADL) index.
- B Any person who has limitations on any aspect of personal activities, especially but not only if acquired as a result of this stroke, should:



- be referred to an occupational therapist with experience in neurological disability, *and*
  - be seen for further assessment within four working days of admission, *and*
  - have treatment of identified problems from the occupational therapist who should also guide and involve other members of a specialist multidisciplinary team.
- C Specific treatments that should be offered (according to need) include:
- the opportunity to practise activities in the most natural (home-like) setting possible
  - assessment for and provision of and training in the use of equipment and adaptations that increase safe independence
  - training of family and carers in helping the patient.
- B The person or team responsible for any patient who wishes to drive should:
- ask about and identify any absolute bars to driving
  - consider the patient's capacity to drive safely
  - discuss driving and give advice to the patient
  - document the findings and conclusions, informing the GP and giving a written record to the patient.
- C Every healthcare professional giving advice on driving should ensure that it is accurate and up-to-date, and should consult the Driver and Vehicle Licensing Agency (DVLA) regulations ([www.dvla.gov.uk/medical/atagance.aspx](http://www.dvla.gov.uk/medical/atagance.aspx)).
- D Every person who has a stroke or transient ischaemic attack and who has a group 2 licence (eg heavy goods vehicle (HGV)) should be told that they must inform the DVLA and that they will not be allowed to drive under this licence for at least 12 months.

### Extended activities of daily living (domestic and community) (6.47.1)

- A Any patient who has had a stroke should be asked to what extent previous extended activities have been limited by the stroke.
- B Any patient whose activities have been limited should be:
- assessed by an occupational therapist with expertise in neurological disability
  - taught how to achieve activities safely and given opportunities to practise under supervision, if activities are potentially achievable
  - assessed for, provided with and taught how to use any adaptations or equipment needed to achieve safe activities.
- C Where a patient cannot undertake a necessary activity safely themselves, then alternative means of achieving the goal must be put in place to ensure safety and well-being.
- E Every person who has a stroke or transient ischaemic attack and who has a group 1 licence (ie ordinary licence) should be told that they must not drive for a minimum of four weeks, and that a return to driving is dependent on satisfactory recovery.
- F Every person who has a stroke leaving them with a neurological deficit of any type (eg visual or cognitive impairments) should be told that they must inform the DVLA.
- G Any person who wishes to return to driving should be assessed for factors that preclude safe driving and disbar them, at least at the time; for example:
- significant visual field defect or reduction in visual acuity (should seek further specialist assessment if necessary)
  - any epileptic seizure within last 12 months, excluding a seizure within the first 24 hours after stroke onset
  - disorders of focused attention, especially hemi-spatial neglect.

### Driving (6.48.1)

- A Before they leave hospital (or the specialist outpatient clinic if not admitted), every person who has had a stroke or transient ischaemic attack should be asked whether they drive or wish to drive.
- H Any person who wishes to return to driving should be advised that:

- they will need sufficient muscle control to control the car, with or without adaptations
- they will also need sufficient cognitive ability to drive safely on a busy road
- clinic-based assessments of cognitive skills may predict failure of an on-the-road assessment, but are of low predictive accuracy
- advice on mechanical adaptations can be obtained from various sources
- on-the-road assessments are the best way to assess ability if there is any doubt
- they should inform their insurance company before returning to driving.

I Any person who needs rehabilitation of driving skills should be offered driving-specific computer-based training.

### Vocational activities (6.49.1)

- A Every person should be asked about the vocational activities they undertook before the stroke.
- B Patients who wish to return to work (paid or unpaid employment) should:
- have their work requirements established with their employer (provided the patient agrees)
  - be assessed cognitively and practically to establish their potential
  - be advised on the most suitable time and way to return to work, if this is practical
  - be referred to a specialist in employment for people with disability if extra assistance or advice is needed (ie the Disability Employment Advisor, in England).
- C Patients who wish to return to or take up a leisure activity should have their cognitive and practical skills assessed, and should be given advice and help in pursuing their activity if appropriate.

### Social interaction – interpersonal relationships (6.50.1)

- A Any patient whose style of social interaction after stroke is causing stress or distress to

others should be assessed by a clinical psychologist and, if necessary, by others (eg a psychiatrist or a speech and language therapist) to determine the underlying causes.

B Following the assessment:

- the nature of the problems and their causes should be explained to the patient's family, to other people in social contact with them and to the rehabilitation team
- the patient should be helped to learn the best way to interact successfully without causing distress
- all those involved in social interactions should be taught how best to respond to inappropriate or distressing behaviour
- if any specific treatable cause is found, the appropriate treatment should be given (eg an antidepressant or an antipsychotic).

### Personal equipment and adaptations (6.51.1)

- A Every patient should have their need for specialist equipment assessed individually in relation to their particular limitations and environment, the need being judged against its effects on:
- safety of the patient or other during activity, and/or
  - independence of the patient undertaking activity, and/or
  - speed, ease or quality of activity being undertaken.
- B All aids, adaptations and equipment should be:
- as appropriate as possible for the patient's physical and social context
  - of known safety and reliability
  - provided as soon as possible.
- C All people (patient or carers) using any equipment or aids should be:
- trained in its safe and effective use
  - given details on who to contact, and how, in case problems arise.
- D The equipment should be reassessed regularly to check that:
- it is being used safely and effectively

- it is still needed
  - it is still safe.
- E Equipment and aids for communication should be considered by an appropriate specialist.

### Environmental equipment and adaptations (6.52.1)

- A Every patient leaving hospital (or who is at home and was not admitted) should be assessed to determine whether equipment or adaptations can increase safety or independence.
- B Prescription and provision of equipment should be based on a careful assessment of:
- the patient and their particular impairments, *and*
  - the physical environment it is to be used in, *and*
  - the social environment it is to be used in.
- C All equipment supplied should:
- be of known (certified) reliability and safety
  - be checked at appropriate intervals.
- D The patient and/or carer(s) should be:
- trained in the safe and effective use of any equipment provided.
  - given a contact point for future advice about or help with any equipment provided.
- E The clinical suitability and use of equipment provided should be reviewed at intervals.

### Further rehabilitation (7.1.1)

- A Any patient whose situation changes (eg new problems or changed environment) should be offered further assessment by the specialist stroke rehabilitation service.
- B Any patient with residual impairment after the end of initial rehabilitation should be offered a formal review at least every six months, to consider whether further interventions are warranted, and should be referred for specialist assessment if:
- new problems, not present when last seen by the specialist service, are present

- the patient's physical or social environment has changed.

- C Further therapy should only be given if clear goals are identified.

### Social participation (7.2.1)

- A The rehabilitation service should establish with each patient specific social activities they would like to undertake and should:
- advise the patient on the potential to undertake the necessary activities
  - identify any barriers to succeeding in the role, and advise the patient how to overcome those barriers
  - where appropriate make referral to community organisations (statutory and non-statutory) that can support the patient in fulfilling their desired roles.
- B Local services should facilitate social participation by disabled people through:
- ensuring a suitable community transport system
  - organising or supporting venues for social activities able to accommodate disabled people, especially people with communication problems
  - organising or supporting social networks to support disabled people (eg through voluntary groups).

### Support (practical and emotional) (7.3.1)

- A Patients and their carers should have their individual practical and emotional support needs identified:
- when they leave hospital
  - when rehabilitation ends
  - at regular intervals thereafter.
- B Health and social services personnel should ensure that:
- any identified support needs are met somehow if at all possible
  - support services appropriate to the needs of the patient and carers are provided if they are the responsibility of statutory services

- patients are informed about organisations able to provide other needed services, and how to contact them
  - patients and carers receive all the financial and practical support that they are entitled to.
- C Health and social service organisations should ensure that accessing support and advice by and for disabled people is easy (eg through single points of access to all organisations).

### Patients in residential care homes (including nursing homes) (7.4.1)

- A All patients in nursing homes, care home and residential homes should be able to receive assessment and treatment from specialist rehabilitation services.
- B All staff in nursing homes, care homes and residential homes should be familiar with the common clinical features of stroke and the optimal management of common impairments and activity limitations.

### Carers (informal, unpaid) (7.5.1)

- A At all times the patient's views on the involvement of their family and other carers should be sought, to establish if possible the extent to which the patient wants family members involved.
- B The carer(s) of every patient with a stroke should be involved with the management process from the outset, specifically:
- as an additional source of important information about the patient both clinically and socially
  - by being given accurate information about the stroke, its nature and prognosis and what to do in the event of a further stroke
  - by being given emotional and practical support as required.
- C With the patient's agreement, family and carers should be involved in all important decisions, as the patient's advocate if necessary.
- D During the rehabilitation phase, carers should be encouraged to participate in an educational programme that:

- explains the nature of stroke and its consequences
- teaches them how to provide care and support
- gives them opportunities to practise care with the patient
- emphasises and reiterates all advice on secondary prevention, especially lifestyle changes.

- E At the time of transfer of care to the home setting, the carer should:
- be offered an assessment of their own support needs by social services
  - be offered the support identified as necessary
  - be given clear guidance on how to seek help if problems develop.
- F After the patient has returned to the home (or residential care) setting, the carer should:
- have their need for information and support reassessed whenever there is a significant change in circumstances (eg if the health of either the patient or the carer deteriorates)
  - be reminded on a regular but not frequent basis of how they may seek further help and support.

### Reference

- 1 Intercollegiate Stroke Working Party. *National clinical guideline for stroke*, 3rd edition. London: Royal College of Physicians, 2008.

### Contact

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# Physiotherapy Concise Guide for Stroke 2008

This concise guide contains recommendations extracted from the *National clinical guideline for stroke*, 3rd edition,<sup>1</sup> which contains over 300 recommendations covering almost every aspect of stroke management. The recommendations below have direct implications for physiotherapists and aim to provide them with ready access to the latest guidance.

Recommendations are given below with their number, so that they can be found in the main guideline. Recommendations that are taken from the National Institute for Health and Clinical Excellence (NICE) stroke guideline<sup>2</sup> have a background tint.

## Specialist stroke services (3.2.1)

B All patients not suitable for transfer home after completion of their acute diagnosis and treatment should be treated in a specialist stroke rehabilitation unit which should fulfil the following criteria:

- it should be a geographically identified unit
- it should have a coordinated multidisciplinary team that meets at least once a week for the interchange of information about individual patients
- the staff should have specialist expertise in stroke and rehabilitation
- educational programmes and information are provided for staff, patients and carers
- it has agreed management for problems, based on evidence wherever available.

## Stroke services for younger adults (3.5.1)

A Younger adults who have had a stroke should be managed within specialist medical and rehabilitation services that:

- recognise and manage the particular physical, psychological and social needs of younger patients with stroke (eg vocational rehabilitation, child care activities)
- are provided in an environment suited to their specific social needs.

## Transfers of care –discharge from hospital (3.7.1)

B Patients should only be discharged early (before the end of acute rehabilitation) from

hospital if there is a specialist stroke rehabilitation team able to continue rehabilitation in the community from the day of transfer and if the patient is able to transfer safely from bed to chair, and if other problems can be safely managed at home.

- E Patients should not be discharged early from hospital to generic (non-specialist) community services (including both home, and community hospitals) unless there is continuing active involvement by the specialist stroke service.
- F Carers of patients unable to transfer independently should receive training in moving and handling and the use of any equipment provided until they are demonstrably able to transfer and position the patient safely in the home environment.
- G All patients should continue to have access to specialist stroke services after leaving hospital, and should know how to make contact.

## Quality improvement (governance, audit) (3.8.1)

- D All clinicians should be involved in audit of stroke care and should use the results to plan and execute service improvements.

## Goal setting (3.11.1)

Every patient involved in the rehabilitation process should:

- D have goals set that:
- are meaningful and relevant to the patient



- are challenging but achievable
- include both short-term (days/weeks) and long-term (weeks/months) targets
- include both single clinicians and also the whole team
- are documented, with specified, time-bound measurable outcomes
- have achievement evaluated using goal attainment
- include family members where appropriate
- are then used to guide and inform therapy and treatment.

### Rehabilitation treatment approach (3.12.1)

All members of a stroke service should:

- A use an agreed consistent approach for each problem faced by a patient, ensuring the patient is given the same advice and taught the same technique to ameliorate or overcome it
- B give as much opportunity as possible for a patient to practise repeatedly and in different settings any tasks or activities that are affected
- C work within their own knowledge, skills, competence and limits in handling patients and using equipment, being taught safe and appropriate ways to move and handle specific patients if necessary.

### Rehabilitation treatment quantity (intensity of therapy) (3.13.1)

- A Patients should undergo as much therapy appropriate to their needs as they are willing and able to tolerate and in the early stages they should receive a minimum of 45 minutes daily of any therapy that is required.
- B The team should promote the practice of skills gained in therapy into the patient's daily routine in a consistent manner and patients should be enabled and encouraged to practise that activity as much as possible.
- C Therapy assistants may facilitate practice but should work under the guidance of a qualified therapist.

### Early positioning and mobilisation (4.15.1)

- A People with acute stroke should be mobilised as soon as possible (when their clinical condition

permits) as part of an active management programme of a specialist stroke unit.

- B Every patient with mobility limitation should be assessed by a specialist to determine the most appropriate and safe methods of transfer and mobilisation.
- C People with acute stroke should be helped to sit up as soon as possible (when their condition permits).

### Initial, early rehabilitation assessment (4.18.1)

- B All patients with any impairment at 24 hours should receive a full multidisciplinary assessment using an agreed procedure or protocol within five working days, and this should be documented in the notes.

### Lifestyle measures (5.3.1)

- B All patients should be advised to take regular exercise as far as they are able:
  - The aim should be to achieve moderate physical activity (sufficient to become slightly breathless) for 20–30 minutes each day.
  - Exercise programmes should be considered, and tailored to the individual following appropriate assessment, starting with low-intensity physical activity and gradually increasing to moderate levels.

### Evaluating and stopping treatments (6.2.1)

- C When a therapist or team stops giving rehabilitation, the therapist or service should:
  - discuss the reasons for this decision with the patient
  - ensure that any continuing support that the patient needs to maintain and/or improve health is provided
  - teach the patient and, if necessary, carers and family how to maintain health
  - provide clear instructions on how to contact the service for reassessment
  - outline what specific events or changes should trigger further contact.

### Acupuncture (6.3.1)

- A Acupuncture should only be used in the context of ongoing clinical trials.

### Aerobic training (fitness) (6.4.1)

- A After stroke all patients should participate in aerobic training unless there are contraindications unrelated to stroke.

### Arm re-education (6.5.1)

- A Patients who have some arm movement should be given every opportunity to practise activities within their capacity.
- B Constraint-induced movement therapy (CIMT) aimed at improving arm function should only be offered to patients after stroke who:
- had their stroke at least two weeks before it is offered
  - have at least 10 degrees of voluntary finger extension
  - have intact cognition
  - are able to walk independently.
- C Bilateral arm training involving functional tasks and repetitive arm movement to improve dexterity and grip strength should be tried in any patient with continuing limitation on arm function after four weeks post stroke.

### Biofeedback (6.6.1)

- A Biofeedback should not be used on a routine basis outside the context of clinical trials.

### Functional electrical stimulation (6.7.1)

- A Functional electrical stimulation of the arm or leg should not be used on a routine basis outside the context of clinical trials.
- B Functional electrical stimulation of the leg should **only** be considered and used for individual patients who:
- have foot drop impeding gait not satisfactorily controlled using ankle-foot orthoses *and*
  - have demonstrable gait improvement from its use.
- C In patients with persistent shoulder pain **and** shoulder subluxation, functional electrical stimulation should be tried for reducing pain.

### Gait retraining, treadmill retraining and walking aids (6.8.1)

- A Every patient who has limited mobility following stroke should be assessed by a specialist neurological physiotherapist to guide management.
- B Patients with limited mobility should be assessed for, provided with and taught how to use any mobility aids, including a wheelchair, needed to facilitate safe independent mobility outside therapy sessions.
- C Patients should be taught and encouraged to practise as much as possible any aspects of mobility judged to be within their safe capability, such as:
- moving around the bed *and/or*
  - transfers from bed to chair and from chair to chair (or toilet) *and/or*
  - walking, indoors and then outdoors *and/or*
  - using stairs.
- D Patients whose recovery is slow or limited should be offered more intense therapy which should include one or more of the following:
- specific additional therapy allowing increased practice (any mobility problem)
  - treadmill retraining with partial body support given in the first three months for patients with some ability to walk independently.

### Mental practice (6.9.1)

- A Patients should be taught and encouraged to use mental practice of an activity as an adjunct to conventional therapy, to improve arm function.

### Orthoses (6.10.1)

- A An ankle-foot orthosis should only be used to improve walking and/or balance, and should be:
- tried in patients with foot drop (reduced ability to dorsiflex the foot during walking) that impedes safe and efficient walking
  - evaluated on an individual patient basis before long-term use
  - individually fitted.

### Positioning (6.11.1)

- A Nurses and care staff should be given training on how to position patients who cannot position themselves after stroke.
- B When lying and when sitting, patients should be put in positions that minimise the risk of complications such as aspiration and other respiratory complications, shoulder pain, contractures, and skin pressure ulceration.
- C Intermittent compression should not be used to treat a swollen hand.

### Robotics (6.12.1)

- A Robot-assisted movement therapy should only be used as an adjunct to conventional therapy when the goal is to reduce arm impairment

### Self-efficacy training (6.13.1)

- A All patients should be offered training in self-management skills, to include active problem-solving and individual goal-setting.
- B Any patient whose recovery appears delayed or limited should be assessed for changes in self-identity, self-esteem and self efficacy (as well as changes in mood).

### Splinting and stretching (to prevent and treat contractures) (6.14.1)

- A Any patient who has increased tone sufficient to reduce passive or active movement around a joint should have their range of passive joint movement assessed as a prelude to starting preventative actions.
- B Any patient whose range of movement at a joint is reduced or at risk of becoming reduced should have a programme of passive stretching of all affected joints on a daily basis and the programme should be taught to the patient and/or carers.
- C Inflatable arm splints enveloping the hand, forearm and elbow, and resting wrist and hand splints, should not be used routinely.
- D If stretching alone does not control contractures, serial casting around a joint

should be considered as a treatment for reducing contractures.

### Strength training – resisted exercise (6.15.1)

- A Resisted exercise should be used:
  - to improve strength in targeted muscles
  - to improve gait speed and endurance.

### Task-specific training (6.16.1)

- A Task-specific training should be used to improve activities of daily living and aspects of mobility:
  - standing up and sitting down
  - gait speed and gait endurance.

### Miscellaneous other specific treatments (6.17.1)

- A The following treatments have been subject to some evaluation and should not be used routinely or outside the context of prospective research:
  - virtual reality technologies
  - standing in an Oswestry standing frame
  - whole body vibration
  - weighted garments.

### Balance impairment (6.18.1)

- A Any patient with significant impairment in maintaining their balance should be given intensive progressive balance training.
- B Any patient with moderate to severe limitation of their walking ability should be given a walking aid to improve their stability.

### Impaired motor control – reduced movement, weakness and clumsiness (6.19.1)

- A All patients should be assessed for motor impairment, and a standardised approach to quantify the impairment should be used (eg the Motricity Index).
- B All patients with significant loss of motor control (ie sufficient to limit an activity) should be assessed by a therapist with experience in neurodisability.
- C Any patient with persistent motor impairment should be taught exercises or activities that will



increase voluntary motor control and strength, including resisted exercise.

- D Any patient with significant limitation in balance or mobility should be given intensive progressive exercise.

### Impaired tone – spasticity and spasms (6.20.1)

- A Any patient with motor weakness should be assessed for the presence of spasticity as a cause of pain, as a factor limiting activities or care, and as a risk factor for the development of contractures.
- B In any patient with spasticity, local and general factors that may cause increased tone (eg pain) should be identified and alleviated.
- C In any patient where spasticity is causing concern, simple procedures to reduce spasticity should be used, including exercise and stretching.
- D For the more active treatments given below, specific goals should be set and monitored using appropriate clinical measures (eg numerical rating scales, the Ashworth scale).
- E In patients with persistent troublesome focal spasticity affecting one or two joints then intramuscular botulinum toxin should be used to alleviate the problem. This should be given in the context of an expert service and accompanied by rehabilitation therapy input over the next 2–8 weeks.
- F For patients experiencing troublesome general spasticity after initial treatment, anti-spastic drugs should be tried unless contraindicated. One of baclofen, gabapentin or tizanidine should be tried first; other drugs and combinations of drugs should only be started by people with specific expertise in managing spasticity.

### Shoulder pain and subluxation (6.22.1)

- A Every patient with significant functional loss in their arm should have the risk of developing shoulder pain reduced by:
- ensuring that everybody handles the weak arm correctly, avoiding mechanical stress (excessive range of movement, tension)

- avoiding the use of overhead arm slings
- correct positioning of the arm, using foam arm supports if necessary.

- B Every patient with arm weakness should be asked about shoulder pain, initially on most days and then less frequently.
- C Every patient who develops shoulder pain should:
- have its severity assessed, recorded and monitored regularly
  - have preventative measures put in place
  - be offered regular simple analgesia (eg paracetamol, non-steroidal anti-inflammatory drugs).
- D Any patient with persistent more troublesome shoulder pain should be considered for one or more of:
- treatment with high-intensity transcutaneous nerve stimulation
  - shoulder strapping
  - functional electrical stimulation but **only** if they also have significant subluxation.

### Musculo-skeletal pain (6.24.1)

- A Every patient with significant motor loss after stroke should be asked whether they have any musculo-skeletal pain.
- B All patients complaining of or experiencing pain should have the cause of the pain diagnosed by someone who can distinguish the various specific, treatable causes.
- C Any patient with musculo-skeletal pain should be assessed to determine whether improvement in movement, posture or moving and handling techniques can reduce the pain.
- D Any patient continuing to experience pain should be offered pharmacological treatment with simple analgesic drugs taken regularly:
- paracetamol, up to 1 g four times daily
  - non-steroidal anti-inflammatory drugs (with gastric protection only if needed)
  - codeine and similar morphine derivatives.
- E Any patient whose pain is still not adequately controlled should be referred to a specialist in pain management.

**Cognitive impairments – general (6.28.1)**

- C The patient's cognitive status should be taken into account by all members of the multidisciplinary team when planning and delivering treatment.

**Personal equipment and adaptations (6.51.1)**

- A Every patient should have their need for specialist equipment assessed individually in relation to their particular limitations and environment, the need being judged against its effects on:
- safety of patient or other during activity, *and/or*
  - independence of patient undertaking activity, *and/or*
  - speed, ease or quality of activity being undertaken.
- B All aids, adaptations and equipment should be:
- as appropriate as possible for the patient's physical and social context
  - of known safety and reliability
  - provided as soon as possible.
- C All people (patient or carers) using any equipment or aids should be:
- trained in its safe and effective use
  - given details on who to contact, and how, in case problems arise.
- D The equipment should be reassessed regularly to check:
- it is being used safely and effectively
  - it is still needed
  - it is still safe.

**Further rehabilitation (7.1.1)**

- B Any patient with residual impairment after the end of initial rehabilitation should be offered a formal review at least every six months, to consider whether further interventions are warranted, and should be referred for specialist assessment if:
- new problems, not present when last seen by the specialist service, are present
  - the patient's physical or social environment has changed.

**Patients in residential care homes (including nursing homes) (7.4.1)**

- A All patients in nursing homes, care homes and residential homes should be able to receive assessment and treatment from specialist rehabilitation services.

**Carers (informal, unpaid) (7.5.1)**

- A At all times the patient's views on the involvement of their family and other carers should be sought, to establish if possible the extent to which the patient wants family members involved.
- B The carer(s) of every patient with a stroke should be involved with the management process from the outset, specifically:
- as an additional source of important information about the patient both clinically and socially
  - being given accurate information about the stroke, its nature and prognosis and what to do in the event of a further stroke
  - being given emotional and practical support as required.
- C With the patient's agreement, family carers should be involved in all important decisions, as the patient's advocate if necessary.

**References**

- 1 Intercollegiate Stroke Working Party. *National clinical guideline for stroke*, 3rd edition. London: Royal College of Physicians, 2008.
- 2 National Collaborating Centre for Chronic Conditions (funded by the National Institute for Health and Clinical Excellence (NICE) to produce guidelines for the NHS). *Stroke: national clinical guideline for diagnosis and initial management of acute stroke and transient ischaemic attack (TIA)*. London: Royal College of Physicians, 2008.
- 3 National Institute for Health and Clinical Excellence. *Nutrition support in adults: oral nutrition support, enteral tube feeding and parenteral nutrition*, NICE clinical guideline no 32. London: NICE, 2008.

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# Speech and Language Therapy Concise Guide for Stroke 2008

This concise guide contains recommendations extracted from the *National clinical guideline for stroke*, 3rd edition,<sup>1</sup> which contains over 300 recommendations covering almost every aspect of stroke management. The recommendations below have direct implications for speech and language therapists and aim to provide them with ready access to the latest guidance.

Recommendations are given below with their number, so that they can be found in the main guideline. Recommendations that are taken from the National Institute for Health and Clinical Excellence (NICE) guideline<sup>2</sup> have a background tint.

## Resources (3.3.1)

- B Each stroke rehabilitation unit and service should be organised as a single team of staff with specialist knowledge and experience of stroke and neurological rehabilitation including:
- consultant physician(s)
  - nurses
  - physiotherapists
  - occupational therapists
  - speech and language therapists
  - dieticians
  - clinical psychologists
  - social workers.
- C Each specialist stroke rehabilitation service should in addition:
- have an education programme for all staff providing the stroke service
  - offer training for junior professionals in the specialty of stroke.

## Location of service delivery (3.4.1)

- B Any patient with a stroke who cannot be admitted to hospital and who is not receiving palliative care should be seen by the specialist teams at home or on an outpatient basis as soon as possible for diagnosis, treatment, rehabilitation, and risk factor reduction at a standard comparable to other patients.

## Quality improvement (governance, audit) (3.8.1)

- D All clinicians should be involved in audit of stroke care and should use the results to plan and execute service improvements.

## Service development (3.9.1)

- B The planning process for any service development should include active involvement of patients and carers, with particular consideration of the views of patients who are unable to participate in the planning process directly.

## Use of assessments/measures (3.10.1)

- D A stroke rehabilitation service should:
- train all staff in the recognition and management of emotional, communicative and cognitive problems.

## Recommendations on feeding: swallowing, hydration and nutrition (4.16.1)

- A On admission, people with acute stroke should have their swallowing screened by an appropriately trained healthcare professional before being given any oral food, fluid or medication.
- B If the admission screen indicates problems with swallowing, the person should have a specialist assessment of swallowing, preferably

within 24 hours of admission and not more than 72 hours afterwards.

- C People with suspected aspiration on specialist assessment or who require tube feeding or dietary modification for three days should be:
  - reassessed and considered for instrumental examination
  - referred for dietary advice.
- D People with acute stroke who are unable to take adequate nutrition and fluids orally should:
  - receive tube feeding with a nasogastric tube within 24 hours of admission
  - be considered for a nasal bridge tube or gastrostomy if they are unable to tolerate a nasogastric tube
  - be referred to an appropriately trained healthcare professional for detailed nutritional assessment, individualised advice and monitoring.
- E Nutrition support should be initiated for people with stroke who are at risk of malnutrition. This may include oral nutritional supplements, specialist dietary advice and/or tube feeding.
- F All people with acute stroke should have their hydration assessed on admission, reviewed regularly and managed so that normal hydration is maintained.
- G In people with dysphagia, food and fluids should be given in a form that can be swallowed without aspiration following specialist assessment of swallowing.
- H Routine nutritional supplementation is not recommended for people with acute stroke who are adequately nourished on admission.

#### Recommendations on initial, early rehabilitation assessment (4.18.1)

- A All patients should be assessed within a few hours of admission for their:
  - ability to swallow, using a validated swallow screening test (eg 50-mL water swallow) administered by an appropriately trained person
  - capacity to understand and follow instructions
  - nutritional status
  - ability to hear, and need for hearing aids
  - ability to see, and need for glasses.

#### Oral nutritional supplementation (4.19.2)

- C When screening for malnutrition and the risk of malnutrition, healthcare professionals should be aware that dysphagia, poor oral health and reduced ability to self-feed will affect nutrition in people with stroke.

#### Depression (6.25.1)

- B In people with aphasia and other impairments complicating assessment of mood, careful observations over time (including response to a trial of antidepressant medication if considered necessary) should be used.

#### Aphasia (dysphasia; impairment of language) (6.36.1)

- A Any patient with left hemisphere cerebral damage should be screened for aphasia using a formal screening tool such as the Frenchay Aphasia Screening Test or Sheffield Aphasia Screening Test.
- B Any patient found to have aphasia on screening or suspected to have it on clinical grounds should:
  - have a full formal assessment of language and communication by a speech and language therapist.
- C When a patient has been found to have aphasia, a speech and language therapist should:
  - explain the nature of the impairment to the patient, family and treating team
  - establish the most appropriate method of communication and then inform (and if necessary train) the family and treating team
  - re-assess the nature and severity of the loss at appropriate intervals.
- D Any patient with aphasia persisting for more than two weeks should:
  - be given treatment aimed at reducing identified specific language impairments while continuing to progress towards goals
  - be considered for early intensive (2–8 hours/week) speech and language therapy if they can tolerate it

- be assessed for alternative means of communication (eg gesture, drawing, writing, use of communication aids) and taught how to use any that are effective.
- E While a patient has difficulties with communication:
- all people interacting regularly with a person who has aphasia should be taught the most effective communication techniques for that person
  - their mood should be assessed using whatever method seems most appropriate (eg direct questioning using adapted techniques, behavioural observation).
- F Any patient with aphasia persisting at six months should:
- be considered for and if appropriate referred for a further episode of specific treatment (in a group setting or one-to-one)
  - have their need and the need of their family for social support and stimulation assessed formally, and met if possible (eg by referral to voluntary sector groups).

### Dysarthria (6.37.1)

- A Any patient whose speech is unclear or unintelligible so that communication is limited or unreliable should be assessed by a speech and language therapist to determine the nature and cause of the speech impairment.
- B Any person who has dysarthria following stroke sufficiently severe to limit communication should:
- be taught techniques to improve the clarity of their speech
  - be assessed for compensatory alternative and augmentative communication aids (eg letter board, communication aids) if speech remains unintelligible.
- C The communication partners (eg family, staff) of a person with severe dysarthria should be taught how to assist the person in their communication.

### Apraxia of speech (6.38.1)

- A Any patient who has marked difficulty articulating words with adequate language function should be formally assessed for apraxia of speech and treated to maximise intelligibility.
- B Any patient with severe communication difficulties but reasonable cognition and language function should be assessed for and provided with appropriate alternative or augmentative communication aids.

### Swallowing problems: assessment and management (6.41.1)

- A Every patient should have their ability to swallow screened and documented as soon as is practical after stroke onset by a person with appropriate training using if appropriate a recognised, standard screening assessment (eg swallowing 50 mL of water).
- B Until a safe swallowing method has been established, all patients with identified swallowing difficulties should:
- receive hydration (and nutrition after 24–48 hours) by alternative means
  - be given their medication by the most appropriate route and in an appropriate form
  - have a comprehensive assessment of their swallowing function undertaken by a speech and language therapist or other appropriately trained professional with specialism in dysphagia
  - be considered for nasogastric tube feeding
  - be considered for the additional use of a nasal bridle if the nasogastric tube needs frequent replacement
  - have written guidance for all staff/carers to use when feeding or providing liquid.
- C Patients with difficulties in swallowing their normal diet should be assessed by a speech and language therapist or other appropriately trained professional with specialism in dysphagia for active management of oral feeding by:



- sensory modification, such as altering taste and temperature of foods or carbonation of fluids
  - texture modification of solids and/or liquids.
- D Every patient who requires food or fluid of a modified consistency should:
- be referred to a dietician or multidisciplinary nutrition team
  - have texture of modified food or liquids described using national agreed descriptors
  - have fluid balance and nutrition monitored.
- E Patients with difficulties in self-feeding should be assessed and provided with the appropriate equipment to enable them to feed independently and safely.
- F Gastrostomy feeding should be considered for patients:
- who need but are unable to tolerate nasogastric tube feeding within the first four weeks
  - are unable to swallow adequate amounts of food and fluid orally at four weeks
  - are at long-term high risk of malnutrition.
- G Instrumental direct investigation of oro-pharyngeal swallowing mechanisms (eg by videofluoroscopy or flexible endoscopic evaluation of swallowing) should only be undertaken:
- in conjunction with a speech and language therapist with specialism in dysphagia
  - if needed to direct an active treatment/rehabilitation technique for their swallowing difficulties, *or*
  - to investigate the nature and causes of aspiration.
- H Any patient unable to swallow food safely at one week after stroke should be considered for an oro-pharyngeal swallowing rehabilitation programme designed and monitored by a speech and language therapist with specialism in dysphagia. This should include one or more of:
- compensatory strategies such as postural changes (eg chin tuck) or different swallowing manoeuvres (eg supraglottic swallow)
  - restorative strategies to improve oropharyngeal motor function (eg Shaker head lifting exercises).
- I Any patient discharged from specialist care services with continuing problems with swallowing food or liquid safely should:
- be trained, or have carers trained, in the identification and management of swallowing difficulties
  - receive planned follow-up and reassessment of the swallowing difficulty.

### Oral health (6.42.1)

- A All patients who are not swallowing, including those with tube feeding should have oral and dental hygiene maintained (by the patient or carers) through regular (four-hourly):
- brushing of teeth, dentures and gums with a suitable cleaning agent (toothpaste or chlorhexidine gluconate dental gel)
  - removal of secretions.
- B All patients with dentures should have their dentures:
- put in appropriately during the day
  - cleaned regularly
  - checked and if necessary replaced by a dentist if ill-fitting, damaged or lost.
- C All patients with swallowing difficulties and/or facial weakness who are taking food orally should be taught or helped to clean their teeth or dentures after each meal.
- D Staff or carers responsible for the care of patients disabled by stroke (in hospital, in residential and in home care settings) should be trained in:
- assessment of oral hygiene
  - selection and use of appropriate oral hygiene equipment and cleaning agents
  - recognition and management of swallowing difficulties.

### Patients in residential care homes (including nursing homes) (7.4.1)

- A All patients in nursing homes, care homes and residential homes should be able to receive assessment and treatment from specialist rehabilitation services.
- B All staff in nursing homes, care homes and residential homes should be familiar with the common clinical features of stroke and the optimal management of common impairments and activity limitations.

### References

- 1 Intercollegiate Stroke Working Party. *National clinical guideline for stroke*, 3rd edition. London: Royal College of Physicians, 2008.
- 2 National Collaborating Centre for Chronic Conditions (funded by the National Institute for Health and Clinical Excellence (NICE) to produce guidelines for the NHS). *Stroke: national clinical guideline for diagnosis and initial management of acute stroke and transient ischaemic attack (TIA)*. London: Royal College of Physicians, 2008.

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# Appendices

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# Appendix I Peer reviewers

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## **Vascular surgery**

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Mr Simon Ashley	Derriford Hospital

## **Consumers**

Mr Graham Barker	Stroke Association
Dr Helen McGrane	Nursing, Midwifery and Allied Health Professions Research Unit, Stirling University
Ms Stephanie Tempest	School of Health Sciences and Social Care, Brunel University
Mr Brian M Archibald	Kingston upon Hull and the East Riding of Yorkshire Stroke Service User Carer Group; stroke survivor
Dr Greg Rogers	Kent and Medway Stroke Forum
Miss Margaret Goose	Chair, Patient and Carer Involvement Unit Steering Group, Royal College of Physicians
Ms Jane Ingham	Royal College of Physicians

## **Department of Health**

Ms Helen O’Kelly	Department of Health
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## **Dietetics**

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Ms Julie Barker	British Dietetic Association
Ms Pat Blaney	British Dietetic Association
Ms June Copeman	Faculty of Health, Leeds Metropolitan University

## **General practice**

Dr George Kassianos	General Practitioner
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## **Medicine**

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Dr Vedamurthy Adhiyaman	Glan Clwyd hospital, Rhyl
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Dr Michael J P Power	Belfast City Hospitals
Dr Paul Foley	Heart of England NHS Foundation Trust

## **Mental capacity**

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## **Neurology**

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Mr Luke De Visser	National Hospital for Neurology and Neurosurgery, London
Miss Emma John	National Hospital for Neurology and Neurosurgery, London
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### **Occupational therapy**

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Ms Louisa Reid	Croydon PCT
Miss Stephanie Wolff	Manchester Royal Infirmary

### **Orthoptics**

Mrs Tracey Shipman	British and Irish Orthoptic Society
Ms Sonia MacDiarmid	British and Irish Orthoptic Society

### **Physiotherapy**

Professor Gert Kwakkel	Vrije University Medical Centre, Amsterdam
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### **Rehabilitation**

Professor Marion Walker	Professor in Stroke Rehabilitation
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### **Speech and language therapy**

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Mr Cameron Sellars	NHS Greater Glasgow and Clyde
Mrs Helen Haworth	Nottinghamshire Adult Speech and Language Therapy Service hosted by Nottinghamshire Community Health
Ms Sally Knapp	Nottinghamshire Adult Speech and Language Therapy Service hosted by Nottinghamshire Community Health
Ms Lisa Everton	Nottinghamshire Adult Speech and Language Therapy Service hosted by Nottinghamshire Community Health
Mrs Barbara Wilkinson	Nottinghamshire Adult Speech and Language Therapy Service hosted by Nottinghamshire Community Health

### **Whole guideline**

The King's College London Stroke Research Patients and Family Group
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## Appendix 2 Evidence table reviewers

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In addition to the members of the working party, the following individuals also reviewed evidence and we are grateful for their time and expertise.

Professor Ann Ashburn	University of Southampton
Dr Jane Barton	Sheffield Teaching Hospitals Foundation Trust
Dr Andrew Bateman	Oliver Zangwill Centre for Neuropsychological Rehabilitation
Dr Jane Burridge	University of Southampton
Mrs Berenice Carter	York Hospital
Dr Janet Cockburn	University of Reading
Dr Susan Coote	University of Limerick, Ireland
Mrs June Copeman	Leeds Metropolitan University
Dr Mary Cramp	University of Southampton
Dr Fiona Cramp	University of the West of England
Ms Claire Gatehouse	Plymouth Teaching Primary Care Trust
Dr David Gillespie	Lothian Stroke MCN, Edinburgh
Miss Joanna Glare	Churchill Hospital, Oxford
Ms Elena Guio Jalon	University of Ulster
Ms Shaheen Hamdy	UK Swallowing Research Group (UKSRG)
Dr Ruth Herbert	University of Sheffield
Dr Lee Hooper	University of East Anglia
Ms Val Hopwood	Coventry University
Ms Kathryn Jarvis	University of Liverpool
Dr Fiona Jones	St George's University of London
Mrs Sue Kellie	British Dietetic Association
Ms Jo Lancaster	University Hospital of North Staffordshire
Dr Pip Logan	University of Nottingham
Miss Melissa Mew	Bournemouth University
Ms Marianne Morse	Newcastle
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Mrs Ruth Nieuwenhuis	Cardiff, and Cardiff and Vale NHS Trust
Mrs Sue Pownall	Sheffield Speech and Language Therapy Agency
Dr Kate Radford	University of Central Lancashire
Dr Jill Ramsay	University of Birmingham
Ms Davina Richardson	Imperial College Health Care NHS Trust, London
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Ms Sandra Stark	International Centre for Neurorehabilitation and Neuropsychiatry, London
Ms Sharon Swain	Royal College of Physicians, London
Mrs Philippa Taylor	North West London Hospitals NHS Trust
Dr Sylvia Taylor-Goh	Kings College, London
Ms Pippa Tyrrell	UKSRG
Dr Sarah Tyson	University of Salford
Professor Marion Walker	University of Nottingham
Mr Angus Wells	UKSRG

## Appendix 3 Van Tulder's quality assessment system

### Randomised controlled trials (RCTs) and controlled clinical trials (CCTs)

Score: 1 = yes; definitely satisfied/described clearly in text  
0 = no; not satisfied, or unable to determine from text.

<b>Patient selection</b>	<b>IV</b>	<b>DC</b>	<b>SC</b>
a Were the eligibility criteria specified?			
b Treatment allocation:			
1 Was a method of randomisation performed?			
2 Was the treatment allocation concealed?			
c Were the groups similar at baseline regarding the most important prognostic indicators?			
<b>Interventions</b>			
d Were the index and control interventions explicitly described?			
e Was the care provider blinded for the intervention?			
f Were co-interventions avoided or comparable?			
g Was the compliance acceptable in all groups?			
h Was the patient blinded to the intervention?			
<b>Outcome measurement</b>			
i Was the outcome assessor blinded to the interventions?			
j Were the outcome measures relevant?			
k Were adverse effects described?			
l Was the withdrawal/drop-out rate described and acceptable?			
m Timing follow-up measurements:			
1 Was a short-term follow-up measurement performed?			
2 Was a long-term follow-up measurement performed?			
n Was the timing of the outcome assessment in both groups comparable?			
<b>Statistics</b>			
o Was the sample size for each group described?			
p Did the analysis include an intention-to-treat analysis?			
q Were point estimates and measures of variability presented for the primary outcome measures?			
<b>Sum score</b>	<b>/11</b>	<b>/6</b>	<b>/2</b>

DC = descriptive criteria; IV = internal validity; SC = statistical criteria.

## Specification of the criteria for methodological quality

- a In order to score a YES, there must be explicit description of inclusion and/or exclusion criteria.
- b
  - 1 A random (unpredictable) assignment sequence (eg numbered opaque sealed envelopes). Methods of allocation using date of birth, date of admission, hospital numbers, or alternation are not regarded as appropriate ('No').
  - 2 Assignment generated by an independent person not responsible for determining eligibility of the patient. This person has no information about the people included in the trial and has no influence on the assignment sequence or the decision about eligibility of the patient.
- c In order to score a 'Yes', groups have to be similar at baseline with regard to age the outcome variables (if recorded) and any known and recorded prognostic factors. If a baseline difference exists in one of these factors, a 'No' is scored.
- d Adequate description of type, modality, application technique, intensity, duration and frequency of sessions for both the index intervention and control intervention(s) in order to be able to replicate the study.
- e The reviewer determines when enough information about the blinding is given in order to score a 'Yes'. For exercise therapy a 'No' is always scored for this item.
- f Co-interventions should either be avoided or comparable between the index and control groups.
- g The reviewer determines when compliance with the interventions is acceptable, based on the reported intensity, duration, number and frequency of sessions for both the experimental intervention and control intervention. Compliance >70% in all groups is considered to be sufficient.
- h The reviewer determines (per outcome parameter) when enough information about the blinding is given to score a 'Yes'. For exercise therapy a 'No' is always scored for this item.
- i The reviewer determines (per outcome parameter) when enough information about blinding is given to score a 'Yes'.
- j The reviewer determines whether the outcome measures were relevant. Usually in rehabilitation it will be an activity or participation measure, but in other trials mortality, length of stay, impairment severity or even computed tomography (CT) scan data may be appropriate.
- k Each event should be described and correctly attributed to allocated treatment: if it is explicitly reported that 'no adverse effects' have occurred, a 'Yes' is scored.
- l
  - 1 Participants who were included in the study but did not complete the observation period, or were not included in the analysis, must be described. If the percentage of withdrawals and drop-outs does not exceed 20% for short-term follow-up and 30% long-term follow-up, and does not lead to substantial bias, a 'Yes' is scored. No report of drop-outs is scored as 'Don't know'.
- m
  - 1 Outcome assessment at the end of the intervention period.
  - 2 Outcome assessment  $\geq 3$  months after the end of the intervention period.

- n Timing of outcome assessment identical for all intervention groups; for all important outcome assessments.
- o To be presented for each group at randomisation and for the most important outcome assessments.
- p All randomised patients are reported/analysed for the most important moments of effect measurement (minus missing values), irrespective of non-compliance and co-interventions.
- q For all of the important outcome measures both point estimates and measures of variability should be presented separately. Point estimates are: means, medians, modes, etc; measures of variability are: standard deviations, 95% confidence intervals, etc. For dichotomous or categorical data, proportions have to be presented.

## Appendix 4 Checklist for systematic reviews

The following checklist for systematic reviews, used in developing these guidelines, is based on the QUOROM (QUality Of Reporting Of Meta-analyses) statement.

### Review details

When reading the systematic review, use this checklist which primarily applies to the methods used in the review process. The questions do not apply to the studies included in the review. Occasionally you may only find the answer in the Results section. For each question you should answer, on the basis of the information you can find easily:

2 = Yes, without doubt

1 = Only partially or with doubt

0 = No, not as far as can be determined easily.

Process	Questions	Answer
Search:	<b>Are:</b>	
	two or more databases named and used (score 1 if only 1 used)	
	reference lists of selected articles searched	
	experts and trialists contacted	
	any journals searched by hand	
	databases searched from their inception (score 1 if later date fully justified)	
	all languages accepted (score 1 if three or more accepted)	
Selection:	<b>Is there a clear definition of:</b>	
	the population being studied	
	the interventions being investigated	
	the principal outcomes being studied	
	the study designs included (and excluded)	
Validity:	<b>Does the review process:</b>	
	assess (measure, quantify) the quality of studies identified	
	blind reviewers to study origin (authors, journal etc)	
	abstract data into a structured database	
	use two independent people to abstract data and assess study quality	
	measure heterogeneity and bias of studies included	
Data:	<b>For each study are the details (or their absence) noted of:</b>	
	participants included in study (number and type)	
	interventions studied	
	outcome	
Analysis:	<b>Does the review process:</b>	
	undertake meta-analysis or state why not done	
	investigate agreement between independent assessors	
	give confidence intervals for outcomes reported	
	<b>TOTAL:</b>	

## Appendix 5 RATS qualitative checklist

The form below reproduces the RATS guidelines for reviewing qualitative research, which were used in the development of these guidelines. RATS is an acronym for the following:

- R – Relevance of study question
- A – Appropriateness of qualitative method
- T – Transparency of procedures
- S – Soundness of interpretive approach.

Ask this of the manuscript	This should be included in the manuscript	<input checked="" type="checkbox"/>
<b>R Relevance of study question</b>		
Is the research question interesting?	Research question explicitly stated	<input type="checkbox"/>
Is the research question relevant to clinical practice, public health, or policy?	Research question justified and linked to the existing knowledge base (empirical research, theory, policy)	<input type="checkbox"/>
<b>A Appropriateness of qualitative method</b>		
Is qualitative methodology the best approach for the study aims? <i>Interviews:</i> experience, perceptions, behaviour, practice, process <i>Focus groups:</i> group dynamics, convenience, non-sensitive topics <i>Ethnography:</i> culture, organizational behaviour, interaction <i>Textual analysis:</i> documents, art, representations, conversations	Study design described and justified, eg why was a particular method (ie interviews) chosen?	<input type="checkbox"/>
<b>T Transparency of procedures</b>		
<i>Sampling</i>		
Are the participants selected the most appropriate to provide access to type of knowledge sought by the study? Is the sampling strategy appropriate?	Criteria for selecting the study sample justified and explained <i>theoretical:</i> based on preconceived or emergent theory <i>purposive:</i> diversity of opinion <i>volunteer:</i> feasibility, hard-to-reach groups	<input type="checkbox"/>
<i>Recruitment</i>		
Was recruitment conducted using appropriate methods? Is the sampling strategy appropriate?	Details of how recruitment was conducted and by whom	<input type="checkbox"/>
Could there be selection bias?	Details of who chose not to participate and why	<input type="checkbox"/>
<i>Data collection</i>		
Was collection of data systematic and comprehensive?	Method(s) outlined and examples given (eg interview questions)	<input type="checkbox"/>
Are characteristics of the study group and setting clear	Study group and setting clearly described	<input type="checkbox"/>
Why and when was data collection stopped, and is this reasonable?	End of data collection justified and described	<input type="checkbox"/>



*Role of researchers*

Is the researcher(s) appropriate? How might they bias (good and bad) the conduct of the study and results?

Do the researchers occupy dual roles (clinician and researcher)?

☐

Are the ethics of this discussed? Do the researcher(s) critically examine their own influence on the formulation of the research question, data collection, and interpretation?

☐*Ethics*

Was informed consent sought and granted?

Informed consent process explicitly and clearly detailed

☐

Were participants' anonymity and confidentiality ensured?

Anonymity and confidentiality discussed

☐

Was approval from an appropriate ethics committee received?

Ethics approval cited

☐**S Soundness of interpretive approach***Analysis*

Is the type of analysis appropriate for the type of study?

*thematic:* exploratory, descriptive, hypothesis generating

*framework:* eg policy

*constant comparison/grounded theory:* theory generating, analytical

Analytic approach described in depth and justified

☐

Are the interpretations clearly presented and adequately supported by the evidence?

*Indicators of quality:* Description of how themes were derived from the data (inductive or deductive)

☐

Are quotes used and are these appropriate and effective?

Evidence of alternative explanations being sought  
Analysis and presentation of negative or deviant cases

☐

Description of the basis on which quotes were chosen

☐

Semi-quantification when appropriate

☐

Illumination of context and/or meaning, richly detailed

☐

Was trustworthiness/reliability of the data and interpretations checked?

Method of reliability check described and justified

☐

eg was an audit trail, triangulation, or member checking employed? Did an independent analyst review data and contest themes?

☐

How were disagreements resolved?

☐*Discussion and presentation*

Are findings sufficiently grounded in a theoretical or conceptual framework?

Findings presented with reference to existing theoretical and empirical literature, and how they contribute

☐

Is adequate account taken of previous knowledge and how the findings add?

Are the limitations thoughtfully considered?

Strengths and limitations explicitly described and discussed

☐

Is the manuscript well written and accessible?

Evidence of following guidelines (format, word count)

☐

Detail of methods or additional quotes contained in appendix

☐

Written for a health sciences audience

☐

Are **red flags** present? These are common features of ill conceived or poorly executed qualitative studies, are a cause for concern, and must be viewed critically. They might be fatal flaws, or they may result from lack of detail or clarity.

*Grounded theory*: not a simple content analysis but a complex, sociological, theory generating approach

*Jargon*: descriptions that are trite, pat, or jargon filled should be viewed sceptically

*Over-interpretation*: interpretation must be grounded in 'accounts' and semi-quantified if possible or appropriate

*Seems anecdotal, self evident*: may be a superficial analysis, not rooted in conceptual framework or linked to previous knowledge, and lacking depth

*Consent process thinly discussed*: may not have met ethics requirements

*Doctor-researcher*: consider the ethical implications for patients and the bias in data collection and interpretation




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The RATS guidelines modified for BioMed Central are copyright Jocalyn Clark, *BMJ*. They can be found in Clark JP. How to peer review a qualitative manuscript. In: Godlee F, Jefferson T (eds): *Peer review in health sciences*, 2nd edn. London: BMJ Books, 2003:219–35.

## Appendix 6 National Stroke Strategy Quality Markers (Department of Health 2007)

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### QM1 Awareness raising

Members of the public and health and care staff are able to recognise and identify the main symptoms of stroke and know it needs to be treated as an emergency.

### QM2 Managing risk

Those at risk of stroke and those who have had a stroke are assessed for and given information about risk factors and lifestyle management issues (exercise, smoking, diet, weight and alcohol), and are advised and supported in possible strategies to modify their lifestyle and risk factors.

Risk factors, including hypertension, obesity, high cholesterol, atrial fibrillation (irregular heartbeats) and diabetes, are managed according to clinical guidelines, and appropriate action is taken to reduce overall vascular risk.

### QM3 Information, advice and support

People who have had a stroke, and their relatives and carers, have access to practical advice, emotional support, advocacy and information throughout the care pathway and lifelong.

### QM4 Involving individuals in developing services

People who have had a stroke and their carers are meaningfully involved in the planning, development, delivery and monitoring of services. People are regularly informed about how their views have influenced services.

### QM5 Assessment – referral to specialist

Immediate referral for appropriately urgent specialist assessment and investigation is considered in all patients presenting with a recent TIA or minor stroke.

A system which identifies as urgent those with early risk of potentially preventable full stroke – to be assessed within 24 hours in high-risk cases; all other cases are assessed within seven days.

Provision to enable brain imaging within 24 hours and carotid intervention, echocardiography and electrocardiogram within 48 hours where clinically indicated.

### QM6 Treatment

All patients with TIA or minor stroke are followed up one month after the event, either in primary or secondary care.

## QM7 Urgent response

All patients with suspected acute stroke are immediately transferred by ambulance to a receiving hospital providing hyper-acute stroke services (where a stroke triage system, expert clinical assessment, timely imaging and the ability to deliver intravenous thrombolysis are available throughout the 24-hour period).

## QM8 Assessment

Patients with suspected acute stroke receive an immediate structured clinical assessment from the right people.

Patients requiring urgent brain imaging are scanned in the next scan slot within usual working hours, and within 60 minutes of request out-of-hours with skilled radiological and clinical interpretation being available 24 hours a day.

Patients diagnosed with stroke receive early multidisciplinary assessment – to include swallow screening (within 24 hours) and identification of cognitive and perceptive problems.

## QM9 Treatment

All stroke patients have prompt access to an acute stroke unit and spend the majority of their time at hospital in a stroke unit with high-quality stroke specialist care.

Hyper-acute stroke services provide, as a minimum, 24-hour access to brain imaging, expert interpretation and the opinion of a consultant stroke specialist, and thrombolysis is given to those who can benefit.

Specialist neuro-intensivist care including interventional neuroradiology/neurosurgery expertise is rapidly available.

Specialist nursing is available for monitoring of patients.

Appropriately qualified clinicians are available to address respiratory, swallowing, dietary and communication issues.

## QM10 High-quality specialist rehabilitation

People who have had strokes access high-quality rehabilitation and, with their carer, receive support from stroke-skilled services as soon as possible after they have a stroke, available in hospital, immediately after transfer from hospital and for as long as they need it.

## QM11 End-of-life care

People who are not likely to recover from their stroke receive care at the end of their lives which takes account of their needs and choices, and is delivered by a workforce with appropriate skills and experience in all care settings.

### QM12 Seamless transfer of care

A workable, clear discharge plan that has fully involved the individual (and their family where appropriate) and responded to the individual's particular circumstances and aspirations is developed by health and social care services, together with other services such as transport and housing.

### QM13 Long-term care and support

A range of services are in place and easily accessible to support the individual long-term needs of individuals and their carers.

### QM14 Assessment and review

People who have had strokes and their carers, either living at home or in care homes, are offered a review from primary care services of their health and social care status and secondary prevention needs, typically within six weeks of discharge home or to care home and again before six months after leaving hospital.

This is followed by an annual health and social care check, which facilitates a clear pathway back to further specialist review, advice, information, support and rehabilitation where required.

### QM15 Participation in community life

People who have had a stroke, and their carers, are enabled to live a full life in the community.

### QM16 Return to work

People who have had a stroke and their carers are enabled to participate in paid, supported and voluntary employment.

### QM17 Networks

Networks are established covering populations of 0.5 to 2 million to review and organise delivery of stroke services across the care pathway.

### QM18 Leadership and skills

All people with stroke, and at risk of stroke, receive care from staff with the skills, competence and experience appropriate to meet their needs.

### QM19 Workforce review and development

Commissioners and employers undertake a review of the current workforce and develop a plan supporting development and training to create a stroke-skilled workforce.

### QM20 Research and audit

All trusts participate in quality research and audit, and make evidence for practice available.

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# Index

## A

activities of daily living 79,101  
     personal 101  
     extended (domestic and community) 101–102  
 equipment 23,33–34,38  
     personal 101,104,105  
     environmental 105–106  
 acupuncture 72–73  
 acute care 22,23,28  
 adaptations 23,101–105  
     hoists 59,105  
     stair 104  
 aerobic training 73  
 alcohol 65  
 alteplase 51  
 amphetamine 100  
 analgesia 83  
 anticonvulsants 83  
 anticoagulation/anticoagulant 49,52–53,55,  
     56,57,58,67–68  
 antidepressant drugs 83,85,87,101,104  
 antiplatelet agents 48–49,51,55,67  
 anxiety 77,84,85,86  
 aphasia 85,93–94  
 apraxia 90  
 apraxia (of speech) 95  
 (arm)slings 82–83  
 arm training 73  
 aspirin 46,48,51,55,58,67  
 aspiration 59–60,77,97,98,110  
 atrial fibrillation 55,63,67  
 audit 6,22,24,34–35,36,49,69

## B

biofeedback 74,80  
 bladder management 60,96  
 continence aids 60,96  
     urinary incontinence 60,96  
 blood glucose 27,56,57,100  
 blood pressure 27,49,56,57,63,66  
 body weight support 75  
 botulinum toxin 25,81,82  
 bowel movement 60,96  
 brain imaging 47,49,50,51,53  
 bromocriptine 100

## C

carers and families 26,29,34,35,36,72,78,81,92,  
     96,97–101,104–105,108–110  
 carotid angioplasty 69  
 carotid endarterectomy 48,69

carotid stenosis 48–49,63,66,69  
 carotid stenting 69  
 carotid ultrasound/duplex 69  
 casting 78  
 catheters 60,96  
 cerebral oedema 22  
 cerebral venous thrombosis 56  
 cholesterol 49  
 clinical audit 34–35  
 clinical psychologist 30,85,104  
 clopidogrel 48,67  
 cognitive impairment/loss/problem 36,37,41,  
     54,61,76,86,87,88,95,99,102–104  
 commissioning 21–26  
 communication 91,93,94,95,104,108  
     aids 23,94,95,105  
 computerised tomography (CT) 47  
 contraception 70  
 constraint-induced therapy 73–74  
 continence aids 96–97  
 contractures 76–78,81

## D

data collection 12,33–36  
 deep vein thrombosis 58  
 depression 39,77,84–86  
 diabetes mellitus 63  
 diagnosis – *see* Chapter 4, acute-phase care  
 diet 49,59–60,65,97  
 dietician 98  
     nutrition and dietetics concise guide 121–124  
 dipyridamole 67  
 discharge 22,23,29,  
     33,34,40,51,86–88,97,98,109–110  
     early supported discharge 22  
 dissection 55,57,67  
 domiciliary rehabilitation 22,29  
 driving 102–103  
 drugs  
     amphetamine 100  
     anticoagulation 67  
     antiplatelet drugs 48–49,51,55,57,67  
     aspirin 46,48,51,55,58,67  
     benzodiazepines 101  
     bromocriptine 100  
     cholesterol lowering 49  
     clopidogrel 48,67  
     dipyridamole 67  
     fluoxetine 101  
     meprobamate 101  
     piracetam 100  
     statins 51,60,68  
     tricyclic antidepressants 83

dysarthria 94,95  
dysphagia 59,60,62,94,97–99

**E**

early supported discharge 22  
education 22,28,29–30, 34,110  
electromyography (EMG) 74  
emotionalism 85–87  
employment 26,103  
end-of-life decisions 39–40  
enteral feeding 100  
equipment 104–105  
    personal aids 104–105  
    environmental 104–105  
executive function 90  
exercise 65

**F**

faecal incontinence 60–96  
families 33,71,72,86,89,90,94–97,101  
feeding 97–99,101  
fever 50  
fluoxetine 101  
functional electrical stimulation (FES) 74,83

**G**

gait 74,75,79  
general practitioners 24,33,35,40  
glucose 27,56,57,100  
goal setting 12–14,33,37,38

**H**

haemorrhage 52  
    intracerebral 4,5,13,16,22,50,52,56  
    subarachnoid 4,22,54  
heparin 56,67  
hoists 59,105  
home 96–97,99  
hormone replacement therapy (HRT) 70  
hydration 39,40,55, 56,59,97,99  
hydrocephalus 22,52–54  
hypertension 65,68

**I**

ICF framework 13–14  
incontinence 96  
    assessment 60  
    equipment 60,96–97  
    faecal 60,96  
    urinary 60,96  
imaging 23,30,47,48,49,50,51,53,54,55,56,67  
impairment 25,37,58,60,61,64,71–72,  
    76–80,81,84,85,87–90,93–94,95–110  
intracerebral haemorrhage 4,5,13,16,22,50,52,56

**L**

leisure activities 103–104  
lifestyle 65  
lipids 68  
long-term management 107

**M**

magnetic resonance imaging (MRI) 47,50  
malnutrition 59–60,62,97,98,99  
memory 88  
meprobamate 101  
mobilisation 58,59,61  
monitoring progress/treatment 51,52,56,59,86–90  
monitoring physiology 22,23,27,56,57,81  
mood disturbance 84–86,100,102  
    anxiety 77,84,85–86  
    depression 39,77,84–86  
    emotionalism 85–87  
motor control 80  
    biofeedback 74  
    functional electrical stimulation (FES) 74,83  
motor impairment 80  
moving and handling 34,76,84  
myocardial infarction 57,68

**N**

nasogastric tube 97,98  
National Sentinel Stroke Audit 6  
neglect (spatial awareness) 80,89,95,99,103,  
    30,39,77  
nurses 112–120  
nursing concise guide 109  
nursing homes 58  
nutrition 49,59–60,65,97  
    diet 98  
    dietician 59–60,62,97,98,99  
    malnutrition 65  
    salt 121–124  
nutrition and dietetics concise guide

**O**

occupational therapist 30,33,101,102  
occupational therapy concise guide 125–133  
oedema (cerebral) 22  
oral hygiene 98  
orthosis/orthotics 76  
outcome assessment, *see* Appendix 3  
oxygen saturation 57

**P**

pain 83  
    central 84  
    musculoskeletal 83  
    neuropathic 82  
    shoulder pain 39  
palliative care 47  
pathology

- |  |                           |   |                   |
|--|---------------------------|---|-------------------|
| patient and carer                              | 108                       | statins   | 60                |
| physiotherapist                                | 30,75                     | strength training   | 78                |
| physiotherapy concise guide                    | 134–139                   | stroke  |                   |
| piracetam                                      | 100                       | definition  | 4                 |
| positioning                                    | 56–57                     | acute ischaemic   | 51,52,55,67       |
| posture  | 76,79,84                  | register  | 34–35             |
| primary intracerebral haemorrhage              | 50,52                     | stroke strategy, <i>see</i> Appendix 6                            | 6,51              |
| primary care                                   | 14,21,64                  | subarachnoid haemorrhage  | 4,22,54           |
| protocol                                       | 23,33,36,51,52,57,59,71   | swallowing, <i>see also</i> dysphagia                             | 59,60,62,94,97–99 |
| psychosocial                                   | 85                        | swollen hand  | 77                |
| pulmonary embolism (PE)                        | 57                        |   |                   |
| <br><b>R</b>                                   |                           |   |                   |
| reduced attention                              | 88                        | <b>T</b>  |                   |
| rehabilitation                                 | 107                       | tearfulness, <i>see</i> emotionalism                              | 87                |
| research                                       | 17                        | temperature   | 56,57             |
| residential care homes                         | 74                        | terminology   | 17                |
| resisted exercise                              | 78                        | therapists, <i>see</i> Profession-specific concise guides section |                   |
| respiratory complications                      | 77                        | thrombolysis  | 23,27,30          |
| robotics                                       | 77                        | transient ischaemic attacks (TIA)                                 | 4,46–47           |
|  |                           | treadmill training  | 75                |
|  |                           | tricyclic antidepressants   | 83                |
| <br><b>S</b>                                   |                           |   |                   |
| salt   | 65                        | <b>U</b>  |                   |
| secondary prevention                           | 63                        | urinary incontinence  | 60,96             |
| sexual function                                | 100                       |   |                   |
| shoulder pain                                  | 82                        | <b>V</b>  |                   |
| arm slings                                     | 82,83                     | venous thrombosis   | 56                |
| prevention                                     | 82                        | videofluoroscopy  | 98                |
| smoking  | 65                        |   |                   |
| social services (adult services)/social worker | 7,23, 25, 30,3133,208,110 | <b>W</b>  |                   |
| spasticity                                     | 81                        | wheelchair  | 75,109            |
| spatial awareness                              | 89                        |   |                   |
| specialist rehabilitation team                 | 23                        | <b>Y</b>  |                   |
| speech and language therapist                  | 30,94–95,97–98,104        | young stroke  | 32                |
| speech and language therapy concise guide      | 140–144                   |   |                   |
| splints/splinting                              | 78                        |   |                   |