National Institute for Health and Care Excellence

Final

Stroke rehabilitation in adults (update)

[E2] Evidence reviews for intensity of rehabilitation

NICE guideline NG236

Evidence reviews underpinning recommendations 1.2.15 to 1.2.22 and research recommendations in the NICE guideline

October 2023

Final

These evidence reviews were developed by NICE

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3 Experiences of intense rehabilitation (qualitative evidence)

3.1.1 Qualitative evidence

Review question:

- In people after stroke what factors are associated with effective delivery of more intensive rehabilitation?

3.1.1.1 Included studies

Forty two qualitative studies were included in the review;[1-42] these are summarised in Table 1 below. Key findings from these studies are summarised in the clinical evidence summary below (**Error! Reference source not found.**). See also the study selection flow chart in Appendix C, study evidence tables in Appendix E, supporting quotes in Appendix F and excluded studies lists in Appendix N.

Interpretations and explanations from the original studies were synthesised to gain an insight into themes present across the body of evidence as a whole. The main concepts found in each individual study which were relevant to our review question were drawn together to inform understanding of overarching themes.

The aims of the included studies varied. A limited number of studies investigated the concept of intensity of rehabilitation[7, 19, 32, 35]. A larger number of studies investigated the experiences of people who were undertaking rehabilitation that could be defined as intense or would be a method of delivering intensive rehabilitation[1, 3-6, 8-16, 18, 20, 22, 24-27, 29-31, 33, 34, 36-39, 42]. Other studies investigated the experiences of people of any stroke service, including their perceptions on intensity[2, 17, 21, 23, 28, 40, 41]. This information was provided by stroke survivors, family members and carers and healthcare professionals. Experiences were obtained from a variety of methods, including semi-structured interviews, focus groups, direct observation and combinations of approaches. A narrative synthesis of the evidence can be found in section 3.1.3 Summary of the qualitative evidence

3.1.1.2 Excluded studies

See the excluded studies list in Appendix N.

3.1.2 Summary of studies included in the qualitative evidence

Table 1: Summary of the qualitative studies included in the evidence review

Study	Design	Population	Research aim	Comments
Bennett 2016[1]	A qualitative descriptive study undertaken using semi-structured interviews and thematic analysis.	**Stroke survivors** Mean age (range): 71 (46-89) years N = 10 Time after stroke: Subacute (7 days – 6 months) Days since stroke (range): 205 (151-312) days.	To explore the experiences, perceptions and preferences of stroke survivors with respect to two novel models of increasing physiotherapy - seven days a week individual therapy or five	Setting: Completed during inpatient rehabilitation after stroke in Australia. Funding: This work was part of a trial funded by the National Health and Medical Research Council of Australia, grant number 631904 and

Study	Design	Population	Research aim	Comments
		Focus of care/therapy: Mixed (physiotherapy).	days a week circuit therapy.	registered with the Australian and New Zealand Trial Registry (ACTRN12610000096055). Risk of bias: Minor limitations. Applicability: Partially applicable. Completed in Australia, but regarding a practice that is conducted in the United Kingdom.
Bowen 2012[2]	Successful feasibility study followed by a randomised trial with economic evaluation, and nested qualitative study using 32 individual interviews. Interview approach adapted to people with communication difficulties. Semi-structed interviews with carers and thematic analysis.	**People after stroke and carers/family members** **People with stroke and communication difficulties** Median age (range): 73 (53-98) years N = 22 Time after stroke: Not stated/unclear. **Carers/family members** Defined as a relative or friend identified by the participant as fulfilling a caring role. Median age (range): 56 (38-77) years. N = 10 Focus of care: Communication.	1. To explore participants'/carers' experiences of speech and language therapy intervention or visitor support. 2. To evaluate from participants'/carers' perspectives the effectiveness of speech and language therapy intervention or visitor support, in terms of both process and outcome. 3. To compare the perceived impact on participant and carer well-being of speech and language therapy intervention or visitor support.	Setting: NHS stroke care from 12 NHS sites across England. Recruitment took place during the inpatient phase. Funding: This project was funded by the NIHR Health Technology Assessment programme and will be published in full in Health Technology Assessment; Vol. 16, No. 26. See the HTA programme website for further project information. The Stroke Association funded part of the excess treatment costs. Risk of bias: Minor limitations. Applicability: Directly applicable. United Kingdom based study. The intervention was provided at various intensities dependent on what the individual experienced, so findings about the intervention are not

Study	Design	Population	Research aim	Comments
				applicable to the review, but the discussion on intensity and how closure related to intensity is important and applicable.
Burke 2021[3]	Qualitative semi-structured telephone interviews with thematic analysis.	**Speech and language therapists** N = 11 Median number of years working as speech and language therapists with people with aphasia: 15-20 years NHS pay band: median 7 (range 7-8). Location of their speech and language input: Inpatient acute = 6, Inpatient rehabilitation = 6, Outpatient Clinic/day unit = 5, Home visits = 9. Focus of study: Speech and language therapy.	To explore the individual accounts of speech and language therapists who implemented the self-managed computer therapy intervention in the Big CACTUS trial.	Setting: Therapists in the United Kingdom across 21 NHS trusts that were trial sites for the randomised controlled trial. Funding: RP was the chief investigator of the Big CACTUS trial, which was funded by the NIHR (National Institute for Health Research) and the Tavistock Trust for Aphasia. MH was employed on the Big CACTUS trial and received fellowship funding from the Stroke Association. Risk of bias: Minor limitations. Applicability: Generalisable to a United Kingdom practice. Across the NHS, so widely applicable.
Celinder 2012[4]	Qualitative triangulation design that included semi-structured interviews and field notes.	**Stroke survivors** Mean age (SD): 68.22 (13.57) years N = 9 Time after stroke: Subacute (7 days – 6 months). Focus of care/therapy: Mixed (occupational therapy).	The aim of this study was to explore stroke patients' experiences with Wii Sports as a supplement to conventional occupational therapy in a controlled hospital setting.	Setting: Stroke inpatient hospital in Denmark. Funding: Not stated/unclear. Risk of bias: Minor limitations. Applicability: Partially applicable. Completed in Denmark, but regarding a practice that can be conducted in the United Kingdom.

Study	Design	Population	Research aim	Comments
Chen 2020[5]	Qualitative study design that involved in-depth semi-structured Thematic analysis was conducted to analyse the data.	**Stroke survivors who had completed an intervention using the home-based telerehabilitation system** Mean age (range): 70 (52-86) years N = 13 Time after stroke: Subacute (7 days – 6 months). Focus of care/therapy: Mixed (multidisciplinary team).	To explore the user acceptance of a home-based stroke rehabilitation system.	Setting: The study was conducted in Southern California, United States of America. Nine of the interviews were conducted in the participants' homes where the devices had been installed, and four interviews were conducted at the university enrolment site. Funding: This work was supported by the National Science Foundation [grant number HCC-1219197] and National Institutes of Health [grant number K24HD074722]. Risk of bias: Moderate limitations (No information on whether the relationship between researcher and participants been adequately considered and no information on the limitations of the study so unclear whether they sufficiently considered their effect in the study). Applicability: Mostly applicable. Based in the United States which has a private healthcare system and so may not be generalisable to a United Kingdom setting (in terms of funding technology amongst other elements).
Cherry 2017[6]	Direct observation and semi-structured interviews with thematic analysis	**Stroke survivors who had experienced a unilateral**	To determine participants' general impressions about the benefits and	Setting: In the person’s home. Conducted in the seven rural districts of Georgia and

Study	Design	Population	Research aim	Comments
		ischaemic or haemorrhagic stroke Mean age (range): 62 (49-88) years N = 10 Time after stroke: Mixed (range 5 months – 4 years) Focus of care/therapy: Functional independence (physiotherapy)	barriers of using robotic therapy devices for in-home rehabilitation.	surrounding areas in the United States of America. Funding: The funding for this project was through the Veteran's Administration Office of Rural Health. Risk of bias: Moderate limitations (No information on whether the relationship between researcher and participants been adequately considered and no information on study ethics). Applicability: Somewhat applicable. Completed in a USA setting so may not necessarily being applicable to a UK healthcare setting. Discusses people in rural areas so may not be as applicable to people in urban areas who may live closer to healthcare settings.
Clarke 2018[7]	A multisite ethnographic case study design. Data was gathered through non-participant observation and semi-structured interviews. Data will be analysed using the Framework approach.	**Stroke survivors, carers and stroke service managers, therapists and other multidisciplinary team members** **Stroke survivors** Mean age (SD): 69.42 (13.51) years N = 77 Mean stroke Severity (NIHSS score on admission to	To develop an in-depth understanding of therapy provision in stroke units in England, including how clinical guideline recommendations are interpreted and implemented by therapists, and experienced by patients and their carers.	Setting: Eight stroke units in four English regions (in the north of England) to include a mix of hyperacute, acute and rehabilitation units. Funding: This paper presents independent research commissioned by the National Institute for Health Research (NIHR) under its Research for Patient Benefit (RfPB) Programme grant

Study	Design	Population	Research aim	Comments
		hospital) (SD): 10.2 (6.48). Mean length of inpatient stay in days (SD): 34.32 (25.04) days. **Carers** Mean age (SD): 59.55 (13.62) years N = 53 **Healthcare professionals** N = 197 Professional background: Physiotherapy = 71 (40%). Occupational therapy = 50 (24.4%). Speech and language therapy = 43 (21.8%). Generic therapy assistant = 8 (4.1%). Nurse = 10 (5.1%). Physician = 7 (3.6%). Non-clinical management = 8 (4.1%). Focus of care: Mixed.		reference number PB-PG-0213-30019). The views expressed are those of the author(s) and not necessarily those of the NHS, the NIHR or the Department of Health. Risk of bias: Minor limitations. Applicability: Directly applicable. UK based study across multiple stroke units of different types across the North of England.
Cobley 2013[8]	Semi-structured interviews with thematic analysis.	**People after stroke** Mean age: 69.85 (13.42) years. N = 27 Time after stroke: Not stated/unclear. **Carers** Mean age (SD): 72.79 (14.10) years. N = 15 Focus of care/therapy:	To investigate patients' and carers' experiences of Early Supported Discharge services and inform future Early Supported Discharge service development and provision.	Setting: Two stroke units in the Nottinghamshire region in the United Kingdom. Funding: This is a CLAHRC study funded by the National Institute for Health Research. This article presents independent research commissioned by the National Institute for Health Research (NIHR). The views expressed in this

Study	Design	Population	Research aim	Comments
		Mixed (multidisciplinary team).		article are those of the author(s) and not necessarily those of the NHS, the NIHR, or the Department of Health in England. Risk of bias: Moderate limitations (No information on whether the relationship between researcher and participants been adequately considered). Applicability: Applicable as from a United Kingdom population. Not completely relevant to a question on intensity, but very relevant to the topic of early supported discharge.
Connell 2018[9]	Semi-structured interviews using an interview guide developed from the Normalization Process Theory and the Consolidation Framework for Implementation Research. The interviews were conducted by the lead author via telephone and Skype.	**Healthcare professionals** Physical therapists and rehabilitation assistants delivering, the DOSE intervention as part of a stroke rehabilitation clinical trial. Mean age (SD): 37 (9.2) years N = 15 Focus of care: Mixed (physiotherapy).	To investigate factors influencing implementation of higher-intensity activity in stroke rehabilitation settings.	Setting: Rehabilitation units across 4 provinces in Canada. Funding: The study was supported by the Canada Research Chair Program (J.J.E.), Canadian Institutes of Health Research (CIHR) (T.K.K., J.J.E.), and Heart and Stroke Canadian Partnership for Stroke Recovery (CPSR) (J.J.E.). Grants to J.J.E. from CIHR and CPSR assisted in funding the DOSE clinical trial. Risk of bias: Minor limitations.

Study	Design	Population	Research aim	Comments
				Applicability: Mostly applicable. The Canadian healthcare system is not too different from a United Kingdom perspective but will have some differences. This is discussing a specific intervention so may not be appropriate to generalise to all of intensive rehabilitation.
Connell 2014[10]	Semi-structured interviews analysed using a coding frame based on implementation theory.	**Physical therapists, occupational therapists and rehabilitation assistants** N = 20 Years of experience (range): 3-37 years. Type of therapists: Physiotherapist = 5, Occupational therapist = 13, Rehabilitation assistant = 2. Focus of care: Upper limb.	To conduct a formative evaluation of the implementation of GRASP to inform the development and implementation of a similar intervention in the United Kingdom.	Setting: Conducted in Canada from people across 8 sites (two sites were in the Greater Vancouver area). Funding: JE and JH developed GRASP but do not benefit financially in any way from its use in clinical practice. No additional information. Risk of bias: Minor limitations. Applicability: Broadly applicable. Canadian healthcare system is mostly relatable to a United Kingdom setting. Discusses a specific technique at delivering intense rehabilitation so may not be relatable to all types of intense intervention.
Connell 2016[11]	Semi-structured face-to-face interviews. Interview transcripts were coded by two investigators using predetermined codes based on the Theoretical Domains Framework.	**Physiotherapists, occupational therapists, therapy managers and therapy assistants** N = 23 Type of therapists: Physiotherapists:	To use the Behaviour Change Wheel (BCW) to identify mechanisms of action and provide a rich explanation as to how our implementation intervention	Setting: Three stroke rehabilitation units in the North West of England. Funding: LC and NM are funded by a National Institute for Health Research Career Development Fellowship. This article presents

Study	Design	Population	Research aim	Comments
		8. Occupational therapists: 11. Therapy assistants: 4 Focus of care/therapy: Mixed (multidisciplinary team).	supported change at a site level.	independent research funded by the National Institute for Health Research (NIHR). The views expressed are those of the author(s) and not necessarily those of the NHS, the NIHR or the Department of Health. Risk of bias: Minor limitations. Applicability: Applicable to a United Kingdom setting. The intervention may not be broadly applicable to more intense rehabilitation (discussed one type of intervention that may be used to provide more intensive rehabilitation).
Demain 2013[13]	Four focus groups with thematic analysis.	**People after a stroke requiring upper limb rehabilitation** Age (range): 46-78 years N = 8 Time since stroke (range): 1-12 years **Family caregivers** Age (range): 44-82 years N = 7 **Healthcare professionals including physiotherapists, occupational therapists and a clinical registrar** N = 6	To identify current assistive technology knowledge and service provision and the barriers and opportunities for evidence based assistive technologies to be used in stroke upper limb rehabilitation practice, as perceived by stroke survivors, family caregivers and healthcare professionals.	Setting: Focus groups at an Assistive Technology interactive exhibition displaying 2 different upper limb assistive technologies for stroke rehabilitation at the University of Southampton in the United Kingdom. Funding: This paper presents independent research funded by the National Institute for Health Research (NIHR) under its Programme Grants for Applied Research Programme (RP-PG0707-10012). The views expressed in this paper are those of the authors and not necessarily those of the NHS, the

Study	Design	Population	Research aim	Comments
		Professional status: 2 physiotherapist (NHS), 1 physiotherapist (private practice), 1 occupational therapist (NHS), 1 occupational therapist (social services), 1 clinical registrar. Focus of care: Upper limb.		NIHR or the Department of Health. Risk of bias: Moderate limitations (No information on whether the relationship between researcher and participants been adequately considered and does not explore the limitations of the study sufficiently). Applicability: Applicable. United Kingdom setting with a wide perspective. A limited number of participants representing each groups, but still mostly applicable.
D'Souza 2021[12]	A qualitative descriptive study. semi structured interviews and focus groups with thematic analysis.	**People after stroke and healthcare professionals** **Stroke survivors** Mean age (SD): 83 (7) years. N = 7 Mean time since stroke (SD): 14 (5) days. **Healthcare professionals** N = 51 Staff role: Acute nurses = 2, clinical nurse manager = 1, medical consultants = 2, rehabilitation nurses = 8, dietician = 1, occupational therapy manager = 1, occupational therapists = 5, occupational therapy assistants	To explore barriers and facilitators to patient communication in an acute and rehabilitation ward setting from the perspectives of hospital staff, volunteers and patients following stroke.	Setting: Conducted on an acute and a rehabilitation ward at a private hospital in Perth, Western Australia. Funding: This work was supported by the Hollywood Private Hospital Research Foundation grant number RF087. SD received an Australian Post Graduate Award Scholarship for the first year of this study and received an ECU Research Travel Grant. Risk of bias: Moderate limitations (No information on whether the relationship between researcher and participants been adequately considered).

Study	Design	Population	Research aim	Comments
		= 3, physiotherapists = 8, physiotherapy assistants = 2, social workers = 5, speech pathology manager = 1, speech pathologists = 4, speech pathology assistant = 1, volunteer manager = 1, volunteers = 6. Focus of care/therapy: Communication (multidisciplinary team).		Applicability: Broadly applicable. Conducted in an Australian setting is somewhat applicable to a United Kingdom setting. The study was conducted in a private hospital involving a mixed acute and rehabilitation ward, which influences the results.
Galvin 2009[14]	Two focus groups. Thematic analysis.	**Physiotherapists working in the area of stroke rehabilitation** N = 10 Focus of care/therapy: Mixed (physiotherapy).	To examine the views of people with stroke, their 'family members/friends' and physiotherapists on the role of the family in physiotherapy and the delivery of exercises following stroke.	Setting: Focus groups in Ireland (Dublin area). Funding: Not stated/unclear. Risk of bias: Major limitations (inappropriate research design, No information on whether the relationship between researcher and participants been adequately considered and no clear statement of findings). Applicability: Broadly applicable. Set in Ireland.
Galvin 2009[15]	Semi-structured interviews and focus groups with thematic analysis	**People with a diagnosis of first stroke** Age (range): 73 (56-88) years N = 10 Mean time after stroke (range): 58 (31-89) days	To examine the experience of inpatient physiotherapy intervention delivered after stroke in Ireland from two different perspectives: that of the person with stroke and that of the physiotherapist.	Setting: Setting was in Ireland with participants from the greater Dublin area. Funding: the authors received a financial contribution from the Seed Funding Scheme in the University College Dublin.

Study	Design	Population	Research aim	Comments
		Focus of care/therapy: Mixed (physiotherapy).		Risk of bias: Moderate limitations (No information on whether the relationship between researcher and participants been adequately considered). Applicability: Broadly applicable. Set in Ireland.
Gustavsson 2020[16]	Individual and two focus group interviews were conducted. A grounded theory approach was used to collect and analyse the data.	**Occupational therapists, physiotherapists, speech and language therapists and medical social workers** N = 12 Focus of care/therapy: Telerehabilitation (multidisciplinary team).	To explore how healthcare professionals use and could potentially use ICT to enable a person-centred rehabilitation process after stroke.	Setting: People from acute rehabilitation and primary care rehabilitation in Stockholm, Sweden. Funding: This work was supported by the Doctoral School in Health Care Sciences at Karolinska Institutet under Grant [2-1955-2013]; the Vardal Foundation under Grant [2014-0108]; Swedish Research Council for Health, Working Life and Welfare (FORTE) under Grant [2014-4656] and the Swedish Stroke Association under Grant [2962/2014]. Risk of bias: Moderate limitations (No information on whether the relationship between researcher and participants been adequately considered). Applicability: Broadly applicable. Sweden health setting. Discusses a primary care and acute care setting which appears transferrable to a UK health model. Mildly

Study	Design	Population	Research aim	Comments
				relates to intensity of rehabilitation.
Hartford 2019[17]	A qualitative descriptive design was used. Individual interviews and field notes with a thematic analysis.	**People after stroke, carer/family members and healthcare professionals** **Stroke survivors** Mean age (range): 68.75 (48-87) years N = 16 Mean duration of stroke (range): 8.74 years (3 months - 26 years). **Spouses of stroke survivors** Mean age (range): 73.5 (62-80) years N = 4 **Stroke recovery group co-ordinators** N = 3 **Speech pathologists** N = 1	To gain insight into healthcare and social structures from the perspective of patients and caregivers that can better support long-term stroke recovery.	Setting: The study took place in a major city in Western Canada. Data was collected in interviews with the majority of interviews taking place on the premises where the recovery groups held their meetings to accommodate the patients' limitations. Canada has a universal healthcare scheme (Medicare) which provides access for all Canadian residents to medically-necessary hospital and physician services. Funding: Not stated/unclear. Risk of bias: Moderate limitations (No information on whether the relationship between researcher and participants been adequately considered). Applicability: Somewhat applicable. Healthcare setting is a bit different as it mixed public and private healthcare settings in a way that is not totally applicable to a UK setting. However, the themes that are appropriate to use in the analysis are appropriate regardless.
Hitch 2020[18]	A mixed methods case design (only the qualitative	**Healthcare professionals including;**	To describe staff perceptions of the trial of an early	Setting: A public health organisation

Study	Design	Population	Research aim	Comments
	component is considered for this review). Qualitative semi-structured interviews and/or focus groups. Qualitative data was evaluated using thematic analysis.	**medical, speech therapists, neuropsychologists, occupational therapists, physiotherapists, nursing and administrators** N = 23 Time after stroke: Subacute (7 days-6 months) Severity: Not stated/unclear Focus of care/therapy: Early supported discharge (multidisciplinary team).	supported discharge model of care for stroke survivors at a large metropolitan public hospital in Australia.	located in a major Australian city. Funding: The author(s) received no specific funding for this work. Risk of bias: Moderate limitations (No information on whether the relationship between researcher and participants been adequately considered, limited applicability to this review). Applicability: To this question limited applicable themes. Setting is appropriate, but the study does not seem to answer the question.
Janssen 2020[19]	Qualitative study embedded in a constructivist paradigm using open-ended semi structured questions. Content analysis was used, with the CFIR as the coding framework.	**People after stroke** Mean age (SD): 58.7 (5.6) years. N = 10 Mean time since stroke (range): 8 (3-18) months. Focus of care/therapy: Mixed (physiotherapy).	To investigate factors influencing implementation of higher intensity activity in people with stroke and to compare this with therapists' perspectives.	Setting: Participants from the DOSE trial which was conducted in 5 metropolitan centres in Canada. Funding: This study was supported by the Canada Research Chair Program, Canadian Institutes of Health Research (FDN 143340 operating grant to J.J. Eng and Doctoral Award to T.D. Klassen), and Heart and Stroke Canadian Partnership for Stroke Recovery. Risk of bias: Minor limitations. Applicability: Broadly applicable. Canadian healthcare system is not too different from

Study	Design	Population	Research aim	Comments
				a UK perspective. Discusses people in a trial of a specific intervention, so may not be applicable to all intense interventions. In addition, most people were involved in exercise or were active before their stroke. This limits the applicability for people who may not have been active before their stroke.
Kelly 2020[20]	Three face-to-face focus groups with thematic analysis.	**Stroke survivors** Median age (IQR): 58 (48 to 69.3) years N = 16 Median time after stroke (IQR) = 19 (12.5 to 30.3) months. **Carers/family members** N = 2 **Healthcare professionals including rehabilitation assistants, specialist therapists and highly specialist therapists (including physiotherapists and occupational therapists)** N = 11 Focus of care: Upper limb (multidisciplinary team)	To explore the perceptions of participants of this intensive upper limb programme, including clinicians, stroke survivors and caregivers	Setting: London. Outpatient clinic in the United Kingdom. Funding: This work was supported by funds from the Occupational Therapy Research Fund, National Hospital for Neurology and Neurosurgery. Risk of bias: Moderate limitations (No information on whether the relationship between researcher and participants been adequately considered, limited applicability to this review). Applicability: Directly applicable. United Kingdom setting. However, small number of participants and only based around or in London.
Last 2021[21]	Interpretive description methodological approach. Conducted as semi-structured interviews.	**Stroke survivors** N = 11 Current of recently discharged patients of three	To explore the perspectives and experiences of patients undergoing hospital-based stroke	Setting: Inpatient, outpatient and restorative care rehabilitation programs in Canada.

Study	Design	Population	Research aim	Comments
		recruitment sites with a confirmed diagnosis of stroke. Five carers/family members were present in four of the interviews. Median age: 60 years. Median time since stroke = 4 months.	rehabilitation in order to understand barriers and facilitators to participation in rehabilitation and generate knowledge that could inform clinical practice.	Funding: No additional information. Risk of bias: Minor limitations. Applicability: Broadly applicable. Canadian based study. Likely applicable to a UK setting.
Marklund 2010[22]	Qualitative interviews were conducted in patients' homes. The data material was processed using qualitative content analysis	**Stroke survivors** Mean age (range) = 55 (35-74) years N = 7 Mean time since stroke (range) = 6 (1-16) years. Focus of care: Lower limb.	To describe stroke patients' experience of training with lower-limb constraint induced movement therapy	Setting: Rehabilitation department in Sweden. Funding: The study was supported with grants from Research and Public Health and the Research Centre for Primary care, Varmland County Council, Karlstad, Sweden and the Enoch Danielsson Foundation, Torsby, Sweden. Risk of bias: Moderate limitations (No information on whether the relationship between researcher and participants been adequately considered, limited applicability to this review). Applicability: Broadly applicable. Swedish setting, but nothing mentioned should be too specific to the setting and the information is likely generalisable to a UK setting.
McGlinchey 2015[23]	A focused ethnographical approach involving semi-structured interviews and	**Stroke survivors** Age (range): 67-82 years N = 4	The aim of this study was to explore the decision-making process in the	Setting: Two stroke units in an NHS trust. One acute and one stroke rehabilitation

Study	Design	Population	Research aim	Comments
	observations of clinical practice. Thematic analysis	Time after stroke (range): 4-12 weeks. **Neurophysiotherapists with experience in acute stroke and stroke rehabilitation** N = 7 Focus of care/therapy: Mixed (multidisciplinary team).	delivery of physiotherapy in a stroke unit.	unit in the United Kingdom. Funding: No funding was provided for this study. Risk of bias: Minor limitations. Applicability: UK based study so very applicable to NHS setting however, study not focused on intensity.
Merlo 2013[24]	Individual interviews and a focus group were conducted. Data analysis included an analytical thematic approach.	**Individuals with chronic stroke who had participated in an intensive intervention** Mean age (SD): 62 (10.05) years N = 8 Mean time since stroke (SD): 21 (8.8) months **Family members who participated in the focus group only** Age (range): 47-78 years N = 3	The purpose of this study was to assess the feasibility of a novel, intensive, task-specific intervention from the patient's perspective.	Setting: Stroke rehabilitation centre in the United States of America. Funding: Financial support for this study was provided by a grant from the American Heart Association (Scientist Development Grant, AHA Award #0835160N). Risk of bias: Moderate limitations (No information on whether the relationship between researcher and participants been adequately considered, limited applicability to this review). Applicability: Partially applicable. The study took place in the USA so findings are not directly applicable to a UK NHS setting.
Merriman 2020[25]	Descriptive qualitative study design involving in-	**Stroke survivors** Age (range): 35-85 years	This qualitative study examined the perspectives	Setting: Community setting in the republic of Ireland.

Study	Design	Population	Research aim	Comments
	depth semi-structured interviews. Thematic analysis.	N = 14 Time after stroke (range): Chronic (<1-17 years) **Carers** Age range: 40-85 years N = 11 **Healthcare professionals involved in providing stroke care. Including; Physiotherapists, OTs, Speech and language therapists, Clinicians, nurses and clinical psychologists** N = 19 Focus of care/therapy: Cognitive rehabilitation (multidisciplinary team).	and preferences of stroke survivors, carers, and healthcare professionals to inform the design of a cognitive rehabilitation intervention.	Funding: Funded by the Health Research Board of Ireland. Risk of bias: Minor limitations. Applicability: Directly applicable. Ireland based study. Only applicable to cognitive rehabilitation.
Mohd Nordin 2014[26]	Focus groups with a topic guide. A thematic analysis was employed.	**Stroke survivors** Age range: 30-72 years N = 8 Time after stroke: Not stated/unclear. **Rehabilitation professionals** Age range: 27-54 years N = 15 Occupation: Rehabilitation physician= 3, Medical social officer= 2, Occupational therapist= 3,	The aims of this study were to explore perceptions of long term rehabilitation among rehabilitation professionals and people with stroke, and identify strategies for the provision of such services.	Setting: This study was conducted at two university-based health institutions: Universiti Kebangsaan Malaysia Medical Centre (UKMMC) and the United Nations University International Institute for Global Health both located in the city of Kuala Lumpur, Malaysia. Funding: Not stated/unclear. Risk of bias: Moderate limitations (No information on whether the relationship between researcher and

Study	Design	Population	Research aim	Comments
		Speech pathologist= 2, Physiotherapist= 5.		participants been adequately considered). Applicability: Study is based in a developing country so not directly applicable to NHS UK setting.
Morris 2007[27]	Focus groups of patients, carers and staff followed a semi-structured format to elucidate experiences. The groups were recorded, transcribed and subjected to thematic analysis.	**Stroke survivors** Age range: 20-80+ years N = 38 Time after stroke: Chronic (≥6 months). **Carers** Age range: 41-80+ years N = 12 **Physiotherapists** N = 15 Focus of care/therapy: Physical activity (physiotherapy).	The aim is to study the experiences of patients, carers and staff throughout a hospital stroke care pathway.	Setting: Specialist hospital stroke service in the United Kingdom. Funding: Supported by a grant (CZH/4/554) from the Chief Scientist Office at the Scottish Government. Risk of bias: Minor limitations. Applicability: Very applicable due to UK setting but slightly outdated.
Moss 2021[28]	Qualitative study was nested within the Supporting well-being through PEER Befriending (SUPERB) study. Only the qualitative part of the study was included in our review. The qualitative study used semi-structured interviews. Data were analysed using framework analysis, a type of thematic analysis.	**Stroke survivors with aphasia** Median (IQR) age: 70 (57.5–77.0) years. N = 20 Aphasia severity: Mild aphasia = 12 Moderate–severe aphasia = 8 **Carers/family members** Median (IQR) age: 70.5 (43–79) years N = 10 Focus of care: Communication	What promotes or hinders adjustment specifically in people with aphasia and their significant others in early recovery, exploring both their internal resources and external sources of care and support.	Setting: Community based in the United Kingdom. Funding: K.G.'s contributions represent independent research part funded by the NIHR Biomedical Research Centre (South London and Maudsley NHS Foundation Trust and King's College London) and the NIHR Applied Research Collaboration South London (King's College Hospital NHS Foundation Trust).

Study	Design	Population	Research aim	Comments
				Risk of bias: Minor limitations. Applicability: Directly applicable as based in the UK. However, the study was only based in London so may not reflect other settings.
Nguyen 2019[29]	Phenomenological qualitative study using an interpretive description methodology. Semi-structured interviews with thematic analysis.	**Stroke clinicians** Age range: 25–50 years N = 10 Physical therapists = 4, occupational therapists = 6. Focus of care/therapy: Virtual reality (multidisciplinary team).	To identify the facilitators and barriers perceived by clinicians to using an Exergaming Room as adjunct to conventional therapy.	Setting: Jewish rehabilitation hospital in Canada. Funding: No funding noted. Risk of bias: Moderate limitations (No information on whether the relationship between researcher and participants been adequately considered, may not be applicable to NHS). Applicability: Partially applicable. Study took place in a private Jewish hospital in Canada so findings may not be applicable to an NHS setting.
Norris 2018[30]	Qualitative study embedded within a pilot RCT. Semi structured audio-recorded interviews. Transcripts were analysed following a modified Framework Approach.	**Stroke survivors** Age (range): 62 (56-91) years N = 10 Range of time after stroke: 2-120 months. Focus of care: Functional independence.	Acceptability and experience of a functional training programme (ReTrain) in community-dwelling stroke survivors in South West England.	Setting: Community setting in the United Kingdom. Funding: This work was supported by the Stroke Association (grant no: TSA 2014-03). Risk of bias: Minor limitations. Applicability: Directly applicable. Based in the UK in an NHS setting, however only based in South West England and the lack of ethnic diversity

Study	Design	Population	Research aim	Comments
				within the participant group was noted by study authors.
Schnabel 2021[31]	A qualitative design, nested within a larger, multi-centre randomised controlled feasibility trial. Semi-structured interviews were conducted. Normalisation Process Theory was used to inform the topic guide and map the findings. Framework analysis was applied.	**Stroke survivors** N = 17 **Carers/family members** Age range: 40-84 years N = 5 Severity (NIHSS) range: 0-13 Focus of care: Upper limb	This study aimed to explore the experiences of stroke survivors and their carers of an augmented arm rehabilitation programme including supported self-management, in terms of its acceptability, appropriateness and relevance.	Setting: Interviews were conducted in stroke survivors' homes, at Glasgow Caledonian University and in hospital in the United Kingdom. Funding: Chartered Society of Physiotherapy Charitable Trust funded the EVERLAP study (grant number N/12/10). Risk of bias: Minor limitations. Applicability: Directly applicable. United Kingdom based study.
Signal 2016[32]	Qualitative descriptive study nested in a mixed methods RCT. Semi-structured interviews with an interview guide were used. Interviews were recorded, transcribed and analysed using qualitative content analysis.	**Stroke survivors** Median age (range): 71 (50-92) years N = 14 Time after stroke median (range): 32 (5-132) months Severity: Not stated/unclear Focus of care: Mixed (physiotherapy).	To explore the factors that influence the acceptability of, and engagement with, a high intensity group-based exercise programme for people with stroke.	Setting: Stroke rehabilitation centre in New Zealand. Funding: Not stated/unclear. Risk of bias: Moderate limitations (No information on whether the relationship between researcher and participants been adequately considered). Applicability: Generally applicable. Based in New Zealand but in a community setting and the intervention of a group based exercise programme is applicable to the NHS .
Stark 2019[33]	Qualitative study embedded within a	**Stroke patients**	What are the experiences of	Setting: Community based in Germany.

Study	Design	Population	Research aim	Comments
	cluster randomized controlled trial. Semi-structured interviews were conducted and a phenomenological data analysis was employed.	Mean age (SD): 57.3 (9.0) years N = 13 Mean time after Stroke (SD): 6.5 (5.3) years. **Carers/family members** Mean age (SD): 58.3 (9.0) years N = 9 Focus of care/therapy: Upper limb (physiotherapy and self-management).	chronic stroke patients and non-professional coaches with homeCIMT?	Funding: The author(s) disclosed receipt of the following financial support for the research, authorship and/or publication of this article: The study was funded by the German Federal Ministry of Education and Research (Grant No. BMBF01-GX-1003). Risk of bias: Minor limitations. Applicability: Generally applicable. Based in Germany and the intervention is applicable to the NHS however patients were younger than the general stroke population so may not be as applicable.
Sweeney 2020[34]	This qualitative study was embedded within a larger feasibility randomised controlled trial (RCT). The qualitative part only was used for this review and involved semi-structured interviews with a thematic analysis.	**Stroke survivors** Mean age: Not stated/unclear N = 8 Time after stroke: Subacute (7 days – 6 months). Severity: Not stated/unclear Focus of care: Upper limb (physiotherapy and occupational therapy).	This study will address the following research questions: What are the barriers and enablers of each intervention and to what extent are CIMT and RAT used within clinical practice in NHS Scotland rehabilitation services?	Setting: Three NHS acute stroke units in the United Kingdom. Funding: Not stated/unclear. Risk of bias: Moderate limitations (No information on whether the relationship between researcher and participants been adequately considered and insufficient details on the data analysis with small sample size). Applicability: directly applicable as the study took place in the UK in an NHS setting.

Study	Design	Population	Research aim	Comments
Taylor 2018[35]	Ethnographic study, including observation and interviews. The theoretical framework drew on the work of Lipsky and Power, framing therapists as 'street level bureaucrats' in an 'audit society'.	**Staff from each of the three therapy professions (Occupational therapists, Physiotherapists and Speech and Language Therapists), Therapy assistants, Doctors, managers, a nurse, people after stroke and a family member/carer** N = 43 Focus of care/therapy: Mixed (multidisciplinary team).	To investigate the delivery of therapy on stroke units in the policy context of the 45 minute guideline and auditing of therapy intensity.	Setting: Three different stroke units in the United Kingdom. Funding: The Stanley Thomas Johnson Foundation provided funding for the doctoral study. The research was supported by the National Institute of Health Research Comprehensive Biomedical Research Centre at Guy's and St Thomas' NHS Foundation Trust, King's College London and National Institute of Health Research Collaboration for Leadership in Applied Health Research and Care (CLAHRC) South London Risk of bias: Minor limitations. Applicability: The study was conducted in an NHS setting and very applicable.
Van Kessel 2017[36]	Qualitative study design using semi structured interviews. The qualitative content analysis utilised the theory of planned behaviour as the framework for analysis.	**Physiotherapists and managers from six different stroke rehabilitation centres** N = 15 Level of seniority: Managers of a physiotherapy departments = 2 Senior stroke rehabilitation physiotherapists = 6 Junior physiotherapists = 7	What are the beliefs of physiotherapists related to attitudes, subjective norms and perceived control that influence their adoption of research evidence, in particular evidence for circuit class therapy and 7-day therapy in stroke rehabilitation	Setting: Six rehabilitation centres in Australia. Funding: This work was funded by the National Health and Research Council of Australia, grant number 631904. Risk of bias: Minor limitations. Applicability: Broadly applicable. Conducted in an Australian setting is somewhat applicable

Study	Design	Population	Research aim	Comments
		Average level of experience: 9.5 years. Focus of care/therapy: Mixed (physiotherapy).		to a United Kingdom setting. A diverse sample of stroke rehabilitation centres were selected based on the region and health system used to make the findings more generalisable.
Vive 2020[37]	Qualitative interviews were conducted in six focus groups. The interviews were analysed with qualitative content analysis.	**Stroke survivors who had just completed an Enriched experience task specific therapy program** Mean age (SD): 61.0 (13.1) years N = 20 Mean time after stroke (SD): 30.4 (34.1) months. Severity (mean Modified Rankin Scale) (SD): 3.4 (0.7) Focus of care/therapy: Mixed (multidisciplinary team).	As interventions move from simple to more complex, evaluation becomes more challenging. Practitioners, policymakers, and researchers are increasingly interested in the evaluation of complex interventions consisting of multiple interacting components. No studies have been conducted combining environmental enrichment and intense rehabilitation and why it is important to understand the experience from participants involved.	Setting: Two rehabilitation facilities in Spain. Funding: The Aina Wallstrom's and Mary-Ann Sjoblom's Foundation, Peter Eriksson Foundation, the Swedish state under the agreement between the Swedish government and the county councils (the ALF-agreement, 725241), Promobilia Foundation, The Swedish Stroke Association, Rune and Ulla Almlov's Foundation, John and Brit Wennerstrom Foundation, P-O Ahls Stiftelse, the Handlaren Hjalmar Svenssons Foundation, Brain Athletics and the Swedish Medical Research Council. Risk of bias: Minor limitations. Applicability: Limited applicability. Study took place in Sweden but the intervention was privately funded and therefore not greatly applicable to an NHS setting.
Walker 2016[38]	A qualitative case study design was used, semi-structured	**Stroke survivors** N = 2	To explore the experience of two participants undergoing a	Setting: Community setting in Australia.

Study	Design	Population	Research aim	Comments
	interviews were conducted individually and a thematic analysis was employed	Participant 1: Male (55 years) Time post stroke was one year Participant 2: Female (69 years). Time post stroke was four years Severity: Not stated/unclear. Focus of care: Upper limb (physiotherapy/self-management).	mCIMT protocol and examine factors influencing adherence to the protocol.	Funding: No funding stated. Risk of bias: Moderate limitations (No information on whether the relationship between researcher and participants has been adequately considered and insufficient details on the data analysis with very small sample size). Applicability: Broadly applicable. Community setting in Australia which is not fully applicable to NHS setting. Only 2 participants were interviewed.
Withiel 2020[39]	Qualitative study using semi-structured interviews. Data were collected and analysed thematically adopting a critical realist approach.	**Stroke survivors** Mean age (SD): 61.90 (10.48) years N = 20 Mean time after stroke (SD): 28.85 (27.67) months Focus of care/therapy: Cognition/neuropsychologists	This study aimed to explore and contrast the qualitative experiences of 20 stroke survivors who received six weeks' training in MSG (manualised memory skills group, n = 10) or individual-CCT (LumosityTM, n = 10).	Setting: Community setting in Australia. Funding: Lumosity was provided free of charge from Lumos labs. Risk of bias: Moderate limitations (No information on whether the relationship between researcher and participants has been adequately considered) Applicability: Broadly applicable. Community setting in Australia which is not fully applicable to NHS setting.
Worrall 2011[40]	Qualitative descriptive study involving semi-structured interviews.	**Stroke survivors with aphasia** Mean age: 63.9 (10.8) years. N = 50 Duration of aphasia (SD):	To gain an understanding of what people with aphasia want from aphasia services.	Setting: People recruited through an aphasia registry, in addition to community contacts in three Australian cities.

Study	Design	Population	Research aim	Comments
		54.9 (43.6) months		Funding: Funding from National Health and Medical Research Council (Project Grant #401532). Risk of bias: Moderate limitations (Relationship between researcher and participant; study ethics was not considered). Applicability: Broadly applicable. Australian-based study that mentions that people wanted additional rehabilitation.
Wray 2020[41]	In-depth, semi-structured interviews that were examined using thematic analysis	**Healthcare professionals (Speech and Language therapists)** N = 18 NHS Banding: 5-7/8. Median = 6.	To explore UK speech and language therapists views of 'self-management' as an approach to stroke rehabilitation including its application in practice with stroke survivors with aphasia.	Setting: United Kingdom. Speech and Language Therapists from five NHS services. Funding: This project was conducted by the first author as part of her PhD funded by the David and Anne-Marie Marsden scholarship for stroke rehabilitation (University of Leeds). Risk of bias: Moderate limitations (Relationship between researcher and participant; study design not appropriate for study aim). Applicability: Broadly applicable. United Kingdom based setting.
Young 2013[42]	Qualitative study nested within a randomized controlled trial.	**Stroke survivors with a communication difficulty**	To explore participants' experiences of speech and language therapy intervention or	Setting: Eight NHS usual care settings in England.

Study	Design	Population	Research aim	Comments
		Median age (range) = 73 (53-98) years N = 22 Communication difficulty: Dysarthria= 5 Aphasia= 12 Both Aphasia and Dysarthria = 5 Time after stroke: Chronic (≥ 6 months) Severity: Not stated/unclear Focus of care: Communication (speech and language therapy).	visitor attention control; contact with any non-professional can have beneficial effects for someone with aphasia or dysarthria in the early weeks following a stroke. The study points to specific conditions that would have to be met for contact to have a positive effect. To evaluate from participants' perspectives the effectiveness of speech and language therapy intervention or visitor attention control, both in terms of process and outcome; To compare the perceived impact on participant well-being of speech and language therapy intervention or visitor attention control.	Funding: This work was supported by the National Institute for Health Research Health Technology Assessment programme (grant number 02/1104) with partial funding for participating NHS Trusts' excess treatment costs provided by a Department of Health central subvention and the Stroke Association. Risk of bias: Minor limitations. Applicability: Directly applicable. NHS setting in the United Kingdom.

See Appendix E for full evidence tables.

3.1.3 Summary of the qualitative evidence

Table 2: Qualitative review findings

Main findings [population]	Statement of finding
Key principles	
More therapy is better[1, 2, 7-9, 14, 19, 21, 27-29, 35, 36, 40, 42] [stroke survivors, family members/carers, healthcare professionals]	Stroke survivors and family members believed that therapy duration was too short. Some healthcare professionals agreed while others were sceptical about the benefits of continued rehabilitation.
Person centred care: Intensity tailored to the individual[1, 2, 7, 10, 20, 21, 23-25, 27, 28, 31, 32, 36-38, 42] [stroke survivors, family members/carers, healthcare professionals]	The amount of rehabilitation should be tailored to the individual. Where people find it difficult to complete rehabilitation in the time block, this should be delivered as more frequent shorter sessions.

Main findings [population]	Statement of finding
Duration of therapy[24-26, 31, 33] [stroke survivors, family members/carers, healthcare professionals]	Stroke survivors and family members believed that therapy duration was too short. Some healthcare professionals agreed while others were sceptical about the benefits of continued rehabilitation.
Person factors	
Medical status[7, 9, 12, 14, 17, 25, 29, 32] [stroke survivors, family members/carers, healthcare professionals]	Medical status or comorbidities may be a barrier to engaging in rehabilitation. Interventions may need to be adapted for co-morbidities.
Fatigue[1, 7, 15, 21, 23-25, 29, 31, 36, 39] [stroke survivors, family members/carers, healthcare professionals]	Fatigue is a barrier for delivering more intense rehabilitation.
Physical factors[19, 29, 32, 33, 36] [stroke survivors, healthcare professionals]	People with higher previous activity levels may find it easier to engage with more intense rehabilitation. People with a reduced capacity who need lots of support may find it harder.
Psychological factors[1, 8, 19-21, 25, 28, 30, 32, 34, 39] [stroke survivors, family members/carers, healthcare professionals]	Psychological factors can be moderators for participation in intensive rehabilitation, including: sense of security, concentration, mood and behaviour challenges, personal achievement and sense of purpose.
Motivation[5, 20, 21, 24, 26, 31-34, 38, 40] [stroke survivors]	Intensity can be a source of motivation for engagement in rehabilitation. Other sources of motivation for intensive rehabilitation includes: self-motivation, motivation from family and therapists, having an altruistic view towards research, other stroke survivors in the group and using novel techniques (such as robot assisted therapy). Motivation may decrease as duration after stroke increases.
Social factors[1, 2, 12, 19-22, 25, 30, 32, 33, 37, 39, 42] [stroke survivors, family members/carers, healthcare professionals]	Observing and interacting with other stroke survivors can provide hope and enhanced self-motivation. The relationship with the therapist is an important moderator for the success of the intervention. For some, faith was an important moderator.
Education[13, 20, 21, 25, 26, 37] [stroke survivors, healthcare professionals]	There was a low awareness among patients and their families regarding optimum rehabilitation that can be a barrier to rehabilitation, while education can be used to increase motivation. Stroke survivors and family members will seek information about technology from any source. They would prefer this to be healthcare professionals, but healthcare professionals may not provide this information.
People requiring specific consideration	
People with communication difficulties[12] [stroke survivors, healthcare professionals]	People with communication difficulties may require additional opportunities for improving communication outside of formal rehabilitation sessions, which may be difficult to achieve in a hospital setting.
People with cognitive difficulties[15, 25, 27] [stroke survivors, family members/carers, healthcare professionals]	People with cognitive difficulties may have 'hidden needs' that require consideration to ensure they can be involved in intense rehabilitation. Rehabilitation may need to be delivered later on after stroke to support them to engage in activities for longer and more intense period of time.
Carer/family member factors	

Main findings [population]	Statement of finding
Support of family and friends[5, 10, 12, 15, 19, 21, 28, 31-33, 36, 37, 41] [stroke survivors, healthcare professionals]	Family provide motivation and support which can be a contributory factor for the success of the intervention. However, wanting to spend time with families at the weekend instead of therapy may be a barrier to therapy seven days a week.
Continuity of care[25, 26, 31] [stroke survivors, family members/carers, healthcare professionals]	A potential approach to increase the continuity of rehabilitation was to involve family members and carers to conduct therapy at home. However, family of stroke survivors may not be given adequate support throughout the process to achieve this.
Healthcare professional factors	
Beliefs about intensity of rehabilitation[7, 10, 17, 35, 36] [stroke survivors, family members/carers, healthcare professionals]	Beliefs about intensity of rehabilitation were varied between professionals, including a conflict between quality and quantity of rehabilitation and knowledge of the evidence for increased frequency and intensity of therapy. Therapists want to be able to adapt their approaches to the needs of the patient rather than fitting a specific model. Most therapists had a positive attitude about 7-day rehabilitation but one had a negative attitude that the quality of therapy over the weekend may not match weekday services.
Communication[2, 14, 28, 30, 32, 42] [stroke survivors]	People after stroke benefited from encouragement, motivation and honesty. They wanted therapists to discourage overoptimistic expectations.
Feedback[1-3, 5, 13, 19, 21, 22, 30, 34, 42] [stroke survivors, healthcare professionals]	Stroke survivors may benefit from receiving feedback during therapy sessions (whether from a therapist or another source, though therapist input was seen to hold validity due to professional status).
Confidence[9, 20, 37] [stroke survivors, healthcare professionals]	Therapists require signs from the patient that the therapy is tolerable and that research supports the intensive approach to feel confident delivering the therapy. In turn, stroke survivors had to trust the therapists to feel confident supporting them with the therapy.
Safety[10, 36] [healthcare professionals]	Therapists needed to balance the intensity against the safety of the intervention for the patient. Safety was often cited as a barrier for prescribing unsupervised exercises.
Prioritisation[23] [stroke survivors, healthcare professionals]	Prioritisation was used to plan surgery with people perceived to have higher priority being more likely to be seen regularly and for a length of time and time of day relating to achieving their goals. This included: newly admitted patients, patients demonstrating potential to rehabilitate, patients who are complaint and motivated, patients who missed out on therapy the previous day, patients at risk of deteriorating and patients requiring imminent discharge.
Consistency in care[25] [family members/carers]	Carers expressed that their loved ones care could be improved if they were consistently seen by the same healthcare professional who was familiar with the stroke survivor and their condition[25]
Intervention factors	
Methods of achieving more intense rehabilitation	
Individual therapy	[9, 10, 21]
Group-based therapy	[1, 7, 21, 30, 32, 36, 37]

Main findings [population]	Statement of finding
'Homework'/self management interventions	[2, 3, 31, 33]
Telerehabilitation, assistive technology and computer-based tools	[3-6, 13, 34, 39]
7-day working	[36]
Longer term rehabilitation	[26]
Intervention themes	
Increased opportunities for social stimulation[1, 5, 21, 25, 30] [stroke survivors, family members/carers, healthcare professionals]	Hospital based/group-based therapies had more opportunities for social interaction with other stroke survivors allowing for exchange of shared experiences and coping strategies. However, carers expressed some reservation that group activity accessibility may be reduced due to noise and lacking confidence to be involved. Telerehabilitation allowed for videoconferencing with the therapist when needed which could make them feel more connected.
Variety in activities and choice[1, 4-6, 13, 29, 34, 39] [stroke survivors, healthcare professionals]	Computer based therapies and group based therapies may provide opportunities for variety in activities and choice. Computer based therapies could provide more enjoyable, challenging and fun exercises than conventional therapy. Group based therapies with varied staff rotations may provide a change in routine and challenges that are of benefit.
Level of person centred care[1, 16, 25, 30, 32] [stroke survivors, family members/carers, healthcare professionals]	People with group based therapies have a mixed level of person centred care, where some found that it met their needs while others noted it was a balance between the needs of the group and the needs of the individual that was not always met. Some computer based therapies may be adapted to the needs of the individual.
Provision of feedback[3-5, 30, 34, 39] [stroke survivors, healthcare professionals]	Computer based therapies could give immediate feedback to the participant which could help provide motivation to improve on previous scores. Telerehabilitation can lead to sufficient feedback from professionals. Feedback from the trainer was seen as important for group based therapies, and depended on the personality of the trainer.
Travel time[6, 13, 16, 25, 29, 32] [stroke survivors, family members/carers, healthcare professionals]	Home-based therapies (including computer based therapies) were seen as positive due to the smaller amount of travel time for stroke survivors, which could leave them more fatigued after the difficulties of reaching the place of therapy. Non-home based therapies could be accessible if in the local community, such as community centres, hospital and outpatient clinics.
Need for technical support and training[3, 5, 6, 13, 16, 29] [stroke survivors, healthcare professionals]	Technical support and training is necessary for some types of therapy (in particular computer-based therapy).
Physical environment[6, 13, 29] [stroke survivors, healthcare professionals]	Physical environment can be a barrier to home-based therapy if technology which requires a fair amount of space is required. While inpatient facilities which were

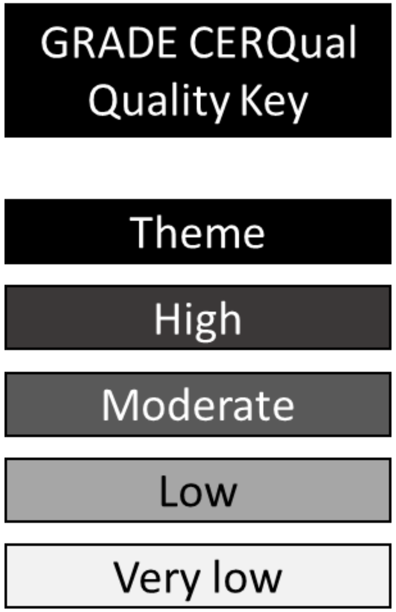
Main findings [population]	Statement of finding
	adapted to the needs of the person were seen as facilitators for rehabilitation.
Goal setting[20-22, 28] [stroke survivors, family members/carers, healthcare professionals]	Setting personalised and functional goals assisted with engagement in rehabilitation programs. Goals were identified by the participants, as motivation during intensive training.
Use of expensive/additional equipment[3, 9, 13, 16] [stroke survivors, family members/carers, healthcare professionals]	Computers and specialist equipment requires extra funding. This may be achievable depending on the local context (including charity funding).
Meaningful activities[21, 25, 31, 32, 38, 40] [stroke survivors, family members/carers, healthcare professionals]	Tasks which were deemed to be meaningful or related to patients' personal goals led to increased motivation and adherence to therapy.
Environmental factors	
Hospital care[12] [stroke survivors, healthcare professionals]	Hospital environments do not encourage socialisation which can be a barrier to people with communication difficulties. Shared rooms can give more opportunities for socialisation to help with this.
Home[5, 8, 13, 25, 38] [stroke survivors, family members/carers, healthcare professionals]	Rehabilitation in the home environment was seen to be more cost-effective and less demanding while being perceived as more focussed towards the individual. However, a lack of supervision and space at home may be a barrier to engagement.
Enriched/adapted environment[20, 22, 37] [stroke survivors]	Training in a specially adapted or well-resourced environment was felt to be stimulating and facilitated the success of the intervention.
Accessible therapy[3, 5, 13, 16, 20, 25, 26, 32] [stroke survivors, family members/carers, healthcare professionals]	Therapy in person was seen as accessible if delivered in a location that could be accessed in the local community. Remote therapy can be delivered remotely to improve geographic accessibility and reduce the effort to the stroke survivor and caregivers, but can produce barriers dependent on the person's use of computers.
Supervision[1, 5, 10, 22, 29-31, 38] [stroke survivors, healthcare professionals]	Lack of supervision was cited as a barrier to intensive therapy by stroke survivors and healthcare professionals. For exercise, barriers to completing exercise without supervision included therapists' beliefs about patients' ability to correctly complete exercises, patient safety awareness, cognitive impairment and a lack of family support. Remote communications via telerehabilitation may increase adherence.
Service factors	
Time spent in information exchange[7, 23, 27] [stroke survivors, family members/carers, healthcare professionals]	Therapist time spent in information exchange activities (for example: daily handovers or board rounds) limits the time they have to deliver more intense therapy. Some view these activities as useful or essential if all of the multidisciplinary team was involved and if the process is based on exchange of information and not simply receipt.
Time spent in other non-patient contact activities[3, 7, 23, 35] [stroke survivors, family members/carers, healthcare professionals]	Other administrative tasks may reduce time therapists have to deliver more intense therapy (including planning and documenting therapy, discharge planning, ordering equipment and transport, training stroke survivors, family/carer and staff and producing information packages). Some therapists consider this a

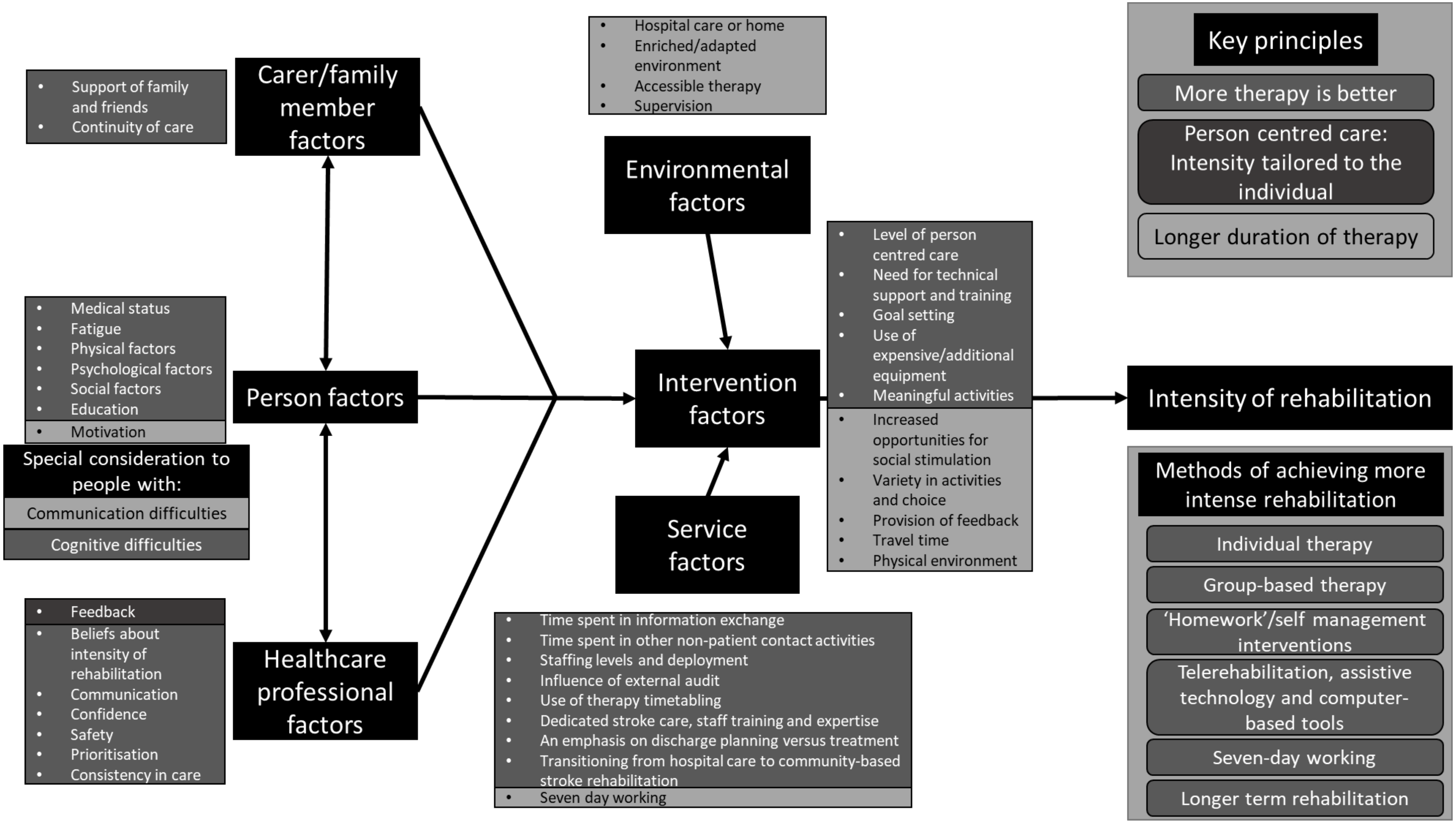
Main findings [population]	Statement of finding
	part of therapy time as they facilitating discharge was their therapy priority and so was a valuable use of time.
Staffing levels and deployment[3, 7, 9, 12, 17, 18, 21, 23, 26-28, 36, 41] [stroke survivors, family members/carers, healthcare professionals]	Lack of staff availability may make it difficult to deliver more intense therapy. Participants viewed limited resources in the current healthcare system as a major barrier.
Seven day working[1, 7, 21, 36] [stroke survivors, family members/carers, healthcare professionals]	The majority of healthcare professionals had a positive view on seven day services. Managers perceived the benefits in preventing patient deterioration over the weekend while therapists viewed it at improving function. An alternative view was that seven day services may not increase intensity if existing staff taken weekdays off in lieu, depleting number of healthcare professionals available during the week.
Influence of external audit[7, 11, 35] [stroke survivors, family members/carers, healthcare professionals]	Auditing may make it more likely for targets to be met and provide evidence for additional staffing requirements. However, this can shape therapists' behaviour, making them focus on increasing recorded therapy minutes rather than providing more patients with more therapy.
Use of therapy timetabling[7, 9, 23, 27] [stroke survivors, family members/carers, healthcare professionals]	Daily or weekly timetabling of therapist activity may help nurses to prioritise their workload and for staff not involved in timetabling to use the schedules to work around planned therapy.
Dedicated stroke care, staff training and expertise[27] [stroke survivors, family members/carers, healthcare professionals]	Daily or weekly timetabling of therapist activity may help nurses to prioritise their workload and for staff not involved in timetabling to use the schedules to work around planned therapy.
An emphasis on discharge planning versus treatment[7, 35] [stroke survivors, healthcare professionals]	A shift of emphasis from treatment to discharge planning was acknowledged by clinical leaders. Discharge planning for patients increased administration, which therapists often prioritised over face-to-face therapy.
Transitioning from hospital care to community-based stroke rehabilitation[8, 13, 17, 19, 25, 26] [stroke survivors, family members/carers, healthcare professionals]	Stroke survivors, carers and healthcare professionals all felt that transitions between services were a source of challenge and could lead to a lack of support[8, 19, 25]. Assistive technologies were seen as a possible way of bridging this gap [13]. Healthcare professionals and stroke survivors agreed that community-based rehabilitation centres are greatly needed to manage long term stroke patients[26]. One stroke survivor indicated that stroke recovery groups substituted for the lack of rehabilitation discharge follow-up by providing an environment where stroke survivors could obtain therapy services, as well as emotional support[17].

See Appendix J for full GRADE-CERQual tables.

3.1.3.1 Diagrammatic summary of key findings

Figure 1: A diagram showing the findings (themes and major subthemes) of the qualitative review





Carer/family member factors

- Support of family and friends
- Continuity of care

Person factors

- Medical status
- Fatigue
- Physical factors
- Psychological factors
- Social factors
- Education
- Motivation

Special consideration to people with:

- Communication difficulties
- Cognitive difficulties

Healthcare professional factors

- Feedback
- Beliefs about intensity of rehabilitation
- Communication
- Confidence
- Safety
- Prioritisation
- Consistency in care

Environmental factors

- Hospital care or home
- Enriched/adapted environment
- Accessible therapy
- Supervision

Intervention factors

- Level of person centred care
- Need for technical support and training
- Goal setting
- Use of expensive/additional equipment
- Meaningful activities
- Increased opportunities for social stimulation
- Variety in activities and choice
- Provision of feedback
- Travel time
- Physical environment

Service factors

- Time spent in information exchange
- Time spent in other non-patient contact activities
- Staffing levels and deployment
- Influence of external audit
- Use of therapy timetabling
- Dedicated stroke care, staff training and expertise
- An emphasis on discharge planning versus treatment
- Transitioning from hospital care to community-based stroke rehabilitation
- Seven day working

Intensity of rehabilitation

Key principles

- More therapy is better
- Person centred care: Intensity tailored to the individual
- Longer duration of therapy

Methods of achieving more intense rehabilitation

- Individual therapy
- Group-based therapy
- 'Homework'/self management interventions
- Telerehabilitation, assistive technology and computer-based tools
- Seven-day working
- Longer term rehabilitation

3.1.3.2 Narrative summary of review findings

3.1.3.1.1 Key principles

Review finding 1: Key principles: More therapy is better

In the most part, people agreed that increasing the amount of therapy delivered led to better recovery after a stroke. Stroke survivors and family members/carers agreed that the more therapy they received the better their recovery would be ("I was only aware of 1 person in the DOSE study when I got there and he was very active and he was recovering very rapidly, much more rapidly than the other patients that were around, and that was kind of an indicator to me that it might be worth doing this if I could get some similar type of recovery, it would be worth a try."[19]). When more intense therapy was delivered in studies, stroke survivors generally responded positively. Where less therapy was provided, people responded that they would have wanted more therapy time as they felt this was important to aid their recovery.

However, opinions about this theme were more varied amongst healthcare professionals. Some agreed that increasing the amount of therapy delivered led to enhanced recovery ("an additional therapy session per week will always be good" (clinician 01)[29]), while others argued that the quality of the rehabilitation being delivered was more important ("We've got to get out of this habit that just because a patient needs physiotherapy that the more they have, the better it is, that's completely wrong thinking. (Physiotherapist, Unit 5)"[7]).

Explanation of quality assessment: no or very minor concerns about methodological limitations; minor concerns about coherence between studies, as while the majority of studies agreed that more therapy was better, two discussed that the quality of rehabilitation was more important; minor concerns about relevance as some studies were conducted in a healthcare setting outside of the United Kingdom; no concerns about adequacy. There was a judgement of moderate confidence in this finding due to the concerns regarding coherence and relevance.

Review finding 2: Key principles: Person centred care: Intensity tailored to the individual

Stroke survivors, family members/carers and healthcare professionals agreed that the amount of rehabilitation provided should be tailored to the individual. While some stroke survivors wanted to complete more intensive rehabilitation, other may not be able to achieve this level. One method of tailoring the intensity was to split the total therapy time into shorter sessions during the day, rather than one long session ("There are patients who can't concentrate for that length of time so they'd be better being trained in two or three 10-minute sessions throughout the day which we might try to do. (Occupational therapist, Unit 2)"[7]).

The care should be delivered in a person centred manner, adapted to the needs of the person. However, many carers agreed that patient care was often too standardised, focused only on physical care and not delivered in a way that met their individual needs. The involvement of stroke survivors in the decision-making process was varied, with some being actively involved in decision-making on their goals and plans while others allowed therapists to decide on the plan without them. The wider needs of the person needed to be considered (for example: whether they wanted to spend time with those important to them at the weekend, instead of pursuing additional therapy). The holistic needs of the stroke survivor are important.

Explanation of quality assessment: no or very minor concerns about methodological limitations; no or very minor concerns about coherence between studies; no or very minor concerns about relevance; no concerns about adequacy. There was a judgement of high confidence in this finding.

Review finding 3: Key principles: Duration of therapy

In general, stroke survivors participating in more intense rehabilitation agreed that the therapy duration was too short. People felt that they had only just adjusted to the intensity of the rehabilitation by the time that the therapy ended ("It [the therapy] really needs to be 2 weeks, 4 weeks, 6 weeks longer to really get the most benefits out of it [be]cause right now I'm at the point where I have the endurance. I built up the endurance, and now I'm there. I'm there let's take it to the next level, and now I [have to] go home.... It's hard work, but it's well worth it, and it's not long enough.... You're feeling really good by the end of the second week, and you can get through the 3 hours, and then, poof, it's gone."[24]). Healthcare professionals agreed that further rehabilitation with stroke survivors was useful provided that the person has the motivation to continue with therapy. However, some professionals were sceptical about the value in longer term therapy.

Explanation of quality assessment: no or very minor concerns about methodological limitations; minor concerns about coherence as there was disagreement between healthcare professionals about the usefulness of long term therapy; minor concerns about relevance as some studies were conducted in a healthcare setting outside of the United Kingdom; minor concerns about adequacy due to the limited number of studies reporting the theme. There was a judgement of low confidence in this finding due to the concerns regarding coherence, relevance and adequacy.

3.1.3.1.2 Person factors

Review finding 4: Person factors: Medical status

Stroke survivors found that their current health and presence of comorbidities may be a barrier to engaging in rehabilitation ("If someone is bed bound (sic), you know the interaction is very minimal… you often walk past and you see them alone in their room… you wonder what happens during those periods of time where they're just in their room and they don't have family. (OT2)"[12]). In order to participate in rehabilitation, especially intense rehabilitation, adjustments are required regarding this. However, this led to dissatisfaction when people perceive that their capabilities and therapeutic needs different from those perceived by their healthcare providers.

Factors that could serve as barriers that related to their medical status included: fatigue, communication limitations, physical limitations, cognitive limitations and level of independence (these will be explored in separate additional subthemes as relevant) ('The kind of patients who are well motivated and if they don't have any cognitive impairment and things like that, they're obviously going to improve.' (Physio B1)[14]).

Explanation of quality assessment: moderate concerns about methodological limitations (due to limitations in considering the relationship between the participant and the researcher); no or very minor concerns about coherence; minor concerns about relevance as some studies were conducted in a healthcare setting outside of the United Kingdom; no concerns about adequacy. There was a judgement of moderate confidence in this finding due to concerns regarding methodological limitations and relevance.

Review finding 5: Person factors: Fatigue

Fatigue was often cited as a barrier for delivering more intense rehabilitation by both stroke survivors and health care professionals hence this was a factor that needed to be considered in the implementation of any rehabilitation programme ("If we feel patients can do more then we'll try and push them, if we feel a patient is too fatigued, then we like to end on a good note because that's the carry over they're going to get. So, we're restricted by patients' fatigue rather than NICE guidelines or staffing levels. (Physiotherapist, Unit 2)"[7]). Stroke survivors may experience their concentration diminishing and so be unable to engage in more intense therapy. One therapist felt that their ability to implement seven-day therapy was limited by fatigue ("The patients that are less motivated, more frail and have more significant deficits. . .came to me exhausted on a Monday, or I came to see them on the weekend and "I just can't do it". They found that it was too much for them. (Participant 14)"[36]).

Explanation of quality assessment: no or very minor concerns about methodological limitations; no or very minor concerns about coherence; minor concerns about relevance as some studies were conducted in a healthcare setting outside of the United Kingdom; no concerns about adequacy. There was a judgement of moderate confidence in this finding due to concerns regarding relevance.

Review finding 6: Person factors: Physical factors

Consisting of two minor subthemes: Previous activity levels and Physical support.

Previous activity levels can be a moderator for engaging with more intense rehabilitation; people who exercised more before their stroke may be more motivated to exercise after. Similarly, participants described their previous experience of exercises and the type they enjoyed doing related their enjoyment of the intervention and so if their rehabilitation integrates this then it is more likely to be successful. It was agreed that stroke survivors with a reduced capacity and who need lots of support may find it harder to engage with interventions, making this a barrier to providing more intense rehabilitation ("I guess it's just the logistics of trying to be able to do that [vary the approach for the individual within a group] in a group setting, but be able to provide enough assistance as you need it to a number of people at the same time. . . we found it hard, especially if patients weren't great on their feet. . .it was sometimes hard to feel safe to challenge them all at the same time."[36]).

Explanation of quality assessment: no or very minor concerns about methodological limitations; no or very minor concerns about coherence; minor concerns about relevance as some studies were conducted in a healthcare setting outside of the United Kingdom; no concerns about adequacy. There was a judgement of moderate confidence in this finding due to concerns regarding relevance.

Review finding 7: Person factors: Psychological factors

Consisting of five minor subthemes: Sense of security, Concentration, Mood and behaviour challenges, Personal achievement and Sense of purpose.

Response to a life changing event can lead to a loss of sense of security. People after a stroke described a new sense of vulnerability, loss of confidence and reduced independence, which lowered their mood. Resilience, determination and optimism were frequently reported to impact adjustment to this change ('Everything starting to look bright, forget the past, I want to move forward with my life. No time to think about what I went through and how it hurt me.'[28]). The consistency and regularity of sessions during a life changing event can be helpful to ground the person in their new life. However, post-stroke denial of the changes to their life can delay engagement with intense therapy (''... they may have been able to get me focussing sooner, not going through that denial to such an extreme'' (Participant 1, 51 y, female, CCT).[1]).

People with difficulties concentrating and with mood and behaviour challenges may have difficulties participating in therapy (''There was always something going on that would take your attention and it breaks your concentration; with the group... they would distract your attention...'' (Participant 10, 77 y, male, 7D).[1]). On the other hand, linking the therapy to a sense of personal achievement can be motivating for engaging with further therapy. This could include using the feeling to compete against previous achievements, which was noted to contribute to adherence and acceptability of an intervention ("they started timing them (activities) to show you the difference in time from when you start to when you finish…to see before and after was just amazing to be honest. It was like day and night" "It was just a confidence booster to see you were getting quicker" Participant 9[34]). Participating in the therapy may provide a sense of purpose in providing an activity to fill time with or to get them out of the house while in recovery. Setting and moving towards targets despite setbacks was key to adjustment and maintaining a positive outlook for some participants.

Explanation of quality assessment: no or very minor concerns about methodological limitations; no or very minor concerns about coherence; no or very minor concerns about relevance; minor concerns about adequacy (due to a limited number of studies reporting each subtheme included in the theme). There was a judgement of moderate confidence in this finding regarding adequacy limitations.

Review finding 8: Person factors: Motivation

Consisting of three minor subthemes: intensity as a source of motivation, other sources of motivation and motivation in the chronic phase.

Many stroke survivors valued how the intensity of physical and mental effort forced them to focus and work hard and linked this to their success. Some identified a link between hard work and reward, with a mentality of 'no pain no gain'. Therapists were concerned that frustration from intense therapy may impact on adherence, while people with stroke did not highlight this as an issue.

Participants referred to sources of motivation including self-motivation, motivation from family and therapists, having an altruistic view towards research and other members of the group that encouraged and helped them sustain their engagement. Stroke survivors may also be motivated by the use of novel techniques, such as robot assisted therapy ("It was different from what your normal occupational therapy was and, because of that I think it was probably a bit more enjoyable" Participant 1[34]). Otherwise, some stroke survivors who have had severe strokes claimed that their motivation level declined as the stroke became chronic hence were not motivated to continue practicing the previously learnt exercises at home ("Initially, I was motivated. After several months, I don't feel that excited anymore." (S8)[26]).

Explanation of quality assessment: moderate concerns about methodological limitations (due to limitations in considering the relationship between the participant and the researcher and for not considering limitations in some studies); no or very minor concerns about coherence; minor concerns about relevance as some studies were conducted in a healthcare setting outside of the United Kingdom; minor concerns about adequacy (due to a limited number of studies reporting each subtheme included in the theme). There was a judgement of low confidence in this finding regarding methodological, relevance and adequacy limitations.

Review finding 9: Person factors: Social factors

Consisting of three minor subthemes: Observing and interacting with other stroke survivors, Relationship with healthcare professionals and Faith.

People can be provided hope and enhanced self-motivation through interacting with other stroke survivors and providing mutual support and encouragement ("Now this chappie could lay on the deck, on the ground and actually get himself up which he could never do before. Now when you see the look on that chappie's face. God! You know there is something going on. And to me that was the biggest motivation for me."[30]). Stroke survivors were therefore largely supportive of being involved in group-based activities, due to the opportunity for social interaction, shared experiences and coping strategies. Stroke survivors also found the relationship with their therapist an important moderate for the success of the intervention. While for a subset of people, faith was highly important, helping them to feel grateful, calm and resilient ('I praise the Lord that I'm still alive, because what I went through, not many people would [be].'[28]).

Explanation of quality assessment: no or very minor concerns about methodological limitations; no or very minor concerns about coherence; minor concerns about relevance as some studies were conducted in a healthcare setting outside of the United Kingdom; minor concerns about adequacy (due to a limited number of studies reporting each subtheme included in the theme). There was a judgement of moderate confidence in this finding regarding relevance and adequacy limitations.

Review finding 10: Person factors: Education

Consisting of three minor subthemes: Low awareness among patients and their families regarding optimum rehabilitation, Education to increase motivation and Information on technologies.

The lack of awareness of the importance of optimum rehabilitation among patients and their families was seen to result in poor compliance to rehabilitation. This was attributed mainly to lack of patient education offered by rehabilitation staff who were occupied with other necessary tasks. Moreover, a lack of information can lead to a sense of frustration, self-doubt, and a loss of confidence ("You do feel you are going mad because you just don't understand why this happened… I think for me, if I had to go back, it would be just for someone to explain, you know, you've had a stroke and as part of your stroke you may feel tired or you may find it hard to concentrate, or you might find it difficult to process information, or you may find it difficult to do things [SS01]."[25]). Education could help to increase motivation; participants noted the importance of knowing how and why the rehabilitation was done this way ("It has meant a whole lot to gain knowledge also about how the brain works to keep the motivation and stimulation going and …it is the effort that counts. It has carried me a lot. Hmm, especially when it doesn't work."[37]). They perceived these elements as essential in motivating themselves to continue the high-intensity training. This view was shared by clinicians who described education as useful to overcome barriers to buy into the rehabilitation programme.

People after stroke and caregivers want information about the condition and options for rehabilitation, including more intense therapies, and will seek this from healthcare professionals or the internet. While they would prefer to seek this information from health professionals they trust, health professionals may be reluctant to provide this information in fear of providing false hope for technologies that have a poor evidence base and potential litigious consequences (both personally and for their organisation) ("I think their (health professionals') time is very constrained anyway, and that's why they have this problem with actually sort of using new equipment. That's my personal opinion. And it's funding. It's the biggest issue of all. We (patients) might know what we want; we know what we'd like (yep, yep, yep), it's actually getting it, you know. And all right, some people can fund it themselves, but they still need to be able to get to the right people to actually give them that equipment…(its knowing) what you can and can't get…it's a matter of education."[13]). If information is not provided by healthcare professionals then people may look for information in other sources and buy technologies to use without supervision.

Explanation of quality assessment: minor concerns about methodological limitations (due to problems in considering the relationship between the researcher and participant, not exploring the limitation of the study sufficiently and limited applicability of the evidence); no or very minor concerns about coherence; minor concerns about relevance as some studies were conducted in a healthcare setting outside of the United Kingdom; moderate concerns about adequacy (due to a limited number of studies throughout the theme with even more limited evidence reporting each subtheme included in the theme). There was a judgement of moderate confidence in this finding regarding methodological and adequacy limitations.

3.1.3.1.3 People requiring specific consideration

Review finding 11: People requiring specific consideration: People with communication difficulties

People with communication difficulties may require additional opportunities for improving communication outside of formal rehabilitation sessions. However, while in hospital, the nature of interactions are driven towards patient's care, restricting opportunities for communication beyond this context. Resources to aid communication with people with aphasia may not be used (including volunteer services to promote communication opportunities). Some staff perceived communication as a task separate from the responsibility of their role, therefore limiting communication opportunities ("They (speech pathologists) do their bit and we do ours… we don't have time to practice speech with them because we really do have to get all of our jobs filled in the time and it's specifically rostered for us to do our work, not to help with someone else's. (Rehabilitation nurse (RehabN)1)"[12]). They may also have a lack of skills in communicating to people with communication difficulties leading to avoidance of or unsuccessful interactions.

Explanation of quality assessment: moderate concerns about methodological limitations (due to problems in considering the relationship between the researcher and participant); no or very minor concerns about coherence; minor concerns about relevance as some studies were conducted in a healthcare setting outside of the United Kingdom; moderate concerns about adequacy (due to a limited number of studies throughout the theme with even more limited evidence reporting each subtheme included in the theme). There was a judgement of low confidence in this finding regarding methodological, relevance and adequacy limitations.

Review finding 12: People requiring specific consideration: People with cognitive difficulties

People may have 'hidden needs' that need additional consideration. The individual's cognitive impairment level may determine the utility of group activities. People may experience daily changes in mood, functioning and fatigue that can impact their ability to engage in rehabilitation. Physiotherapists also reported that cognitive impairment could impede recovery because of limited carryover by the patient ('Cognitive impairment would be a huge factor in the carry-over and instructions' (Physio A4)[14]).

The timings for when to deliver more intense rehabilitation may vary compared to people without cognitive difficulties. A commonly articulated view was that the further the person is into recovery the more likely they will be able to engage in activities for longer and more intense periods of time.

Explanation of quality assessment: no or very minor concerns about methodological limitations; no or very minor concerns about coherence; no or very minor concerns about relevance; minor concerns about adequacy (due to a limited number of studies reporting the subtheme). There was a judgement of moderate confidence in this finding regarding adequacy limitations.

3.1.3.1.4 Carer/family member factors

Review finding 13: Carer/family member factors: Support of family and friends

Motivation and support of the family was mentioned as a contributory factor for success of the more intense rehabilitation by both the stroke survivors and therapists ("I had a really good support system because I scared everybody.—laughs—I had a good friend, … and he did not let me sulk—none of that. So my scheduling—he would send me a text, "Okay, you have to go the gym this, this, and this day." And I'll say, "No, I don't want to." "Hey, either you call the bus or I'll come get you."—laughs—So, that was my scheduling. You just have to have a good support system. Do not talk yourself out of exercise."[19]). However, wanting to spend time with families at the weekend rather than in therapy was identified as a potential barrier to seven-day therapy by some physiotherapists. The balance between time spent with family and friends and spent engaging with rehabilitation is important for providing for the holistic needs of the person.

Explanation of quality assessment: no or very minor concerns about methodological limitations; no or very minor concerns about coherence (while the two statements shows that family member involvement can be a facilitator or barrier, it was decided that this was the nature of the moderate and so was not an inherent sign of a lack of coherence, just a different perspective of the theme); minor concerns about relevance as some studies were conducted in a healthcare setting outside of the United Kingdom; minor concerns about adequacy (due to a limited number of studies reporting the subtheme). There was a judgement of moderate confidence in this finding regarding relevance and adequacy limitations.

Review finding 14: Carer/family member factors: Continuity of care

A potential approach to increase the continuity of rehabilitation, was to involve the family members and carers in conducting basic therapy at home (‘Yes I help Timo once the study physiotherapist shows us what to do and she has 393 advised me how far you can go. And which muscles can em ... .’[31]). However, the majority of participants (rehabilitation therapists and stroke survivors) felt that the family of stroke patients had not given adequate support throughout the rehabilitation process, especially in the later stage of stroke recovery. This provides an increased burden to carers/family members and so needs to be considered by all involved.

Explanation of quality assessment: no or very minor concerns about methodological limitations; no or very minor concerns about coherence (while the two statements shows that family member involvement can be a facilitator or barrier, it was decided that this was the nature of the moderate and so was not an inherent sign of a lack of coherence, just a different perspective of the theme); no or very minor concerns about relevance; minor concerns about adequacy (due to a limited number of studies reporting the subtheme). There was a judgement of moderate confidence in this finding regarding adequacy limitations.

3.1.3.1.5 Healthcare professional factors

Review finding 15: Healthcare professional factors: Beliefs about intensity of rehabilitation

Consisting of three minor subthemes: Conflict between quality and quantity of rehabilitation; Knowledge of the evidence for increased frequency and intensity of therapy; The influence of experience.

Therapists may not engage in more time intensive rehabilitation as they believe that more quality movement for less time is as effective. To one group of professionals, stroke survivors were less concerned about the quantity of therapy offered to them than the quality of care and the nature of the therapy they received (“‘I thought it was a good idea that they were getting extra practice, one of my initial concerns was the quality of the movement because we are always so concerned that we want to get them to move as biomechanically proper as possible…’ #PT2”[10]). A barrier to providing more intense therapy may be that therapists may not be aware of the evidence for increased frequency and intensity of therapy and need to balance these findings with the needs of the person.

The physiotherapists beliefs were linked strongly to their experiences, including university training, professional development, observation of colleges, previous work experience, current work experience and direct experience with research. Physiotherapists advocated that stroke rehabilitation models should support physiotherapists to modify and adapt approaches to the goals of the individual patients and respond to the diversity of patient needs. Most had a positive attitude about seven-day rehabilitation based on the effects on their patients (“. . .you do it and it works and even though it’s not an RCT in a reputable journal, you do that because you know it works. (Participant 15)”[36]). Only one therapist had a negative attitude based on their personal experience that the quality of therapy over a weekend may not consistently match weekday services (“I know what kind of treatment techniques are done on the weekend versus probably during the week. And it does tend to be the bare essentials a little bit. So I don’t know if people are really being challenged so much during their weekend sessions because you don’t know the patients. (Participant 6)”[36]).

Explanation of quality assessment: no or very minor concerns about methodological limitations; no or very minor concerns about coherence; minor concerns about relevance as some studies were conducted in a healthcare setting outside of the United Kingdom; minor concerns about adequacy (due to a limited number of studies reporting the subtheme). There was a judgement of moderate confidence in this finding regarding relevance and adequacy limitations.

Review finding 16: Healthcare professional factors: Communication

People after stroke benefited from encouragement, motivation and honesty. They wanted therapists to discourage overoptimistic expectations. Participants identified five helpful characteristics for positive interactions during contact: the ability to put someone at ease; the ability to make an individual feel important; the visitor/speech and language therapist displaying a positive mood themselves; being empathic; being a good communicator. Having a good relationship with the healthcare professionals is important to help people engage with rehabilitation ("And they know a little bit about you more than just—you build a relationship that's deeper than purely a clinical one. That helps a lot, especially for me during the recovery process, you—stroke tends to remove some of your feelings of humanity, if that means anything and you feel less of a person, and part of the rebuilding is coming to terms with the changes that you are going through, accepting that some of them will to some degree and other be permanent, and having people around you that you feel actually care helps in during the recovery and helps you start regaining a sense of being a worthwhile person again, if that makes sense."[19]).

Explanation of quality assessment: no or very minor concerns about methodological limitations; no or very minor concerns about coherence; no or very minor concerns about relevance; minor concerns about adequacy (due to a limited number of studies reporting the subtheme). There was a judgement of moderate confidence in this finding regarding adequacy limitations.

Review finding 17: Healthcare professional factors: Feedback

Stroke survivors may benefit from receiving feedback during therapy sessions (''It was very straight which I appreciated, because she was very critical. If she didn't like something she told me straight away and I appreciated that because I knew where I was going wrong, like to improve myself...''[1]). This could be from a variety of different sources, including the therapist or as a component of the intervention, though therapist input was seen to hold validity due to professional status.

Explanation of quality assessment: no or very minor concerns about methodological limitations; no or very minor concerns about coherence; no or very minor concerns about relevance; no concerns about adequacy. There was a judgement of high confidence in this finding.

Review finding 18: Healthcare professional factors: Confidence

Therapists require signs (objective and subjective) from the patient that the therapy is tolerable, and that research supports the intensive approach to feel confident delivering the therapy. Similarly, the stroke survivors had to trust the competence of the rehabilitation staff to feel confident undertaking the intensive training ("Very um . . . helpful she'd [the therapist] point out where you were going wrong and, and finding you . . . how to get it right . . . just build your confidence up so where, where you think 'oh, I can't do that word,' just, just try a different way or . . . work out what you could say instead, take out words you couldn't say y'know so y'know like when they say, oh, I use three words instead of one it's because you can't do the one (laughs) so use three, it's easier. (Speech and language therapy)"[42]).

Explanation of quality assessment: no or very minor concerns about methodological limitations; no or very minor concerns about coherence; minor concerns about relevance as some studies were conducted in a healthcare setting outside of the United Kingdom; minor concerns about adequacy (due to a limited number of studies reporting the subtheme). There was a judgement of moderate confidence in this finding regarding adequacy limitations.

Review finding 19: Healthcare professional factors: Safety

Therapists needed to balance the intensity against the safety of the intervention for the patient ("I guess it's just the logistics of trying to be able to do that [vary the approach for the individual within a group] in a group setting, but be able to provide enough assistance as you need it to a number of people at the same time. . . we found it hard, especially if patients weren't great on their feet. . .it was sometimes hard to feel safe to challenge them all at the same time. (Participant 10)"[36]). Safety was often cited by physiotherapists in one study as a barrier for prescribing unsupervised exercises.

Explanation of quality assessment: no or very minor concerns about methodological limitations; no or very minor concerns about coherence; minor concerns about relevance as some studies were conducted in a healthcare setting outside of the United Kingdom; minor concerns about adequacy (due to a limited number of studies reporting the subtheme). There was a judgement of moderate confidence in this finding regarding relevance and adequacy limitations.

Review finding 20: Healthcare professional factors: Prioritisation

Prioritisation was used to plan physiotherapy. People perceived to be higher priorities were more likely to be seen regularly and for a length of time and time of day relating to achieving their goals (''Alright. The next double is XXXX. He's got to be able to do stairs, so we need to get to him. Are you free this afternoon at all?''[23]). Those people included: newly admitted patients, patients demonstrating potential to rehabilitate, patients who are complaint and motivated, patients who missed out on therapy the previous day, patients at risk of deteriorating, patients requiring imminent discharge.

Explanation of quality assessment: no or very minor concerns about methodological limitations; no or very minor concerns about coherence; no or very minor concerns about relevance; moderate concerns about adequacy (due to a limited number of studies reporting the subtheme which was explanatory in nature). There was a judgement of moderate confidence in this finding regarding adequacy limitations.

Review finding 21: Healthcare professional factors: Consistency in care

Carers expressed that their loved one's care could be improved if they were consistently seen by the same healthcare professional who was familiar with the stroke survivor and their condition ("Common across all interviewee groups was the need for regularity and consistency, which SS06 described as providing "an anchor", with others suggesting it would reduce the risk of regression"[25]). This was not expressed by any other groups.

Explanation of quality assessment: no or very minor concerns about methodological limitations; no or very minor concerns about coherence; no or very minor concerns about relevance; moderate concerns about adequacy (due to a limited number of studies reporting the subtheme). There was a judgement of moderate confidence in this finding regarding adequacy limitations.

3.1.3.1.6 Intervention factors

Review finding 22: Intervention factors: Methods of achieving more intense rehabilitation

A range of different methods for providing more intense rehabilitation was discussed in the studies. These included individual therapy (2 studies), group-based therapy (6 studies), 'homework'/self management interventions (4 studies), telerehabilitation, assistive technology and computer-based tools (7 studies), seven-day working (1 study) and longer term rehabilitation (1 study).

Explanation of quality assessment: no or very minor concerns about methodological limitations; no or very minor concerns about coherence (as while there are conflicting methods of delivering rehabilitation highlighted, multiple of these could be used as part of someone's rehabilitation and so they were not considered to conflict the nature of the subtheme); no or very minor concerns about relevance; moderate concerns about adequacy (due to a very limited number of studies reporting some of the methods highlighted above). There was a judgement of moderate confidence in this finding regarding adequacy limitations.

Review finding 23: Intervention factors: Increased opportunities for social stimulation

Group-based therapies:

Stroke survivors were largely supportive of being involved in group-based activities, noting the social aspect of group work, including opportunities for social interaction and shared experiences and coping strategies (''When they was coming, call me to go to the physio, I was happy because I get to see another friend, you know, talk together''[1]). However, carers expressed some reservation about group activities citing issues such as noise and lacking confidence to speak out.

Computer-based therapies:

Where computer-based therapies included videoconferencing, this allowed them to talk to their therapist and therefore feel more connected in the therapy session.

Explanation of quality assessment: no or very minor concerns about methodological limitations; minor concerns about coherence (due to disagreement between populations); minor concerns about relevance as some studies were conducted in a healthcare setting outside of the United Kingdom; moderate concerns about adequacy (due to only one study discussing the use of computer-based therapies). There was a judgement of low confidence in this finding regarding coherence, relevance and adequacy limitations.

Review finding 24: Intervention factors: Variety in activities and choice

Computer-based therapies:

Stroke survivors felt that computer based and 'high-tech' assisted therapies were more enjoyable, challenging and fun than traditional therapy exercises. This included assistive technology, using a Nintendo Wii device, computerised cognitive therapy and robot assistive devices ("[While] my wife watched [me playing Wii], she said, 'Oh yes, it looks like a lot of fun. We should probably have one like that at home, also for our grandchildren.'"[4]). This view was shared by health care professionals and led to an increase in referrals to exergaming rehabilitation. On the contrary some stroke survivors felt the games were tedious if they were too repetitive or weren't taxing enough ("There was some of the games, you could say were a bit tedious. That was maybe because they didn't tax you enough"[34]).

Through choosing and playing a variety of games, people perceived the exercises to be more engaging compared with conventional repetitive rehabilitative exercises.

Group-based therapies:

Most participants from both formats (individual and group based) were content with the variety of exercises in their programme. Some participants valued the variety that accompanied staff rotations in group-based therapies and enjoyed a change in routine and challenges with weekend staff.

Explanation of quality assessment: moderate concerns about methodological limitations (due to problems in considering the relationship between the researcher and participant, not exploring the limitation of the study sufficiently, study ethics not being considered in a study and limited applicability of the evidence); no or very minor concerns about coherence; minor concerns about relevance as some studies were conducted in a healthcare setting outside of the United Kingdom; moderate concerns about adequacy (due to only one study discussing the use of group-based therapies). There was a judgement of low confidence in this finding regarding methodological, relevance and adequacy limitations.

Review finding 25: Intervention factors: Level of person-centred care

Group-based therapies:

The difficulty in balancing the group needs alongside individual problems and attention was noted by several participants ("We've tried to do some group sessions in the past and it can be quite hard, just depending on how patients are medically. And how different patients are at different times. So it's hard to get a group of patients at the same level… if there's a vast difference, if you have a mild and a severe [mix] I don't think a group setting would fit for that… [But] if you could get a group of patients with similar levels of difficulty that would be really useful, and patients may learn more in that setting."[25]). Limitations and lack of choice within therapy sessions were reported by some participants and in some instances individual needs were not optimally met (''I like the one to one... I think they would do a little bit more with trying to walk or keep your balance''[1]).

Computer-based therapies:

Some of the professionals used computer software for home training for the participants. They described this as increasing independence, as well as intensity level and motivation in the rehabilitation process. Being able to share the progress of the rehabilitation and communicate from a distance were considered to generate a sense of closeness and be motivating for both patients and professionals. This was adapted to the needs of the person.

Explanation of quality assessment: no or very minor concerns about methodological limitations; minor concerns about coherence (due to varied experiences in the group-based therapy group); minor concerns about relevance as some studies were conducted in a healthcare setting outside of the United Kingdom; moderate concerns about adequacy (due to only one study discussing the use of computer-based therapies). There was a judgement of moderate confidence in this finding regarding coherence, relevance and adequacy limitations.

Review finding 26: Intervention factors: Provision of feedback

Computer-based therapies:

Computer based and virtual reality therapies can provide immediate feedback which participants felt added excitement and motivation to beat their previous scores ("You get motivated to go down there [to play Wii], and there you have a faster result. You can see if you win or what you can do. It motivates you for the next session, for example in bowling, to beat your own record and get more and more points"[4]). Stroke survivors rated their experience using the videoconferencing software highly. They found that this tool provided a channel for therapists to observe, correct and provide feedback and encouragement.

Group-based therapies:

Participants discussed how the personality of the trainer got them through the hardest parts of the course, encouraging and challenging them to take that additional step ("[Trainer]) was a great encourager and that was his great benefit and he just encouraged us to do more and more. He saw that you were willing to be pushed and he pushed and so the two together worked."[30]).

Explanation of quality assessment: minor concerns about methodological limitations (due to problems in considering the relationship between the researcher and participant and limited applicability of the evidence); no or very minor concerns about coherence; minor concerns about relevance as some studies were conducted in a healthcare setting outside of the United Kingdom; moderate concerns about adequacy (due to a very limited number of studies reporting the subtheme). There was a judgement of low confidence in this finding regarding limitations, relevance and adequacy limitations.

Review finding 27: Intervention factors: Travel time

Home-based:

Stroke survivors spoke positively about their experience of having someone visit them in their home. The participants expressed the convenience of using the devices in their homes rather than traveling to therapy (counteracting the difficulties of getting to therapy appointments) (‘‘We’d have to go to Decatur [Georgia] from here and that’s a good 4 hours with travel time. Normally when we have a doctor’s appointment, we’d leave at around 4 in the morning so that we can get down there’’. Another patient explained, ‘‘I wouldn’t have done the therapy if I had to go down there’’[6]).

Non-home based:

There was consensus that the rehabilitation should be delivered at a location that was accessible and within the local community. Suggestions included local community centres, hospitals and outpatient clinics.

Computer-based therapies:

Barriers to computer-based therapies that could not be moved out of the hospital included transportation and financial difficulties for outpatients needing to commute to the hospital. Otherwise, the use of ICT could enhance communication and allow healthcare professionals to follow up the progress of rehabilitation from a distance, for example, through videoconferencing. These solutions could save time and money through less travel, both for professionals and for patients (“Very often they (the patients) might just have one question. Then they waste perhaps one or one and a half hours just getting here and then going back … It feels like it would be easier if we could communicate in some other way!”[16]).

Explanation of quality assessment: moderate concerns about methodological limitations (due to problems in considering the relationship between the researcher and participant, not exploring the limitation of the study sufficiently, study ethics not being considered in a study and limited applicability of the evidence); no or very minor concerns about coherence; minor concerns about relevance as some studies were conducted in a healthcare setting outside of the United Kingdom; minor concerns about adequacy (due to a limited number of studies reporting the subtheme). There was a judgement of low confidence in this finding regarding methodological, relevance and adequacy limitations.

Review finding 28: Intervention factors: Need for technical support and training

The need for technical support and training along with difficulties in the setting up of equipment were identified as barriers for the implementation of computer based and assistive technologies by healthcare professionals (‘‘Ya’ll got a software problem with the machine ... the screen would just lock up on me and I’d have to unplug it and then reboot it up’’[6]).

Using computers requires technical skills and technical support, availability of devices that can use any relevant software and acquisition and funding of software. This can be facilitated through tailoring the approach to the individual, training, developing a shared understanding with IT departments, exploring funding and loaning models that work for the local context (including charity funding) (“To try to find a way that makes it work … being able to continue using your mobile phone, computer and tablet and anything you could have used before you became ill."[16]).

Explanation of quality assessment: moderate concerns about methodological limitations (due to problems in considering the relationship between the researcher and participant, not exploring the limitation of the study sufficiently, study ethics not being considered in a study and limited applicability of the evidence); no or very minor concerns about coherence; minor concerns about relevance as some studies were conducted in a healthcare setting outside of the United Kingdom; no or very minor concerns about adequacy. There was a judgement of moderate confidence in this finding regarding methodological limitations and relevance.

Review finding 29: Intervention factors: Physical environment

For computer-based therapies delivered in hospital in a specific area: the accessibility of the room to patients along with the low amount of resources required to operate the room was deemed to be a facilitator. Some barriers were identified such as the needs for more varied exergames systems, additional rooms and space.

Regarding home use of computer-based therapies: Concerns were expressed about devices which needed complex adjustment between patients (robots and dynamic splints), which might be difficult to move to the patient (robots), which were complex to programme (electrical stimulation, robots), which were time consuming to clean (most products) and difficult to store (robots in particular) ("Make them (robots) much more user-friendly. I think they are such big bits of kit. You can imagine, it's like taking an X-ray machine onto a ward…We've only got in a day, 20 minutes, twice, to work on a limb. I prefer to give them exercises and go, "just keep working, keep working""[13]).

Explanation of quality assessment: moderate concerns about methodological limitations (due to problems in considering the relationship between the researcher and participant, not exploring the limitation of the study sufficiently, study ethics not being considered in a study and limited applicability of the evidence); no or very minor concerns about coherence; minor concerns about relevance as some studies were conducted in a healthcare setting outside of the United Kingdom; minor concerns about adequacy (due to a limited number of studies reporting the subtheme). There was a judgement of low confidence in this finding regarding methodological, relevance and adequacy limitations.

Review finding 30: Intervention factors: Goal setting

Setting personalised and functional goals assisted stroke survivors with engagement in rehabilitation programmes. Goals were identified by the participants, as part of the motivation process to give them strength for the intensive training ('Here's your thing – this is individualised, tailored to you, your needs, your goal.'[20]).

Explanation of quality assessment: moderate concerns about methodological limitations (due to problems in considering the relationship between the researcher and participant and limited applicability of the evidence); no or very minor concerns about coherence; no or very minor concerns about relevance; minor concerns about adequacy (due to a limited number of studies reporting the subtheme). There was a judgement of moderate confidence in this finding regarding methodological and adequacy limitations.

Review finding 31: Intervention factors: Use of expensive/additional equipment

Using computers requires technical skills and technical support, availability of devices that can use any relevant software and acquisition and funding of software. This can be facilitated through training, developing a shared understanding with IT departments, exploring funding and loaning models that work for the local context (including charity funding).

However, a lack of funding for specialist equipment was often cited as a barrier for intensive rehabilitation ("Personally, myself as a manager, I think it's [computer software] costly, as an investment, in the licenses, for a small department like us"[3]). The cost of software licenses, assistive technologies and the need for a graded exercise test, and ideally equipment (heart rate monitors, step counters, treadmills, harnesses) make the intensive intervention more difficult to implement.

Explanation of quality assessment: minor concerns about methodological limitations (due to problems in considering the relationship between the researcher and participant and not exploring the limitation of the study sufficiently); no or very minor concerns about coherence; no or very minor concerns about relevance; minor concerns about adequacy (due to a limited number of studies reporting the subtheme). There was a judgement of moderate confidence in this finding regarding methodological and adequacy limitations.

Review finding 32: Intervention factors: Meaningful activities

Tasks which were deemed to be meaningful or related to patients' personal goals led to increased motivation and adherence to the rehabilitation programme ("I'm . . . football fanatic so most of the things she [the therapist] got me to read and do was over football and that's where . . . the letter 'M' came into it. I found I struggled saying [inaudible] . . . [Manchester] United, she did football teams to make it interesting for me. She'd pick my interests out and put it into a way of teaching me that I enjoyed. I think that's why I enjoyed the speech therapy so much. (Speech and language therapy)"[42]).

Explanation of quality assessment: minor concerns about methodological limitations (due to problems in considering the relationship between the researcher and participant, it being unclear if data analysis was sufficiently rigorous in one study and limited applicability of the evidence); no or very minor concerns about coherence; minor concerns about relevance as some studies were conducted in a healthcare setting outside of the United Kingdom; no or very minor concerns about adequacy. There was a judgement of moderate confidence in this finding regarding methodological limitations and relevance.

3.1.3.1.7 Environmental factors

Review finding 33: Environmental factors: Hospital care

Hospital environments do not encourage socialisation (with background noise and environmental distractions in large rooms) which can make it hard for people with communication difficulties to communicate ("They (patients) can hear other people talking… there is (sic) a lot of voices going on which is going to impact on their understanding as well."[12]). Shared rooms can give more opportunities for socialisation (including communal areas for people in private rooms) – this is particularly important for people with communication difficulties ("We used to co-locate our stroke patients (sic) and often using our shared rooms. That's when people had more opportunities for interacting with one another."[12]).

Explanation of quality assessment: moderate concerns about methodological limitations (due to lack of exploration of the relationship between the researcher and the participant); no or very minor concerns about coherence; minor concerns about relevance (as the findings from this outcome are specific to only one part of the population, people with communication difficulties); moderate concerns about adequacy (due to only one study reporting the subtheme). There was a judgement of low confidence in this finding regarding methodological limitations, relevance and adequacy limitations.

Review finding 34: Environmental factors: Home

Rehabilitation in the home environment was seen to be more cost-effective and less demanding. Furthermore, the home environment was perceived to be more focused toward rehabilitation outcomes and stroke survivors spoke positively about their experience of having someone visit them in their home ("if you've got any questions … you could ask them, whereas when you're in a hospital, I feel that I can't take up the people's time because they haven't really got time"[8]). However, the lack of supervision during a home-based programme was highlighted as a barrier to engagement by one stroke survivor completing constraint induced movement therapy. Conversely limited space at home made it difficult for people to participate in exercises.

Explanation of quality assessment: moderate concerns about methodological limitations (due to problems in considering the relationship between the researcher and participant, not exploring the limitation of the study sufficiently, it being unclear if the data analysis was sufficiently rigorous in a study and limited applicability of the evidence); minor concerns about coherence (as there was disagreement with one person in one study); no or very minor concerns about relevance; minor concerns about adequacy (due to a limited number of studies reporting the subtheme). There was a judgement of low confidence in this finding regarding methodological, coherence and adequacy limitations.

Review finding 35: Environmental factors: Enriched/adapted environment

Training in a specially adapted or well-resourced environment was felt to be stimulating and facilitated the success of the intervention ("This clearly means a lot. Positive surroundings. I only see the colours, the ocean… Most of us have been ill for a long time and have perhaps not experienced many other things during this time. Maybe you've had to give up travelling or other things that you used to do."[37]).

Explanation of quality assessment: moderate concerns about methodological limitations (due to problems in considering the relationship between the researcher and participant and limited applicability of the evidence); no or very minor concerns about coherence; minor concerns about relevance as some studies were conducted in a healthcare setting outside of the United Kingdom; minor concerns about adequacy (due to a limited number of studies reporting the subtheme). There was a judgement of low confidence in this finding regarding methodological, relevance and adequacy limitations.

Review finding 36: Environmental factors: Accessible therapy

In person:

People agreed that rehabilitation should be delivered at a location that is accessible and within the local community. Suggestions included local community centres, hospitals and outpatient clinics.

Remotely:

Technology that allows therapy to be delivered remotely can improve geographic accessibility and reduce effort to the stroke survivor and any caregivers ("It's not easy for them [the patients] to pay to come by cab…so expensive. Now they have to pay about 30 ringgit or more. So, transportation becomes a problem."[26]), but can provide additional barriers dependent on the person's ability to use computers. The convenience in location and time led to have higher doses of therapy compared to that achieved when having to travel to a therapist at a scheduled time.

Explanation of quality assessment: moderate concerns about methodological limitations (due to problems in considering the relationship between the researcher and participant, not exploring the limitation of the study sufficiently and limited applicability of the evidence); minor concerns about coherence (as there was disagreement when discussing remote delivery of therapy); no or very minor concerns about relevance; minor concerns about adequacy (due to a limited number of studies reporting the subtheme). There was a judgement of low confidence in this finding regarding methodological, coherence and adequacy limitations.

Review finding 37: Environmental factors: Supervision

Lack of supervision was cited as barrier to intensive training for both stroke survivors and healthcare professionals (‘‘[The therapist] went away and left me on my own and I have to keep walking ....you can’t stop it, and I was just going for too long’’[1]). More specifically the barriers to prescribing exercises to be completed outside of therapy time included therapists' beliefs about patients' ability to correctly complete exercises, patient safety awareness, cognitive impairment and lack of family support for self-directed exercise. As a result exercises were most often completed with the supervision of a rehabilitation assistant. Remote communication via telerehabilitation led to an increase in adherence as participants felt more obliged to complete their assignments in comparison to working by themselves.

Explanation of quality assessment: minor concerns about methodological limitations (due to problems in considering the relationship between the researcher and participant, it being unclear if the data analysis was sufficiently rigorous in a study and limited applicability of the evidence); no or very minor concerns about coherence; minor concerns about relevance as some studies were conducted in a healthcare setting outside of the United Kingdom; minor concerns about adequacy (due to a limited number of studies reporting the subtheme). There was a judgement of low confidence in this finding regarding methodological, relevance and adequacy limitations.

3.1.3.1.8 Service factors

Review finding 38: Service factors: Time spent in information exchange

Therapist time spent in information exchange activities (for example: daily handovers or board rounds) limits the time they have to deliver more intense therapy. These may include repetition of information that is not relevant to therapists and therapist attendance could be minimised to increase availability for therapy (“There’s often nothing new to report and sometimes that does seem a waste of time to sit and hear the same thing as the day before. (Stroke co-ordinator, Unit 6)”[7]). Staff meetings, in-service training and ward handovers also reduced the amount of time available for treatment sessions (“Some days it may feel as though the information that we get is not appropriate, but it’s important that we have handover, as the therapy team, we have our input as well as taking information from them. (Physiotherapist, Unit 4)”[7]). Some view these activities as useful or essential if all of the multidisciplinary team was involved and if the process is based on exchange of information and not simply receipt.

Explanation of quality assessment: no or very minor concerns about methodological limitations; no or very minor concerns about coherence; no or very minor concerns about relevance; minor concerns about adequacy (due to a limited number of studies reporting the subtheme). There was a judgement of moderate confidence in this finding regarding adequacy limitations.

Review finding 39: Service factors: Time spent in other non-patient contact activities

Other administrative tasks may reduce time therapists have to deliver more intense therapy. This included planning therapy, documenting therapy provided; discharge planning, ordering equipment and transport; developing patient and family/carer training and information packages; supervising and training staff (“We have a large indirect role; because indirect isn’t included in your 45minutes therapy it’s not part of [achieving] your target, but it is a vital part of somebody’s treatment with us. Sometimes it can take 30minutes to fill out a bed-rail risk assessment. (Occupational therapist, Unit 4)”[7]). Therapists would justify the recording of administration as therapy time based on the argument that facilitating the patient’s discharge was their therapy priority and should therefore be seen as valuable use of their therapists’ time.

Explanation of quality assessment: no or very minor concerns about methodological limitations; no or very minor concerns about coherence; no or very minor concerns about relevance; minor concerns about adequacy (due to a limited number of studies reporting the subtheme). There was a judgement of moderate confidence in this finding regarding adequacy limitations.

Review finding 40: Service factors: Staffing level and deployment

Lack of staff availability may make it difficult to deliver more intense therapy ("We [local NHS speech and language therapy service] don't have the staffing any more to provide that kind of 1:1 therapy that we used to..."[3]). Participants viewed limited resources in the current healthcare system as a major barrier. A stroke survivor and spouse both reported that scheduled therapy sessions were often cancelled due to unavailability of rehabilitation staff ("I think it's the system more than the people, and I think the system just doesn't work for intensive therapy… I think there's been a real lack of intensive therapy…. at least for the first three months we needed way more therapy. There was a lot of assessing, therapy minimal at times…frustrating."[17]). Another spouse suggested that essential intensive therapy was minimal and not prioritized by the healthcare system. This view was shared by healthcare professionals who highlighted that not having sufficient resources to do lots of one to one therapy sessions, or only having short windows of therapy time with patients after their stroke led to them giving less therapy than they would like.

Explanation of quality assessment: no or very minor concerns about methodological limitations; no or very minor concerns about coherence; minor concerns about relevance as some studies were conducted in a healthcare setting outside of the United Kingdom; no or very minor concerns about adequacy. There was a judgement of moderate confidence in this finding due to relevance limitations.

Review finding 41: Service factors: Seven day working

The majority of healthcare professionals had a positive view on seven day services, and believed that it increased therapy time. Managers perceived the benefits to be in preventing patient deterioration over the weekend, rather than improving function. Conversely the physiotherapists felt that it led to improved function and based this on positive feedback from patients. Keeping busy was important to some stroke survivors and seven-day therapy provided an antidote to boredom on weekends. An alternative view was that seven-day services may not increase therapy frequency and intensity if existing staff take weekdays off in lieu, depleting their numbers ("I think seven-day working is exactly what we should be doing but not how this Trust is doing it because you're making five day working less effective because you're just spreading it [therapists] too thinly to tick a box. (Speech and language therapist, Unit 1"[7]).

Explanation of quality assessment: no or very minor concerns about methodological limitations; minor concerns about coherence (due to disagreement between professionals); minor concerns about relevance as some studies were conducted in a healthcare setting outside of the United Kingdom; minor concerns about adequacy (due to a limited number of studies reporting the subtheme). There was a judgement of low confidence in this finding regarding coherence, relevance and adequacy limitations.

Review finding 42: Service factors: Influence of external audit

Auditing can make it more likely for targets to be met. The SSNAP audit helps to improve stroke services, providing evidence to support additional staffing requirements ("It's better to have some standard about the amount of therapy that patients should be receiving, because that gives a target to work towards and you're more likely to give patients adequate therapy […]. That is measured and known throughout your region and to the public, and the Trust is going to be judged upon it. (Stroke co-ordinator, Unit 6)"[7]). However, this can shape therapists' behaviour; making their focus on increasing recording therapy minutes rather than providing more patients with more therapy more frequently. For therapists in all stroke units, there was ambiguity about what counted as auditable therapy ("We count [group activity] as contact time, sometimes it feels like a bit of a cheat because I know it's not therapy, we're just seeing the patients, making sure they're okay and seeing them from a mental point of view, trying to perk their moods up. (Physiotherapist, Unit 6)"[7]). Therapists questioned the quality of the national audit data for therapy, and they used language such as 'bending the rules', 'playing the numbers game' or 'lying' when discussing the practices of other teams.

Explanation of quality assessment: no or very minor concerns about methodological limitations; minor concerns about coherence (due to disagreement between professionals); no or very minor concerns about relevance; minor concerns about adequacy (due to a limited number of studies reporting the subtheme). There was a judgement of moderate confidence in this finding regarding coherence and adequacy limitations.

Review finding 43: Service factors: Use of therapy timetabling

Daily or weekly timetabling of therapist activity may help nurses to prioritise their workload (by ensuring patients were out of bed and ready for therapy) and for staff not involved in timetabling to use the schedules to work around planned therapy ("If the day before, they [therapists] could let us know who they're going to first in the morning, then obviously nursing staff would be able to prepare for that. (Registered nurse, Unit 2)"[7]). The net effect of shared timetables was that patients were available for therapy, therapists did not compete for the same time slot, few sessions were missed and more minutes of therapy could be provided.

Explanation of quality assessment: no or very minor concerns about methodological limitations; no or very minor concerns about coherence; no or very minor concerns about relevance; minor concerns about adequacy (due to a limited number of studies reporting the subtheme). There was a judgement of moderate confidence in this finding regarding adequacy limitations.

Review finding 44: Service factors: Dedicated stroke care, staff training and expertise

Three staff groups described ways in which the dedicated stroke service and care pathway were key strengths. Staff develop expertise in stroke care, which benefits patients and carers through the provision of tailored input ('... the therapists are very used to the stroke patients, I think that's a positive thing for them, ...'[27]). Conversely where there were physical or professional separations in the service, problems occurred ('... there are two philosophies of care in place, and ... it's made people incredibly anxious and defensive in their practice and quite a blaming culture has grown up ... ... so there seems to be a kind of reciprocal relationship of blame between THE nurses and THE therapy team ...'[27]).

Explanation of quality assessment: no or very minor concerns about methodological limitations; no or very minor concerns about coherence; no or very minor concerns about relevance; moderate concerns about adequacy (due to a very limited number of studies reporting the subtheme). There was a judgement of moderate confidence in this finding regarding adequacy limitations.

Review finding 45: Service factors: An emphasis on discharge planning versus treatment

A shift of emphasis from treatment to discharge planning was acknowledged by clinical leaders ("We don't use the word 'rehab' in relation to inpatient stroke services at [NHS organisation] anymore because the concept is about community. Rehab happens in the community… I think I'm very clear… yes, the therapists don't do therapy, but they get their patients home."). Discharge planning for patients (particularly those with complex needs) increased administration, which therapists often prioritised over face-to-face therapy.

Explanation of quality assessment: no or very minor concerns about methodological limitations; no or very minor concerns about coherence; no or very minor concerns about relevance; minor concerns about adequacy (due to a limited number of studies reporting the subtheme). There was a judgement of moderate confidence in this finding regarding adequacy limitations.

Review finding 46: Service factors: Transitioning from hospital care to community-based stroke rehabilitation

Stroke survivors, carers and healthcare professionals all felt that transitions between services were a source of challenge and could lead to a lack of support (‘... all of a sudden it’s like, ‘Oh, we’ve referred you to the hospital again to get the physio,’ which has took, like, three months. So I’ve had intense physio for six weeks and then, for three months, I’ve had nothing’). Assistive technologies were seen as a possible way of bridging this gap (“I think that it (assistive technology use) has got to start before you are, before you are discharged, to be able to carry it home, and then do whatever it is you need to do afterwards.”).

Explanation of quality assessment: moderate concerns about methodological limitations (due to problems in considering the relationship between the researcher and participant and not exploring the limitations of the study sufficiently); no or very minor concerns about coherence; minor concerns about relevance as some studies were conducted in a healthcare setting outside of the United Kingdom; no or very minor concerns about adequacy. There was a judgement of moderate confidence in this finding regarding methodological and relevance limitations.

4 Moderators of intense rehabilitation (mixed methods synthesis)

Review questions:

In people after stroke, what is the clinical and cost effectiveness of more intensive rehabilitation compared with standard rehabilitation?

This question includes two subquestions:

- In people after stroke, what is the clinical and cost effectiveness of more intensive rehabilitation compared with standard rehabilitation?
- In people after stroke what factors are associated with effective delivery of more intensive rehabilitation?

4.1.1 Summary of mixed methods synthesis

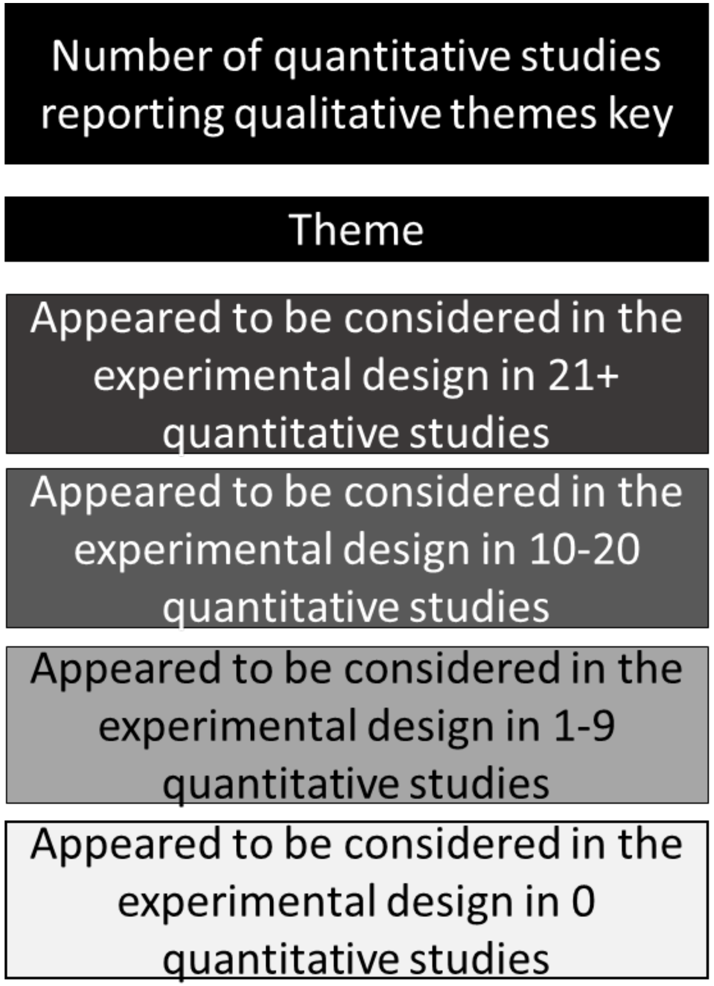
All studies from the effectiveness evidence (106 studies) were reviewed for their relation to the themes identified from the qualitative evidence (39 studies). This was completed using two approaches:

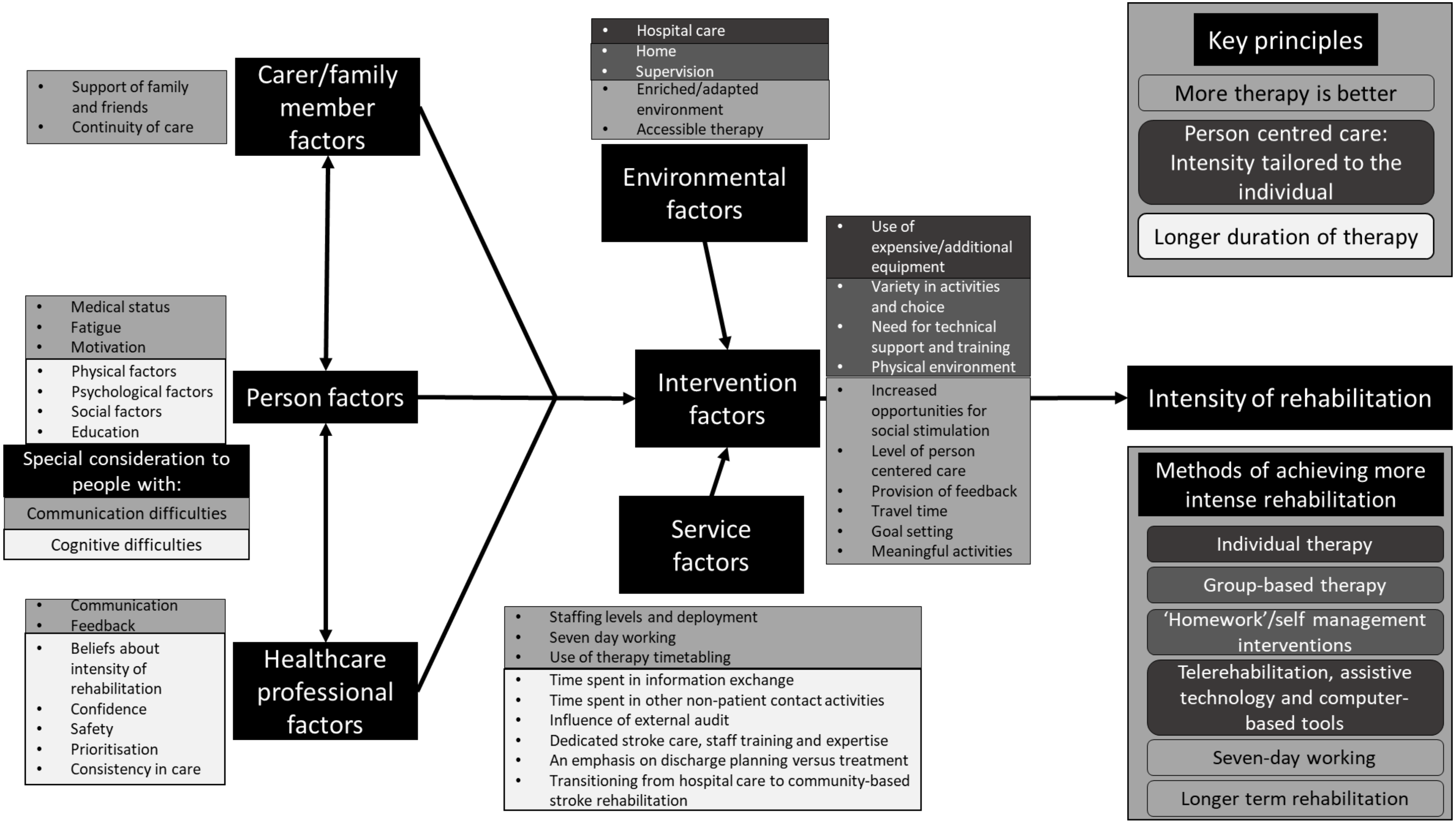
1) For all themes, matrices comparing which quantitative studies considered each qualitative theme – this is reported in a summary diagram (see section 4.1.2) and summary matrices (see Appendix P)
2) For relevant themes, sensitivity analyses were conducted to investigate if the consideration of the themes changed the outcome

The matrices comparing the quantitative and qualitative evidence can be found in Appendix P. The results of the sensitivity analyses can be found in section 4.1.3. An exploration of the results of the mixed methods synthesis can be found in section 4.1.4 Mixed methods synthesis conclusion. Also see forest plots in Appendix H.

4.1.2 Diagrammatic summary of mixed methods synthesis

Figure 2: A diagram indicating the number of quantitative studies reporting the themes identified from the qualitative studies.





- Support of family and friends
- Continuity of care

Carer/family member factors

- Medical status
- Fatigue
- Motivation
- Physical factors
- Psychological factors
- Social factors
- Education

Special consideration to people with:

Communication difficulties

Cognitive difficulties

Person factors

- Communication
- Feedback
- Beliefs about intensity of rehabilitation
- Confidence
- Safety
- Prioritisation
- Consistency in care

Healthcare professional factors

- Hospital care
- Home
- Supervision
- Enriched/adapted environment
- Accessible therapy

Environmental factors

Intervention factors

- Use of expensive/additional equipment
- Variety in activities and choice
- Need for technical support and training
- Physical environment
- Increased opportunities for social stimulation
- Level of person centered care
- Provision of feedback
- Travel time
- Goal setting
- Meaningful activities

Service factors

- Staffing levels and deployment
- Seven day working
- Use of therapy timetabling
- Time spent in information exchange
- Time spent in other non-patient contact activities
- Influence of external audit
- Dedicated stroke care, staff training and expertise
- An emphasis on discharge planning versus treatment
- Transitioning from hospital care to community-based stroke rehabilitation

Intensity of rehabilitation

Key principles

More therapy is better

Person centred care: Intensity tailored to the individual

Longer duration of therapy

Methods of achieving more intense rehabilitation

Individual therapy

Group-based therapy

‘Homework’/self management interventions

Telerehabilitation, assistive technology and computer-based tools

Seven-day working

Longer term rehabilitation

4.1.3 Sensitivity analysis comparing the quantitative and qualitative evidence

Sensitivity analyses were completed to investigate whether studies that were thought to consider the themes and subthemes identified in the qualitative evidence led to different outcomes in the quantitative evidence. A summary of the results is shown in **Table 3: Summary of the findings from the sensitivity analysis comparing the quantitative and qualitative evidenceTable 3**. Forest plots where a sensitivity analysis was possible for the relevant themes can be found in Appendix H.

Table 3: Summary of the findings from the sensitivity analysis comparing the quantitative and qualitative evidence

Theme/subtheme name	Number of studies included in the analysis	Summary of findings
Key principles		
More therapy is better	2	All outcomes included only one study. Therefore, it is difficult to interpret the evidence available. More evidence is required to make a conclusion.
Person centred care: Intensity tailored to the individual	27	Most outcomes included only one study. Of the outcomes where more than one study was included: Physiotherapy - >45 min-1 hour 5d/wk compared to ≤45 min 5d/wk – Discontinuation from study at <6 months – **No clinically important difference compared to the original outcome** Physiotherapy - >1 hour-2 hours 5d/wk compared to ≤45 min 5d/wk – Discontinuation from study at <6 months – **No clinically important difference compared to the original outcome** (the studies mentioning person centred care have worse rates of discontinuation than those that do not. However, these studies have zero events in one study arm and are small studies and so the certainty in this is limited). Physiotherapy - >1 hour-2 hours 5d/wk compared to >45 min-1 hour 5d/wk – Physical function – upper limb at <6 months – **No clinically important difference compared to the original outcome** Physiotherapy - >1 hour-2 hours 5d/wk compared to >45 min-1 hour 5d/wk – Discontinuation from study at <6 months – **No clinically important difference compared to the original outcome** More evidence is required to make a conclusion.
Person centred care: Intensity tailored to the individual (splitting therapy time during the day)	9	Most outcomes included only one study. Of the outcomes where more than one study was included: Physiotherapy - >1 hour-2 hours 5d/wk compared to >45 min-1 hour 5d/wk – Physical function – upper limb at <6 months – **No clinically important difference compared to the original outcome** (the effect size appears larger in the group where therapy was split between the day. However, this effect appears to be amplified by one study leading to heterogeneity and so it is difficult to draw a conclusion from this). Physiotherapy - >1 hour-2 hours 5d/wk compared to >45 min-1 hour 5d/wk – Discontinuation at <6 months – **No**

Theme/subtheme name	Number of studies included in the analysis	Summary of findings
		clinically important difference compared to the original outcome More evidence is required to make a conclusion.
Duration of therapy	0	Analysis not possible.
Person factors		
Medical status	1	Analysis not conducted as insufficient number of studies to draw adequate conclusions.
Fatigue	8	Most outcomes included only one study. Of the outcomes where more than one study was included: Physiotherapy - >45 min-1 hour 5d/wk compared to ≤45 min 5d/wk – Discontinuation from study at <6 months – **No clinically important difference compared to the original outcome** Physiotherapy - >1 hour-2 hours 5d/wk compared to ≤45 min 5d/wk – Discontinuation from study at <6 months – **No clinically important difference compared to the original outcome** (studies mentioning fatigue have larger rates of discontinuation than those without. However, as fatigue was a reason for discontinuation and the studies were small with zero events in one study arm, it is difficult to make conclusions from this). Physiotherapy - >1 hour-2 hours 5d/wk compared to >45 min-1 hour 5d/wk – Physical function – upper limb at <6 months – **No clinically important difference compared to the original outcome** Physiotherapy - >1 hour-2 hours 5d/wk compared to >45 min-1 hour 5d/wk – Discontinuation from study at <6 months – **No clinically important difference compared to the original outcome** More evidence is required to make a conclusion.
Physical factors	0	Analysis not possible.
Psychological factors	0	Analysis not possible.
Motivation	4	Analysis not conducted as the studies discussion of the theme was heterogenous and combining the studies for this analysis and so would not be appropriate for use in making conclusions.
Social factors	0	Analysis not possible.
Education	0	Analysis not possible.
People requiring specific consideration		
People with communication difficulties	9	Analysis not conducted as this was already considered as a population stratification.
People with cognitive difficulties	0	Analysis not possible.
Carer/family member factors		
Support of family and friends	6	Analysis not conducted as the studies discussion of the theme was heterogenous and combining the studies for this analysis and so would not be appropriate for use in making conclusions.

Theme/subtheme name	Number of studies included in the analysis	Summary of findings
Continuity of care	4	All outcomes included only one study. Therefore, it is difficult to interpret the evidence available. More evidence is required to make a conclusion.
Healthcare professional factors		
Beliefs about intensity of rehabilitation	0	Analysis not possible.
Communication	1	Analysis not conducted as insufficient number of studies to make adequate conclusions.
Feedback	4	See Intervention factors – Provision of feedback
Confidence	0	Analysis not possible.
Safety	0	Analysis not possible.
Prioritisation	0	Analysis not possible.
Consistency in care	0	Analysis not possible.
Intervention factors - Methods of achieving more intense rehabilitation		
Individual therapy	98	Outcomes often included multiple studies that included individual therapy, but a limited number of comparable studies (for example: group-based therapy or a combination of individual and group-based therapy) that did not include individual therapy. This meant that outcomes did not change after the sensitivity analysis. Therefore, it is difficult to interpret the evidence available. More evidence for group-based therapy is required to make a conclusion.
Group-based therapy	13	See Individual therapy. More evidence is required to make a conclusion.
‘Homework’/self management interventions	16	All outcomes included only one study or insufficient studies to draw adequate conclusions from the analysis. Therefore, it is difficult to interpret the evidence available. More evidence is required to make a conclusion.
Telerehabilitation, assistive technology and computer-based tools	33	Most outcomes included only one study or insufficient studies to draw adequate conclusions from analysis. Of the outcomes where more than one study was included: Physiotherapy - >45 min-1 hour 5d/wk compared to ≤45 min 5d/wk – Physical function – lower limb at <6 months – **No clinically important difference compared to the original outcome** Physiotherapy - >45 min-1 hour 5d/wk compared to ≤45 min 5d/wk – Discontinuation from study at <6 months – **No clinically important difference compared to the original outcome** Physiotherapy - >1 hour-2 hours 5d/wk compared to >45 min-1 hour 5d/wk – Activities of daily living at <6 months – Change from **clinically important benefit** to **no clinically important difference when compared to the original outcome** (however, this outcome includes one study that significantly inflates the effect size of the effect size when all outcomes are included. If this study was not present then the outcome would show no clinically important difference regardless of this analysis). Physiotherapy - >1 hour-2 hours 5d/wk compared to >45 min-1 hour 5d/wk – Physical function lower limb at <6

Theme/subtheme name	Number of studies included in the analysis	Summary of findings
		months – **No clinically important difference compared to the original outcome** Physiotherapy - >1 hour-2 hours 5d/wk compared to >45 min-1 hour 5d/wk – Discontinuation from study at <6 months – Change from **no clinically important difference** to **clinically important benefit when compared to the original outcome**. Physiotherapy - >1 hour-2 hours 5d/wk compared to >45 min-1 hour 5d/wk – Discontinuation from study at ≥6 months – **No clinically important difference compared to the original outcome** More evidence is required to make a conclusion.
Seven-day working	3	Analysis not conducted as already considered as an intervention stratification.
Longer term rehabilitation	1	Analysis not conducted as insufficient number of studies to draw adequate conclusions.
Intervention factors		
Increased opportunity for social stimulation	4	All outcomes included only one study in the analysis. Therefore, it is difficult to interpret the evidence available. More evidence is required to make a conclusion.
Variety in activities and choice	17	Most outcomes included only one study or insufficient studies to draw adequate conclusions from analysis. Of the outcomes where more than one study was included: Physiotherapy - >45 min-1 hour 5d/wk compared to ≤45 min 5d/wk – Discontinuation from study at <6 months – **No clinically important difference compared to the original outcome**
Level of person centred care	3	See Key Principles (combined in the analysis of 'Person centred care: Intensity tailored to the individual' due to having similar themes)
Provision of feedback	10	All outcomes included only one study in the analysis. Therefore, it is difficult to interpret the evidence available. More evidence is required to make a conclusion.
Travel time	2	Analysis not conducted as the theme is an inherent property of certain types of therapy or other themes and so analysis is unlikely to add additional information.
Need for technical support and training	11	Analysis not conducted as the theme is an inherent property of certain types of therapy or other themes and so analysis is unlikely to add additional information.
Physical environment	10	Analysis not conducted as the theme is an inherent property of certain types of therapy or other themes and so analysis is unlikely to add additional information.
Goal setting	6	All outcomes included only one study in the analysis. Therefore, it is difficult to interpret the evidence available. More evidence is required to make a conclusion.
Use of expensive/additional equipment	35	Analysis not conducted as the theme is an inherent property of certain types of therapy or other themes and so analysis is unlikely to add additional information.
Meaningful activities	4	All outcomes included only one study in the analysis. Therefore, it is difficult to interpret the evidence available. More evidence is required to make a conclusion.

Theme/subtheme name	Number of studies included in the analysis	Summary of findings
Environmental factors		
Hospital care	91	Outcomes often included multiple studies that included hospital care, but a limited number of comparable studies (for example: home-based care) that did not include hospital care. This meant that outcomes did not change after the sensitivity analysis. Therefore, it is difficult to interpret the evidence available. More evidence for home-based care is required to make a conclusion.
Home	14	See Environmental factors – Hospital care. More evidence is required to make a conclusion.
Enriched/adapted environment	1	Analysis not conducted as insufficient number of studies to draw adequate conclusions.
Accessible therapy	2	Analysis not conducted as insufficient number of studies to draw adequate conclusions.
Supervision	19	All outcomes included only one study in the analysis. Therefore, it is difficult to interpret the evidence available. More evidence is required to make a conclusion.
Service factors		
Time spent in information exchange	0	Analysis not possible.
Time spent in other non-patient contact activities	0	Analysis not possible.
Staffing levels and deployment	1	Analysis not conducted as insufficient number of studies to draw adequate conclusions.
Seven day working	3	See Intervention Findings – Methods for achieving more intense rehabilitation (combined in the analysis of ‘Seven day working’ due to having similar themes).
Influence of external audit	0	Analysis not possible.
Use of therapy timetabling	1	Analysis not conducted as insufficient number of studies to draw adequate conclusions.
Dedicated stroke care, staff training and expertise	0	Analysis not possible.
An emphasis on discharge planning versus treatment	0	Analysis not possible.
Transition from hospital care to community-based stroke rehabilitation	0	Analysis not possible.

4.1.4 Mixed methods synthesis conclusion

4.1.4.1 Are the results/findings from individual synthesis supportive or contradictory?

With the limited available information provided, it is difficult to say if the quantitative and qualitative evidence is supportive or contradictory. In general, the quantitative evidence suggested a benefit from providing more intense physiotherapy to people after stroke, which was supported by the qualitative evidence. However, the quantitative evidence was less clear for other types of therapy, such as speech and language therapy. In the majority of studies, information about qualitative themes that would impact the delivery of more intense rehabilitation was not provided and so it is difficult to conclude as to whether there is agreement between the two types of evidence. When evidence was available and sensitivity analyses were conducted, no consistent change in the effectiveness of the quantitative data was noted. However, this may be better explained by the limited amount of evidence available for each comparison, and if more evidence was available that reported more information about the qualitative themes this may provide a clearer perspective.

4.1.4.2 Does the qualitative evidence explain why the intervention is or is not effective?

The qualitative evidence provides explanations as to how the intervention could be utilised to be effective and about the contexts where it is most effective. However, these factors were not clearly reported in the quantitative evidence and so it is difficult to conclude whether the explanations influence the quantitative results of treatment.

4.1.4.3 Does the qualitative evidence help explain differences in the direction and size of effect across the included quantitative studies?

The qualitative evidence did not appear to explain difference in the direction and size of effect across the included quantitative studies identified in this review. However, due to the sparsity of data across the different comparisons, it is difficult to conclude as to whether the qualitative evidence can explain the differences. Further quantitative research that reports information regarding the qualitative themes would help to provide more certainty in this result.

4.1.4.4 Which aspects of the quantitative evidence are/are not explored in the qualitative studies?

The qualitative studies explored a wide perspective of the quantitative evidence and appeared to encapsulate all types of rehabilitation. There was limited evidence available discussing types of rehabilitation other than physiotherapy (such as speech and language therapy and psychology/neuropsychology). However, quantitative evidence was also limited in these areas.

4.1.4.5 Which aspects of the qualitative evidence are/are not tested in the quantitative evidence?

There was limited reporting of the qualitative themes in the quantitative evidence, which made it difficult to draw conclusions in this synthesis. Quantitative evidence generally reported information about the key principles, person factors and intervention factors themes and was less likely to report information about the carer/family member factors, healthcare professional factors, environmental factors and service factor themes. People who were identified as requiring specific consideration (people with communication and cognitive difficulties) were often excluded from quantitative studies and so highlighted the importance of considering these people in research in the future.

5 The committee’s discussion and interpretation of the evidence

5.1.15.1 The outcomes that matter most

The committee included the following outcomes: person/participant health-related quality of life (including stroke-specific quality of life measures), carer health-related quality of life, stroke outcome – modified Rankin scale, activities of daily living, physical function (including upper and lower limb function), communication (including overall language ability, impairment specific measures [such as naming, auditory comprehension, reading, expressive language and dysarthria speech impairment] and functional communication), psychological distress (specifically depression scores), stroke-related scales of cognition (including non-spatial attention and working memory, spatial attention, memory and executive functions), swallow function and ability and discontinuation from study.

All outcomes were considered equally important for decision making and therefore have all been rated as critical. Person/participant health-related quality of life outcomes, were considered particularly important as a holistic measure of the impact on the person’s quality of living. Similarly, activities of daily living were considered important as these determine people’s functional independence and will influence future care needs. The Modified Rankin scale was also highlighted as important by the committee as this is a measure of the degree of dependence and is a widely used clinical outcome for people after a stroke. Other outcomes were important when understanding specific types of therapy (such as: physical function being important while understanding rehabilitation including physiotherapy and occupational therapy; communication being important while understanding rehabilitation including speech and language therapy).

The committee chose to investigate these outcomes at less than 6 months and at 6 months or more, as they considered that there could be a difference in the short-term and long-term effects of more intensive rehabilitation.

There was evidence available for the majority of the outcomes, but after the evidence was stratified by the population (presence of communication difficulties) and intervention (type of therapy) strata there was limited evidence reporting each outcome per comparison. In most cases outcomes were only reported by 1 study. The most widely reported outcomes were activities of daily living, physical function and discontinuation from the study. Evidence for communication-, cognition- and swallowing-related outcomes were particularly limited.

5.1.15.2 The quality of the evidence

Quantitative evidence

1 individual patient data network meta-analysis and 106 randomised controlled trial studies were included in the review. The evidence varied from moderate to very low quality, with the majority being low quality. Outcomes were commonly downgraded for risk of bias and imprecision. In a few cases where inconsistency was present, this was not explained by subgroup analysis or resolved by sensitivity analyses (see section 5.1.1.5 for more information about the mixed methods analysis). The number of participants varied between comparisons, but the majority included small sample sizes (N=50).

The interventions were stratified by the therapy team who delivered the therapy intervention (for example: physiotherapy, occupational therapy, speech and language therapy, psychology/neuropsychology, multidisciplinary team). They were then separated by the intensity of therapy delivered.

5.1.15.2.1 People without communication difficulties

5.1.15.2.1.1 Physiotherapy

Less than and equal to 45 minutes

Evidence was available comparing physiotherapy (in people without communication difficulties) for less than and equal to 45 minutes for the following comparisons: less than 5 days a week compared to usual care; 5 days per week compared to usual care and less than and equal to 45 minutes, less than 5 days a week; 6 days a week compared to usual care and more than 45 minutes to 1 hour, less than 5 days a week and 7 days a week compared to less than and equal to 45 minutes, 5 days a week.

- When less than and equal to 45 minutes for less than 5 days a week was compared to usual care the evidence was generally of very low quality. Where downgrading occurred, this was often for risk of bias (due to missing outcome data) and imprecision. One outcome was downgraded for heterogeneity due to conflicting number of events in different studies.
- When less than and equal to 45 minutes for 5 days a week was compared to usual care, evidence was generally of very low quality, but ranged from moderate to very low. Where downgrading occurred, this was often for risk of bias (due to deviations from the intended interventions and bias due to missing outcome data) and imprecision. Two outcomes were downgraded for heterogeneity unexplained by subgroup analyses. For the comparison less than 45 minutes for 5 days a week compared to less than and equal to 45 minutes, less than 5 days, only 1 outcome was reported. This was of very low quality and downgraded for risk of bias (bias arising from the randomisation process) and imprecision due to zero events and small sample size.
- When less than and equal to 45 minutes for 6 days a week was compared to usual care, the evidence consisted of 1 outcome which was of low quality and downgraded due to risk of bias (arising from the randomisation process and bias due to missing outcome data). When compared to 45 minutes to 1 hour, less than 5 days a week, evidence was generally of very low quality, but ranged from low to very low quality. When downgrading occurred, this was often for risk of bias (due to bias arising from the randomisation process and bias in both measurement of the outcome and selection of the reported result) and imprecision.
- For less than and equal to 45 minutes, 7 days a week compared to less than and equal to 45 minutes, 5 days a week, only 1 outcome was reported. This was of low quality due to imprecision.

More than 45 minutes to 1 hour

Evidence was available comparing physiotherapy (in people without communication difficulties) for more than 45 minutes to 1 hour for the following comparisons: less than 5 days a week compared to less than and equal to 45 minutes for less than 5 days a week; 5 days per week compared to less than and equal to 45 minutes, less than 5 days a week, less than and equal to 45 minutes for 5 days a week and more than 45 minutes to 1 hour for less than 5 days a week; 7 days a week compared to less than and equal to 45 minutes, less than 5 days a week.

- When more than 45 minutes to 1 hour for less than 5 days a week was compared to less than and equal to 45 minutes, less than 5 days a week, the evidence was of low quality for 1 outcome and very low quality for the other. Downgrading was due to risk of bias (specifically bias due to missing outcome data) and imprecision.
- When more than 45 minutes to 1 hour for 5 days a week was compared to less than and equal to 45 minutes, less than 5 days a week, evidence was of moderate to very low

quality. Downgrading was due to risk of bias (arising from the randomisation process, measurement in the outcome or selection of the reported result) and imprecision.

- When more than 45 minutes to 1 hour for 5 days a week was compared to less than and equal to 45 minutes, 5 days a week, the evidence was generally of low quality but this ranged from moderate to very low. Where downgrading occurred, this was most often for risk of bias (arising from the randomisation process) and imprecision. One outcome was downgraded for heterogeneity due to conflicting number of events in different studies.
- When more than 45 minutes to 1 hour for 5 days a week was compared to more than 45 minutes to 1 hour, less than 5 days a week, evidence was generally of low quality but ranged from moderate to very low. This was due to risk of bias (arising from the randomisation process) and imprecision.
- When more than 45 minutes to 1 hour 7 days a week was compared to less than and equal to 45 minutes, less than 5 days a week, evidence was all of moderate quality. The evidence was downgraded by 1 increment due to risk of bias (arising from the randomisation process).

More than 1 hour to 2 hours

Evidence was available comparing physiotherapy (in people without communication difficulties) for more than 1 to 2 hours for the following comparisons: less than 5 days a week compared to less than and equal to 45 minutes less than 5 days a week and more than 45 minutes to 1 hour less than 5 days a week; 5 days a week compared to usual care, less than and equal to 45 minutes less than 5 days a week, less than and equal to 45 minutes 5 days a week, less than and equal to 45 minutes, 7 days a week and more than 45 minutes to 1 hour 5 days a week; 6 days a week compared to more than 45 minutes to 1 hour, 5 days a week and more than 45 minutes to 1 hour, 6 days a week.

- When more than 1 hour to 2 hours for less than 5 days a week was compared to less than and equal to 45 minutes less than 5 days a week, the evidence was all graded very low quality. Where downgrading occurred, this was most often for risk of bias (arising from the randomisation process and bias due to missing outcome data) and imprecision. One study was downgraded for heterogeneity due to conflicting number of events in different studies.
- When more than 1 hour to 2 hours for less than 5 days a week was compared to more than 45 minutes to 1 hour, less than 5 days a week, the majority of evidence was of low to very low quality with 1 outcome of moderate quality. Downgrading was due to risk of bias (arising from the randomisation process, missing outcome data and bias in measurement of the outcome) along with imprecision.
- When more than 1 hour to 2 hours for 5 days a week was compared to usual care, the majority of the evidence was of very low quality but ranged from moderate to low quality. Downgrading occurred due to risk of bias (for missing outcome data) and imprecision.
- For the comparison of more than 1 hour to 2 hours for 5 days a week to less than and equal to 45 minutes, less than 5 days a week, 2 outcomes were of low quality and 1 of very low quality. Outcomes were downgraded for risk of bias (due to bias arising from the randomisation process) and imprecision. When compared to less than and equal to 45 minutes, 5 days a week, the majority of outcomes were of low quality but ranged from moderate to very low quality. Where downgrading occurred, this was most often for risk of bias (due to missing outcome data), imprecision and heterogeneity unexplained by subgroup analysis.
- For the comparison more than 1 hour to 2 hours, 5 days a week, compared to less than and equal to 45 minutes, 7 days a week, only 1 outcome was reported and this was of low quality and downgraded for imprecision.
- Where more than 1 hour to 2 hours 5 days a week was compared more than 45 minutes to 1 hour, 5 days a week, the majority of outcomes were of low and very low quality with 3

outcomes graded moderate quality. Where downgrading occurred, this was most often due to risk of bias (in particular, a mixture of bias arising from the randomisation process, bias due to missing outcome data and bias in measurement of outcome), imprecision and heterogeneity unexplained by subgroup analysis.

- When more than 1 hour to 2 hours for 6 days a week was compared to more than 45 minutes to 1 hour, 5 days a week, the majority of evidence was rated low quality with 1 outcome rated moderate quality. Downgrading occurred due to risk of bias (in selection of the reported result) and imprecision.
- When more than 1 hour to 2 hours for 6 days a week was compared to more than 45 minutes to 1 hour, 6 days a week, all outcomes were rated very low quality. Evidence was downgraded due to risk of bias (specifically missing outcome data and bias in measurement of the outcome) and imprecision.

More than 2 to 4 hours

Evidence was available comparing physiotherapy (in people without communication difficulties) for more than 2 to 4 hours, 5 days a week to less than and equal to 45 minutes, 5 days a week; more than 45 minutes to 1 hour, 5 days a week and more than 1 hour to 2 hours, 5 days a week. Evidence was also available for more than 2 to 4 hours, 6 days a week compared to more than 1 hour to 2 hours, 5 days a week.

- When more than 2 to 4 hours for 5 days a week was compared to less than and equal to 45 minutes, 5 days a week, the evidence was rated moderate or very low quality for the 2 reported outcomes. These were downgraded due to risk of bias (missing outcome data) and imprecision due to zero events and a small sample size.
- When compared to more than 45 minutes to 1 hour, 5 days a week, all evidence was rated very low quality. Evidence was generally downgraded due to risk of bias and imprecision. One outcome was downgraded for heterogeneity unexplained by subgroup analysis.
- When more than 2 to 4 hours, 5 days were compared to more than 1 hour to 2 hours, 5 days a week, evidence was rated low or very low quality. The majority of the evidence was downgraded due to risk of bias (due to a mixture of bias arising from the randomisation process, bias due to missing outcome data and bias in measurement of the outcome) and imprecision. One outcome was downgraded for heterogeneity, unexplained by subgroup analysis.
- When more than 2 to 4 hours for 6 days a week was compared to more than 1 hour to 2 hours, 5 days a week, evidence was available from 2 outcomes, 1 of high quality and the other of low quality. Both were downgraded due to imprecision.

More than 4 hours

Evidence was available comparing physiotherapy to usual care (in people without communication difficulties) for more than 4 hours, 5 days a week and more than 2 hours to 4 hours, 5 days a week.

- When more than 4 hours of physiotherapy for 5 days a week was compared to usual care, the majority of evidence was rated very low quality with 2 outcomes rated low quality. Where downgrading occurred, this was most often for risk of bias (due to missing outcome data and bias in selection of the reported result) and imprecision.
- When compared to more than 2 to 4 hours, 5 days a week, both reported outcomes were rated very low quality. These were downgraded due to risk of bias (a mixture of bias arising from the randomisation process, deviations from the intended interventions and in the measurement of the outcome) and imprecision. One outcome was also downgraded for heterogeneity due to a conflicting number of events in different studies.

5.1.15.2.1.2 Occupational therapy

Less than and equal to 45 minutes

Evidence was available comparing occupational therapy to usual care (in people without communication difficulties) for less than and equal to 45 minutes, less than 5 days a week compared and for less than and equal to 45 minutes, 5 days a week.

- When less than and equal to 45 minutes of occupational therapy for less than 5 days a week was compared to usual care, outcomes were rated between low and very low quality. Downgrading occurred due to risk of bias (due to bias arising from the randomisation process and due to missing outcome data) or imprecision.
- When less than and equal to 45 minutes, 5 days a week was compared to usual care, 1 outcome was reported that was of very low quality due to risk of bias (due to missing outcome data) and imprecision.

More than 45 minutes to 1 hour

Evidence was available more than 45 minutes to 1 hour of occupational therapy less than 5 days a week to less than and equal to 45 minutes, less than 5 days a week. In addition, more than 45 minutes to 1 hour of occupational therapy 5 days was compared to less than and equal to 45 minutes, less than 5 days a week, less than and equal to 45 minutes, 5 days a week.

- When more than 45 minutes to 1 hour for less than 5 days a week was compared to less than and equal to 45 minutes, less than 5 days a week, evidence consisted of only 1 outcome rated very low quality. This was downgraded due to risk of bias (arising from the randomisation process, missing outcome data and bias in measurement of the outcome) and imprecision.
- When more than 45 minutes to 1 hour for 5 days a week was compared to less than and equal to 45 minutes, less than 5 days a week, the majority of the evidence was of very low quality but ranged from low to very low. Where downgrading occurred, this was due to risk of bias (arising from the randomisation process and missing outcome data) and imprecision.
- When more than 45 minutes to 1 hour for 5 days a week was compared to less than and equal to 45 minutes, 5 days a week, 2 outcomes were of very low quality and one outcome of low quality. Evidence was downgraded for risk of bias (due to a mix of bias arising from the randomisation process, missing outcome data and bias in measurement of the outcome) and imprecision.

More than 1 hour to 2 hours

Evidence was available for more than 1 to 2 hours of occupational therapy, 5 days a week, compared to: less than and equal to 45 minutes, less than 5 days a week; less than and equal to 45 minutes, 5 days a week; and more than 45 minutes to 1 hour, 5 days a week.

- When more than 1 to 2 hours for 5 days a week was compared to less than and equal to 45 minutes, less than 5 days a week, evidence consisted of 2 outcomes which were both of low quality and downgraded due to risk of bias (arising from the randomisation process and bias due to missing outcome data).
- When more than 1 to 2 hours for 5 days a week was compared to less than and equal to 45 minutes, 5 days a week, the evidence consisted of 2 outcomes which were rated as low and very low quality respectively. They were downgraded due to risk of bias (arising from a mixture of the randomisation process and missing outcome data) and imprecision.
- When more than 1 to 2 hours for 5 days a week was compared to more than 45 minutes to 1 hour, 5 days a week, evidence was ranged from high to very low quality.

Downgrading occurred due to risk of bias (arising from the randomisation process and missing outcome data) and imprecision. One outcome was downgraded for inconsistency due to heterogeneity.

More than 2 hours to 4 hours

Evidence was available for more than 2 to 4 hours of occupational therapy for 5 days a week was compared to more than 1 hour to 2 hours, 5 days a week. The majority of evidence was rated low quality with 1 outcome rated as very low quality. In general, the evidence was downgraded for imprecision and risk of bias (due to bias arising from the randomisation process).

5.1.15.2.1.3 Speech and language therapy

Less than and equal to 45 minutes

Evidence was available for 1 comparison, less than and equal to 45 minutes of speech and language therapy 7 days a week compared to less than and equal to 45 minutes, less than 5 days a week. 2 outcomes were reported in the evidence and both were rated low quality. One outcome was downgraded due to imprecision. The other was downgraded due to outcome indirectness (as the outcome is a dichotomous outcome when the protocol specified continuous outcomes) and imprecision.

More than 1 hour to 2 hours

Evidence was available for 1 comparison, more than 1 hour to 2 hours of speech and language therapy 5 days a week compared to more than 45 minutes to 1 hour, 5 days a week. 2 outcomes were reported in the evidence and both were rated very low quality. Both were downgraded for risk of bias (arising from the randomisation process) and imprecision.

5.1.15.2.2.4 Psychology/neuropsychology

More than 1 hour to 2 hours

Evidence was available for one comparison of more than 1 to 2 hours of psychology/neuropsychology for less than 5 days a week compared to usual care. Evidence was of very low and low quality. Downgrading was due to risk of bias (in particular, bias arising from the randomisation process and in the measurement of the outcome).

More than 2 hours to 4 hours

Evidence was available for 1 comparison of more than 2 hours to 4 hours of psychology/neuropsychology for 5 days a week compared to more than 1 hour to 2 hours, 5 days a week. The evidence was rated moderate to low quality. In general, the evidence was downgraded for imprecision and risk of bias (due to bias arising from the randomisation process).

5.1.15.2.1.4 Multidisciplinary team

More than 45 minutes to 1 hour

Evidence was available for more than 45 minutes to 1 hour of multidisciplinary care for 5 days a week compared to less than and equal to 45 minutes, 5 days a week. The evidence was of low quality. Downgrading occurred due to imprecision.

More than 1 hour to 2 hours

Evidence was available for more than 1 to 2 hours of multidisciplinary care for 5 days a week compared to: less than and equal to 45 minutes, 5 days a week and more than 45 minutes to 1 hour for 5 days a week.

- When more than 1 hour to 2 hours for 5 days a week was compared to less than and equal to 45 minutes, 5 days a week, the evidence consisted of only 1 outcome which was rated very low quality. Downgrading was due to risk of bias (arising from the randomisation process) and imprecision.
- When more than 1 hour to 2 hours for 5 days a week was compared to more than 45 minutes to 1 hour, 5 days a week, the majority of evidence was rated very low quality. However, some outcomes were rated as low quality and one was moderate quality. Where downgrading occurred, this was most often for imprecision and risk of bias (due to a mixture of bias arising from the randomisation process and bias due to missing outcome data). Several outcomes were downgraded due to inconsistency. This was either due to heterogeneity unexplained by subgroup analysis or due to conflicting number of events in different studies.

More than 2 hours to 4 hours

Evidence was available for more than 2 to 4 hours of multidisciplinary care for less than 5 days a week compared to usual care. The majority of evidence was of very low quality with 1 outcome rated low quality. Evidence was downgraded due to risk of bias (arising from the randomisation process and missing outcome data) and imprecision.

More than 4 hours

Evidence was available for one comparison of more than 4 hours of multidisciplinary care for 5 days a week compared to more than 2 hours to 4 hours, 5 days a week. The evidence was rated moderate or low quality and was downgraded due to imprecision.

5.1.15.2.2 People with communication difficulties

5.1.15.2.2.1 Physiotherapy

More than 1 hour to 2 hours

Evidence was available for only 1 comparison which compared physiotherapy (in people with communication difficulties) for more than 1 to 2 hours, less than 5 days a week, to more than 45 minutes to 1 hour, less than 5 days a week. In this comparison, 2 outcomes were of low quality while one outcome was rated moderate quality. Outcomes were downgraded for imprecision due to crossing 1 or both MIDs or to zero events and a small sample size.

5.1.15.2.2.2 Occupational therapy

Less than and equal to 45 minutes

Evidence was available for only 1 comparison which compared less than and equal to 45 minutes of multidisciplinary care (with communication difficulties) for 5 days per week to usual care. In this comparison, 1 outcome was reported which was of very low quality and downgraded due to imprecision and risk of bias (arising from the randomisation process).

5.1.15.2.2.3 Speech and Language therapy

Individual patient data network meta analysis

The results of an individual patient data network meta analysis was incorporated into the review. The results were separated by the number of hours of therapy provided per week (including 9 or more hours compared to 4-9 hours, 9 or more hours compared to 3-4 hours, 9 or more hours compared to 2-3 hours, 9 or more hours compared to up to 2 hours, 4-9 hours compared to 3-4 hours, 4-9 hours compared to 2-3 hours, 4-9 hours compared to up to 2 hours, 3-4 hours compared to 2-3 hours, 3-4 hours compared to up to 2 hours and 2-3 hours compared to up to 2 hours) and by the number of days of therapy provided per week (including 5 or more days per week compared to 5 days per week, 5 or more days per week compared to 4 days per week, 5 or more days per week compared to 3 days per week, 5 or more days per week compared to up to 2 days per week, 5 days per week compared to 4 days per week, 5 days per week compared to 3 days per week, 5 days per week compared to up to 2 days per week, 4 days per week compared to up to 2 days per week and 3 days per week compared to up to 2 days per week). All outcomes ranged from moderate to very low quality. Outcomes specified for hours of therapy per week were downgraded for indirectness as the protocol were intervention was studying variations in the number of minutes and hours of therapy per day, which made it difficult to compare the results against others in the review. Some outcomes were downgraded for imprecision.

More than 45 minutes to 1 hour

Evidence was available for more than 45 minutes to 1 hour of speech and language therapy for 5 days a week compared to less than and equal to 45 minutes, less than 5 days a week and more than 45 minutes to 1 hour, less than 5 days a week.

- When more than 45 minutes to 1 hour for 5 days a week was compared to less than and equal to 45 minutes less than 5 days a week, the majority of evidence was of moderate quality with several outcomes rated low quality. Evidence was downgraded due to risk of bias (due to bias due to missing outcome data) and imprecision.
- When more than 45 minutes to 1 hour for 5 days a week was compared to more than 45 minutes to 1 hour, less than 5 days a week, the evidence was rated as low or very low quality. Downgrading occurred due to risk of bias (missing outcome data, bias in measurement of the outcome and bias in selection of the reported result) and imprecision.

More than 1 hour to 2 hours

Evidence was available for more than 1 to 2 hours of speech and language therapy for less than 5 days a week compared to more than 45 minutes to 1 hour, less than 5 days a week and for more than 1 hour to 2 hours 5 days a week compared to more than 45 minutes to 1 hour, 5 days a week.

- When more than 1 to 2 hours for less than 5 days a week was compared to more than 45 minutes to 1 hour for less than 5 days a week, the evidence consisted of 2 outcomes both of which were rated very low quality. These were both downgraded due to risk of bias (due to bias arising from the randomisation process and bias due to missing outcome data) and imprecision.
- When more than 1 to 2 hours for 5 days a week was compared to more than 45 minutes to 1 hour for 5 days a week, the majority of the evidence was of very low quality with 1 outcome rated low quality. Downgrading occurred due to risk of bias (from the randomisation process and bias due to deviations from the intended interventions) and imprecision.

More than 2 hours to 4 hours

Evidence was available for more than 2 to 4 hours of speech and language therapy for less than 5 days a week compared to more than 1 to 2 hours, less than 5 days a week. More than 2 to 4 hours of therapy 5 days per week was compared to more than 1 hour to 2 hours, 5 days a week.

- When more than 2 to 4 hours for less than 5 days a week was compared to more than 1 to 2 hours less than 5 days a week, the majority of evidence was of low quality with 1 outcome rated moderate quality. Downgrading occurred due to imprecision caused by the confidence interval crossing 1 or 2 MIDs or due to zero events and small sample size.
- When more than 2 to 4 hours for 5 days a week was compared to usual care, the majority of the evidence was of high quality, but ranged from high to low quality. Downgrading occurred in one outcome due to imprecision.
- When more than 2 to 4 hours for 5 days a week was compared to more than 1 to 2 hours 5 days a week, the majority of evidence was of moderate quality with 1 outcome rated low quality. Where downgrading occurred, this was due to imprecision.

5.1.15.2.2.4 Psychology/neuropsychology

More than 45 minutes to 1 hour

Evidence was available for only 1 comparison which compared psychology/neuropsychology to usual care (in people with communication difficulties) for more than 45 minutes to 1 hour for less than 5 days a week. In this comparison, all the evidence was rated low quality and was downgraded due to risk of bias, (due to bias in measurement of the outcome) and imprecision.

5.1.15.2.2.5 Multidisciplinary team

Less than and equal to 45 minutes

Evidence was available for only 1 comparison which compared less than and equal to 45 minutes of multidisciplinary care (with communication difficulties) for 5 days per week to usual care. In this comparison, 1 outcome was reported which was of very low quality and downgraded due to imprecision and risk of bias (arising from the randomisation process).

5.1.15.2.3 Qualitative evidence

Forty-two qualitative studies were included in the review;[1-42]. Eight themes and 46 sub-themes were identified as contributory moderators for success in more intense rehabilitation after a stroke. These included key principles, person factors, people requiring specific consideration, carer/family member factors, healthcare professional factors, intervention factors, environmental factors and service factors. The confidence in the review findings varied from high to low, with the majority of evidence being of moderate quality. The main reasons for downgrading were methodological limitations, relevance and adequacy. Studies were downgraded for relevance if conducted outside the United Kingdom since the specific aim of this qualitative review was to look at means of improving implementation of intense rehabilitation in the United Kingdom healthcare system.

5.1.15.2.3.1 Key principles

This theme consisted of 3 sub-themes: 1) more therapy is better, 2) person-centred care – intensity tailored to the individual and 3) duration of therapy, with the quality of evidence for each sub-theme being moderate, high and low, respectively. Sub-theme 1 was downgraded for coherence, as there were differences in opinion between population groups, and relevance, as some studies were conducted in a healthcare setting outside of the United Kingdom. Both elements were considered minor concerns and so an overall rating of moderate quality was given. Sub-theme 3 was also downgraded for coherence and relevance, but additionally for adequacy as there was a limited number of studies discussing the theme.

5.1.15.2.3.2 Person factors

This theme consisted of 7 sub-themes: 1) medical status, 2) fatigue, 3) physical factors, 4) psychological factors, 5) motivation, 6) social factors and 7) education. The quality of the evidence ranged from moderate to low, with the majority being of moderate quality. The reasons for downgrading varied between sub-themes. Sub-themes 1, 5 and 7 were downgraded for methodological limitations. The reasons for this including limitations in considering the relationship between the participant and the researcher, not exploring the limitations of the study sufficiently and limited applicability of the evidence). Sub-themes 1, 2, 3, 5, 6 and 7 were downgraded for relevance as some studies were conducted in a healthcare setting outside of the United Kingdom. Sub-themes 4, 5, 6 and 7 were downgraded for adequacy, as there were a limited number of studies reporting the subthemes or components incorporated in the sub-theme.

5.1.15.2.3.3 People requiring specific consideration

This theme consisted of 2 sub-themes: 1) people with communication difficulties and 2) people with cognitive difficulties. The quality of the evidence was low and moderate respectively. Sub-theme 1 was downgraded for methodological limitations (due to problems in considering the relationship between the researcher and the participant), relevance (as some studies were conducted in a healthcare setting outside of the United Kingdom) and adequacy as the subtheme was reported in a limited number of studies. Sub-theme 2 was downgraded for adequacy only, as a limited number of studies were reporting the subtheme.

5.1.15.2.3.4 Carer/family member factors

This theme consisted of 2 sub-themes: 1) support of family and friends and 2) continuity of care. The quality of the evidence was moderate. Both sub-themes were downgraded for adequacy as there were a limited number of studies discussing the subthemes. However, sub-theme 1 was also downgraded for relevance, as some studies were in a healthcare setting outside of the United Kingdom.

5.1.15.2.3.5 Healthcare professional factors

This theme consisted of 7 sub-themes: 1) beliefs about intensity of rehabilitation, 2) communication, 3) feedback, 4) confidence, 5) safety, 6) prioritisation and 7) consistency in care. The quality of the evidence ranged from moderate to high, with the majority being of moderate quality. All sub-themes (apart from sub-theme 3) were downgraded for adequacy, as there were a limited number of studies discussing this theme. Sub-themes 1, 4 and 5 were downgraded for problems with relevance as some studies were in a healthcare setting outside of the United Kingdom.

5.1.15.2.3.6 Intervention factors

This theme consisted of 11 sub-themes: 1) methods of achieving more intense rehabilitation, 2) increased opportunity for social stimulation, 3) variety in activities and choice, 4) level of person-centred care, 5) provision of feedback, 6) travel time, 7) need for technical support and training, 8) physical environment, 9) goal setting, 10) use of expensive/additional equipment and 11) meaningful activities. The quality of the evidence ranged from low to moderate, with the majority being of low quality. The reasons for downgrading varied between sub-themes. Sub-themes 3, 5, 6, 7, 8, 9, 10 and 11 were downgraded for methodological limitations. This was due to a mixture of no consideration between the researcher and the participant, not exploring the limitation of the study sufficiently, it being unclear if the data analysis was sufficiently rigorous in 1 study, study ethics not being considered in a study and limited applicability of the evidence. Sub-themes 2 and 4 were downgraded for problems with coherence. In sub-theme 2 this was due to disagreement between different populations, while in sub-theme 4 this was due to different experiences within a population of group-based therapy. Sub-themes 2, 3, 4, 5, 6, 7, 8 and 11 were downgraded for problems with relevance, as studies were conducted in a healthcare setting outside of the United Kingdom. Otherwise, all sub-themes (apart from sub-theme 7) were downgraded for problems with adequacy as only a small number of studies either reported or discussed components of the sub-theme.

5.1.15.2.3.7 Environmental factors

This theme consisted of 5 sub-themes: 1) hospital care, 2) home, 3) enriched/adapted environment, 4) accessible therapy and 5) supervision. The quality of the evidence was low. All sub-themes (apart from sub-theme 2) were downgraded for problems with methodological limitations (due to problems in considering the relationship between the researcher and the participant, not exploring the limitations of the study sufficiently, it being unclear if the data analysis was sufficiently rigorous and limited applicability of the evidence), relevance (due to either the study not being conducted in a United Kingdom healthcare setting or for including only a subset of the population in the study design) and adequacy (due to a limited number of studies reporting the sub-themes). Sub-theme 2 was also downgraded for limitations and adequacy (for similar reasons to the other subthemes) but was downgraded for coherence as there was disagreement within the same population in a study.

5.1.15.2.3.8 Service factors

This theme consisted of 9 sub-themes: 1) time spent in information exchange, 2) time spent in other non-patient contact activities, 3) staffing levels and deployment, 4) seven day working, 5) influence of external audit, 6) use of therapy timetabling, 7) dedicated stroke care, staff training and expertise, 8) an emphasis on discharge planning versus treatment and 9) transitioning from hospital care to community-based stroke rehabilitation. The quality of the evidence ranged from low to moderate, with the majority being of moderate quality. Sub-theme 9 was downgraded for problems with methodological limitations due to problems in considering the relationship between the researcher and participant and not exploring the limitations of the study sufficiently. Sub-themes 4 and 5 were downgraded for coherence due to disagreement about the subthemes within the same population. Subgroups 3, 4 and 9 were downgraded for relevance as some studies were conducted outside of a United Kingdom healthcare setting. Sub-themes 1, 2, 4, 5, 6, 7 and 8 were downgraded for adequacy problems as there were a limited number of studies reporting the sub-themes.

5.1.15.3 Benefits and harms of more intense rehabilitation (quantitative)

5.1.15.3.1 People without communication difficulties

5.1.15.3.1.1 Physiotherapy

On consideration of the evidence, the committee agreed that clinically important benefits were associated with the delivery of more intense rehabilitation with limited evidence of harms. Overall trends showing benefits were seen in person/participant health-related quality of life at less than and greater than 6 months, modified Rankin scale at less than 6 months, activities of daily living at less than 6 months, physical function – lower limb at less than 6 months, stroke-related scale of cognition – spatial attention at less than 6 months. Unclear effects with some evidence of benefit from more intense rehabilitation and some of no clinically important difference seen in physical function – upper limb at less than 6 months and discontinuation at less than and greater than 6 months. Overall trends showing no clinically important difference were seen in carer health-related quality of life at less than 6 months, modified Rankin scale at greater than and equal to 6 months, activities of daily living at greater than and equal to 6 months, physical function – upper limb at greater than and equal to 6 months, physical function – lower limb at greater than and equal to 6 months, psychological distress – depression at less than and greater than 6 months. Occasionally clinically important harms were seen in person/participant health-related quality of life at less than 6 months and discontinuation at less than and greater than 6 months.

The committee agreed that increasing the amount of physiotherapy delivered led to benefits. The committee acknowledged the limitations in the quality of the evidence, with the evidence of benefits ranging between moderate and very low quality, the majority being of low quality, with a significant number of outcomes being populated by small studies with less than 100 participants. On consideration of this, the committee agreed that conducting trials to investigate intensity are difficult within a randomised controlled trial setting and that clinical experience of increased intensity leading to better outcomes supported the findings from the trials.

On discussing the number of hours of therapy per week, the committee agreed that the majority of the evidence of benefit was seen at more than 1 hour to 2 hours, with the most significant long-term benefits in quality of life being seen at this time period along with benefits in the modified Rankin scale and some benefit in activities of daily living and physical function (upper and lower limb).

On discussing the number of days per week spent on therapy, the committee agreed that the majority of the evidence of benefit was seen at 5 days per week. The committee acknowledged that evidence of intense therapy being delivered at 6 and 7 days per week was limited and so it was difficult to draw conclusions from this. However, the evidence that was available showed no clinically important difference in increasing the amount of therapy to 6 or 7 days a week.

The committee weighed up the benefits and the potential harms, the limitations of the evidence, considerations from the qualitative and mixed methods syntheses and their expert opinion. The committee concluded that there was likely to be increased benefit from providing physiotherapy for 1 to 2 hours at least 5 days per week. They acknowledged that, to achieve this, therapy may require to be split and delivered in smaller chunks, which could include delivering the total time over a 7 day per week service. The committee agreed that a person-centred approach should be taken and that a ‘needs-based’ approach should be taken for rehabilitation and that this amount of time should be a guideline with people receiving as much therapy as they require.

5.1.15.3.2 Occupational therapy

The committee noted that the data was limited and the evidence for benefits from increased intensity of occupational therapy was unclear. Some studies showed clinically important benefits for person/participant health-related quality of life at less than 6 months, physical function – upper limb at both time periods and discontinuation from the study at less than 6 months, but other studies showed no benefit. There was no clinically important difference in activities of daily living at less than and greater than 6 months, physical function – lower limb at less than 6 months, stroke-related scale of cognition – spatial attention at less than 6 months and discontinuation from the study at greater than and equal to 6 months. A clinically important benefit was seen in swallowing function and ability at less than 6 months when comparing greater than 45 minutes to 1 hour of therapy to less than and equal to 45 minutes, both delivered for 5 days a week. However, while defined as being delivered by an occupational therapist, it was agreed that this evidence applied more to the role of the speech and language therapist in the NHS.

The committee acknowledged that the evidence was very limited and difficult to draw conclusions from. This may in part be due to differences in the way occupational therapy is defined across the world, where some studies that have been classified in other stratifications may reflect occupational therapy practice. The committee agreed that the quality of the evidence was also low, with studies generally having less than 100 participants and, in some cases, reporting outcomes that were not in the preferred list stated in the protocol (for example: for person/participant health-related quality of life reporting non-utility scores for quality of life). Given the evidence available in this review, the benefits of increasing intensity of therapy for occupational therapy are unclear.

On weighing up the unclear evidence of benefits, the limited nature of the evidence, the quality of evidence and the committee's expert opinion, they agreed that the intensity of occupational therapy provided should remain at least 45 minutes, 5 days a week with an emphasis that therapy should be delivered in a person-centred manner and that this is the minimum therapy that someone should receive. Additional therapy could be considered when appropriate for the individual.

5.1.15.3.3 Speech and Language therapy

Two comparisons reported outcomes related to this stratification. For swallowing function and ability and discontinuation from the study, there was no clinically important difference in providing therapy for less than and equal to 45 minutes, 7 days a week, when compared to less than 5 days a week at greater than and equal to 6 months or at more than 1 hour to 2 hours, 5 days a week compared to more than 45 minutes to 1 hour, 5 days a week at less than 6 months.

The committee acknowledged the evidence was very limited. They weighed up this evidence with that on swallowing function for occupational therapy, which showed a benefit from more intense swallowing therapy at less than 6 months. Given the low quality and limitations of the evidence, the committee used their expert opinion and agreed that the intensity of speech and language therapy provided should remain at least 45 minutes, 5 days a week with an emphasis that therapy should be delivered in a person-centred manner and that this is the minimum therapy that someone should receive. Additional therapy should be considered when appropriate for the individual.

5.1.15.3.4 Psychology/neuropsychology

One study compared two different intensities (greater than 2 hours to 4 hours, 5 days a week compared to greater than 1 hour to 2 hours, 5 days a week), while other studies compared an intervention provided for greater than 1 hour to 2 hours, less than 5 days a week to usual care without specifying the amount of therapy that was provided for the usual care group. This limited evidence showed clinically important benefits of higher intensity therapy in person/participant health-related quality of life and psychological distress – depression, but no clinically important difference in activities of daily living and a clinically important harm in discontinuation all at less than 6 months.

Given the limitations in the evidence, the committee used their expert opinion and agreed that there is insufficient evidence available to recommend an intensity that psychology/neuropsychology should be provided at. Given the limited evidence, the committee agreed that additional research was required. Due to this they agreed a research recommendation on the topic.

5.1.15.3.5 Multidisciplinary team

Limited evidence was available when looking at multidisciplinary packages of care that were delivered at different intensities to each other. In the evidence available unclear effects where some outcomes showed clinically important benefits and others showed no clinically important difference were seen for activities of daily living at less than 6 months and physical function – upper limb at greater than and equal to 6 months. No clinically important differences were seen in patient/participant health-related quality of life at greater than and equal to 6 months, modified Rankin scale at greater than and equal to 6 months, activities of daily living at greater than and equal to 6 months, physical function – upper limb at less than 6 months, physical function – lower limb at less than and greater than 6 months and psychological distress – depression at less than and greater than 6 months. Unclear effects with possible benefits or harms were seen in discontinuation at less than and greater than 6 months.

The committee acknowledged the limitations in this evidence. When weighing up the quality and sparsity of the evidence against their expert opinion, the committee agreed that the intensity of all relevant therapies should remain to be available for at least 45 minutes, 5 days a week with an emphasis that therapy should be delivered in a person-centred manner and that this is the minimum therapy that someone should receive. Additional therapy should be considered when appropriate for the individual.

5.1.15.4 People with communication difficulties

The amount of evidence reported for people with communication difficulties was more limited. The majority of the evidence was included for the speech and language therapy stratification, with limited evidence being available discussing the delivery of intense therapy for people with communication difficulties receiving interventions that fall under other disciplines of therapy.

5.1.15.4.1 Physiotherapy

Very limited evidence was available for people with communication difficulties receiving physiotherapy. Evidence showed a clinically important benefit in activities of daily living at less than 6 months. There was no clinically important difference in physical function – lower limb at less than 6 months and discontinuation at less than 6 months.

Given the limitations in this evidence, the committee viewed it in combination with the evidence for people without communication difficulties. The committee weighed up the benefits and the potential harms, the limitations of the evidence, considerations from the qualitative and mixed methods syntheses and their expert opinion. They concluded that there was likely to be increased benefit from providing physiotherapy for 1 to 2 hours at least 5 days per week. They acknowledged that to achieve this therapy may require to be split and delivered in smaller chunks, which could include delivering the total time over a 7 day per week service. The committee agreed that a person-centred approach should be taken and that a ‘needs-based’ approach should be taken for rehabilitation and that this amount of time should be a guideline with people receiving as much therapy as they require. The committee acknowledged that people with communication difficulties may require adjustments to ensure that they receive the therapy that they need.

5.1.15.4.2 Occupational therapy

Very limited evidence was available for people with communication difficulties receiving occupational therapy. Evidence showed a clinically important benefit in activities of daily living at less than 6 months, no clinically important difference in psychological distress –

depression at less than 6 months and an unclear potential harm in discontinuation from study at less than 6 months.

Given the limitations in this evidence, the committee viewed it in combination with the evidence for people without communication difficulties. On weighing up the unclear evidence of benefits, the limited, low quality of the evidence and the committee's expert opinion, they agreed that the intensity of occupational therapy provided should remain at least 45 minutes, 5 days a week with an emphasis that therapy should be delivered in a person-centred manner and that this is the minimum therapy that someone should receive. Additional therapy should be considered when appropriate for the individual. The committee acknowledged that people with communication difficulties may require adjustments to ensure that they receive the therapy that they need.

5.1.15.4.3 Speech and Language therapy

An individual patient data network meta analysis was incorporated which provided indirect evidence to support this review. Evidence generally indicated no clinically important difference in communication outcomes (overall language ability, naming, auditory comprehension and functional communication) from increased intensity of speech and language therapy at follow up with some results that showed clinically important benefits from reduced intensity (naming at 9+ hours compared to up to 2 hours, naming at 4-9 hours compared to up to 2 hours, auditory comprehension at 2-3 hours compared to up to 2 hours) though the committee agreed this may be due to imprecision and quality concerns in the individual studies included in the analysis. This data was limited to a smaller number of participants and further research may be useful to reduce the uncertainty in the results. The uncertainty was consistent with the results from studies that provided direct evidence that indicated mixed results, where some showed clinically important benefits for some outcomes (naming and auditory comprehension at more than and equal to 6 months when more than 45 minutes to 1 hour, 5 days a week was compared to more than 45 minutes to 1 hour, less than 5 days a week; psychological distress – depression at less than 6 months when more than 1 to 2 hours, less than 5 days a week was compared to less than 45 minutes, less than 5 days a week; discontinuation from study at less than 6 months when more than 1 hour to 2 hours, less than 5 days a week was compared to more than 45 minutes to 1 hour, less than 5 days a week) while most showed no clinically important differences or benefits of the less intense intervention (discontinuation from study at less than and greater than 6 months when comparing more than 45 minutes to 1 hour, 5 days a week to less than and equal to 45 minutes, less than 5 days a week; discontinuation from study at less than and greater than 6 months when more than 45 minutes to 1 hour, 5 days a week was compared to more than 45 minutes to 1 hour, less than 5 days a week; functional communication at less than 6 months when more than 2 hours to 4 hours less than 5 days a week was compared to more than 1 hour to 2 hours, less than 5 days a week and discontinuation from study at <6 months when more than 2 to 4 hours, 5 days a week was compared to more than 1 hour to 2 hours, 5 days a week). Where benefits were seen (for example: the benefit in reducing psychological distress when more than 1 to 2 hours, less than 5 days a week was compared to less than 45 minutes, less than 5 days a week) this was seen in trials with a small number of participants and the evidence was often very low quality. Overall, the committee agreed that the evidence highlighted that there was still uncertainty in the evidence for intensity of speech and language therapy and that further research was required before a conclusion could be made about the optimal intensity of therapy. The evidence came from a small number of studies with a limited number of participants and ranged from moderate to very low quality with the majority being of low quality.

Given the low quality and limitations of the evidence, the committee used their expert opinion and agreed that the recommended intensity of speech and language therapy provided should remain at least 45 minutes, 5 days a week with an emphasis that therapy should be delivered in a person-centred manner and that this is the minimum therapy that someone should receive. Additional therapy should be considered when appropriate for the individual. The committee noted that 45 minutes of speech and language therapy should be available for each area of difficult that a speech and language therapy may need to provide support for (for example: 45 minutes of therapy for communication if someone has aphasia and 45 minutes of therapy for swallowing if someone has dysphagia).

5.1.15.4.4 Psychology/neuropsychology

Very limited evidence was available for people with communication difficulties receiving psychology/neuropsychology. Evidence showed no clinically important difference in carer health-related quality of life, activities of daily living, psychological distress – depression and discontinuation from the study all at greater than and equal to 6 months.

Given the limitations in the evidence, the committee used their expert opinion and agreed that there is insufficient evidence available to recommend an intensity that psychology/neuropsychology should be provided at. Given the limited evidence, the committee agreed that additional research was required. Due to this they agreed a research recommendation for this area.

5.1.15.4.5 Multidisciplinary team

Very limited evidence was available for people with communication difficulties receiving multidisciplinary team care, limited to 1 outcome reporting that there was no clinically important difference in discontinuation from the study at less than 6 months.

Given the limitations in this evidence, the committee viewed it in combination with the evidence for people without communication difficulties. When weighing up the quality and sparsity of the evidence against their expert opinion, the committee agreed that the intensity of all relevant therapies should remain to be available for at least 45 minutes, 5 days a week with an emphasis that therapy should be delivered in a person-centred manner and that this is the minimum therapy that someone should receive. Additional therapy should be considered when appropriate for the individual.

5.1.15.5 People's experiences of more intense rehabilitation (qualitative)

The qualitative review showed that intense rehabilitation is complex with several moderators that work towards the successful delivery of care. The review was separated into 8 overarching themes that interact to effect this including: key principles, person factors, people requiring specific consideration, carer/family member factors, healthcare professional factors, intervention factors, environmental factors and service factors. Forty-six sub-themes were included amongst these themes.

The majority of the evidence indicated that stroke survivors and family members believed that the more therapy that they received, the better their outcomes would be. This was not always achieved in current healthcare systems for multiple reasons. The majority of healthcare professionals agreed with this, while some highlighted that the quality of the rehabilitation being performed could be more important. The committee agreed that quality should be a priority but provided at every opportunity possible and ensuring high quality of therapy at an increased intensity would likely be beneficial. Regardless, all agreed that the amount of rehabilitation provided should be tailored to the individual, with there being multiple methods of achieving this. The opportunity for this therapy should be accessible for all people after stroke with adaptations put in place to ensure equitable access for all people. Some people may have difficulty accessing this therapy, including people with communication difficulties and cognitive difficulties, who may require additional support to participate in therapy.

5.1.15.5.1 Positive findings (facilitators)

A number of sub-themes that could facilitate the delivery of rehabilitation were raised including:

- Key principles:
    - Splitting the amount of therapy delivered during the day – this was highlighted as a method of delivering the same intensity of therapy to people who may not be able to participate in a more intense block of therapy. On considering the evidence and using their expert consensus, the committee agreed that methods of delivering this included delivering therapy multiple times in the same day, or splitting therapy time across the week including delivering therapy over 7 days of the week.
- Person factors:
    - Social factors – support and understanding from other people can be highly important to a person after a stroke. Stroke survivors interacting with other stroke survivors can provide a sense of mutual support and encouragement. Relationships with their therapist can also aid with this and faith can be important in supporting the person. The relationships with family and carers were also critical with this and that support was highly valued.
- Intervention factors:
    - Goal setting and meaningful activities – working in partnership between the stroke survivor and all involved in their care to develop meaningful goals for their rehabilitation, that are personalised to their needs, can be important in supporting the delivery of any therapy.

5.1.15.5.2 Negative findings (barriers)

A number of sub-themes that could be barriers to the delivery of rehabilitation were raised including:

- Person factors:
    - The medical status of the individual – people who are medically unwell or have comorbidities may find it more difficult to participate in intense rehabilitation. In this scenario a partnership between the healthcare professionals and the individual may need to agree how best to proceed and adjustments may need to be put in place to support people to participate as much as they are able to.
    - Post-stroke fatigue –this was identified as a common barrier to participating in more intensive rehabilitation. This needs to be considered in all people after stroke and their rehabilitation adapted accordingly.
- Intervention factors:
    - Travel time – methods of providing more intensive rehabilitation that do not require people to travel for long periods of time may be seen as preferable. Travel can require a significant number of extra considerations that can lead to a person being exhausted before they can start their therapy (when considering other factors such as post-stroke fatigue). Therefore, minimising the amount people have to travel people to receive therapy, and the barriers involved in this, would be of great benefit.
- Service factors:
    - Staff availability – The availability of staff was a significant moderator to whether intense therapy could be delivered. The limited resources available meant that intense therapy could not always be delivered and services had to decide who to prioritise for more intensive therapy. Transitioning from hospital to outpatient services – it was often reported the transitions between services were challenging and could lead the person after stroke and their family and carers feeling unsupported. Providing a way to bridge the gap between services was seen as an important in minimising this barrier.

5.1.15.5.3 *Moderators of intense rehabilitation*

Several themes could not be summarised purely as facilitators or barriers, including:

- Person factors
    - A person's previous activity level and need for physical support – people who have previously increased activity levels may find it easier to participate in intense rehabilitation than those who had lower activity levels. But equally the amount of physical support someone required and the amount of difficulty after their stroke can influence this as well.
    - Psychological factors – a complex interweave of psychological factors can moderate someone's ability to participate in intense rehabilitation. While there are some factors that are more likely to occur after someone has a stroke, such as a feeling of a loss of security, consequences of the stroke that can affect concentration and mood and behaviour, the response to these factors appeared to be important in how people participated with more intensive therapy. Intensive therapy could provide people with a sense of personal achievement that might encourage them to continue. However, the nature of this is likely to vary between difficult individuals and their personal response to their stroke.
    - Motivation – Motivation during intense rehabilitation was complicated and varies between people. Intensity can provide motivation if the results of therapy lead to positive improvements and are visible to the person. However, if results are not seen and as the duration after the stroke increases, the motivation to participate may reduce. Motivation may be fostered through multiple sources, including self-motivation, motivation from family and therapist, being involved in novel research and a feeling of altruism, and from other people who have had a stroke.
- Person factors and healthcare professional factors:
    - Education – for all people, education about the benefits of intensive rehabilitation was positive and helped to encourage them to participate and provide this therapy. For people after stroke, a lack of information could lead to a sense of frustration, self-doubt and a loss of confidence. Both people after stroke and caregivers may want further information about the condition and options for rehabilitation and would ideally want this information from healthcare professionals but will seek this information from other sources if not provided.
- Carer and family member factors:
    - Support of family and friends – the support of the family was highlighted as a contributory factor for the success of intense rehabilitation. However, a balance needed to be had between providing therapy and time spent with family and friends to provide holistic care for recovery. This provided a potential barrier to providing therapy 7 days a week. The involvement of family members could provide an opportunity to increase continuity of rehabilitation on leaving hospital. However, the burden experienced by the family member needs to be considered carefully.
- Healthcare professional factors:
    - The relationship between the person after stroke and the healthcare professionals – this was an important moderator for the success of rehabilitation. If people believed that more intensive rehabilitation was appropriate, if communication was honest, motivating and provided encouragement, and feedback was provided by the person after stroke about their experience and the healthcare professional to reinforce the progress being made, then this fostered a feeling of confidence in the therapy for both parties. Therapists reported needing to balance the safety of the intervention against the needs of the person, especially when considering prescribing unsupervised therapeutic activities. Consistency in the person providing therapy and the quality of the care provided helped support more intensive therapy, although some people reported

  - that variety in the person providing therapy and their approach could help to provide motivation to try new things and engage with the therapy.
- Intervention factors:
  - Methods of providing more intensive rehabilitation – a variety of different methods could be used to increase the delivery of therapy including individual therapy, group-based therapy, self-management interventions, use of computer-based tools, seven-day working and longer-term rehabilitation. The resources available for some of these methods may make their delivery less feasible. Some therapeutic approaches may lead to increased variety in activities and choice and adapting therapy in a person-centred manner (such as computer-based tools) while others may have additional barriers in this (such as group-based therapy). Some approaches may require the use of specialist equipment which requires training and support that may make the effect on resources saved by being self-direct unclear (such as computer-based tools). If equipment is required for the therapy to be delivered at home, the physical environment must be adapted and expensive equipment may need to be provided, if not owned by the person.
- Environmental factors:
  - The environment therapy is delivered in is important. Hospital environments can impede rehabilitation if they are not designed to facilitate interactions and communication, for people with communication difficulties. Home care can be appropriate for some people. However, the lack of supervision was seen as a possible barrier. Adaptations put in place to make therapy more accessible however it is delivered is seen as important.
- Service factors:
  - The balance between delivering therapy and supporting discharge – staff availability was reported as split between delivering therapy and completing non-patient contact activities, such as planning and documenting therapy, discharge planning, ordering of equipment and training others. The balance between achieving goals for the person that could sometimes conflict with each other was important including the complex balance between providing therapy and discharge planning. Maximising the potential time that staff had for delivering therapy was seen as important, including using therapy timetabling so that there are no conflicts between different aspects of care, minimising the amount of administrative tasks people had to partake where possible, ensuring sufficient staff numbers are provided to support this and reducing time spent in information exchange so that only meaningful exchanges take place.

On balance, the committee agreed the evidence highlighted elements of good practice that could increase the likelihood of more successful delivery of intensive rehabilitation. Some of these are already included in existing recommendations in CG162, Stroke rehabilitation in Adults. Considering the evidence and their expert opinion, the committee agreed a new recommendation to encourage other important factors, while also referring to other NICE guidance which supports the delivery of care.

5.1.15.6 Synthesis of the quantitative and qualitative evidence (mixed methods analysis)

The quantitative and qualitative evidence for this review was synthesised by comparing whether the qualitative themes that could improve the delivery of intensive rehabilitation were present in the studies reporting the quantitative evidence. This was synthesised using matrices reporting when studies reported factors that could be considered as related to the sub-themes and in sensitivity analyses identifying whether, in the studies where these themes were considered, the outcomes were different.

This analysis identified that the reporting of features was generally limited, with studies being more likely to report the key principles and intervention themes, including splitting the amount of therapy during the day, the variety in activities and choice, goal setting and the support of other people, such as family and friends. Fatigue was considered in some studies and was reported as a reason for discontinuation from some more intense therapies. Most of the studies were conducted in a hospital setting on an individual basis with 8 studies discussing group-based therapy. Thirty-one studies included telerehabilitation, assistive technology or computer-based tool use, which was linked to the use of expensive and additional equipment and the need for technical support and training. Seven-day working was reported in three studies. The person and healthcare professional factors discussing how care was delivered was not commonly reported. No obvious trend was seen to identify that better outcomes were seen when more intense rehabilitation was delivered incorporating these themes.

Due to the sparse nature of the data from the quantitative review, with studies being spread between a wide range of different comparisons, it was difficult to make conclusions from the sensitivity analyses with analyses often leaving just one study after removing the studies that do not report the themes. Sensitivity analyses were not possible for all themes as it was not appropriate to dichotomise the theme in a manner where the analysis could be performed. Meaningful analyses were possible in a minority of analysis, the majority of which showed no clinically important difference after the sensitivity analysis was completed. The scenarios where a clinically important difference occurred when discussed with the committee were agreed to be confounded by small low-quality studies that acted as outliers and so the changes could be put down to chance rather than being a causal link.

The committee acknowledged the uncertainty in this analysis and that the reporting of the qualitative themes in the quantitative studies and the absence of this may not be a true reflection of the practices involved in the studies. Regardless, the committee agreed that further research into these areas should consider integrating elements of good practice identified in the qualitative evidence when providing more intense rehabilitation to help improve the delivery of therapy.

5.1.15.7 Key uncertainties

In the qualitative review, people with communication difficulties and people with cognitive difficulties were highlighted as those requiring specific consideration with regards to accessing intense rehabilitation. On examining the evidence, the committee agreed that only a minority of the quantitative studies explicitly included people with communication and/or cognitive difficulties (with 8 studies identified that explicitly considering people with communication difficulties and no studies explicitly considering people with cognitive difficulties) with a significant number excluding people from the study if they experienced either. The care required for these people may be different from that required by those who do not have these difficulties and providing equitable care was highlighted as important. The committee agreed that this was an important area for further research and so highlighted the importance of including people from these groups in research recommendations.

The committee acknowledged the limited evidence. The majority of the evidence included in the quantitative review reported the use of physiotherapy interventions. Very limited evidence reported the use of psychological therapy and swallowing therapy. The committee recommended further research in these areas. The committee noted that there was insufficient evidence to evaluate the effectiveness of delivering therapy seven days a week compared to five days a week. This has been highlighted as a priority National Stroke Service Model for the NHS. The committee also recommended this as an area for further research.

5.1.15.8 Cost effectiveness and resource use

More intensive rehabilitation, by definition, requires greater resource use, especially staff time. However, if effective, there is potential for these extra costs to be at least partially offset by cost savings from reduced care needs.

The economic evidence review identified eight relevant published economic evaluations (Reported in Evidence review E - Intensity of rehabilitation E health economics). Original economic modelling was also undertaken (see Evidence review E - Intensity of rehabilitation F model write-up for full technical report).

5.1.15.8.1 Physiotherapy

Three studies compared more intensive physiotherapy for people without communication difficulties. One study was a cost-utility analysis that compared three groups: high intensity physiotherapy (where participants received either additional conventional physiotherapy or functional strength training alongside conventional strength training) to conventional physiotherapy alone (i.e., usual care). The results found that both higher-intensity physiotherapy groups dominated usual care, with cost savings of £1,520 and £1,369 and QALY gains of 0.05 and 0.12 for additional conventional physiotherapy and functional strength training groups, respectively. This study was assessed as partially applicable as the use of 2010 Canadian resource estimates and 2013-unit costs may not reflect the current UK NHS context. A 5% discount rate for costs and outcomes was also applied when 3.5% is the preferred rate by NICE. Potentially serious limitations included the use of a single RCT as the basis for key model inputs, as the results only reflect this study and not the wider evidence base identified in the clinical review. As well as this, bed days saved with higher intensity interventions were based on expert opinion, which was the main driver of cost savings.

The second study included in this category was a cost-utility analysis that compared three groups: more intensive physiotherapy (where participants received usual care plus robot-assisted arm-training or enhanced upper limb therapy (EULT)) to usual care. The results found that usual care dominated both higher-intensity physiotherapy groups, with additional costs of £741 and £1,601 and low or no QALY gains (0.00 and 0.01) for robot-assisted arm-training and EULT groups, respectively. Usual care also had an 81% probability of being cost-effective at a £20,000 willingness-to-pay threshold, while the EULT group had a 19% probability being cost-effective (and 0% for Robot-training). This study was assessed as directly applicable with minor limitations as it was a within-trial analysis based on the RATULS RCT and so only reflects this study and not the wider evidence base identified in the clinical review.

The last study included in this category was a cost-consequence analysis which found that more intensive physiotherapy (i.e., individualised regular coaching) during rehabilitation incurred higher costs (£1,957 more per patient) compared to usual care, with no significant difference in terms of health outcomes. This study was assessed as partially applicable as QALYs were not used as the health outcome measure and EQ-5D 5L (UK tariff) was collected and analysed in the trial, but numerical results were not reported, however the authors reported that no difference was found. Potentially serious limitations were identified, as the study was a within-trial analysis of the LAST RCT included in the clinical review and so by definition only reflects one of the included clinical studies. Sensitivity analyses were also not reported.

Due to limitations with these studies, original modelling was conducted – see 5.1.15.12.

5.1.15.8.2 *Occupational therapy*

One comparative cost analysis compared increased occupational therapy for people with communication difficulties, the results of which found the intervention had higher total costs (£796 more per patient) compared to usual care, with no significant difference in terms of health outcomes. This study was assessed as partially applicable because QALYs (and cost per QALY) were not calculated. The French healthcare perspective including 2009-2019 resource use estimates may also not reflect the current UK NHS context. Potentially serious limitations were noted as follows: baseline outcomes and intervention effects for the higher dose group were based on single non-randomised retrospective study excluded from clinical review; estimates of resource use were based on data from the study population and not a systematic review; the follow-up period was vaguely reported and may not sufficiently assess the full costs and benefits; only intervention-related healthcare costs and resource use were incorporated into the analysis (no downstream resource use included); references for unit costs (including cost year) were not reported. No probabilistic sensitivity analyses were performed.

5.1.15.8.3 *Speech and language therapy*

No health economic studies were included that assessed solely speech and language therapy.

5.1.15.9 Psychology/neuropsychology

One cost-effectiveness analysis compared usual care to cognitive behavioural therapy plus usual care for people with communication difficulties and low mood. The results of which found that cognitive behavioural therapy during rehabilitation would cost £263 for a 1-point reduction in Stroke Aphasic Depression Questionnaire Hospital version 21 (SADQH21). This study was assessed as partially applicable as QALYs were not used as the health outcome and the use of 2011 unit costs may not reflect the current UK NHS context. Potentially serious limitations were identified as the study was a within-trial analysis of a single RCT and so only reflects this study and not the wider evidence base identified in the clinical review. Furthermore, the analysis of costs compared resource use collected at 6 months to that at 3 months; it is unclear if this is appropriate, and the justification was not discussed. Health outcomes associated with the intervention may also not be fully captured by only considering impact on SADQH21. Only limited sensitivity analyses were performed.

5.1.15.10 Multidisciplinary team

Three studies compared increased intensity of multidisciplinary rehabilitation for people without communication difficulties. One was a cost-effectiveness analysis which found that high-frequency multidisciplinary rehabilitation would cost £638 per case of mRS>2 averted. This study was assessed as partially applicable, as QALYs (and cost per QALY gained) were not presented and the Japanese healthcare perspective with 2013-2016 resource use estimates may not reflect the current UK NHS context. Potentially serious limitations were identified as well, as it was a within-trial analysis based on a retrospective study not the wider evidence based identified in the clinical review. Additional limitations were noted as the following: follow-up data was only collected until discharge from hospital which may not sufficiently assess the full costs and benefits; median (not mean) outcomes reported; intervention costs associated with increased frequency of rehabilitation were not incorporated into costs differences between groups; references for unit costs (including costs year) were not reported which limits interpretation of results for UK context and no probabilistic sensitivity analyses were performed.

The second study in this category was a comparative cost analysis which found that high-intensity multidisciplinary rehabilitation was not statistically more costly than normal-frequency rehabilitation (cost difference: £812 per patient (p=0.0653). This study was assessed as partially applicable as, similar to the previous study, QALYs (and cost per QALY gained) were not presented and Japanese healthcare perspective and 2005-2017 resource use estimates may not reflect the current UK NHS context. Potentially serious limitations were identified as follows: the within-trial analysis was based on a retrospective natural experiment study not the wider evidence based identified in the clinical review; references for unit costs were not reported which limits interpretation of results for UK context and no probabilistic sensitivity analyses were performed.

The final analysis included in this category was conducted by the NGC as part of the previous Stroke Rehabilitation guideline. This was a cost-utility analysis, which concluded more intensive rehabilitation was cost effective compared to less intensive rehabilitation, based on a modelled analysis using levels of intervention and outcomes from the Ryan et al. 2006 study (24 versus 18 rehabilitation sessions; EQ5D difference 0.14 at 3 months) and a range of long-term utility assumptions. The analysis was assessed as partially applicable however, as 2000-2002 resource use estimates and 2013-unit costs may not reflect the current UK NHS context. Furthermore, the intensity of multidisciplinary rehabilitation in both the intervention and comparator arms of Ryan are well below current UK levels. Potentially seriously limitations were noted as the model is based on a single trial and so only reflects this study and not the wider evidence base identified in the clinical review. Ryan 2006 was not included in updated clinical review because it was judged that there was insufficient information to categorise the study in line with new review protocol stratifications; however, as it compared higher versus lower intensity multidisciplinary rehabilitation and is the model from previous guideline it has not been excluded on this basis. Additionally, the base-case analysis assumed no difference in post-rehabilitation costs; however, greater functional ability could plausibly result in lower dependency and potentially lower social care costs however, this would further favour more intensive rehabilitation and so would not change conclusions.

5.1.15.11 Overview of health economic literature

Although several health economic studies were identified in the literature, the committee concluded that the evidence was insufficient to use as the basis for recommendations for increasing any specific or multi-disciplinary form of therapy-based rehabilitation.

In particular, the two studies that focused on more intensive occupational therapy and cognitive therapy were both within-trial analyses that did not incorporate QALYs as an outcome and applied either out-dated or non-UK costs, which limited the committee’s ability to interpret the study results for a current UK NHS context.

For studies that assessed additional multi-disciplinary rehabilitation, two analyses were within-trial analyses conducted in Japanese healthcare settings that incorporate QALYs as an outcome, while the original economic analysis developed for the previous guideline also had limited applicability as the intensity of rehabilitation in both trial arms was below current UK levels, rendering the study results as inadequate to use as evidence for increasing intensity above what is currently provided.

Moreover, the three analyses assessing more intensive physiotherapy reported contrasting conclusions, with QALY gains ranging from zero to 0.07 and cost differences between trial arms ranging from £1,957 more per patient to cost savings of £1,520. The variation of the study conclusions is attributable to each study using a different trial for their analyses, which meant that clinical inputs, intervention costs and follow-up periods were not consistent.

5.1.15.12 Original modelling

Ultimately, the committee agreed that there was uncertainty about the cost-effectiveness of the interventions assessed in the literature but that there was likely to be a substantial resource impact if more intensive rehabilitation was recommended compared to current practice. As a result, in this guideline update, the cost-effectiveness of increased intensity of rehabilitation was prioritised for original health economic modelling.

A cost-utility analysis was undertaken where lifetime quality-adjusted life years (QALYs) and costs from a current UK NHS and personal social services perspective were considered. The analysis followed the standard assumptions of the NICE reference case. The model structure was based on the model developed as part of the 2013 CG162 guideline, previously described, which compared more versus less intensive therapy delivered by a multidisciplinary team.

The treatment effect of more intensive rehabilitation was taken from the clinical review; it found that most of the available evidence was for physiotherapy, showing benefits with higher intensity that appeared most evidenced at 1-2 hours per day, 5 days per week. Limited evidence was identified for all other stratifications, which either showed a potential trend towards a benefit or no clinical difference in outcomes. Furthermore, very limited evidence was identified for cognitive therapy (mainly from a single psychological therapy study) and swallowing therapy. Very limited evidence was also identified for therapy delivered for 7 days a week.

It was decided that the model comparators would be higher physiotherapy (1-2 hours, 5 days per week) with lower intensity physiotherapy that closely matched the current recommendation of 45 minutes to 1 hour, 5 days per week (i.e., new versus current practice). This was also the comparison with the most data from the clinical review.

The clinical evidence for physiotherapy with the relevant model comparators was comprised of heterogeneous studies that differed in areas such as the clinical setting, time since stroke and the type of physiotherapy assessed. This also meant that resource use varied across studies, at the method of delivery in terms of equipment costs and staff time differed depending on the interventions provided and the study participants' individual needs and ability to tolerate more intensive rehabilitation. Despite these concerns, it was decided that the best approach would be to use the pooled study results as our best estimate of the effect of higher intensity physiotherapy.

Limited EQ-5D data were reported in the included clinical studies, so to maximise the data that could be incorporated into the cost effectiveness analysis, an algorithm was used to map Barthel Index scores reported in the clinical review to EQ-5D-3L. Studies that reported EQ-5D-5L scores were also mapped to EQ-5D-3L. The mapped EQ-5D change scores (i.e., change from baseline in the higher intensity and lower intensity groups from each study) were then meta-analysed as this was deemed to be the most precise way of using the data from the trials as it would remove treatment-specific baseline differences from the model.

Intervention costs were based on a weighted average of the resource use in the clinical trials. Longer-term resource use was based on the relationship between Barthel Index scores and care needs from a UK observational study.

The cost-effectiveness of more intensive physiotherapy is dependent on the duration of the treatment effect post-intervention, which is uncertain as most studies included in the analysis didn't report follow-up beyond 6 weeks. Therefore, an original cost effectiveness analysis compared intensive therapy (1 to 2 hours, 5 days a week) with less intensive therapy (<45 minutes, 5 days a week) for the following scenarios:

- Scenario 1: The difference in utility disappears over time.
    - a) intervention costs only

    - b) with post-rehabilitation care cost savings
- Scenario 2: The difference in utility is maintained.
    - a) intervention costs only
    - b) with post-rehabilitation care cost savings

In each of these base case analyses, higher intensity physiotherapy was either cost-effective or dominant compared to lower intensity physiotherapy, except for the most conservative scenario, 1a (£48,539 per QALY gained).

The results of each scenario were robust to changes in other model parameters except that higher intensity was no longer cost effective if the time horizon was very short or the population was very old.

5.1.15.13 Conclusions

The committee's view was that some of the benefit of higher intensity is likely to be maintained after rehabilitation has ended and that there are likely to be some savings in care costs in the longer term, although both effects are difficult to quantify. They concluded that, although there is uncertainty about cost effectiveness, it is likely that 1-2 hours of physiotherapy, 5 days a week is cost effective. Cost effectiveness could depend on the specific characteristics of the intervention.

The evidence for the cost effectiveness of increased intensity for other forms of therapy was inconclusive, therefore the intensity was not changed from the previous version of the guideline. The committee made a research recommendation for around more intensive swallowing therapy.

5.1.15.14 Other factors the committee took into account

Alongside this analysis, the highest quality trials that informed the recommendations for higher intensity physiotherapy were examined alongside real-world data from the SSNAP audit in order to investigate whether the participants eligible for the trials are comparable to those in a UK NHS context. On examination of three studies (Cho, et al. 2012; Horsley, et al. 2019 and Lee, et al. 2012) 48.6%, 8.1% and 4.1% of people in the SSNAP audit would have been eligible for inclusion in the trials respectively. Common exclusion reasons between the three trials were people who cannot communicate age and current month (relating to people with cognitive difficulties) and people with severe aphasia. Lee, et al. 2012 excluded people with a previous stroke or transient ischaemic attack. The qualitative review highlighted how people with communication and cognitive difficulties required extra consideration and the mixed methods synthesis highlighted how this was not always considered in the quantitative evidence. Therefore, this evidence further highlights this disparity. The committee reflected on this and highlighted this while making research recommendations, highlighting that people with communication and cognitive difficulties, and people who have had a previous stroke or transient ischaemic attack should be included in research to ensure that their needs are being met.

Other NICE guidance may provide information that can help with the delivery of more intense rehabilitation. This includes:

- CG138 Patient experience in adult NHS services: improving the experience of care for people using adult NHS services

5.1.16 Recommendations supported by this evidence review

This evidence review supports recommendations 1.2.15 to 1.2.22 and the research recommendations on intensity of rehabilitation – therapy for 7 days a week, intensity of rehabilitation – psychological therapy and intensity of rehabilitation – swallowing therapy. Other evidence supporting these recommendations can be found in the evidence review on eating and drinking (I).

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