

Stroke rehabilitation in adults (update)

[E] Evidence reviews for intensity of rehabilitation

NICE guideline GID-NG10175

Evidence reviews underpinning recommendations 1.2.15 to 1.2.19 and research recommendations in the NICE guideline

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Draft for Consultation

*These evidence reviews were developed
by the Guideline Development Team at
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.	<p>registered with the Australian and New Zealand Trial Registry (ACTRN126100009 6055).</p> <p>Risk of bias: Minor limitations.</p> <p>Applicability: Partially applicable. Completed in Australia, but regarding a practice that is conducted in the United Kingdom.</p>
Bowen 2012 ²	<p>Successful feasibility study followed by a randomised trial with economic evaluation, and nested qualitative study using 32 individual interviews.</p> <p>Interview approach adapted to people with communication difficulties. Semi-structured interviews with carers and thematic analysis.</p>	<p>People after stroke and carers/family members</p> <p>People with stroke and communication difficulties Median age (range): 73 (53-98) years N = 22</p> <p>Time after stroke: Not stated/unclear.</p> <p>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</p> <p>Focus of care: Communication.</p>	<p>1. To explore participants'/carers' experiences of speech and language therapy intervention or visitor support.</p> <p>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.</p> <p>3. To compare the perceived impact on participant and carer well-being of speech and language therapy intervention or visitor support.</p>	<p>Setting: NHS stroke care from 12 NHS sites across England. Recruitment took place during the inpatient phase.</p> <p>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.</p> <p>Risk of bias: Minor limitations.</p> <p>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</p>

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.	<p>Speech and language therapists N = 11 Median number of years working as speech and language therapists with people with aphasia: 15-20 years</p> <p>NHS pay band: median 7 (range 7-8).</p> <p>Location of their speech and language input: Inpatient acute = 6, Inpatient rehabilitation = 6, Outpatient Clinic/day unit = 5, Home visits = 9.</p> <p>Focus of study: Speech and language therapy.</p>	To explore the individual accounts of speech and language therapists who implemented the self-managed computer therapy intervention in the Big CACTUS trial.	<p>Setting: Therapists in the United Kingdom across 21 NHS trusts that were trial sites for the randomised controlled trial.</p> <p>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.</p> <p>Risk of bias: Minor limitations.</p> <p>Applicability: Generalisable to a United Kingdom practice. Across the NHS, so widely applicable.</p>
Celinder 2012 ⁴	Qualitative triangulation design that included semi-structured interviews and field notes.	<p>Stroke survivors Mean age (SD): 68.22 (13.57) years N = 9</p> <p>Time after stroke: Subacute (7 days – 6 months).</p> <p>Focus of care/therapy: Mixed (occupational therapy).</p>	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.	<p>Setting: Stroke inpatient hospital in Denmark.</p> <p>Funding: Not stated/unclear.</p> <p>Risk of bias: Minor limitations.</p> <p>Applicability: Partially applicable. Completed in Denmark, but regarding a practice that can be conducted in the United Kingdom.</p>

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.	<p>Stroke survivors who had completed an intervention using the home-based telerehabilitation system</p> <p>Mean age (range): 70 (52-86) years N = 13</p> <p>Time after stroke: Subacute (7 days – 6 months).</p> <p>Focus of care/therapy: Mixed (multidisciplinary team).</p>	To explore the user acceptance of a home-based stroke rehabilitation system.	<p>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.</p> <p>Funding: This work was supported by the National Science Foundation [grant number HCC-1219197] and National Institutes of Health [grant number K24HD074722].</p> <p>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).</p> <p>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).</p>
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
		<p>ischaemic or haemorrhagic stroke</p> <p>Mean age (range): 62 (49-88) years N = 10</p> <p>Time after stroke: Mixed (range 5 months – 4 years)</p> <p>Focus of care/therapy: Functional independence (physiotherapy)</p>	barriers of using robotic therapy devices for in-home rehabilitation.	<p>surrounding areas in the United States of America.</p> <p>Funding: The funding for this project was through the Veteran's Administration Office of Rural Health.</p> <p>Risk of bias: Moderate limitations (No information on whether the relationship between researcher and participants been adequately considered and no information on study ethics).</p> <p>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.</p>
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.	<p>Stroke survivors, carers and stroke service managers, therapists and other multidisciplinary team members</p> <p>Stroke survivors Mean age (SD): 69.42 (13.51) years N = 77</p> <p>Mean stroke Severity (NIHSS score on admission to</p>	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.	<p>Setting: Eight stroke units in four English regions (in the north of England) to include a mix of hyperacute, acute and rehabilitation units.</p> <p>Funding: This paper presents independent research commissioned by the National Institute for Health Research (NIHR) under its Research for Patient Benefit (RfPB) Programme grant</p>

Study	Design	Population	Research aim	Comments
		<p>hospital) (SD): 10.2 (6.48).</p> <p>Mean length of inpatient stay in days (SD): 34.32 (25.04) days.</p> <p>Carers Mean age (SD): 59.55 (13.62) years N = 53</p> <p>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%).</p> <p>Focus of care: Mixed.</p>		<p>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.</p> <p>Risk of bias: Minor limitations.</p> <p>Applicability: Directly applicable. UK based study across multiple stroke units of different types across the North of England.</p>
Cobley 2013 ⁸	Semi-structured interviews with thematic analysis.	<p>People after stroke Mean age: 69.85 (13.42) years. N = 27</p> <p>Time after stroke: Not stated/unclear.</p> <p>Carers Mean age (SD): 72.79 (14.10) years. N = 15</p> <p>Focus of care/therapy:</p>	To investigate patients' and carers' experiences of Early Supported Discharge services and inform future Early Supported Discharge service development and provision.	<p>Setting: Two stroke units in the Nottinghamshire region in the United Kingdom.</p> <p>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</p>

Study	Design	Population	Research aim	Comments
		Mixed (multidisciplinary team).		<p>article are those of the author(s) and not necessarily those of the NHS, the NIHR, or the Department of Health in England.</p> <p>Risk of bias: Moderate limitations (No information on whether the relationship between researcher and participants been adequately considered).</p> <p>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.</p>
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.	<p>Healthcare professionals Physical therapists and rehabilitation assistants delivering, the DOSE intervention as part of a stroke rehabilitation clinical trial.</p> <p>Mean age (SD): 37 (9.2) years N = 15</p> <p>Focus of care: Mixed (physiotherapy).</p>	To investigate factors influencing implementation of higher-intensity activity in stroke rehabilitation settings.	<p>Setting: Rehabilitation units across 4 provinces in Canada.</p> <p>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.</p> <p>Risk of bias: Minor limitations.</p>

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.	<p>Physical therapists, occupational therapists and rehabilitation assistants</p> <p>N = 20</p> <p>Years of experience (range): 3-37 years.</p> <p>Type of therapists: Physiotherapist = 5, Occupational therapist = 13, Rehabilitation assistant = 2.</p> <p>Focus of care: Upper limb.</p>	To conduct a formative evaluation of the implementation of GRASP to inform the development and implementation of a similar intervention in the United Kingdom.	<p>Setting: Conducted in Canada from people across 8 sites (two sites were in the Greater Vancouver area).</p> <p>Funding: JE and JH developed GRASP but do not benefit financially in any way from its use in clinical practice. No additional information.</p> <p>Risk of bias: Minor limitations.</p> <p>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.</p>
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.	<p>Physiotherapists, occupational therapists, therapy managers and therapy assistants</p> <p>N = 23</p> <p>Type of therapists: Physiotherapists:</p>	To use the Behaviour Change Wheel (BCW) to identify mechanisms of action and provide a rich explanation as to how our implementation intervention	<p>Setting: Three stroke rehabilitation units in the North West of England.</p> <p>Funding: LC and NM are funded by a National Institute for Health Research Career Development Fellowship. This article presents</p>

Study	Design	Population	Research aim	Comments
		<p>8. Occupational therapists: 11. Therapy assistants: 4</p> <p>Focus of care/therapy: Mixed (multidisciplinary team).</p>	supported change at a site level.	<p>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.</p> <p>Risk of bias: Minor limitations.</p> <p>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).</p>
Demain 2013 ¹³	Four focus groups with thematic analysis.	<p>People after a stroke requiring upper limb rehabilitation Age (range): 46-78 years N = 8</p> <p>Time since stroke (range): 1-12 years</p> <p>Family caregivers Age (range): 44-82 years N = 7</p> <p>Healthcare professionals including physiotherapists, occupational therapists and a clinical registrar N = 6</p>	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.	<p>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.</p> <p>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</p>

Study	Design	Population	Research aim	Comments
		<p>Professional status: 2 physiotherapist (NHS), 1 physiotherapist (private practice), 1 occupational therapist (NHS), 1 occupational therapist (social services), 1 clinical registrar.</p> <p>Focus of care: Upper limb.</p>		<p>NIHR or the Department of Health.</p> <p>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).</p> <p>Applicability: Applicable. United Kingdom setting with a wide perspective. A limited number of participants representing each groups, but still mostly applicable.</p>
D'Souza 2021 ¹²	A qualitative descriptive study. semi structured interviews and focus groups with thematic analysis.	<p>People after stroke and healthcare professionals</p> <p>Stroke survivors Mean age (SD): 83 (7) years. N = 7</p> <p>Mean time since stroke (SD): 14 (5) days.</p> <p>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</p>	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.	<p>Setting: Conducted on an acute and a rehabilitation ward at a private hospital in Perth, Western Australia.</p> <p>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.</p> <p>Risk of bias: Moderate limitations (No information on whether the relationship between researcher and participants been adequately considered).</p>

Study	Design	Population	Research aim	Comments
		<p>= 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.</p> <p>Focus of care/therapy: Communication (multidisciplinary team).</p>		<p>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.</p>
Galvin 2009 ¹⁴	Two focus groups. Thematic analysis.	<p>Physiotherapists working in the area of stroke rehabilitation N = 10</p> <p>Focus of care/therapy: Mixed (physiotherapy).</p>	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.	<p>Setting: Focus groups in Ireland (Dublin area).</p> <p>Funding: Not stated/unclear.</p> <p>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).</p> <p>Applicability: Broadly applicable. Set in Ireland.</p>
Galvin 2009 ¹⁵	Semi-structured interviews and focus groups with thematic analysis	<p>People with a diagnosis of first stroke Age (range): 73 (56-88) years N = 10</p> <p>Mean time after stroke (range): 58 (31-89) days</p>	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.	<p>Setting: Setting was in Ireland with participants from the greater Dublin area.</p> <p>Funding: the authors received a financial contribution from the Seed Funding Scheme in the University College Dublin.</p>

Study	Design	Population	Research aim	Comments
		Focus of care/therapy: Mixed (physiotherapy).		<p>Risk of bias: Moderate limitations (No information on whether the relationship between researcher and participants been adequately considered).</p> <p>Applicability: Broadly applicable. Set in Ireland.</p>
Gustavsson 2020 ¹⁶	Individual and two focus group interviews were conducted. A grounded theory approach was used to collect and analyse the data.	<p>Occupational therapists, physiotherapists, speech and language therapists and medical social workers N = 12</p> <p>Focus of care/therapy: Telerehabilitation (multidisciplinary team).</p>	To explore how healthcare professionals use and could potentially use ICT to enable a person-centred rehabilitation process after stroke.	<p>Setting: People from acute rehabilitation and primary care rehabilitation in Stockholm, Sweden.</p> <p>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].</p> <p>Risk of bias: Moderate limitations (No information on whether the relationship between researcher and participants been adequately considered).</p> <p>Applicability: Broadly applicable. Sweden health setting. Discusses a primary care and acute care setting which appears transferrable to a UK health model. Mildly</p>

Study	Design	Population	Research aim	Comments
Hartford 2019 ¹⁷	A qualitative descriptive design was used. Individual interviews and field notes with a thematic analysis.	<p>People after stroke, carer/family members and healthcare professionals</p> <p>Stroke survivors Mean age (range): 68.75 (48-87) years N = 16</p> <p>Mean duration of stroke (range): 8.74 years (3 months - 26 years).</p> <p>Spouses of stroke survivors Mean age (range): 73.5 (62-80) years N = 4</p> <p>Stroke recovery group co-ordinators N = 3</p> <p>Speech pathologists N = 1</p>	To gain insight into healthcare and social structures from the perspective of patients and caregivers that can better support long-term stroke recovery.	<p>relates to intensity of rehabilitation.</p> <p>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.</p> <p>Funding: Not stated/unclear.</p> <p>Risk of bias: Moderate limitations (No information on whether the relationship between researcher and participants been adequately considered).</p> <p>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.</p>
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.	<p>medical, speech therapists, neuropsychologists, occupational therapists, physiotherapists, nursing and administrators</p> <p>N = 23</p> <p>Time after stroke: Subacute (7 days-6 months)</p> <p>Severity: Not stated/unclear</p> <p>Focus of care/therapy: Early supported discharge (multidisciplinary team).</p>	supported discharge model of care for stroke survivors at a large metropolitan public hospital in Australia.	<p>located in a major Australian city.</p> <p>Funding: The author(s) received no specific funding for this work.</p> <p>Risk of bias: Moderate limitations (No information on whether the relationship between researcher and participants been adequately considered, limited applicability to this review).</p> <p>Applicability: To this question limited applicable themes. Setting is appropriate, but the study does not seem to answer the question.</p>
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.	<p>People after stroke</p> <p>Mean age (SD): 58.7 (5.6) years. N = 10</p> <p>Mean time since stroke (range): 8 (3-18) months.</p> <p>Focus of care/therapy: Mixed (physiotherapy).</p>	To investigate factors influencing implementation of higher intensity activity in people with stroke and to compare this with therapists' perspectives.	<p>Setting: Participants from the DOSE trial which was conducted in 5 metropolitan centres in Canada.</p> <p>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.</p> <p>Risk of bias: Minor limitations.</p> <p>Applicability: Broadly applicable. Canadian healthcare system is not too different from</p>

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.	<p>Stroke survivors Median age (IQR): 58 (48 to 69.3) years N = 16</p> <p>Median time after stroke (IQR) = 19 (12.5 to 30.3) months.</p> <p>Carers/family members N = 2</p> <p>Healthcare professionals including rehabilitation assistants, specialist therapists and highly specialist therapists (including physiotherapists and occupational therapists) N = 11</p> <p>Focus of care: Upper limb (multidisciplinary team)</p>	To explore the perceptions of participants of this intensive upper limb programme, including clinicians, stroke survivors and caregivers	<p>Setting: London. Outpatient clinic in the United Kingdom.</p> <p>Funding: This work was supported by funds from the Occupational Therapy Research Fund, National Hospital for Neurology and Neurosurgery.</p> <p>Risk of bias: Moderate limitations (No information on whether the relationship between researcher and participants been adequately considered, limited applicability to this review).</p> <p>Applicability: Directly applicable. United Kingdom setting. However, small number of participants and only based around or in London.</p>
Last 2021 ²¹	Interpretive description methodological approach. Conducted as semi-structured interviews.	<p>Stroke survivors N = 11</p> <p>Current of recently discharged patients of three</p>	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	<p>Time after stroke (range): 4-12 weeks.</p> <p>Neurophysiotherapists with experience in acute stroke and stroke rehabilitation N = 7</p> <p>Focus of care/therapy: Mixed (multidisciplinary team).</p>	delivery of physiotherapy in a stroke unit.	<p>unit in the United Kingdom.</p> <p>Funding: No funding was provided for this study.</p> <p>Risk of bias: Minor limitations.</p> <p>Applicability: UK based study so very applicable to NHS setting however, study not focused on intensity.</p>
Merlo 2013 ²⁴	Individual interviews and a focus group were conducted. Data analysis included an analytical thematic approach.	<p>Individuals with chronic stroke who had participated in an intensive intervention Mean age (SD): 62 (10.05) years N = 8</p> <p>Mean time since stroke (SD): 21 (8.8) months</p> <p>Family members who participated in the focus group only Age (range): 47-78 years N = 3</p>	The purpose of this study was to assess the feasibility of a novel, intensive, task-specific intervention from the patient's perspective.	<p>Setting: Stroke rehabilitation centre in the United States of America.</p> <p>Funding: Financial support for this study was provided by a grant from the American Heart Association (Scientist Development Grant, AHA Award #0835160N).</p> <p>Risk of bias: Moderate limitations (No information on whether the relationship between researcher and participants been adequately considered, limited applicability to this review).</p> <p>Applicability: Partially applicable. The study took place in the USA so findings are not directly applicable to a UK NHS setting.</p>
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.	<p>N = 14</p> <p>Time after stroke (range): Chronic (<1-17 years)</p> <p>Carers Age range: 40-85 years N = 11</p> <p>Healthcare professionals involved in providing stroke care. Including; Physiotherapists, OTs, Speech and language therapists, Clinicians, nurses and clinical psychologists N = 19</p> <p>Focus of care/therapy: Cognitive rehabilitation (multidisciplinary team).</p>	and preferences of stroke survivors, carers, and healthcare professionals to inform the design of a cognitive rehabilitation intervention.	<p>Funding: Funded by the Health Research Board of Ireland.</p> <p>Risk of bias: Minor limitations.</p> <p>Applicability: Directly applicable. Ireland based study. Only applicable to cognitive rehabilitation.</p>
Mohd Nordin 2014 ²⁶	Focus groups with a topic guide. A thematic analysis was employed.	<p>Stroke survivors Age range: 30-72 years N = 8</p> <p>Time after stroke: Not stated/unclear.</p> <p>Rehabilitation professionals Age range: 27-54 years N = 15</p> <p>Occupation: Rehabilitation physician= 3, Medical social officer= 2, Occupational therapist= 3,</p>	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.	<p>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.</p> <p>Funding: Not stated/unclear.</p> <p>Risk of bias: Moderate limitations (No information on whether the relationship between researcher and</p>

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

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.	<p>Stroke survivors N = 17</p> <p>Carers/family members Age range: 40-84 years N = 5</p> <p>Severity (NIHSS) range: 0-13</p> <p>Focus of care: Upper limb</p>	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.	<p>Setting: Interviews were conducted in stroke survivors' homes, at Glasgow Caledonian University and in hospital in the United Kingdom.</p> <p>Funding: Chartered Society of Physiotherapy Charitable Trust funded the EVERLAP study (grant number N/12/10).</p> <p>Risk of bias: Minor limitations.</p> <p>Applicability: Directly applicable. United Kingdom based study.</p>
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.	<p>Stroke survivors Median age (range): 71 (50-92) years N = 14</p> <p>Time after stroke median (range): 32 (5-132) months</p> <p>Severity: Not stated/unclear</p> <p>Focus of care: Mixed (physiotherapy).</p>	To explore the factors that influence the acceptability of, and engagement with, a high intensity group-based exercise programme for people with stroke.	<p>Setting: Stroke rehabilitation centre in New Zealand.</p> <p>Funding: Not stated/unclear.</p> <p>Risk of bias: Moderate limitations (No information on whether the relationship between researcher and participants been adequately considered).</p> <p>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 .</p>
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.	<p>Mean age (SD): 57.3 (9.0) years N = 13</p> <p>Mean time after Stroke (SD): 6.5 (5.3) years.</p> <p>Carers/family members Mean age (SD): 58.3 (9.0) years N = 9</p> <p>Focus of care/therapy: Upper limb (physiotherapy and self-management).</p>	chronic stroke patients and non-professional coaches with homeCIMT?	<p>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).</p> <p>Risk of bias: Minor limitations.</p> <p>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.</p>
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.	<p>Stroke survivors Mean age: Not stated/unclear N = 8</p> <p>Time after stroke: Subacute (7 days – 6 months). Severity: Not stated/unclear</p> <p>Focus of care: Upper limb (physiotherapy and occupational therapy).</p>	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?	<p>Setting: Three NHS acute stroke units in the United Kingdom.</p> <p>Funding: Not stated/unclear.</p> <p>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).</p> <p>Applicability: directly applicable as the study took place in the UK in an NHS setting.</p>

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'.	<p>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</p> <p>Focus of care/therapy: Mixed (multidisciplinary team).</p>	To investigate the delivery of therapy on stroke units in the policy context of the 45 minute guideline and auditing of therapy intensity.	<p>Setting: Three different stroke units in the United Kingdom.</p> <p>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</p> <p>Risk of bias: Minor limitations.</p> <p>Applicability: The study was conducted in an NHS setting and very applicable.</p>
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.	<p>Physiotherapists and managers from six different stroke rehabilitation centres N = 15</p> <p>Level of seniority: Managers of a physiotherapy departments = 2 Senior stroke rehabilitation physiotherapists = 6 Junior physiotherapists = 7</p>	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	<p>Setting: Six rehabilitation centres in Australia.</p> <p>Funding: This work was funded by the National Health and Research Council of Australia, grant number 631904.</p> <p>Risk of bias: Minor limitations.</p> <p>Applicability: Broadly applicable. Conducted in an Australian setting is somewhat applicable</p>

Study	Design	Population	Research aim	Comments
		<p>Average level of experience: 9.5 years.</p> <p>Focus of care/therapy: Mixed (physiotherapy).</p>		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.	<p>Stroke survivors who had just completed an Enriched experience task specific therapy program</p> <p>Mean age (SD): 61.0 (13.1) years N = 20</p> <p>Mean time after stroke (SD): 30.4 (34.1) months.</p> <p>Severity (mean Modified Rankin Scale) (SD): 3.4 (0.7)</p> <p>Focus of care/therapy: Mixed (multidisciplinary team).</p>	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.	<p>Setting: Two rehabilitation facilities in Spain.</p> <p>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.</p> <p>Risk of bias: Minor limitations.</p> <p>Applicability: Limited applicability. Study took place in Sweden but the intervention was privately funded and therefore not greatly applicable to an NHS setting.</p>
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		<p>Funding: Funding from National Health and Medical Research Council (Project Grant #401532).</p> <p>Risk of bias: Moderate limitations (Relationship between researcher and participant; study ethics was not considered).</p> <p>Applicability: Broadly applicable. Australian-based study that mentions that people wanted additional rehabilitation.</p>
Wray 2020 ⁴¹	In-depth, semi-structured interviews that were examined using thematic analysis	<p>Healthcare professionals (Speech and Language therapists)</p> <p>N = 18</p> <p>NHS Banding: 5-7/8. Median = 6.</p>	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.	<p>Setting: United Kingdom. Speech and Language Therapists from five NHS services.</p> <p>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).</p> <p>Risk of bias: Moderate limitations (Relationship between researcher and participant; study design not appropriate for study aim).</p> <p>Applicability: Broadly applicable. United Kingdom based setting.</p>
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
		<p>Median age (range) = 73 (53-98) years N = 22</p> <p>Communication difficulty: Dysarthria= 5 Aphasia= 12 Both Aphasia and Dysarthria = 5</p> <p>Time after stroke: Chronic (≥ 6 months)</p> <p>Severity: Not stated/unclear</p> <p>Focus of care: Communication (speech and language therapy).</p>	<p>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.</p> <p>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.</p>	<p>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.</p> <p>Risk of bias: Minor limitations.</p> <p>Applicability: Directly applicable. NHS setting in the United Kingdom.</p>

1

2 See [Appendix E](#) for full evidence tables.

3 3.1.3 Summary of the qualitative evidence

4 Table 2: Qualitative review findings

Main findings [population]	Statement of finding
Key principles	
<p><u>More therapy is better</u>^{1, 2, 7-9, 14, 19, 21, 27-29, 35, 36, 40, 42} [stroke survivors, family members/carers, healthcare professionals]</p>	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.
<p><u>Person centred care: Intensity tailored to the individual</u>^{1, 2, 7, 10, 20, 21, 23-25, 27, 28, 31, 32, 36-38, 42} [stroke survivors, family members/carers, healthcare professionals]</p>	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
<p><u>Duration of therapy</u>^{24-26, 31, 33} [stroke survivors, family members/carers, healthcare professionals]</p>	<p>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.</p>
Person factors	
<p><u>Medical status</u>^{7, 9, 12, 14, 17, 25, 29, 32} [stroke survivors, family members/carers, healthcare professionals]</p>	<p>Medical status or comorbidities may be a barrier to engaging in rehabilitation. Interventions may need to be adapted for co-morbidities.</p>
<p><u>Fatigue</u>^{1, 7, 15, 21, 23-25, 29, 31, 36, 39} [stroke survivors, family members/carers, healthcare professionals]</p>	<p>Fatigue is a barrier for delivering more intense rehabilitation.</p>
<p><u>Physical factors</u>^{19, 29, 32, 33, 36} [stroke survivors, healthcare professionals]</p>	<p>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.</p>
<p><u>Psychological factors</u>^{1, 8, 19-21, 25, 28, 30, 32, 34, 39} [stroke survivors, family members/carers, healthcare professionals]</p>	<p>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.</p>
<p><u>Motivation</u>^{5, 20, 21, 24, 26, 31-34, 38, 40} [stroke survivors]</p>	<p>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.</p>
<p><u>Social factors</u>^{1, 2, 12, 19-22, 25, 30, 32, 33, 37, 39, 42} [stroke survivors, family members/carers, healthcare professionals]</p>	<p>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.</p>
<p><u>Education</u>^{13, 20, 21, 25, 26, 37} [stroke survivors, healthcare professionals]</p>	<p>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.</p> <p>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.</p>
People requiring specific consideration	
<p><u>People with communication difficulties</u>¹² [stroke survivors, healthcare professionals]</p>	<p>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.</p>
<p><u>People with cognitive difficulties</u>^{15, 25, 27} [stroke survivors, family members/carers, healthcare professionals]</p>	<p>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.</p>
Carer/family member factors	

Main findings [population]	Statement of finding
<p><u>Support of family and friends</u>^{5, 10, 12, 15, 19, 21, 28, 31-33, 36, 37, 41}</p> <p>[stroke survivors, healthcare professionals]</p>	<p>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.</p>
<p><u>Continuity of care</u>^{25, 26, 31}</p> <p>[stroke survivors, family members/carers, healthcare professionals]</p>	<p>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.</p>
Healthcare professional factors	
<p><u>Beliefs about intensity of rehabilitation</u>^{7, 10, 17, 35, 36}</p> <p>[stroke survivors, family members/carers, healthcare professionals]</p>	<p>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.</p>
<p><u>Communication</u>^{2, 14, 28, 30, 32, 42}</p> <p>[stroke survivors]</p>	<p>People after stroke benefited from encouragement, motivation and honesty. They wanted therapists to discourage overoptimistic expectations.</p>
<p><u>Feedback</u>^{1-3, 5, 13, 19, 21, 22, 30, 34, 42}</p> <p>[stroke survivors, healthcare professionals]</p>	<p>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).</p>
<p><u>Confidence</u>^{9, 20, 37}</p> <p>[stroke survivors, healthcare professionals]</p>	<p>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.</p>
<p><u>Safety</u>^{10, 36}</p> <p>[healthcare professionals]</p>	<p>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.</p>
<p>Prioritisation²³</p> <p>[stroke survivors, healthcare professionals]</p>	<p>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.</p>
<p>Consistency in care²⁵</p> <p>[family members/carers]</p>	<p>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 condition²⁵</p>
Intervention factors	
<u>Methods of achieving more intense rehabilitation</u>	
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]	<p>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.</p> <p>Some computer based therapies may be adapted to the needs of the individual.</p>
Provision of feedback ^{3-5, 30, 34, 39} [stroke survivors, healthcare professionals]	<p>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.</p> <p>Feedback from the trainer was seen as important for group based therapies, and depended on the personality of the trainer.</p>
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

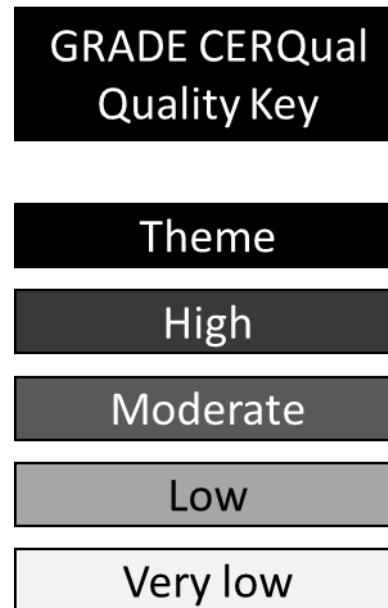
Main findings [population]	Statement of finding
	adapted to the needs of the person were seen as facilitators for rehabilitation.
Goal setting ^{20-22, 28} [stroke survivors, family members/carers, healthcare professionals]	Setting personalised and functional goals assisted with engagement in rehabilitation 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 .

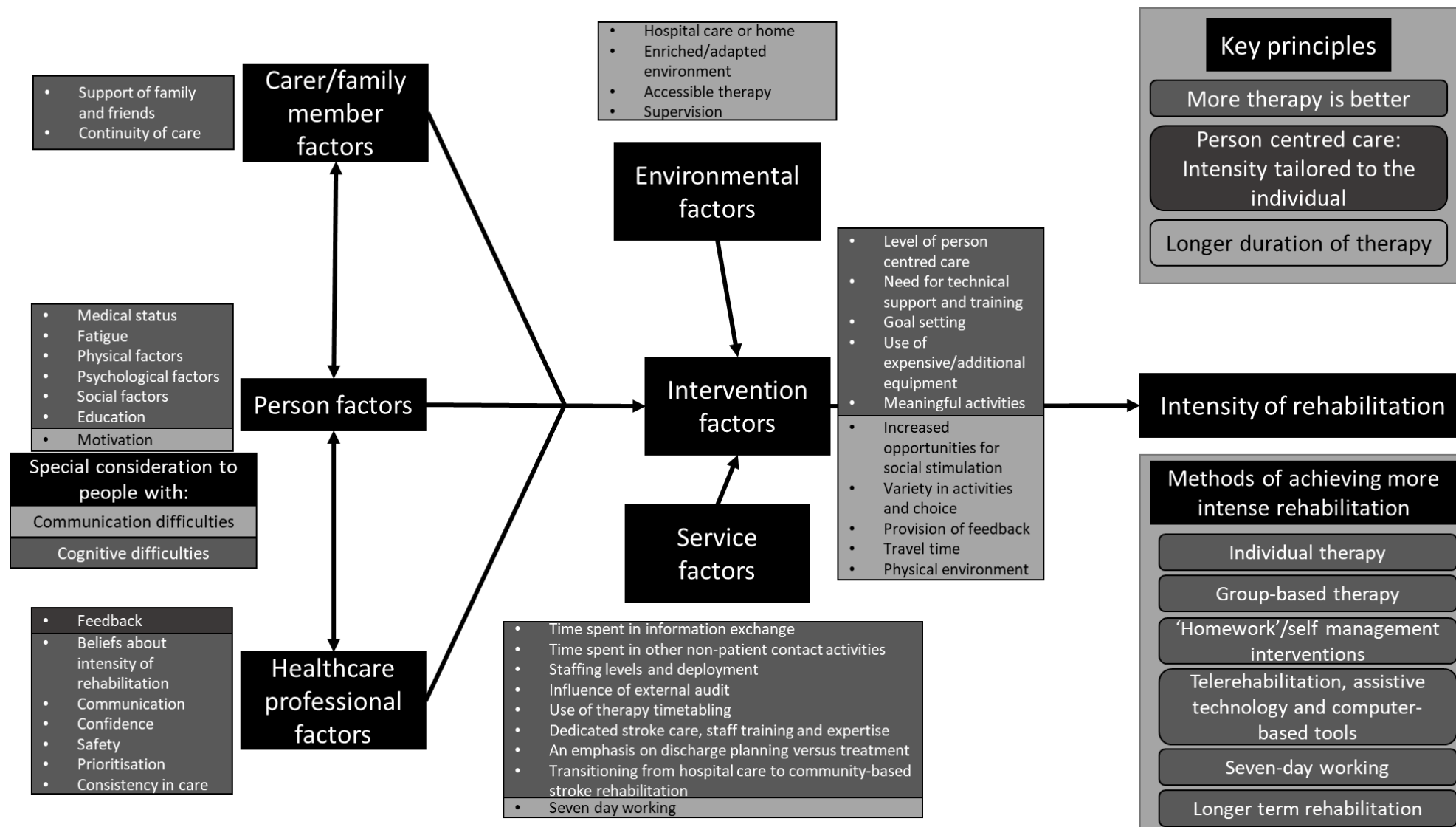
1 See [Appendix J](#) for full GRADE-CERQual tables.

1 **3.1.3.1 Diagrammatic summary of key findings**

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



3



1 **3.1.3.2 Narrative summary of review findings**

2 **3.1.3.1.1 Key principles**

3 **Review finding 1: Key principles: More therapy is better**

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

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

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

27 **Review finding 2: Key principles: Person centred care: Intensity tailored to the** 28 **individual**

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

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

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

1 **Review finding 3: Key principles: Duration of therapy**

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

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

20 **3.1.3.1.2 Person factors**

21 **Review finding 4: Person factors: Medical status**

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

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

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

41 **Review finding 5: Person factors: Fatigue**

42 Fatigue was often cited as a barrier for delivering more intense rehabilitation by both stroke
43 survivors and health care professionals hence this was a factor that needed to be considered
44 in the implementation of any rehabilitation programme (“If we feel patients can do more then
45 we’ll try and push them, if we feel a patient is too fatigued, then we like to end on a good note
46 because that’s the carry over they’re going to get. So, we’re restricted by patients’ fatigue
47 rather than NICE guidelines or staffing levels. (Physiotherapist, Unit 2)⁷). Stroke survivors
48 may experience their concentration diminishing and so be unable to engage in more intense
49 therapy. One therapist felt that their ability to implement seven-day therapy was limited by

1 fatigue (“The patients that are less motivated, more frail and have more significant deficits. .
2 .came to me exhausted on a Monday, or I came to see them on the weekend and “I just can’t
3 do it”. They found that it was too much for them. (Participant 14)³⁶).

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

9 **Review finding 6: Person factors: Physical factors**

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

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

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

27 **Review finding 7: Person factors: Psychological factors**

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

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

40 People with difficulties concentrating and with mood and behaviour challenges may have
41 difficulties participating in therapy (“There was always something going on that would take
42 your attention and it breaks your concentration; with the group... they would distract your
43 attention...” (Participant 10, 77 y, male, 7D).¹). On the other hand, linking the therapy to a
44 sense of personal achievement can be motivating for engaging with further therapy. This
45 could include using the feeling to compete against previous achievements, which was noted
46 to contribute to adherence and acceptability of an intervention (“they started timing them
47 (activities) to show you the difference in time from when you start to when you finish... to see
48 before and after was just amazing to be honest. It was like day and night” “It was just a
49 confidence booster to see you were getting quicker” Participant 9³⁴). Participating in the
50 therapy may provide a sense of purpose in providing an activity to fill time with or to get them

1 out of the house while in recovery. Setting and moving towards targets despite setbacks was
2 key to adjustment and maintaining a positive outlook for some participants.

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

8 **Review finding 8: Person factors: Motivation**

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

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

16 Participants referred to sources of motivation including self-motivation, motivation from family
17 and therapists, having an altruistic view towards research and other members of the group
18 that encouraged and helped them sustain their engagement. Stroke survivors may also be
19 motivated by the use of novel techniques, such as robot assisted therapy ("It was different
20 from what your normal occupational therapy was and, because of that I think it was probably
21 a bit more enjoyable" Participant 1³⁴). Otherwise, some stroke survivors who have had
22 severe strokes claimed that their motivation level declined as the stroke became chronic
23 hence were not motivated to continue practicing the previously learnt exercises at home
24 ("Initially, I was motivated. After several months, I don't feel that excited anymore." (S8)²⁶).

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

32 **Review finding 9: Person factors: Social factors**

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

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

46 Explanation of quality assessment: no or very minor concerns about methodological
47 limitations; no or very minor concerns about coherence; minor concerns about relevance as
48 some studies were conducted in a healthcare setting outside of the United Kingdom; minor
49 concerns about adequacy (due to a limited number of studies reporting each subtheme

1 included in the theme). There was a judgement of moderate confidence in this finding
2 regarding relevance and adequacy limitations.

3 **Review finding 10: Person factors: Education**

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

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

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

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

45 **3.1.3.1.3 People requiring specific consideration**

46 **Review finding 11: People requiring specific consideration: People with** 47 **communication difficulties**

48 People with communication difficulties may require additional opportunities for improving
49 communication outside of formal rehabilitation sessions. However, while in hospital, the
50 nature of interactions are driven towards patient’s care, restricting opportunities for

1 communication beyond this context. Resources to aid communication with people with
2 aphasia may not be used (including volunteer services to promote communication
3 opportunities). Some staff perceived communication as a task separate from the
4 responsibility of their role, therefore limiting communication opportunities (“They (speech
5 pathologists) do their bit and we do ours... we don’t have time to practice speech with them
6 because we really do have to get all of our jobs filled in the time and it’s specifically rostered
7 for us to do our work, not to help with someone else’s. (Rehabilitation nurse (RehabN)1)”¹²).
8 They may also have a lack of skills in communicating to people with communication
9 difficulties leading to avoidance of or unsuccessful interactions.

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

17 **Review finding 12: People requiring specific consideration: People with cognitive** 18 **difficulties**

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

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

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

34 **3.1.3.1.4 Carer/family member factors**

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

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

47 Explanation of quality assessment: no or very minor concerns about methodological
48 limitations; no or very minor concerns about coherence (while the two statements shows that
49 family member involvement can be a facilitator or barrier, it was decided that this was the

1 nature of the moderate and so was not an inherent sign of a lack of coherence, just a
2 different perspective of the theme); minor concerns about relevance as some studies were
3 conducted in a healthcare setting outside of the United Kingdom; minor concerns about
4 adequacy (due to a limited number of studies reporting the subtheme). There was a
5 judgement of moderate confidence in this finding regarding relevance and adequacy
6 limitations.

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

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

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

23 **3.1.3.1.5 Healthcare professional factors**

24 **Review finding 15: Healthcare professional factors: Beliefs about intensity of** 25 **rehabilitation**

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

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

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

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

7 **Review finding 16: Healthcare professional factors: Communication**

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

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

27 **Review finding 17: Healthcare professional factors: Feedback**

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

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

38 **Review finding 18: Healthcare professional factors: Confidence**

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

48 Explanation of quality assessment: no or very minor concerns about methodological
49 limitations; no or very minor concerns about coherence; minor concerns about relevance as
50 some studies were conducted in a healthcare setting outside of the United Kingdom; minor

1 concerns about adequacy (due to a limited number of studies reporting the subtheme). There
2 was a judgement of moderate confidence in this finding regarding adequacy limitations.

3 Review finding 19: Healthcare professional factors: Safety

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

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

17 Review finding 20: Healthcare professional factors: Prioritisation

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

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

30 Review finding 21: Healthcare professional factors: Consistency in care

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

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

41 3.1.3.1.6 Intervention factors

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

44 A range of different methods for providing more intense rehabilitation was discussed in the
45 studies. These included individual therapy (2 studies), group-based therapy (6 studies),
46 ‘homework’/self management interventions (4 studies), telerehabilitation, assistive

1 technology and computer-based tools (7 studies), seven-day working (1 study) and longer
2 term rehabilitation (1 study).

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

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

12 Group-based therapies:

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

19 Computer-based therapies:

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

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

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

29 Computer-based therapies:

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

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

41 Group-based therapies:

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

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

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

10 Group-based therapies:

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

21 Computer-based therapies:

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

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

34 **Review finding 26: Intervention factors: Provision of feedback**

35 Computer-based therapies:

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

43 Group-based therapies:

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

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

8 **Review finding 27: Intervention factors: Travel time**

9 Home-based:

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

17 Non-home based:

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

21 Computer-based therapies:

22 Barriers to computer-based therapies that could not be moved out of the hospital included
23 transportation and financial difficulties for outpatients needing to commute to the hospital.
24 Otherwise, the use of ICT could enhance communication and allow healthcare professionals
25 to follow up the progress of rehabilitation from a distance, for example, through
26 videoconferencing. These solutions could save time and money through less travel, both for
27 professionals and for patients (“Very often they (the patients) might just have one question.
28 Then they waste perhaps one or one and a half hours just getting here and then going back
29 ... It feels like it would be easier if we could communicate in some other way!”⁶).

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

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

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

43 Using computers requires technical skills and technical support, availability of devices that
44 can use any relevant software and acquisition and funding of software. This can be facilitated
45 through tailoring the approach to the individual, training, developing a shared understanding
46 with IT departments, exploring funding and loaning models that work for the local context
47 (including charity funding) (“To try to find a way that makes it work ... being able to continue

1 using your mobile phone, computer and tablet and anything you could have used before you
2 became ill.”¹⁶).

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

10 **Review finding 29: Intervention factors: Physical environment**

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

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

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

31 **Review finding 30: Intervention factors: Goal setting**

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

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

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

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

47 However, a lack of funding for specialist equipment was often cited as a barrier for intensive
48 rehabilitation (“Personally, myself as a manager, I think it’s [computer software] costly, as an

1 investment, in the licenses, for a small department like us”³). The cost of software licenses,
2 assistive technologies and the need for a graded exercise test, and ideally equipment (heart
3 rate monitors, step counters, treadmills, harnesses) make the intensive intervention more
4 difficult to implement.

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

11 **Review finding 32: Intervention factors: Meaningful activities**

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

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

26 **3.1.3.1.7 Environmental factors**

27 **Review finding 33: Environmental factors: Hospital care**

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

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

44 **Review finding 34: Environmental factors: Home**

45 Rehabilitation in the home environment was seen to be more cost-effective and less
46 demanding. Furthermore, the home environment was perceived to be more focused toward
47 rehabilitation outcomes and stroke survivors spoke positively about their experience of
48 having someone visit them in their home (“if you’ve got any questions ... you could ask them,
49 whereas when you’re in a hospital, I feel that I can’t take up the people’s time because they

1 haven't really got time"⁸). However, the lack of supervision during a home-based programme
2 was highlighted as a barrier to engagement by one stroke survivor completing constraint
3 induced movement therapy. Conversely limited space at home made it difficult for people to
4 participate in exercises.

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

13 **Review finding 35: Environmental factors: Enriched/adapted environment**

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

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

26 **Review finding 36: Environmental factors: Accessible therapy**

27 In person:

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

31 Remotely:

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

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

47 **Review finding 37: Environmental factors: Supervision**

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

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

18 **3.1.3.1.8 Service factors**

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

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

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

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

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

48 Explanation of quality assessment: no or very minor concerns about methodological
49 limitations; no or very minor concerns about coherence; no or very minor concerns about
50 relevance; minor concerns about adequacy (due to a limited number of studies reporting the

1 subtheme). There was a judgement of moderate confidence in this finding regarding
2 adequacy limitations.

3 **Review finding 40: Service factors: Staffing level and deployment**

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

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

22 **Review finding 41: Service factors: Seven day working**

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

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

40 **Review finding 42: Service factors: Influence of external audit**

41 Auditing can make it more likely for targets to be met. The SSNAP audit helps to improve
42 stroke services, providing evidence to support additional staffing requirements (“It’s better to
43 have some standard about the amount of therapy that patients should be receiving, because
44 that gives a target to work towards and you’re more likely to give patients adequate therapy
45 [...]. That is measured and known throughout your region and to the public, and the Trust is
46 going to be judged upon it. (Stroke co-ordinator, Unit 6)”⁷). However, this can shape
47 therapists’ behaviour; making their focus on increasing recording therapy minutes rather than
48 providing more patients with more therapy more frequently. For therapists in all stroke units,
49 there was ambiguity about what counted as auditable therapy (“We count [group activity] as
50 contact time, sometimes it feels like a bit of a cheat because I know it’s not therapy, we’re

1 just seeing the patients, making sure they're okay and seeing them from a mental point of
2 view, trying to perk their moods up. (Physiotherapist, Unit 6)⁷). Therapists questioned the
3 quality of the national audit data for therapy, and they used language such as 'bending the
4 rules', 'playing the numbers game' or 'lying' when discussing the practices of other teams.

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

10 **Review finding 43: Service factors: Use of therapy timetabling**

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

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

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

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

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

37 **Review finding 45: Service factors: An emphasis on discharge planning versus** 38 **treatment**

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

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

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

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

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

1 **4 Moderators of intense rehabilitation** 2 **(mixed methods synthesis)**

3 Review questions:

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

6 This question includes two subquestions:

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

11 **4.1.1 Summary of mixed methods synthesis**

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

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

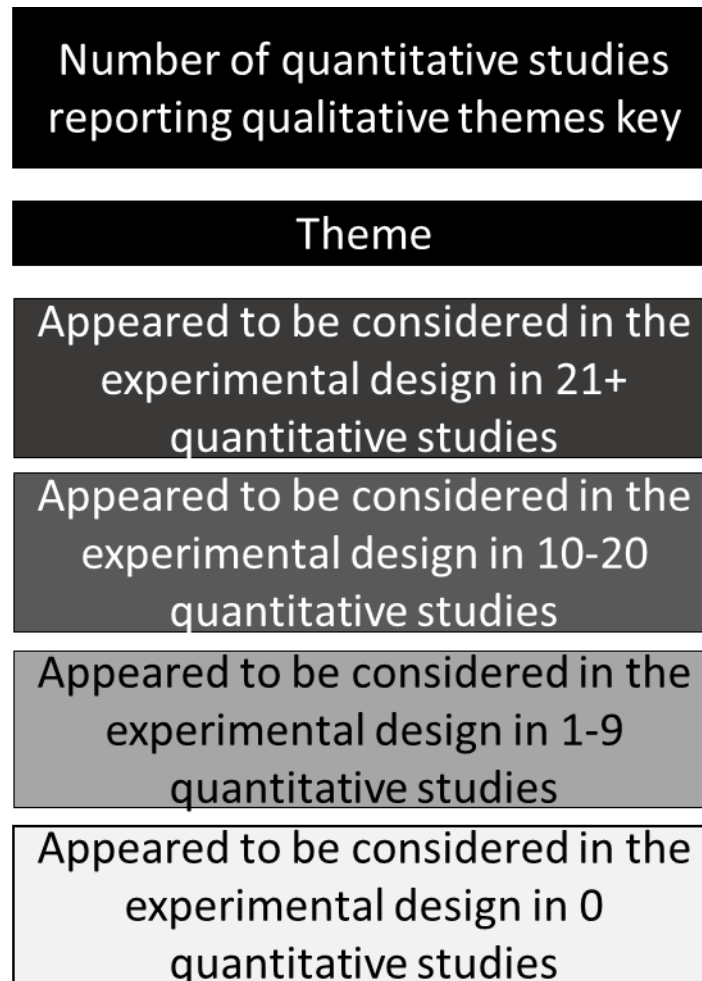
20 The matrices comparing the quantitative and qualitative evidence can be found in [Appendix](#)
21 [P](#). The results of the sensitivity analyses can be found in section 4.1.3. An exploration of the
22 results of the mixed methods synthesis can be found in section 4.1.4 Mixed methods
23 synthesis conclusion. Also see forest plots in [Appendix H](#).

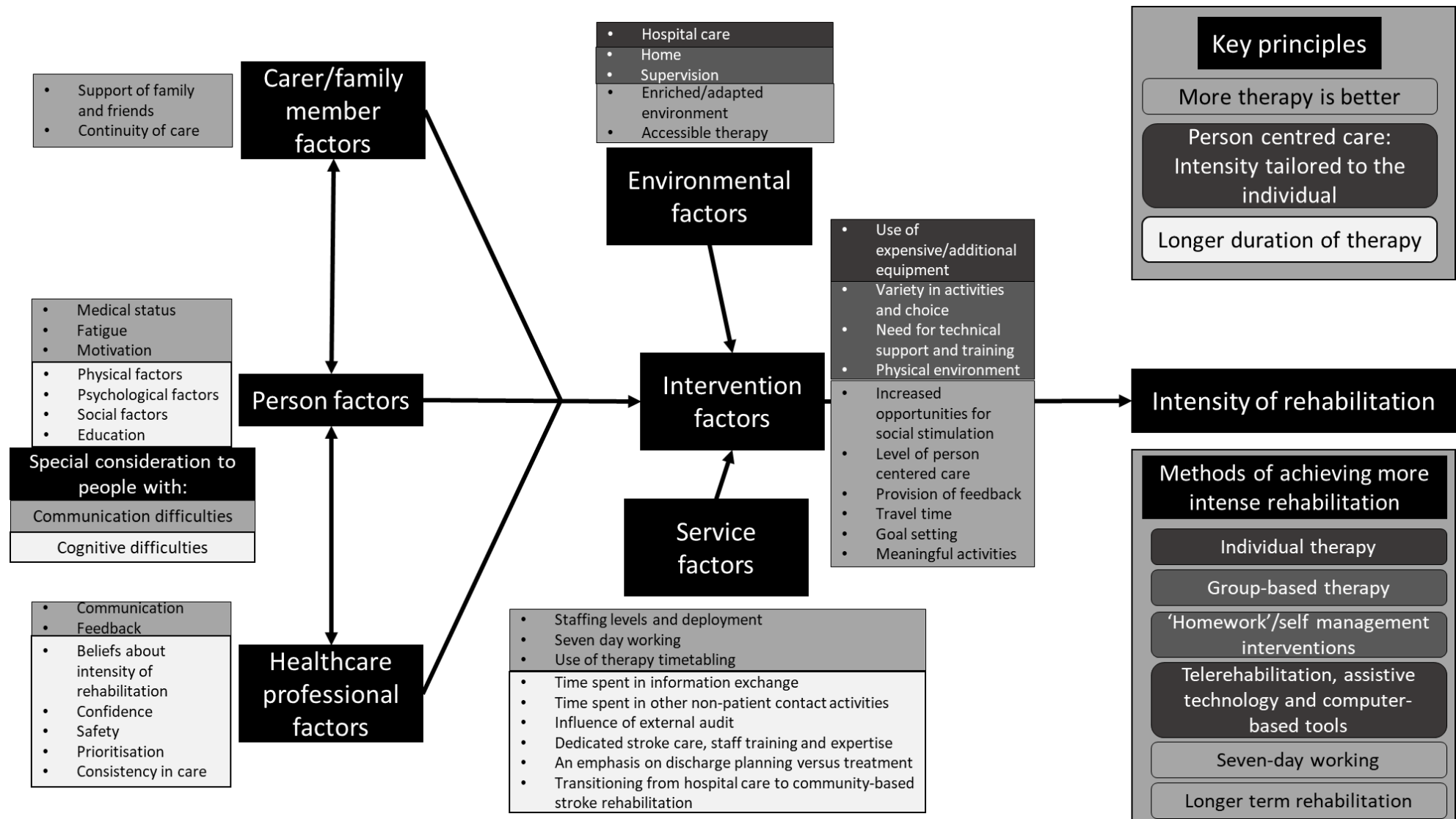
24

25

1 **4.1.2 Diagrammatic summary of mixed methods synthesis**

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





1

1 4.1.3 Sensitivity analysis comparing the quantitative and qualitative evidence

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

8 **Table 3: Summary of the findings from the sensitivity analysis comparing the**
 9 **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	<p>Most outcomes included only one study. Of the outcomes where more than one study was included:</p> <p>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</p> <p>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).</p> <p>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</p> <p>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</p> <p>More evidence is required to make a conclusion.</p>
Person centred care: Intensity tailored to the individual (splitting therapy time during the day)	9	<p>Most outcomes included only one study. Of the outcomes where more than one study was included:</p> <p>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).</p> <p>Physiotherapy - >1 hour-2 hours 5d/wk compared to >45 min-1 hour 5d/wk – Discontinuation at <6 months – No</p>

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	<p>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:</p> <p>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</p> <p>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</p> <p>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).</p> <p>Physiotherapy - >1 hour-2 hours 5d/wk compared to >45 min-1 hour 5d/wk – Physical function lower limb at <6</p>

Theme/subtheme name	Number of studies included in the analysis	Summary of findings
		<p>months – No clinically important difference compared to the original outcome</p> <p>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.</p> <p>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</p> <p>More evidence is required to make a conclusion.</p>
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.

1 **4.1.4 Mixed methods synthesis conclusion**

2 **4.1.4.1 Are the results/findings from individual synthesis supportive or contradictory?**

3 With the limited available information provided, it is difficult to say if the quantitative and
4 qualitative evidence is supportive or contradictory. In general, the quantitative evidence
5 suggested a benefit from providing more intense physiotherapy to people after stroke, which
6 was supported by the qualitative evidence. However, the quantitative evidence was less
7 clear for other types of therapy, such as speech and language therapy. In the majority of
8 studies, information about qualitative themes that would impact the delivery of more intense
9 rehabilitation was not provided and so it is difficult to conclude as to whether there is
10 agreement between the two types of evidence. When evidence was available and sensitivity
11 analyses were conducted, no consistent change in the effectiveness of the quantitative data
12 was noted. However, this may be better explained by the limited amount of evidence
13 available for each comparison, and if more evidence was available that reported more
14 information about the qualitative themes this may provide a clearer perspective.
15

16 **4.1.4.2 Does the qualitative evidence explain why the intervention is or is not
17 effective?**

18 The qualitative evidence provides explanations as to how the intervention could be utilised to
19 be effective and about the contexts where it is most effective. However, these factors were
20 not clearly reported in the quantitative evidence and so it is difficult to conclude whether the
21 explanations influence the quantitative results of treatment.
22

23 **4.1.4.3 Does the qualitative evidence help explain differences in the direction and size
24 of effect across the included quantitative studies?**

25 The qualitative evidence did not appear to explain difference in the direction and size of
26 effect across the included quantitative studies identified in this review. However, due to the
27 sparsity of data across the different comparisons, it is difficult to conclude as to whether the
28 qualitative evidence can explain the differences. Further quantitative research that reports
29 information regarding the qualitative themes would help to provide more certainty in this
30 result.
31

32 **4.1.4.4 Which aspects of the quantitative evidence are/are not explored in the
33 qualitative studies?**

34 The qualitative studies explored a wide perspective of the quantitative evidence and
35 appeared to encapsulate all types of rehabilitation. There was limited evidence available
36 discussing types of rehabilitation other than physiotherapy (such as speech and language
37 therapy and psychology/neuropsychology). However, quantitative evidence was also limited
38 in these areas.
39

40 **4.1.4.5 Which aspects of the qualitative evidence are/are not tested in the quantitative
41 evidence?**

42 There was limited reporting of the qualitative themes in the quantitative evidence, which
43 made it difficult to draw conclusions in this synthesis. Quantitative evidence generally
44 reported information about the key principles, person factors and intervention factors themes

1 and was less likely to report information about the carer/family member factors, healthcare
2 professional factors, environmental factors and service factor themes. People who were
3 identified as requiring specific consideration (people with communication and cognitive
4 difficulties) were often excluded from quantitative studies and so highlighted the importance
5 of considering these people in research in the future.

1 **5 The committee's discussion and** 2 **interpretation of the evidence**

3 **5.1.15.1 The outcomes that matter most**

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

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

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

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

33 **5.1.15.2 The quality of the evidence**

34 ***Quantitative evidence***

35 1 individual patient data network meta-analysis and 106 randomised controlled trial studies
36 were included in the review. The evidence varied from moderate to very low quality, with the
37 majority being low quality. Outcomes were commonly downgraded for risk of bias and
38 imprecision. In a few cases where inconsistency was present, this was not explained by
39 subgroup analysis or resolved by sensitivity analyses (see section 5.1.1.5 for more
40 information about the mixed methods analysis). The number of participants varied between
41 comparisons, but the majority included small sample sizes (N=50).

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

1 **5.1.15.2.1 People without communication difficulties**

2 **5.1.15.2.1.1 Physiotherapy**

3 **Less than and equal to 45 minutes**

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

- 10 • When less than and equal to 45 minutes for less than 5 days a week was compared to
11 usual care the evidence was generally of very low quality. Where downgrading occurred,
12 this was often for risk of bias (due to missing outcome data) and imprecision. One
13 outcome was downgraded for heterogeneity due to conflicting number of events in
14 different studies.
- 15 • When less than and equal to 45 minutes for 5 days a week was compared to usual care,
16 evidence was generally of very low quality, but ranged from moderate to very low. Where
17 downgrading occurred, this was often for risk of bias (due to deviations from the intended
18 interventions and bias due to missing outcome data) and imprecision. Two outcomes were
19 downgraded for heterogeneity unexplained by subgroup analyses. For the comparison
20 less than 45 minutes for 5 days a week compared to less than and equal to 45 minutes,
21 less than 5 days, only 1 outcome was reported. This was of very low quality and
22 downgraded for risk of bias (bias arising from the randomisation process) and imprecision
23 due to zero events and small sample size.
- 24 • When less than and equal to 45 minutes for 6 days a week was compared to usual care,
25 the evidence consisted of 1 outcome which was of low quality and downgraded due to risk
26 of bias (arising from the randomisation process and bias due to missing outcome data).
27 When compared to 45 minutes to 1 hour, less than 5 days a week, evidence was
28 generally of very low quality, but ranged from low to very low quality. When downgrading
29 occurred, this was often for risk of bias (due to bias arising from the randomisation
30 process and bias in both measurement of the outcome and selection of the reported
31 result) and imprecision.
- 32 • For less than and equal to 45 minutes, 7 days a week compared to less than and equal to
33 45 minutes, 5 days a week, only 1 outcome was reported. This was of low quality due to
34 imprecision.

35 **More than 45 minutes to 1 hour**

36 Evidence was available comparing physiotherapy (in people without communication
37 difficulties) for more than 45 minutes to 1 hour for the following comparisons: less than 5
38 days a week compared to less than and equal to 45 minutes for less than 5 days a week; 5
39 days per week compared to less than and equal to 45 minutes, less than 5 days a week, less
40 than and equal to 45 minutes for 5 days a week and more than 45 minutes to 1 hour for less
41 than 5 days a week; 7 days a week compared to less than and equal to 45 minutes, less than
42 5 days a week.

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

- 1 quality. Downgrading was due to risk of bias (arising from the randomisation process,
2 measurement in the outcome or selection of the reported result) and imprecision.
- 3 • When more than 45 minutes to 1 hour for 5 days a week was compared to less than and
4 equal to 45 minutes, 5 days a week, the evidence was generally of low quality but this
5 ranged from moderate to very low. Where downgrading occurred, this was most often for
6 risk of bias (arising from the randomisation process) and imprecision. One outcome was
7 downgraded for heterogeneity due to conflicting number of events in different studies.
 - 8 • When more than 45 minutes to 1 hour for 5 days a week was compared to more than 45
9 minutes to 1 hour, less than 5 days a week, evidence was generally of low quality but
10 ranged from moderate to very low. This was due to risk of bias (arising from the
11 randomisation process) and imprecision.
 - 12 • When more than 45 minutes to 1 hour 7 days a week was compared to less than and
13 equal to 45 minutes, less than 5 days a week, evidence was all of moderate quality. The
14 evidence was downgraded by 1 increment due to risk of bias (arising from the
15 randomisation process).

16 ***More than 1 hour to 2 hours***

- 17 Evidence was available comparing physiotherapy (in people without communication
18 difficulties) for more than 1 to 2 hours for the following comparisons: less than 5 days a week
19 compared to less than and equal to 45 minutes less than 5 days a week and more than 45
20 minutes to 1 hour less than 5 days a week; 5 days a week compared to usual care, less than
21 and equal to 45 minutes less than 5 days a week, less than and equal to 45 minutes 5 days a
22 week, less than and equal to 45 minutes, 7 days a week and more than 45 minutes to 1 hour
23 5 days a week; 6 days a week compared to more than 45 minutes to 1 hour, 5 days a week
24 and more than 45 minutes to 1 hour, 6 days a week.
- 25 • When more than 1 hour to 2 hours for less than 5 days a week was compared to less than
26 and equal to 45 minutes less than 5 days a week, the evidence was all graded very low
27 quality. Where downgrading occurred, this was most often for risk of bias (arising from the
28 randomisation process and bias due to missing outcome data) and imprecision. One study
29 was downgraded for heterogeneity due to conflicting number of events in different studies.
 - 30 • When more than 1 hour to 2 hours for less than 5 days a week was compared to more
31 than 45 minutes to 1 hour, less than 5 days a week, the majority of evidence was of low to
32 very low quality with 1 outcome of moderate quality. Downgrading was due to risk of bias
33 (arising from the randomisation process, missing outcome data and bias in measurement
34 of the outcome) along with imprecision.
 - 35 • When more than 1 hour to 2 hours for 5 days a week was compared to usual care, the
36 majority of the evidence was of very low quality but ranged from moderate to low quality.
37 Downgrading occurred due to risk of bias (for missing outcome data) and imprecision.
 - 38 • For the comparison of more than 1 hour to 2 hours for 5 days a week to less than and
39 equal to 45 minutes, less than 5 days a week, 2 outcomes were of low quality and 1 of
40 very low quality. Outcomes were downgraded for risk of bias (due to bias arising from the
41 randomisation process) and imprecision. When compared to less than and equal to 45
42 minutes, 5 days a week, the majority of outcomes were of low quality but ranged from
43 moderate to very low quality. Where downgrading occurred, this was most often for risk of
44 bias (due to missing outcome data), imprecision and heterogeneity unexplained by
45 subgroup analysis.
 - 46 • For the comparison more than 1 hour to 2 hours, 5 days a week, compared to less than
47 and equal to 45 minutes, 7 days a week, only 1 outcome was reported and this was of low
48 quality and downgraded for imprecision.
 - 49 • Where more than 1 hour to 2 hours 5 days a week was compared more than 45 minutes
50 to 1 hour, 5 days a week, the majority of outcomes were of low and very low quality with 3

- 1 outcomes graded moderate quality. Where downgrading occurred, this was most often
2 due to risk of bias (in particular, a mixture of bias arising from the randomisation process,
3 bias due to missing outcome data and bias in measurement of outcome), imprecision and
4 heterogeneity unexplained by subgroup analysis.
- 5 • When more than 1 hour to 2 hours for 6 days a week was compared to more than 45
6 minutes to 1 hour, 5 days a week, the majority of evidence was rated low quality with 1
7 outcome rated moderate quality. Downgrading occurred due to risk of bias (in selection of
8 the reported result) and imprecision.
- 9 • When more than 1 hour to 2 hours for 6 days a week was compared to more than 45
10 minutes to 1 hour, 6 days a week, all outcomes were rated very low quality. Evidence was
11 downgraded due to risk of bias (specifically missing outcome data and bias in
12 measurement of the outcome) and imprecision.

13 ***More than 2 to 4 hours***

- 14 Evidence was available comparing physiotherapy (in people without communication
15 difficulties) for more than 2 to 4 hours, 5 days a week to less than and equal to 45 minutes, 5
16 days a week; more than 45 minutes to 1 hour, 5 days a week and more than 1 hour to 2
17 hours, 5 days a week. Evidence was also available for more than 2 to 4 hours, 6 days a
18 week compared to more than 1 hour to 2 hours, 5 days a week.
- 19 • When more than 2 to 4 hours for 5 days a week was compared to less than and equal to
20 45 minutes, 5 days a week, the evidence was rated moderate or very low quality for the 2
21 reported outcomes. These were downgraded due to risk of bias (missing outcome data)
22 and imprecision due to zero events and a small sample size.
- 23 • When compared to more than 45 minutes to 1 hour, 5 days a week, all evidence was
24 rated very low quality. Evidence was generally downgraded due to risk of bias and
25 imprecision. One outcome was downgraded for heterogeneity unexplained by subgroup
26 analysis.
- 27 • When more than 2 to 4 hours, 5 days were compared to more than 1 hour to 2 hours, 5
28 days a week, evidence was rated low or very low quality. The majority of the evidence
29 was downgraded due to risk of bias (due to a mixture of bias arising from the
30 randomisation process, bias due to missing outcome data and bias in measurement of the
31 outcome) and imprecision. One outcome was downgraded for heterogeneity, unexplained
32 by subgroup analysis.
- 33 • When more than 2 to 4 hours for 6 days a week was compared to more than 1 hour to 2
34 hours, 5 days a week, evidence was available from 2 outcomes, 1 of high quality and the
35 other of low quality. Both were downgraded due to imprecision.

36 ***More than 4 hours***

- 37 Evidence was available comparing physiotherapy to usual care (in people without
38 communication difficulties) for more than 4 hours, 5 days a week and more than 2 hours to 4
39 hours, 5 days a week.
- 40 • When more than 4 hours of physiotherapy for 5 days a week was compared to usual care,
41 the majority of evidence was rated very low quality with 2 outcomes rated low quality.
42 Where downgrading occurred, this was most often for risk of bias (due to missing outcome
43 data and bias in selection of the reported result) and imprecision.
- 44 • When compared to more than 2 to 4 hours, 5 days a week, both reported outcomes were
45 rated very low quality. These were downgraded due to risk of bias (a mixture of bias
46 arising from the randomisation process, deviations from the intended interventions and in
47 the measurement of the outcome) and imprecision. One outcome was also downgraded
48 for heterogeneity due to a conflicting number of events in different studies.

1 5.1.15.2.1.2 Occupational therapy**2 Less than and equal to 45 minutes**

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

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

13 More than 45 minutes to 1 hour

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

- 19 • When more than 45 minutes to 1 hour for less than 5 days a week was compared to less
20 than and equal to 45 minutes, less than 5 days a week, evidence consisted of only 1
21 outcome rated very low quality. This was downgraded due to risk of bias (arising from the
22 randomisation process, missing outcome data and bias in measurement of the outcome)
23 and imprecision.
- 24 • When more than 45 minutes to 1 hour for 5 days a week was compared to less than and
25 equal to 45 minutes, less than 5 days a week, the majority of the evidence was of very low
26 quality but ranged from low to very low. Where downgrading occurred, this was due to risk
27 of bias (arising from the randomisation process and missing outcome data) and
28 imprecision.
- 29 • When more than 45 minutes to 1 hour for 5 days a week was compared to less than and
30 equal to 45 minutes, 5 days a week, 2 outcomes were of very low quality and one
31 outcome of low quality. Evidence was downgraded for risk of bias (due to a mix of bias
32 arising from the randomisation process, missing outcome data and bias in measurement
33 of the outcome) and imprecision.

34 More than 1 hour to 2 hours

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

- 38 • When more than 1 to 2 hours for 5 days a week was compared to less than and equal to
39 45 minutes, less than 5 days a week, evidence consisted of 2 outcomes which were both
40 of low quality and downgraded due to risk of bias (arising from the randomisation process
41 and bias due to missing outcome data).
- 42 • When more than 1 to 2 hours for 5 days a week was compared to less than and equal to
43 45 minutes, 5 days a week, the evidence consisted of 2 outcomes which were rated as
44 low and very low quality respectively. They were downgraded due to risk of bias (arising
45 from a mixture of the randomisation process and missing outcome data) and imprecision.
- 46 • When more than 1 to 2 hours for 5 days a week was compared to more than 45 minutes
47 to 1 hour, 5 days a week, evidence was ranged from high to very low quality.

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

4 **More than 2 hours to 4 hours**

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

10 **5.1.15.2.1.3 Speech and language therapy**

11 **Less than and equal to 45 minutes**

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

18 **More than 1 hour to 2 hours**

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

23 **5.1.15.2.2.4 Psychology/neuropsychology**

24 **More than 1 hour to 2 hours**

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

29 **More than 2 hours to 4 hours**

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

35 **5.1.15.2.1.4 Multidisciplinary team**

36 **More than 45 minutes to 1 hour**

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

1 **More than 1 hour to 2 hours**

2 Evidence was available for more than 1 to 2 hours of multidisciplinary care for 5 days a week
3 compared to: less than and equal to 45 minutes, 5 days a week and more than 45 minutes to
4 1 hour for 5 days a week.

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

17 **More than 2 hours to 4 hours**

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

22 **More than 4 hours**

23 Evidence was available for one comparison of more than 4 hours of multidisciplinary care for
24 5 days a week compared to more than 2 hours to 4 hours, 5 days a week. The evidence was
25 rated moderate or low quality and was downgraded due to imprecision.

26

27 **5.1.15.2.2 People with communication difficulties**

28 **5.1.15.2.2.1 Physiotherapy**

29 **More than 1 hour to 2 hours**

30 Evidence was available for only 1 comparison which compared physiotherapy (in people with
31 communication difficulties) for more than 1 to 2 hours, less than 5 days a week, to more than
32 45 minutes to 1 hour, less than 5 days a week. In this comparison, 2 outcomes were of low
33 quality while one outcome was rated moderate quality. Outcomes were downgraded for
34 imprecision due to crossing 1 or both MIDs or to zero events and a small sample size.

35 **5.1.15.2.2.2 Occupational therapy**

36 **Less than and equal to 45 minutes**

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

41

1 **5.1.15.2.2.3 Speech and Language therapy**

2 **Individual patient data network meta analysis**

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

20 **More than 45 minutes to 1 hour**

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

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

32 **More than 1 hour to 2 hours**

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

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

1 **More than 2 hours to 4 hours**

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

- 6 • When more than 2 to 4 hours for less than 5 days a week was compared to more than 1
7 to 2 hours less than 5 days a week, the majority of evidence was of low quality with 1
8 outcome rated moderate quality. Downgrading occurred due to imprecision caused by the
9 confidence interval crossing 1 or 2 MIDDs or due to zero events and small sample size.
- 10 • When more than 2 to 4 hours for 5 days a week was compared to usual care, the majority
11 of the evidence was of high quality, but ranged from high to low quality. Downgrading
12 occurred in one outcome due to imprecision.
- 13 • When more than 2 to 4 hours for 5 days a week was compared to more than 1 to 2 hours
14 5 days a week, the majority of evidence was of moderate quality with 1 outcome rated low
15 quality. Where downgrading occurred, this was due to imprecision.

16 **5.1.15.2.2.4 Psychology/neuropsychology**

17 **More than 45 minutes to 1 hour**

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

23 **5.1.15.2.2.5 Multidisciplinary team**

24 **Less than and equal to 45 minutes**

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

29

30 **5.1.15.2.3 Qualitative evidence**

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

41 **5.1.15.2.3.1 Key principles**

42 This theme consisted of 3 sub-themes: 1) more therapy is better, 2) person-centred care –
43 intensity tailored to the individual and 3) duration of therapy, with the quality of evidence for
44 each sub-theme being moderate, high and low, respectively. Sub-theme 1 was downgraded

1 for coherence, as there were differences in opinion between population groups, and
2 relevance, as some studies were conducted in a healthcare setting outside of the United
3 Kingdom. Both elements were considered minor concerns and so an overall rating of
4 moderate quality was given. Sub-theme 3 was also downgraded for coherence and
5 relevance, but additionally for adequacy as there was a limited number of studies discussing
6 the theme.

7 **5.1.15.2.3.2 Person factors**

8 This theme consisted of 7 sub-themes: 1) medical status, 2) fatigue, 3) physical factors, 4)
9 psychological factors, 5) motivation, 6) social factors and 7) education. The quality of the
10 evidence ranged from moderate to low, with the majority being of moderate quality. The
11 reasons for downgrading varied between sub-themes. Sub-themes 1, 5 and 7 were
12 downgraded for methodological limitations. The reasons for this including limitations in
13 considering the relationship between the participant and the researcher, not exploring the
14 limitations of the study sufficiently and limited applicability of the evidence). Sub-themes 1, 2,
15 3, 5, 6 and 7 were downgraded for relevance as some studies were conducted in a
16 healthcare setting outside of the United Kingdom. Sub-themes 4, 5, 6 and 7 were
17 downgraded for adequacy, as there were a limited number of studies reporting the
18 subthemes or components incorporated in the sub-theme.

19 **5.1.15.2.3.3 People requiring specific consideration**

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

27 **5.1.15.2.3.4 Carer/family member factors**

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

33 **5.1.15.2.3.5 Healthcare professional factors**

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

41 **5.1.15.2.3.6 Intervention factors**

42 This theme consisted of 11 sub-themes: 1) methods of achieving more intense rehabilitation,
43 2) increased opportunity for social stimulation, 3) variety in activities and choice, 4) level of
44 person-centred care, 5) provision of feedback, 6) travel time, 7) need for technical support
45 and training, 8) physical environment, 9) goal setting, 10) use of expensive/additional
46 equipment and 11) meaningful activities. The quality of the evidence ranged from low to
47 moderate, with the majority being of low quality. The reasons for downgrading varied

1 between sub-themes. Sub-themes 3, 5, 6, 7, 8, 9, 10 and 11 were downgraded for
2 methodological limitations. This was due to a mixture of no consideration between the
3 researcher and the participant, not exploring the limitation of the study sufficiently, it being
4 unclear if the data analysis was sufficiently rigorous in 1 study, study ethics not being
5 considered in a study and limited applicability of the evidence. Sub-themes 2 and 4 were
6 downgraded for problems with coherence. In sub-theme 2 this was due to disagreement
7 between different populations, while in sub-theme 4 this was due to different experiences
8 within a population of group-based therapy. Sub-themes 2, 3, 4, 5, 6, 7, 8 and 11 were
9 downgraded for problems with relevance, as studies were conducted in a healthcare setting
10 outside of the United Kingdom. Otherwise, all sub-themes (apart from sub-theme 7) were
11 downgraded for problems with adequacy as only a small number of studies either reported or
12 discussed components of the sub-theme.

13 **5.1.15.2.3.7 Environmental factors**

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

25 **5.1.15.2.3.8 Service factors**

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

39 **5.1.15.3 Benefits and harms of more intense rehabilitation (quantitative)**

40 **5.1.15.3.1 People without communication difficulties**

41 **5.1.15.3.1.1 Physiotherapy**

42 On consideration of the evidence, the committee agreed that clinically important benefits
43 were associated with the delivery of more intense rehabilitation with limited evidence of
44 harms. Overall trends showing benefits were seen in person/participant health-related quality
45 of life at less than and greater than 6 months, modified Rankin scale at less than 6 months,
46 activities of daily living at less than 6 months, physical function – lower limb at less than 6
47 months, stroke-related scale of cognition – spatial attention at less than 6 months. Unclear
48 effects with some evidence of benefit from more intense rehabilitation and some of no

1 clinically important difference seen in physical function – upper limb at less than 6 months
2 and discontinuation at less than and greater than 6 months. Overall trends showing no
3 clinically important difference were seen in carer health-related quality of life at less than 6
4 months, modified Rankin scale at greater than and equal to 6 months, activities of daily living
5 at greater than and equal to 6 months, physical function – upper limb at greater than and
6 equal to 6 months, physical function – lower limb at greater than and equal to 6 months,
7 psychological distress – depression at less than and greater than 6 months. Occasionally
8 clinically important harms were seen in person/participant health-related quality of life at less
9 than 6 months and discontinuation at less than and greater than 6 months.

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

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

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

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

38 **5.1.15.3.2 Occupational therapy**

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

1 occupational therapist, it was agreed that this evidence applied more to the role of the
2 speech and language therapist in the NHS.

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

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

18 **5.1.15.3.3 *Speech and Language therapy***

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

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

33 **5.1.15.3.4 *Psychology/neuropsychology***

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

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

1 5.1.15.3.5 Multidisciplinary team

2 Limited evidence was available when looking at multidisciplinary packages of care that were
3 delivered at different intensities to each other. In the evidence available unclear effects
4 where some outcomes showed clinically important benefits and others showed no clinically
5 important difference were seen for activities of daily living at less than 6 months and physical
6 function – upper limb at greater than and equal to 6 months. No clinically important
7 differences were seen in patient/participant health-related quality of life at greater than and
8 equal to 6 months, modified Rankin scale at greater than and equal to 6 months, activities of
9 daily living at greater than and equal to 6 months, physical function – upper limb at less than
10 6 months, physical function – lower limb at less than and greater than 6 months and
11 psychological distress – depression at less than and greater than 6 months. Unclear effects
12 with possible benefits or harms were seen in discontinuation at less than and greater than 6
13 months.

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

20

21 5.1.15.4 People with communication difficulties

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

27 5.1.15.4.1 Physiotherapy

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

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

44 5.1.15.4.2 Occupational therapy

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

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

3 Given the limitations in this evidence, the committee viewed it in combination with the
4 evidence for people without communication difficulties. On weighing up the unclear evidence
5 of benefits, the limited, low quality of the evidence and the committee's expert opinion, they
6 agreed that the intensity of occupational therapy provided should remain at least 45 minutes,
7 5 days a week with an emphasis that therapy should be delivered in a person-centred
8 manner and that this is the minimum therapy that someone should receive. Additional
9 therapy should be considered when appropriate for the individual. The committee
10 acknowledged that people with communication difficulties may require adjustments to ensure
11 that they receive the therapy that they need.

12 **5.1.15.4.3 *Speech and Language therapy***

13 An individual patient data network meta analysis was incorporated which provided indirect
14 evidence to support this review. Evidence generally indicated no clinically important
15 difference in communication outcomes (overall language ability, naming, auditory
16 comprehension and functional communication) from increased intensity of speech and
17 language therapy at follow up with some results that showed clinically important benefits
18 from reduced intensity (naming at 9+ hours compared to up to 2 hours, naming at 4-9 hours
19 compared to up to 2 hours, auditory comprehension at 2-3 hours compared to up to 2 hours)
20 though the committee agreed this may be due to imprecision and quality concerns in the
21 individual studies included in the analysis. This data was limited to a smaller number of
22 participants and further research may be useful to reduce the uncertainty in the results. The
23 uncertainty was consistent with the results from studies that provided direct evidence that
24 indicated mixed results, where some showed clinically important benefits for some outcomes
25 (naming and auditory comprehension at more than and equal to 6 months when more than
26 45 minutes to 1 hour, 5 days a week was compared to more than 45 minutes to 1 hour, less
27 than 5 days a week; psychological distress – depression at less than 6 months when more
28 than 1 to 2 hours, less than 5 days a week was compared to less than 45 minutes, less than
29 5 days a week; discontinuation from study at less than 6 months when more than 1 hour to 2
30 hours, less than 5 days a week was compared to more than 45 minutes to 1 hour, less than 5
31 days a week) while most showed no clinically important differences or benefits of the less
32 intense intervention (discontinuation from study at less than and greater than 6 months when
33 comparing more than 45 minutes to 1 hour, 5 days a week to less than and equal to 45
34 minutes, less than 5 days a week; discontinuation from study at less than and greater than 6
35 months when more than 45 minutes to 1 hour, 5 days a week was compared to more than 45
36 minutes to 1 hour, less than 5 days a week; functional communication at less than 6 months
37 when more than 2 hours to 4 hours less than 5 days a week was compared to more than 1
38 hour to 2 hours, less than 5 days a week and discontinuation from study at <6 months when
39 more than 2 to 4 hours, 5 days a week was compared to more than 1 hour to 2 hours, 5 days
40 a week). Where benefits were seen (for example: the benefit in reducing psychological
41 distress when more than 1 to 2 hours, less than 5 days a week was compared to less than
42 45 minutes, less than 5 days a week) this was seen in trials with a small number of
43 participants and the evidence was often very low quality. Overall, the committee agreed that
44 the evidence highlighted that there was still uncertainty in the evidence for intensity of
45 speech and language therapy and that further research was required before a conclusion
46 could be made about the optimal intensity of therapy. The evidence came from a small
47 number of studies with a limited number of participants and ranged from moderate to very
48 low quality with the majority being of low quality.

49 Given the low quality and limitations of the evidence, the committee used their expert opinion
50 and agreed that the recommended intensity of speech and language therapy provided should
51 remain at least 45 minutes, 5 days a week with an emphasis that therapy should be delivered
52 in a person-centred manner and that this is the minimum therapy that someone should

1 receive. Additional therapy should be considered when appropriate for the individual. The
2 committee noted that 45 minutes of speech and language therapy should be available for
3 each area of difficult that a speech and language therapy may need to provide support for
4 (for example: 45 minutes of therapy for communication if someone has aphasia and 45
5 minutes of therapy for swallowing if someone has dysphagia).

6 **5.1.15.4.4 Psychology/neuropsychology**

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

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

16 **5.1.15.4.5 Multidisciplinary team**

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

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

27 **5.1.15.5 People's experiences of more intense rehabilitation (qualitative)**

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

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

1 **5.1.15.5.1 Positive findings (facilitators)**

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

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

23 **5.1.15.5.2 Negative findings (barriers)**

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

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

1 **5.1.15.5.3** *Moderators of intense rehabilitation*

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

3 • Person factors

- 4 ○ A person's previous activity level and need for physical support – people who have
5 previously increased activity levels may find it easier to participate in intense
6 rehabilitation than those who had lower activity levels. But equally the amount of
7 physical support someone required and the amount of difficulty after their stroke can
8 influence this as well.
- 9 ○ Psychological factors – a complex interweave of psychological factors can moderate
10 someone's ability to participate in intense rehabilitation. While there are some factors
11 that are more likely to occur after someone has a stroke, such as a feeling of a loss of
12 security, consequences of the stroke that can affect concentration and mood and
13 behaviour, the response to these factors appeared to be important in how people
14 participated with more intensive therapy. Intensive therapy could provide people with a
15 sense of personal achievement that might encourage them to continue. However, the
16 nature of this is likely to vary between difficult individuals and their personal response
17 to their stroke.
- 18 ○ Motivation – Motivation during intense rehabilitation was complicated and varies
19 between people. Intensity can provide motivation if the results of therapy lead to
20 positive improvements and are visible to the person. However, if results are not seen
21 and as the duration after the stroke increases, the motivation to participate may reduce.
22 Motivation may be fostered through multiple sources, including self-motivation,
23 motivation from family and therapist, being involved in novel research and a feeling of
24 altruism, and from other people who have had a stroke.

25 • Person factors and healthcare professional factors:

- 26 ○ Education – for all people, education about the benefits of intensive rehabilitation was
27 positive and helped to encourage them to participate and provide this therapy. For
28 people after stroke, a lack of information could lead to a sense of frustration, self-doubt
29 and a loss of confidence. Both people after stroke and caregivers may want further
30 information about the condition and options for rehabilitation and would ideally want
31 this information from healthcare professionals but will seek this information from other
32 sources if not provided.

33 • Carer and family member factors:

- 34 ○ Support of family and friends – the support of the family was highlighted as a
35 contributory factor for the success of intense rehabilitation. However, a balance needed
36 to be had between providing therapy and time spent with family and friends to provide
37 holistic care for recovery. This provided a potential barrier to providing therapy 7 days a
38 week. The involvement of family members could provide an opportunity to increase
39 continuity of rehabilitation on leaving hospital. However, the burden experienced by the
40 family member needs to be considered carefully..

41 • Healthcare professional factors:

- 42 ○ The relationship between the person after stroke and the healthcare professionals –
43 this was an important moderator for the success of rehabilitation. If people believed
44 that more intensive rehabilitation was appropriate, if communication was honest,
45 motivating and provided encouragement, and feedback was provided by the person
46 after stroke about their experience and the healthcare professional to reinforce the
47 progress being made, then this fostered a feeling of confidence in the therapy for both
48 parties. Therapists reported needing to balance the safety of the intervention against
49 the needs of the person, especially when considering prescribing unsupervised
50 therapeutic activities. Consistency in the person providing therapy and the quality of the
51 care provided helped support more intensive therapy, although some people reported

1 that variety in the person providing therapy and their approach could help to provide
2 motivation to try new things and engage with the therapy.

3 • Intervention factors:

4 ○ Methods of providing more intensive rehabilitation – a variety of different methods
5 could be used to increase the delivery of therapy including individual therapy, group-
6 based therapy, self-management interventions, use of computer-based tools, seven-
7 day working and longer-term rehabilitation. The resources available for some of these
8 methods may make their delivery less feasible. Some therapeutic approaches may
9 lead to increased variety in activities and choice and adapting therapy in a person-
10 centred manner (such as computer-based tools) while others may have additional
11 barriers in this (such as group-based therapy). Some approaches may require the use
12 of specialist equipment which requires training and support that may make the effect on
13 resources saved by being self-directed unclear (such as computer-based tools). If
14 equipment is required for the therapy to be delivered at home, the physical
15 environment must be adapted and expensive equipment may need to be provided, if
16 not owned by the person.

17 • Environmental factors:

18 ○ The environment therapy is delivered in is important. Hospital environments can
19 impede rehabilitation if they are not designed to facilitate interactions and
20 communication, for people with communication difficulties. Home care can be
21 appropriate for some people. However, the lack of supervision was seen as a possible
22 barrier. Adaptations put in place to make therapy more accessible however it is
23 delivered is seen as important.

24 • Service factors:

25 ○ The balance between delivering therapy and supporting discharge – staff availability
26 was reported as split between delivering therapy and completing non-patient contact
27 activities, such as planning and documenting therapy, discharge planning, ordering of
28 equipment and training others. The balance between achieving goals for the person
29 that could sometimes conflict with each other was important including the complex
30 balance between providing therapy and discharge planning. Maximising the potential
31 time that staff had for delivering therapy was seen as important, including using therapy
32 timetabling so that there are no conflicts between different aspects of care, minimising
33 the amount of administrative tasks people had to partake where possible, ensuring
34 sufficient staff numbers are provided to support this and reducing time spent in
35 information exchange so that only meaningful exchanges take place.

36

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

43 **5.1.15.6 Synthesis of the quantitative and qualitative evidence (mixed methods**
44 **analysis)**

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

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

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

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

29 **5.1.15.7 Key uncertainties**

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

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

1 **5.1.15.8 Cost effectiveness and resource use**

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

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

9

10

11 **5.1.15.8.1 Physiotherapy**

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

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

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

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

1 **5.1.15.8.2 Occupational therapy**

2 One comparative cost analysis compared increased occupational therapy for people with
3 communication difficulties, the results of which found the intervention had higher total costs
4 (£796 more per patient) compared to usual care, with no significant difference in terms of
5 health outcomes. This study was assessed as partially applicable because QALYs (and cost
6 per QALY) were not calculated. The French healthcare perspective including 2009-2019
7 resource use estimates may also not reflect the current UK NHS context. Potentially serious
8 limitations were noted as follows: baseline outcomes and intervention effects for the higher
9 dose group were based on single non-randomised retrospective study excluded from clinical
10 review; estimates of resource use were based on data from the study population and not a
11 systematic review; the follow-up period was vaguely reported and may not sufficiently assess
12 the full costs and benefits; only intervention-related healthcare costs and resource use were
13 incorporated into the analysis (no downstream resource use included); references for unit
14 costs (including cost year) were not reported. No probabilistic sensitivity analyses were
15 performed.

16 **5.1.15.8.3 Speech and language therapy**

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

19 **5.1.15.9 Psychology/neuropsychology**

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

32 **5.1.15.10 Multidisciplinary team**

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

47 The second study in this category was a comparative cost analysis which found that high-
48 intensity multidisciplinary rehabilitation was not statistically more costly than normal-

1 frequency rehabilitation (cost difference: £812 per patient ($p=0.0653$). This study was
2 assessed as partially applicable as, similar to the previous study, QALYs (and cost per QALY
3 gained) were not presented and Japanese healthcare perspective and 2005-2017 resource
4 use estimates may not reflect the current UK NHS context. Potentially serious limitations
5 were identified as follows: the within-trial analysis was based on a retrospective natural
6 experiment study not the wider evidence based identified in the clinical review; references for
7 unit costs were not reported which limits interpretation of results for UK context and no
8 probabilistic sensitivity analyses were performed.

9 The final analysis included in this category was conducted by the NGC as part of the
10 previous Stroke Rehabilitation guideline. This was a cost-utility analysis, which concluded
11 more intensive rehabilitation was cost effective compared to less intensive rehabilitation,
12 based on a modelled analysis using levels of intervention and outcomes from the Ryan et al.
13 2006 study (24 versus 18 rehabilitation sessions; EQ5D difference 0.14 at 3 months) and a
14 range of long-term utility assumptions. The analysis was assessed as partially applicable
15 however, as 2000-2002 resource use estimates and 2013-unit costs may not reflect the
16 current UK NHS context. Furthermore, the intensity of multidisciplinary rehabilitation in both
17 the intervention and comparator arms of Ryan are well below current UK levels. Potentially
18 seriously limitations were noted as the model is based on a single trial and so only reflects
19 this study and not the wider evidence base identified in the clinical review. Ryan 2006 was
20 not included in updated clinical review because it was judged that there was insufficient
21 information to categorise the study in line with new review protocol stratifications; however,
22 as it compared higher versus lower intensity multidisciplinary rehabilitation and is the model
23 from previous guideline it has not been excluded on this basis. Additionally, the base-case
24 analysis assumed no difference in post-rehabilitation costs; however, greater functional
25 ability could plausibly result in lower dependency and potentially lower social care costs
26 however, this would further favour more intensive rehabilitation and so would not change
27 conclusions.

28 **5.1.15.11 Overview of health economic literature**

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

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

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

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

1 5.1.15.12 Original modelling

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

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

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

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

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

33 Limited EQ-5D data were reported in the included clinical studies, so to maximise the data
34 that could be incorporated into the cost effectiveness analysis, an algorithm was used to map
35 Barthel Index scores reported in the clinical review to EQ-5D-3L. Studies that reported EQ-
36 5D-5L scores were also mapped to EQ-5D-3L. The mapped EQ-5D change scores (i.e.,
37 change from baseline in the higher intensity and lower intensity groups from each study)
38 were then meta-analysed as this was deemed to be the most precise way of using the data
39 from the trials as it would remove treatment-specific baseline differences from the model.

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

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

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

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

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

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

11 **5.1.15.13 Conclusions**

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

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

22

23 **5.1.15.14 Other factors the committee took into account**

24 Alongside this analysis, the highest quality trials that informed the recommendations for
25 higher intensity physiotherapy were examined alongside real-world data from the SSNAP
26 audit in order to investigate whether the participants eligible for the trials are comparable to
27 those in a UK NHS context. On examination of three studies (Cho, et al. 2012; Horsley, et al.
28 2019 and Lee, et al. 2012) 48.6%, 8.1% and 4.1% of people in the SSNAP audit would have
29 been eligible for inclusion in the trials respectively. Common exclusion reasons between the
30 three trials were people who cannot communicate age and current month (relating to people
31 with cognitive difficulties) and people with severe aphasia. Lee, et al. 2012 excluded people
32 with a previous stroke or transient ischaemic attack. The qualitative review highlighted how
33 people with communication and cognitive difficulties required extra consideration and the
34 mixed methods synthesis highlighted how this was not always considered in the quantitative
35 evidence. Therefore, this evidence further highlights this disparity. The committee reflected
36 on this and highlighted this while making research recommendations, highlighting that people
37 with communication and cognitive difficulties, and people who have had a previous stroke or
38 transient ischaemic attack should be included in research to ensure that their needs are
39 being met.

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

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

44

1 5.1.16 Recommendations supported by this evidence review

- 2 This evidence review supports recommendations 1.2.15 to 1.2.19 and the research
- 3 recommendations on intensity of rehabilitation – therapy for 7 days a week, intensity of
- 4 rehabilitation – psychological therapy and intensity of rehabilitation – swallowing therapy.
- 5 Other evidence supporting these recommendations can be found in the evidence reviews on
- 6 oral feeding (I).
- 7

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