Canadian Stroke Best Practices

CANADIAN STROKE BEST PRACTICE RECOMMENDATIONS

Rehabilitation, Recovery and Community Participation Following Stroke

Part One: Stroke Rehabilitation Planning for Optimal Care Delivery

Evidence Tables

Virtual Stroke Rehabilitation

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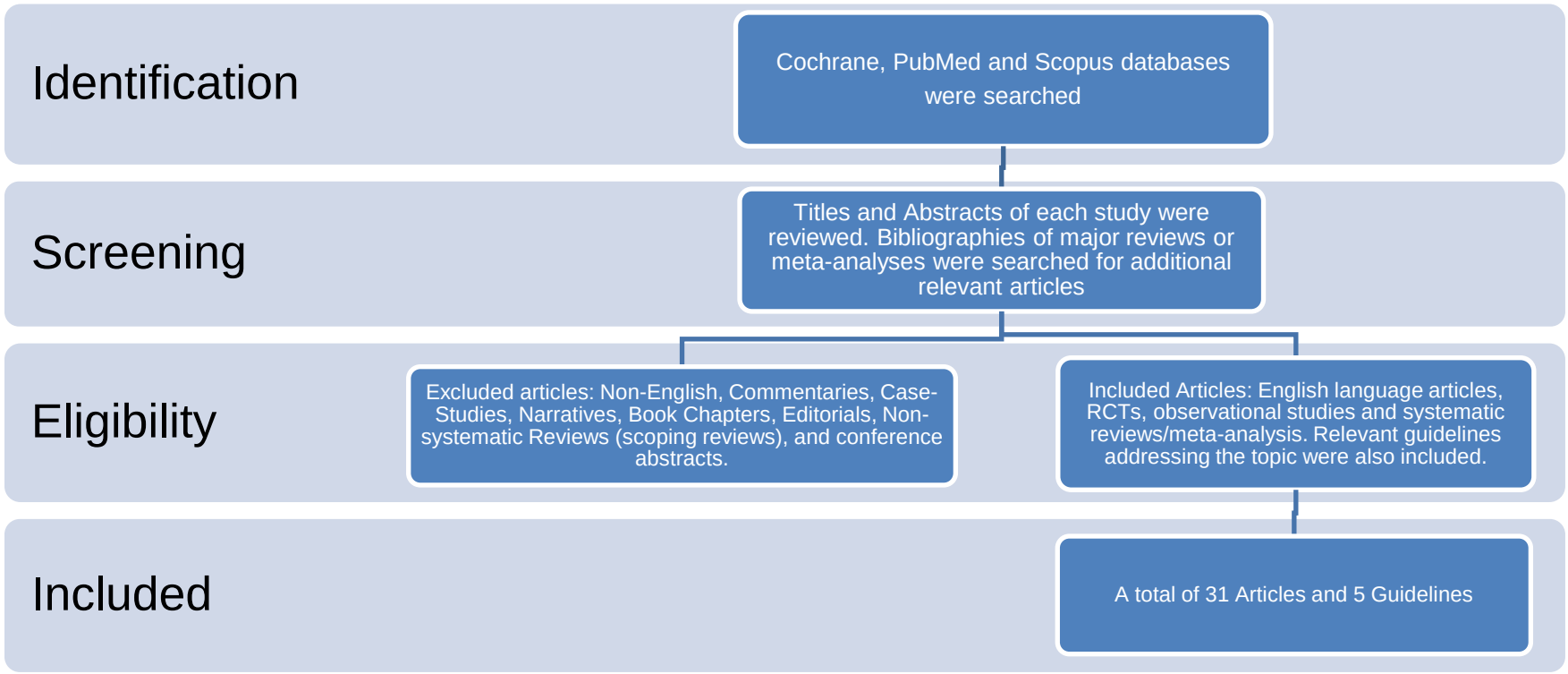
Search Strategy



Cochrane, PubMed, and Scopus databases were search using terms such as telerehabilitation, stroke, aphasia, virtual care, remote care and telemedicine. Titles and abstract of each article were reviewed for relevance. Bibliographies were reviewed to find additional relevant articles. Articles were excluded if they were: non-English, commentaries, case-studies, narrative, book chapters, editorials, non-systematic review, or conference abstracts. Additional searches for relevant best practice guidelines were completed and included in a separate section of the review.

Published Guidelines

Guideline	Recommendations
Management of Stroke Rehabilitation Working Group. VA/DoD clinical practice guideline for the management of stroke rehabilitation. Washington (DC): Veterans Health Administration, Department of Defense; Version 5.0 – 2024. **Available at: https://www.healthquality.va.gov/guidelines/Rehab/stroke/**	We suggest either face-to-face therapy or telerehabilitation, depending on patient characteristics and preferences. Weak for There is insufficient evidence to recommend for or against the use of telerehabilitation and technology-based interventions to improve stroke-related dysphagia or aphasia outcomes or both. Neither for nor against There is insufficient evidence to recommend for or against technology-based caregiver support/education interventions to improve caregiver quality of life. Neither for nor against
National Clinical Guideline for Stroke for the UK and Ireland. London: Intercollegiate Stroke Working Party; 2023 May 4. **Available at:** www.strokeguideline.org**.** **(selected)**	A People undergoing rehabilitation after stroke should be considered for remotely delivered rehabilitation to augment conventional face-to-face rehabilitation. Telerehabilitation programmes should: – be personalised to the individual's goals and preferences; – be used when it is considered to be the most beneficial option to promote recovery and should not be used as a substitute for essential in-person rehabilitation; – be monitored and adapted by the therapist according to progress towards goals; – be supplemented with face-to-face reviews and include the facility for contact with the therapist as required. B People receiving rehabilitation after stroke should have an assessment of their ability to use assistive technology and programmes and equipment should be adapted accordingly. C Stroke services should ensure adequate technology is available to enable access to telerehabilitation for people with stroke (this could be resourced via grants, community health services, library loan services etc.)
Clinical Guidelines for Stroke Management 2017. Melbourne (Australia): National Stroke Foundation. **Section 4. Rehabilitation**	**Weak recommendation** Telehealth services may be used as an alternative approach to delivering rehabilitation, especially for patients who cannot access specialist rehabilitation in the community. It may also be used as an adjunct to in-person therapy. Delivering of specific interventions via telehealth should only be considered for those that have demonstrated benefits.
Winstein CJ, Stein J, Arena R, Bates B, Cherney LR, Cramer SC et al; on behalf of the American Heart Association Stroke Council, Council on Cardiovascular and Stroke Nursing, Council on Clinical Cardiology, and	**Recommendations: Assessment of Communication Impairment** Telerehabilitation is reasonable when face-to-face assessment is impossible or impractical. Class IIa, Level A **Recommendations: Motor Speech Disorders: Dysarthria and Apraxia of Speech** Telerehabilitation is reasonable when face-to-face assessment is impossible or impractical. Class IIa, Level C

Guideline	Recommendations
Council on Quality of Care and Outcomes Research. **Guidelines for adult stroke rehabilitation and recovery: A guideline for healthcare professionals from the American Heart Association/American Stroke Association.** ***Stroke* 2016;47:e98–e169**	
Schwamm LH, Holloway RG, Amarenco P, Audebert HJ, Bakas T, Chumbler NR et al; on behalf of the American Heart Association Stroke Council and the Interdisciplinary Council on Peripheral Vascular Disease. **A review of the evidence for the use of telemedicine within stroke systems of care: A scientific statement from the American Heart Association/American Stroke Association.** ***Stroke* 2009;40:2616 –2634.**	**Class I recommendations** 8. Assessment of occupational, physical, or speech disability in stroke patients by allied health professionals via high-quality videoconferencing systems using specific standardized assessments is recommended when in-person assessment is impractical, the standardized rating instruments have been validated for high-quality videoconferencing use, and administration is by trained personnel using a structured interview (Class I, Level of Evidence B). 9. Telephonic assessment for measuring functional disability after stroke is recommended when in-person assessment is impractical, the standardized rating instruments have been validated for telephonic use, and administration is by trained personnel using a structured interview (Class I, Level of Evidence B). **Class II recommendations** 5. Delivery of occupational or physical therapy to stroke patients by allied health professionals via high-quality videoconferencing systems is reasonable when in-person assessment is impractical (Class IIa, Level of Evidence B).

Evidence Tables

Telemedicine for Stroke Rehabilitation (Systematic reviews)

Study/Type	Quality Rating	Sample Description	Method	Outcomes	Key Findings and Recommendations
Hao et al. 2023 **China** **Systematic review & meta-analysis**	7 trials were of good quality (PEDro 6-8) and 2 were of fair quality (PEDro 4-5)	9 RCTs including 260 participants recovering from stroke with chronicity of one-10 months (n=1) and ≥6 months (n=8)	Trials compared conventional in-person rehabilitation vs. virtual reality-based telerehabilitation. Training was provided 15-45 minutes/day 3-4x/week for 3-12 weeks. Microsoft Kinect was the most commonly used virtual reality system. In the VR group, therapy was provided both synchronously (n=6) and asynchronously (n=3) in the home, hospital room (simulating the home environment) long-term care homes or the community.	**Primary outcomes:** Fugl Meyer Assessment (FMA), upper limb, the Box and Block Test, Berg Balance Scale (BBS)	VR-based rehabilitation was associated with significantly higher FMA scores compared with the control group (SMD=1.05, 95% CI 0.04 to 2.06; results from 3 trials). There was no significant difference between groups on the Box & Block test (SMD=0.37; 95% CI -0.06 to 0.79; results from 2 trials). There was no significant difference between groups on the BBS (SMD=0.05; 95% CI -0.30 to 0.40; results from 5 trials). Results were available from only one study each assessing the outcomes of the Two-Minute Walk Test, the 10-metre walk test, Functional Ambulatory Category, MoCA, Barthel Index, and EuroQol-5D, therefore pooled analyses were not conducted.
Knepley et al. 2021 **USA** **Systematic review**	PEDro scores ranged from 2-8.	34 studies (n= 1,025 patients), of which 14 did not include a control group. Participants were recovering from stroke.	Trials compared rehabilitation therapy delivered through telerehabilitation (TR) with conventional in person outpatient rehabilitation, no rehabilitation or other TR therapies. Interventions were related to motor retraining (n=12), virtual reality (n=8), speech therapy (n=7), robot assisted (n=4), community-based exercises (n=2), goal setting (n=1)	**Primary outcome:** None stated a priori Common outcomes included The Wolf Motor Function test, the Fugl-Meyer assessment, FIM, Western Aphasia Battery and satisfaction	In all 34 studies, there was improvement from baseline after TR therapy. Among the 16 studies with non-TR control interventions, 9 observed equivalent outcomes between TR and non-TR, and 7 observed better outcomes after TR, although many of these had mixed results. Two studies reported superior patient satisfaction or anxiety scores in patients receiving TR compared with those receiving traditional clinical therapy, while 2 reported no significant differences between groups.
Laver et al. 2020 **Australia**	Items where ≥50% of the trials were considered to have low	22 RCTs (n=1937) including patients with all stroke types, including SAH at all levels of severity and at	Trials compared telerehabilitation (services delivered using information and communication technologies) programs composed of ≥1 session, compared with in-	**Primary outcome:** Independence in ADL **Secondary outcome:**	14 studies were used in pooled analyses, which included 2 pre-planned comparisons. *In person rehabilitation vs. telerehabilitation*

Study/Type	Quality Rating	Sample Description	Method	Outcomes	Key Findings and Recommendations
Cochrane review	risk of bias included random sequence generation, concealed allocation, blinding of outcome assessment and incomplete outcome data. 70% of trials were considered to be at high or unclear risk of bias for selective reporting	all stages stroke recovery. 13 studies excluded participants with significant cognitive impairment and 4 excluded those without a caregiver. 8 trials recruited patients in the acute stage of stroke, following discharge from hospital while the remainder recruited patients in the subacute and chronic stage.	person or no rehabilitation and trials comparing 2 different types of telerehabilitation. All interventions were delivered in patient's homes, or, in one case, a long-term care facility. 8 studies aimed to enhance care and well-being after discharge through interventions that included goal setting, education about secondary prevention, family therapy, and case management. Studies used customised computer-based training programmes to improve physical function, 4 studies used customised telerehabilitation systems and communication between the participant and the therapist and one study involved exercises delivered remotely plus electrical stimulation	Self-care & domestic life, mobility, balance, participant satisfaction, HR QoL, depression, upper-limb function, cognitive function, functional communication, cost-effectiveness	At the end of the intervention there was no difference between groups in mean ADL function (MD=0.59, 95% CI -5.50 to 6.68). Results from 2 trials included (n=75). There were no significant differences between groups in measures of balance (MD=0.48, 95% CI -1.36 to 2.32, 3 trials included, n=106) or measures of upper extremity function (MD=1.23, 95% CI -2.17 to 4.64, 3 trials included, n=170) *Usual care vs. telerehabilitation* At the end of the intervention there were no differences between groups on any of the outcomes assessed (Independence in ADL, mobility, self-reported health-related quality of life, depression or upper-limb function.
Appleby et al. 2019 **Australia** **Systematic review**	Using the modified McMaster Critical Appraisal Tool, scores ranged from 7–12 out of 14	13 RCTs including participants who had suffered a stroke.	Trials compared telerehabilitation therapies designed to improve function +/ usual care compared with usual care. 8 studies used videoconferencing for instruction and communication, 3 studies used 3-D motion equipment and software to generate virtual representations of participants' movements and one study combined videoconferencing with biofeedback and physiological data. Four studies had each session supervised by a telerehabilitation system, 9 studies included partial supervision through	**Primary outcomes:** Motor function (upper and lower extremity) and ADL	Motor function was assessed in 11 studies. Of 10 studies that reported between group differences, none reported significant between group differences. There were significant within group improvements in each group in 8 studies. Three studies investigated ADLs. Of these, none reported significant between group differences; all reported within group improvements.

Study/Type	Quality Rating	Sample Description	Method	Outcomes	Key Findings and Recommendations
			telerehabilitation systems and physical assistance.		
Sarfo et al. 2018 **USA** **Systematic review**	NA	22 studies that included persons recovering from stroke.	Studies compared rehabilitation interventions and assessments conducted using telemedicine, telecommunication media, and intervention programs including phone, videoconferencing, tele-rehabilitation system, robot assisted rehabilitation, and virtual and augmented reality therapy compared with usual or no care. Minimum duration of therapy was 2 weeks	**Primary outcome:** Motor function, depression, higher cortical dysfunction	Among 18 studies that focused on motor deficits, 11 assessed interventions on mobility or movement limitations, 6 focused on upper limb interventions, and 1 on ankle disability. In general, improvements in motor function were reported in all studies in both the intervention and control groups receiving tele-rehabilitation, while there were significantly greater improvements reported in the intervention group in 7/18 studies. Two studies assessed tele-rehabilitation intervention for aphasia and visuo-spatial neglect. Both studies reported feasibility of the interventions with no significant between group differences. Two studies assessed tele-rehabilitation on resolution of depression among stroke survivors or caregivers. Participants in both groups improved over time, with no significant between group differences.
Tchero et al. 2018 **France** **Systematic review & meta-analysis**	All trials had low risk of bias for their methods of random sequence generation, blinding of outcome assessors, and reducing the risk of attrition bias, except for 3 trials in each domain.	15 RCTs including 1,339 patients recovering from stroke.	Trials compared different models of telerehabilitation vs. standard rehabilitation care or a home-based exercise program. The follow-up period ranged between 4 and 24 weeks.	**Primary outcomes:** ADL, balance	There was no significant difference in Barthel Index scores between groups (SMD= –0.05, 95% CI –0.18 to 0.08, p=.47. Results from 6 trials included). There was no significant difference in Berg Balance Scale scores between groups (SMD= –0.04, 95% CI –0.34 to 026, p=.78. Results from 4 trials included). There was no significant difference in Fugl-Meyer Upper Extremity scores between groups (SMD= 0.5, 95% CI –0.19 to 1.09, p=.10. Results from 2 trials included). There was no significant difference in Action Research Arm Test scores between groups (SMD= -0.06, 95% CI –0.46 to 0.33, p=.75. Results from 2 trials included).

Study/Type	Quality Rating	Sample Description	Method	Outcomes	Key Findings and Recommendations
					There was no significant difference in Stroke Impact Scale (mobility subscale) scores between groups (SMD= 0.18, 95% CI –0.13 to 0.48, p=0.26).
Chen et al. 2015 **China** **Systematic review & meta-analysis**	NA	7 RCTs that included patients ≥18 years who had sustained a stroke and received rehab therapies through telemedicine systems for a minimum of 4 weeks in duration. Mean ages of patients ranged from 53-75 years.	In 6 trials, virtual reality-based training was used to provide rehab therapies, while therapies or support were provided by either the phone or the internet in 2 trials. The control group in most trials was usual or standard care.	**Primary outcome:** Measures of disability or ADL assessment **Secondary outcomes:** Motor function, cognitive assessments, health-related QoL	There was no significant difference in mean Barthel Index scores between groups (SMD=-0.05, 95% CI -0.24-0.13, p=0.57. Results from 6 trials included). There was no significant difference in mean Berg Balance Scale scores between groups (SMD=-0.17, 95% CI -0.70-0.37, p=0.54. Results from 2 trials included). There was no significant difference in mean Fugl-Meyer (Upper Extremity) scores between groups (SMD=0.05, 95% CI -0.09-1.09, p=0.10. Results from 2 trials included).

Telerehabilitation for Motor & Cognitive Impairment

Study/Type	Quality Rating	Sample Description	Method	Outcomes	Key Findings and Recommendations
Sakakibara et al. 2023 **Canada** **RCT** ***TeleRehabilitation with Aims to Improve Lower extremity recovery poststroke (TRAIL)***	CA: ☑ Blinding patient: ☒ assessor:☑ ITT: ☑	96 persons (planned) >18 years, living in the community within one year of stroke, recruited from 5 sites with lower extremity hemiparesis who can walk at least 10 m and can tolerate 50 min of activity; and have cognitive-communicative ability to participate.	Participants will be randomized 1:1 to the TRAIL programme, a 4-week progressive exercise and self-management intervention delivered synchronously using video-conferencing technology (twice weekly sessions of 60-90 minutes) or an attention-controlled education programme (EDUCATION) focusing on stroke risk factor control.	**Primary outcome:** Timed Up and Go **Secondary outcomes:** Sit-to-stand, Functional Reach, Tandem Stand, Fugl-Meyer Assessment, Balance Confidence Scale, Stroke Impact Scale and an economic evaluation. Feasibility indicators will also be collected	Estimated study completion date is August 2024.

Study/Type	Quality Rating	Sample Description	Method	Outcomes	Key Findings and Recommendations
				Outcomes will be assessed virtually at baseline (T1), the end of the 4-week intervention (T2), 3 months postintervention (T3) and 6 months postintervention (T4)	
Asano et al. 2021 **Singapore** **RCT** ***The Singapore Tele-technology Aided Rehabilitation in Stroke (STARS)***	CA: ☒ Blinding patient: ☒ assessor:☑ ITT: ☑	124 persons aged ≥40 years who had suffered a first or recurrent stroke within the previous 4 weeks, who were living in the community before the stroke and expected to be discharged home. Mean age was 64 years, 52% were men.	Participants were randomized to receive 3 months of physiotherapy (PT) and occupational therapy (OT) via a tele-rehabilitation system that includes exercise 5-days-a-week using an iPad-based system that allows recording of daily exercise with video and sensor data and weekly videoconferencing with tele-therapists after data review vs. standard PT and OT.	**Primary outcome:** Late-Life Function and Disability Instrument (LLFDI) **Secondary outcomes:** The timed 5-metre walk test, 2-minute walking distance, BI, Activities-Specific Balance (ABC) scale and the EuroQoL (EQ-5D) Assessments were completed at baseline and at the end of treatment.	11 participants from the tele-rehab group and 15 from the control group withdrew prior to the 3-month assessment. While persons in both groups had improved, there was no significant difference in the adjusted mean change score between groups for either the LLFDI-total frequency score (-0.56, 95% CI -4.22 to 3.09) or LLFDI-total limitation score (1.08, 95% CI -7.15 to 9.31). There were no significant differences in the adjusted mean change score between groups for any of the secondary outcomes
Saywell et al. 2021 **New Zealand** **RCT** ***Augmented Community Telerehabilitation Intervention (ACTIV)***	CA: ☑ Blinding patient: ☒ assessor:☑ ITT: ☑	95 patients with first-ever stroke, recruited from 4 centres, who were discharged home with arm and/or leg impairment. Mean age was 73 years, 51.5% were men. Mean time since stroke was 6.6 months. All participants had already completed usual rehabilitation.	Participants were randomized 1:1 to the ACTIV program, a structured 6-month program using face-to-face sessions, telephone contact, and text messages to augment stroke rehabilitation or usual care. The ACTIV focused on 2 functional categories: “staying upright” and “using your arm” and was provided by physical therapists.	**Primary outcome:** The physical subcomponent of the Stroke Impact Scale (SIS 3.0) at 6 months **Secondary outcomes:** SIS 3.0 physical subcomponent, hand grip strength, Step Test (balance), Stroke Self-Efficacy Questionnaire (SSEQ), EuroQol 5D VAS (EQ-5D)	There was no significant difference in the adjusted mean change score for the primary outcome (4·51, 95% CI -0·46 to 9·48), or at 12 months (1·72, 95% CI -4·04 to 7·48). However, in the per protocol analysis there was significantly greater improvement in the ACTIV group at 6 months. There were no significant differences between groups in mean change scores for grip strength, Step Test, SSEQ scores, total SIS 3.0 scores, or subcomponents (strength, memory, emotion, communication, mobility or use of hand) at either 6 or 12 months. There was significantly greater improvement in the ACTIV group at 6 months on mean EQ-5D (10·09, 95% CI 0·53 to 19·65) in the ACTIV group at 6

Study/Type	Quality Rating	Sample Description	Method	Outcomes	Key Findings and Recommendations
				Outcomes were assessed at baseline, 6 and 12 months.	months, but significant decline at 12 months (-10·09, 95% CI -19·86 to -1·67). At 6 months, there was significantly greater improvement in the mean change score for the participation subscale of the SIS (11.34; 95% CI 2.54 to 20.14), but not at 12 months.
Wilson et al. 2021 **Australia** **RCT**	CA: ☑ Blinding patient: ☒ assessor:☑ ITT: ☑	17 patients with upper-extremity dysfunction following unilateral stroke. Mean age was younger in the EDNA-22 group (70 vs. 77 years), 70.5% were men. Mean time since stroke was 4 months.	Patients were randomized to a virtual rehabilitation-based system using the EDNA-22 tablet, composed of a suite of tailored movement tasks, and performance monitoring via cloud computing data storage (n=10) or to an active control group (GRASP, n=7). Patients in both groups received 30-minute sessions, 3–4 times weekly for 8 weeks. The EDNA training tasks consisted of 4 goal-based and 3 exploratory movement activities that required the manipulation of handheld objects.	**Primary outcomes:** Box and Blocks Task (BBT) and 9-Hole Pegboard Test (9HPT), MoCA **Secondary outcomes:** Stroke Impact Scale (SIS) recovery Assessments were conducted at baseline, at the end of the intervention and at 3-month follow-up.	There was significantly greater improvement in mean BBT scores at the end of follow-up among patients in the EDNA-22 group (Δ 11.2 vs. -0.3, p=0.04). There was no significant difference between groups in the change in mean 9HPT and SIS scores between groups (0.13 vs. 0.06 and 9.3 vs. -1.2, respectively). There was significantly greater improvement in mean MoCA scores at the end of follow-up among patients in the EDNA-22 group (Δ 3.4 vs. 0.1, p=0.036).
Yang et al. 2021 **Canada** **Prospective study**	NA	9 adults with difficulty using their affected upper extremity associated with a remote stroke, who were living in the community. Mean age was 66 years, 4 were women. Mean time since stroke was 66 months.	Two iterations of the Graded Repetitive Arm Supplementary Program (GRASP) were delivered over 10 weeks by videoconferencing (Zoom) The program was evaluated using the Reach, Effectiveness, Adoption, Implementation, and Maintenance (RE-AIM) framework	**Primary outcomes:** Arm Capacity and Movement test (ArmCAM), The Rating of Everyday Arm-use in the Community and Home Scale (REACH) and the Stroke Impact Scale Hand subscore (SIS-Hand) Assessments were conducted at baseline, end of treatment and 6-month follow-up	Mean baseline, post-test and follow-up scores (total possible score) ArmCAM (/30): 18.67, 20.00, 19.78 REACH (0–5): 3.00, 3.56, 3.44 SIS-Hand (/100): 35.56, 47.56, 50.22 SIS-Hand Recovery (/100): 46.67, 60.56, 58.78 There were significant changes in mean scores across time for all outcomes. Effect sizes for changes from baseline to post test ranged from 0.45 to 0.60. Effect sizes for changes from baseline to end of follow-up ranged from 0.47 to 0.63.

Study/Type	Quality Rating	Sample Description	Method	Outcomes	Key Findings and Recommendations
					All 4 staff and instructors reported the virtual format of the GRASP program generally worked very well, although some challenges were noted. Sometimes it was difficult to observe participants due to the web camera set-up and background noise could be distracting.
Chen et al. 2020 **China** **RCT**	CA: ☑ Blinding patient: ☒ assessor: ☑ ITT: ☑	52 patients with hemiplegia following stroke, Mean age was 62 years, 50% were men. Mean time since stroke was 14 days.	Patients were randomized to a 12-week home-based motor training telerehabilitation (TR) group or a conventional rehabilitation (CR) group. Patients in the TR group used the Telemedicine Rehabilitation System (TRS) under the therapists' guidance. Therapy included 10 sessions of OT/PT (60 minutes each) and EMG-triggered neuromuscular (20 minutes each). Patients in the CR group received dose-matched face-to-face therapy in the outpatient department.	**Primary outcomes:** Fugl-Meyer assessment (FMA), modified BI (mBI)	Mean baseline FMA scores for the TR and CR groups were 71.88 and 71.65, respectively. There was a significantly greater improvement in scores in the TR group following the intervention (11.12 vs. 5.31, mean difference=5.81, p for non-inferiority=0.003, p for superiority =0.011). Mean baseline mBI scores for the TR and CR groups were 70.0 and 70.5, respectively. There was a significantly greater improvement in scores in the TR group following the intervention (12.7 vs. 7.1, mean difference=5.58, p for non-inferiority=0.019, p for superiority =0.097).
Hassett et al. 2020 **Australia** **RCT**	CA: ☑ Blinding patient: ☒ assessor: ☑ ITT: ☑	300 inpatients recruited from 3 hospitals with mobility limitations, receiving neurological rehabilitation. Approximately 50% of participants had experienced a neurological condition. Mean age was 72 years, 50% were women.	Patients were randomized to receive usual care or usual care + an additional intervention that used devices to target mobility and physical activity problems, individually prescribed by a physiotherapist, including virtual reality video games, activity monitors, and handheld computer devices for 6 months in hospital and at home.	**Primary outcomes:** Mobility (performance-based Short Physical Performance Battery [SPPB]) and upright time as a proxy measure of physical activity (proportion of the day upright measured with activPAL) at 6 months	Intervention participants received on average 12 supervised inpatient sessions using 4 different devices and 15 physiotherapy contacts supporting device use after hospital discharge. The mean improvement in mobility scores was 2.3 in the intervention group and 2.1 in the control group (mean between-group difference was 0.2 points, 95% CI 0.1 to 0.3; p = 0.006). There was no significant difference in the mean proportion of the day spent upright at 6 months: intervention group, 18.2% vs. control group, 18.4%, mean difference=−0.2%, 95% CI −2.7 to 2.3; p = 0.87)
Johnson et al. 2020 **Australia**	CA: ☑ Blinding patient: ☒	60 participants who were part of a community-based stroke support group	Participants were randomized to receive 8 weeks of virtual therapy (VT) or usual care. The VT intervention was designed to	**Primary outcomes:** Fugl-Meyer Upper Extremity scale (FMA-UE) and Action	From baseline to the end of the intervention, persons in the VT group experienced significant improvement in mean FMA-UE (36.6 vs. 47.5), while those in the usual care group did not (38.2

Study/Type	Quality Rating	Sample Description	Method	Outcomes	Key Findings and Recommendations
RCT ***STRoke Interactive Virtual thErapy (STRIVE)***	assessor: ☑ ITT: ☑	having experienced a stroke an average of 13.6 years previously. Mean age was 64.1 years, 42% were women.	improve upper extremity range of motion, motor control, strength, and dexterity of the shoulder, elbow, and wrist, and was provided for 45 minutes, 2x/week using the Jintronix Rehabilitation System. Persons in the usual care group were requested to maintain their usual activity and treatment plans.	Research Arm Test (ARAT)	vs. 36.1). The difference in scores between groups was significant. There was no significant improvement in mean ARAT scores from baseline to end of the intervention among persons in either the VT group (31.5 to 35.5) or usual care group (29.8 to 30.4).
Wu et al. 2020 **China** **RCT**	CA: ☑ Blinding patient: ☒ assessor: ☑ ITT: ☒	64 patients admitted to hospital with acute ischemic or hemorrhagic stroke, with a NIHSS score 5-15 and limb dysfunction, who chose home rehabilitation after hospital discharge. Mean age was 58 years, 60% were men.	Participants were randomized to receive standard inpatient rehabilitation + home remote rehabilitation guidance using the Internet-based TCMeeting v6.0 video conferencing system, installed in the patient's home, providing remote rehabilitation instruction twice a week (experimental group) or weekly rehabilitation phone calls (control group) after discharge. Assessments were conducted on the day of discharge, the 4th 8th and 12th week after discharge	**Primary outcomes:** Fugl-Meyer Assessment (FMA), Berg Balance Scale (BBS) and Timed "UP & GO" (TUG) test **Secondary outcome:** Stroke-Specific Quality of Life Scale (SS-QoL)	There were 3 dropouts (2 in intervention, 1 in control group). Patients in both groups improved over time and from each assessment point to the next) on all outcomes. Patients in the intervention group had significantly greater improvement over time in mean scores for all outcomes (overall time*group interaction).
Cramer et al. 2019 **USA** **RCT (non-inferiority)**	CA: ☑ Blinding patient: ☒ assessor: ☑ ITT: ☑	124 adults recruited from 11 sites who had experienced stroke 4 to 36 weeks prior and had mild to severe arm motor deficits (Fugl-Meyer [FM] score, 22-56). Mean age was 61 years, 27% were women. Baseline FM score was 43.	Participants were randomized (1:1) to receive telerehabilitation therapy in the home (TR group) or therapy at an outpatient rehabilitation therapy clinic (IC group). Participants received 36 sessions, (18 supervised, 18 unsupervised), 70 minutes each of task-oriented arm motor therapy plus stroke education, with therapy intensity, duration, and frequency matched across groups during a 6–8-week period.	**Primary outcome:** Change in FM (UE) score from baseline to 4 weeks **Secondary outcome:** Box and Blocks Test, Stroke Impact Scale (SIS) –hand motor domain, change in stroke knowledge	Adherence was high in both groups, (93.4% in IC group and 98.3% in TR group) Persons in both groups improved significantly from baseline to 4 weeks after the end of treatment. The mean unadjusted FM change score was 8.36 points in the IC TR group and 7.86 points in the TR group. The adjusted mean change in FM score was 0.06 points larger in the TR group (95% CI, −2.14 to 2.26; p = .96), which indicated that TR was non-inferior to IC therapy. Box and Blocks Test scores increased significantly by 9.5 in the TR group and by 8.8 in the IC group and indicated noninferiority of TR therapy.

Study/Type	Quality Rating	Sample Description	Method	Outcomes	Key Findings and Recommendations
			The TR system consisted of an internet-enabled computer with table, chair, and 12 gaming input devices.		SIS hand motor domain scores increased significantly by 23.7 in the TR group and by 29.2 in the IC group. Non-inferiority of TR was not demonstrated. Stroke knowledge was similar between groups at baseline and follow-up.
Vloothuis et al. 2019 **The Netherlands** **RCT** ***CARE4STROKE***	CA: ☑ Blinding patient: ☒ assessor: ☑ ITT: ☑	66 stroke patient-caregiver couples, recruited from inpatient rehabilitation wards, who had lived independently prior to stroke. Mean age of patients was 60 years, 61% were women. Median time after stroke was 37 days.	Patients were randomized to the CARE4STROKE program, which used an e-Health app that provided an additional 150 minutes a week with a caregiver + usual care or usual care only for 8 weeks.	**Primary outcomes:** Self-reported mobility domain of the Stroke Impact Scale 3.0 (SIS) and length of stay (LOS), assessed at 8 and 12 weeks **Secondary outcomes:** Motor impairment, strength, walking ability, balance, mobility and Extended ADL of patients, caregiver strain and mood, self-efficacy, fatigue and quality of life of both patients and caregivers.	There were no significant differences between groups in SIS mobility scores at either 8 (p=0.229) or 12 weeks (p= 0.961), or LOS (p= 0.818). There were significant differences between groups favouring the intervention group in patient's anxiety at 8 and 12 weeks (p= 0.023, p=0.009) and caregiver's depression at 8 weeks (p=0.003).
van den Berg et al. 2016 **The Netherlands** **RCT**	CA: ☑ Blinding patient: ☒ assessor: ☑ ITT: ☑	63 patients recruited from 2 acute stroke units and 1 rehabilitation unit. Mean age was 68.7, 64% were women.	Patients were randomized to an 8-week caregiver-mediated exercises program with support using a customized exercise app loaded onto a tablet or conventional inpatient rehabilitation. In the intervention group, the patient and their caregiver were asked to perform a selective set of exercises for 8 weeks, at least 5 times a week for 30 minutes, and had a weekly evaluation session with the physiotherapist.	**Primary outcome:** Stroke Impact Scale (SIS) mobility domain **Secondary outcomes:** LOS, other SIS domains, readmissions, motor impairment, strength, walking ability, balance, mobility, (extended) ADL, psychosocial functioning, self-efficacy, quality of life, and fatigue	In ITT analysis, there was no between-group difference in SIS mobility at 8 weeks (mean difference=-2.5, 95% CI -11.9 to -7, p=0.6) p=0.6). In ITT analysis, there were significantly greater improvements in the SIS domains of strength and memory, favouring the intervention group at 12 weeks. There were significant between-group differences in favor of the intervention group for the Nottingham Extended ADL index at week 8 and 12 weeks.

Study/Type	Quality Rating	Sample Description	Method	Outcomes	Key Findings and Recommendations
					In ITT analysis, there were no significant differences between groups in hospital LOS or readmissions during the first year. There were significantly greater improvements in the Timed Up and Go test, the Fatigue Severity Scale and the General Self - Efficacy Scale (caregiver) at 12 weeks.
Huijgen et al. 2008 **The Netherlands** **RCT**	CA: ☒ Blinding patient: ☒ assessor: ☒ ITT: ☒	81 subjects >18 years, with stroke (n=16), TBI or MS, with performance on 9-Hole Peg test (9HPT)>180 sec, who were living at home in stable clinical status. Patients with serious cognitive/behavioural/visual/ communication/problems and medical complications, were excluded.	Patients were randomized to an intervention group (n=55), consisting of 1 month of usual care, (general exercise program) followed by a 1-month program (30 min, 5 days/week) using the Home Care Activity Desk, using a portable telemedicine system, to facilitate upper-limb rehabilitation, or to a control group (n=26) and received usual care for 2 months	**Primary outcome:** Action Research Arm test (ARAT), 9-hole peg test (9HPT) **Secondary outcome:** User satisfaction (100-point VAS) Outcomes were assessed at baseline, 1 month and 2 months	There were no significant differences between groups at any of the assessment points. Mean (±sd) ARAT and 9HPT scores for stroke patients in the control group at T0, T1 and T2 were: 46.7±11.2, 44.3±15.1 and 47.3±40.9; 73.4±58.7, 61.0±45 and 61.0±48.4 2/9 vs. 1/9 stroke patients in the intervention and control groups reported clinically significant improvement (±5.7 ARAT points) Mean (±sd) ARAT and 9HPT scores for stroke patients in the intervention group at T0, T1 and T2 were: 40.7±12.6, 39.3±14.2 and 40.9±13.4 106.4±65.0, 85.5±57.6 and 88.5±54.3 Both patients and therapists were generally satisfied with 6 aspects of the program (acceptance, aesthetic aspect, ease of use, hardness of the task, suitability of the tasks, general opinion). 11 patients were lost to follow up.

Telerehabilitation for Communication Impairment

Study/Type	Quality Rating	Sample Description	Method	Outcomes	Key Findings and Recommendations
Øra et al. 2020 **Norway** **RCT**	CA: ☑ Blinding Patient: ☒ Assessor: ☑ ITT: ☑	62 patients, recruited from 4 stroke units, rehabilitation centres and from SLPs with naming impairment associated with aphasia. Mean age was 65 years, 66% were men. 45% of patients had stroke within previous 3 months, 14.5% within 3-12 months and 40.5% ≥12 months.	Patients were randomized to receive 5 hours of speech and language telerehabilitation targeting functional, expressive language by videoconference each week for 4 consecutive weeks +/- usual care or usual care alone.	**Primary outcome:** Norwegian Basic Aphasia (NBA) Assessment (naming subtest) **Secondary outcomes:** NBA (repetition, auditory comprehension subtests), Verb and Sentence Test (VST) total score, intransitive and transitive verbs subtests Outcomes were assessed at baseline, post intervention and at 4 month follow-up.	There was no significant group x time interaction for the primary outcome. There was significantly greater improvement in the intervention group for NBA (repetition), VST (total score, intransitive and transitive verbs subtests) at 4 months.
Palmer et al. 2019 **UK** **RCT** ***Big CACTUS***	CA: ☑ Blinding Patient: ☒ Assessor: ☑ ITT: ☑	278 adults recruited from 21 speech and language therapy (SLT) departments, with aphasia post-stroke of at least 4 months duration and had word-finding difficulties. Mean age was 65.4 years, 61% were men. 44% of participants had mild word finding difficulties, 30% had moderate difficulties and 26% had severe difficulties. Median duration post stro0ke was 2 years.	Participants were randomly assigned to receive either 6 months of usual care (n=101), daily self managed computerized SLT plus usual care (CSLT, n=97), or attention control plus usual care (n=80). Patients in the CSLT group completed daily, self-managed, word-finding exercises on a computer at home, tailored to their individual needs. Practice was supported by a therapy assistant or volunteer. Patients in the attention control group completed paper-based puzzle book activities daily, and received supportive telephone calls	**Primary outcomes:** Change in word finding ability at 6 months from baseline, change in functional communication at 6 months from baseline, using Therapy Outcome Measures (TOMs) **Secondary outcomes:** Change in patient perception of communication and quality life at 6 months, assessed using	Participants in the CSLT group had significantly improved word finding compared with those in the usual care group (adjusted MD=16·2% 95% CI 12·7–19·6, p<0·0001). Participants in the CSLT group had significantly improved word finding compared with those in the attention control group (adjusted MD=14·4%, 95% CI 10·8- 18·1, p<0.0001). There was no significant improvement in word finding between persons in the usual care and attention control groups. There were no significant changes between CSLT and attention control or usual care groups in functional communication. The mean changes in COAST scores from baseline to 6 months were 0·5, 95% CI (–3·1 to

Study/Type	Quality Rating	Sample Description	Method	Outcomes	Key Findings and Recommendations
			from the research team once a month.	Communications Outcomes After Stroke (COAST)	4·1, p=0·772 (CSLT vs. usual care); 3·8, 95% CI –0·0 to 7·5, p=0·051 (CSLT vs. attention control) and –3·2, 95% CI –7·0 to 0·5, p=0·089 (attention control vs. usual care)
Meltzer et al. 2018 **Canada** **RCT (non-inferiority)**	NA	44 patients with a history of unilateral stroke ≥6 months previously, resulting in a communication disorder (aphasia, n=33 or cognitive-linguistic communication disorder [CLCD], n=11). Mean age was 64 years, 39% were women.	Participants had an initial 2 hour in-person meeting with the therapy team and were then randomized to receive in-person (IP) treatment or remote therapy (telerehabilitation) using teleconferencing equipment. All patients received 10, one-hour weekly sessions.	**Primary outcomes:** Western Aphasia Battery aphasia quotient (WAB-AQ) (for aphasia) and Cognitive-Linguistic Quick Test (CLQT) (for CLCD) and subjective gains with the Communication Confidence Rating Scale for Aphasia (CCRSA) (self-rating) and Communication Effectiveness Index (CETI) (partner rating)	Among the 30 persons with aphasia who completed both assessments, there was no significant difference in the degree of improvement on the WAB-AQ score (mean gain of 7.68 points in TR group vs. 6.58 in IP group, p=0.55). In a formal non-inferiority test, TR was non-inferior to IP treatment. Among persons with aphasia, communication confidence was improved significantly more in the IP group (mean CCRSA change 4.79 vs. 2.18, p=0.028). Mean partner rated CETI gains did not differ between group (TR 11.2 vs. IP 11.9, p=0.83). Among the 11 persons with CLCD, the mean gain in the CLQT language domain did not differ significantly between groups (TR 3.0 vs IP 4.0, p=0.64). There were no significantly different gains between groups in other domains (memory, executive function, attention, visual-spatial).

Telerehabilitation for Self-Management

Study/Type	Quality Rating	Sample Description	Method	Outcomes	Key Findings and Recommendations
Lo et al. 2023 **China** **RCT**	CA: ☑ Blinding Patient: ☒ Assessor: ☑ ITT: ☑	355 patients recruited from 10 hospitals who had sustained an ischemic or hemorrhagic stroke and who could be randomized within 12 months of stroke onset. Mean age was 62 years, 58% were men.	Patients were randomized 1:1 to the Virtual Multidisciplinary Stroke Care Clinic service (monthly online consultations with a nurse, follow-up phone calls, and access to an online platform with access to 85 educational videos) or to a control group that received usual care consisting of services available in the community.	**Primary outcomes:** Stroke Self-Efficacy Questionnaire (SSEQ) **Secondary outcomes:** Stroke Self-Management Behaviors Performance Scale (SSMBP), Reintegration to Normal Living Index	There was significantly greater improvement in mean SSEQ total scores from baseline to 6 months in the intervention group (103.9 to 109.5 vs. 110.2 to 112.1, Hedge's *g*= 0.27, 95% CI 0.03 to 0.51). There was significantly greater improvement in mean SSMBP and GDS total scores from baseline to 6 months in the intervention group (from 78.5 to 82.0 vs. 84.0 to 83.0,

Study/Type	Quality Rating	Sample Description	Method	Outcomes	Key Findings and Recommendations
		Mean time since stroke onset was 1.3 months. 83% of patients had mild symptoms (NIHSS 0-4).		(RNLI), Geriatric Depression Scale (GDS) Outcomes were assessed at baseline, 3 and 6 months.	Hedge's *g*= 0.33, 95% CI 0.09 to 0.57 and from 10.2 to 7.3 vs. 8.4 to 7.8, Hedge's *g* = 0.36, 95% CI 0.13 to 0.60, respectively). There was no significant difference in mean SSMBP scores between groups at 3 or 6 months.
Chumbler et al. 2012, 2015 **USA** **RCT** ***Stroke Telerehabilitation (STeleR)***	CA: ☑ Blinding patient: ☒ assessor: ☑ ITT: ☒	52 veterans who had suffered a stroke within the previous 2 years, aged 45-90 years, living in the community, without cognitive impairment, and a discharge FIM score of 18-88 were included.	Patients were randomized to a STeleR group (n=25) or to a usual care group (n=23) The STeleR intervention focused on improvement of functional mobility. The program lasted 3 months and included 3 components: 3x 1-hour televisits to the participant's home, 5 telephone calls and an in-home messaging device system to instruct patients on functional exercises and adaptive strategies. Patients in the usual care group could receive any services provided by VA or non-VA, at their discretion	**Primary outcome (2012):** Telephone Version of FIM (FONEFIM), overall function domain of the Late-Life Function and Disability Instrument (LLFDI) **Secondary outcome (2012):** Additional domains of the LLFDI **Primary outcomes (2015):** Falls Efficacy Scale (FES), Stroke-specific Patient Satisfaction with Care Scale (SSPSC)-9 items for hospital care, 4 items for home care Outcomes were assessed a baseline, 3 and 6 months	48 patients completed baseline assessments. **2012** Mean±sd scores for STeleR and usual care groups at baseline and 6 months were: FONEFIM (motor domain): 83.5±9.5 to 83.7±9.9 vs. 81.5±12.1 to 80.9±12.0, p=0.306 LLFDI (overall function total): 49.5±10.1 to 54.6±12.0 vs. 51.7±12.8 to 50.6±11.7, p=0.248 LLFDI (disability components): Personal role frequency: 47.6±10.8 to 49.6±18.1 vs. 49.2±14.8 to 47.2±11.9, p=0.025 Difficulty dimension total: 53.9±21.5 to 68.0±16.6 vs. 62.2±15.3 to 59.5±17.7, p=0.025 Instrumental role difficulty: 52.5±21.5 to 68.1±13.2 vs. 61.2±15.9 to 58.0±18.7, p=0.031. There were no significant differences between groups on any of the other LLFDI function domains (upper, lower or advance lower extremity scores), or the remaining disability components (frequency dimension total and social role frequency) **2015** There were no significant differences in mean baseline FES scores between groups or 6-month follow-up. The scores in both groups increased over time (2.2 vs. 2.3 points)

Study/Type	Quality Rating	Sample Description	Method	Outcomes	Key Findings and Recommendations
					There was a significant increase in the mean SSPSC score (hospital care) at 6 months between groups favouring the STeleR group (+4.5 vs. -3.2, p=0.029). There was no significant difference in mean SSPSC score (home care) at 6 months between groups (+1.7 vs. -0.4, p=0.077). Dropouts and losses to follow-up: n=5

Virtual (Remote) Assessment

Study/Type	Quality Rating	Sample Description	Method	Outcomes	Key Findings and Recommendations
Peters et al. 2021 **Canada** **Feasibility/pilot study**	NA	5 persons with remote stroke (≥6 months) living in the community with impairment issues. Mean age was 63 years. One participant was a woman.	Based on consultation with 7 physiotherapists/ students, a Fugl-Meyer (FM) assessment, suitable for virtual care use (FM-tele) was developed. The feasibility of the newly developed tool was assessed with the input of assessors and individuals with stroke. Finally, agreement between the traditional FM and the FM-tele was assessed.	**Primary outcome:** Not applicable	*Development* The FM-tele excluded the categories of reflexes, movement out of synergy, and normal reflexes. FM-tele included 4 components from the original FM assessment: a proximal subscore (0-14), knee ankle subscore (0-4) and a coordination/speed subscore (0-6). Total scores range from 0-24. *Feasibility* All patients reported having some technical difficulties. The most common problems were with the iPad screen freezing and the inability to access clear audio. All of the assessors reported having some difficulty with the software; glitches were common. *Agreement* Proportional agreement between the FM-tele conducted in person and conducted remotely by the same assessor, one week apart was 4/5 for all flexor-synergy and extensor synergy items. Proportional agreement for both items of movement combining synergy items was 5/5. For

Study/Type	Quality Rating	Sample Description	Method	Outcomes	Key Findings and Recommendations
					coordination/speed, agreement was 5/5 for tremor, 3/5 for dysmetria and 2/5 for speed Total in person FM-tele scores for the 5 patients were: 18, 20, 20, 12 and 20. Corresponding total score assessment for remote were: 16, 20, 23, 13 and 21 out of a possible 24 points.
Gillespie et al. 2021 **Canada** **Reliability study**	NA	20 persons with stroke recruited from an early supported discharge program, or a physiotherapy clinic. Mean age was 73 years, 55% were men. Mean FIM score was 111. All participants walked independently or with supervision, most with the use of a gait aid.	Two raters, a physiotherapist and an occupational therapist, each administered the Berg Balance Scale (BBS) to all participants, using both telerehabilitation (videoconferencing) and traditional in-person approaches, in random order. During the telerehabilitation assessment, clinicians were located in a hospital, while participants and therapy assistants were located at participants' home. During the in-person portion, assessments were conducted in the patient's home.	**Primary outcome:** Inter-rater reliability	The initial assessment was performed an average of 50 days post stroke (n=18). In 2 cases, stroke had occurred years previously. The mean BBS scores were 47.7 using telerehabilitation and 47.0, in person. The agreement between raters was excellent using Krippendorff's α (0.97, 95% CI 0.96-0.99) and Cohen's κ (0.97, 95% CI 0.96- 0.99). The intra-class correlation coefficient (ICC) for total BBS score was 1.0. For individual BBS items, ICCs ranged from 0.81-0.99. Agreement was highest for the items of standing with eyes closed (ICC = 0.99, 95% CI 0.94- 0.99) and pick up object (ICC= 0.97, 95% CI 0.93-0.99). Agreement was lowest for the items of turning to look behind (ICC=0.84 95% CI 0.61- 0.94) and tandem stance (ICC=0.81 95% CI 0.52- 0.93).
Amano et al. 2018 **Japan** **Reliability study**	NA	30 persons recovering from stroke with hemiparesis, recruited from a single site. Median age was 65.5 years, 40% were women. Median time since stroke was 41.2 months.	Assessments of 2 measures (the arm section of the Fugl-Meyer Assessment [FMA] and the Action Research Arm Test [ARAT] were conducted by 2 trained assessors, using direct observation and video observation of each participant. The direct observation assessment was video-recorded for the video observation assessment.	**Primary outcome:** Inter-rater reliability	Median FMA score was 44 using direct assessment and 43 using video assessment. Median ARAT score was 41 for both direct assessment and video assessment The intra-class correlation coefficient (ICC) for total FMA scores was 0.998 (95% CI 0.995-0.999). ICCs for the sum of individual items within each section ranged from 0.992 to 0.998. Spearman's *r* for total FMA scores was 0.992 (95% CI 0.983-0.996). Correlations for the sum of

Study/Type	Quality Rating	Sample Description	Method	Outcomes	Key Findings and Recommendations
					individual items within each section ranged from 0.986 to 1.000. The intra-class correlation coefficient (ICC) for total ARAT scores was 0.998 (95% CI 0.996-0.999). ICCs for individual the sum of items within each section ranged from 0.980 to 0.999. Spearman's *r* for total ARAT scores was 0.993 (95% CI 0.984-0.997). Correlations for the sum of individual items within each section ranged from 0.949 to 0.997.
Palsbo et al. 2007 **USA** **Prospective Study**	NA	24 adults recovering from stroke who were currently receiving outpatient or inpatient therapy for speech or physical problems. Median age was 64 years, 75% were men.	Participants were randomized to a remote or face-to-face administration of a subset of the Boston Diagnostic Aphasia Examination (BDAE) and to remote or face-to-face assessment of 3 of 11 constructs from the National Outcomes Measurement System (speech comprehension, speech expression and motor speech). Assessments were conducted by 4 Speech-Language Pathologists (SLP) at 2 sites. Remote and in-person assessments were conducted simultaneously.	**Primary outcome:** Agreement	*Face-to-face administration of BDAE* Percentage within the 95% limits of agreement/percent exact agreement Motor speech 92%/67% Speech comprehension 92%/50% Speech expression 92%/50% *Remote administration of BDAE* Percentage within the 95% limits of agreement/ percent exact agreement Motor speech 100%/25% Speech comprehension 92%/8% Speech expression 100%/25%

Virtual Family Conference

Study/Type	Quality Rating	Sample Description	Method	Outcomes	Key Findings and Recommendations
Ritsma et al. 2023 **Canada** **Single group intervention study**	NA	87 carers of patients who were receiving inpatient rehabilitation. 67% of carers were women and 41% lived with the patient. Mean age of the patients was 75 years.	Participants attended a 1-hour virtual family conference, using a teleconference platform 1-2 weeks prior to discharge, addressing 9 primary themes/topics, which was led by the patient's physiatrist.	**Primary outcomes:** Stroke Knowledge and Transition Preparedness Questionnaire (5 items), Information Satisfaction Questionnaire (5	There were 48 virtual family conferences. There was significant improvement in all 5 questions related to stroke knowledge with more responses rated as good or excellent post intervention.

Study/Type	Quality Rating	Sample Description	Method	Outcomes	Key Findings and Recommendations
			Carers were asked to complete three online questionnaires before and after the family conference.	items), Kingston Caregiver Stress Scale (4 items)	There was in increase in the number of "yes" responses to all questions on the Information Satisfaction Questionnaire post intervention (e.g. Do you feel you know enough about what a stroke is? 72% pre intervention vs. 93% post intervention). There were fewer significant improvements in the proportion of respondents reporting having extreme stress, a lot of stress, moderate stress, some stress or no stress post intervention for all 4 items of the Kingston Caregiver Stress Scale.

Abbreviations

ADL: Activity of Daily Living	CA: Concealed Allocation	CI: Confidence Interval
FIM: Functional Independence Measure	LOS: length of stay	ITT: Intention to treat
MD: mean difference	N/A: Not assessed	OR: Odds Ratio
RCT: randomized controlled trial	SLP: Speech & Language Pathologist	SMD: Standardized Mean Difference

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