NGC banner

Guideline Summary NGC-5318

Guideline Title

Clinical practice guidelines for intensity and organization of rehabilitation.

Bibliographic Source(s)

Brosseau L, Wells GA, Finestone HM, Egan M, Dubouloz CJ, Graham I, Casimiro L, Robinson VA, Bilodeau M, McGowan J. Clinical practice guidelines for intensity and organization of rehabilitation. Top Stroke Rehabil 2006 Spring;13(2):68-97.

Guideline Status

This is the current release of the guideline.

Scope

Disease/Condition(s)

Hemiplegia or hemiparesis following a single clinically identifiable ischemic or hemorrhagic cerebrovascular accident (CVA)

Guideline Category

Management

Rehabilitation

Clinical Specialty

Neurology

Physical Medicine and Rehabilitation

Intended Users

Occupational Therapists

Patients

Physical Therapists

Physicians

Students

Guideline Objective(s)

To promote the appropriate use of various rehabilitation interventions in the management of stroke survivors

Target Population

Adult patients (>18 years of age) presenting with hemiplegia or hemiparesis following a single clinically identifiable ischemic or hemorrhagic cerebrovascular accident (CVA)

Interventions and Practices Considered

1. Stroke unit care
2. Enhanced physical therapy
3. Enhanced occupational therapy
4. Enhanced upper extremity therapy
5. Intensive outpatient physiotherapy rehabilitation

Note: See the "Major Recommendations" field and the original guideline document for specific recommendations for individual interventions.

Major Outcomes Considered

- Body function: pain reduction, muscle strength, motor function/motor recovery, range of motion (ROM), postural status, balance status, gait status, cadence, stride length, sensory status, spasticity/muscle tone, global physician assessment, global patient assessment, and cardiopulmonary function.
- Activities and participation: walking speed, walking distance, endurance, functional status, patient adherence, patient satisfaction, length of stay, discharge disposition, quality of life, and return to work.

Methodology

Methods Used to Collect/Select the Evidence

Searches of Electronic Databases

Description of Methods Used to Collect/Select the Evidence

Literature Search

The library scientist developed a structured literature search based on the sensitive search strategy recommended by The Cochrane Collaboration and modifications to that strategy proposed by Haynes et al*. The Cochrane Collaboration method minimizes bias through a quantitative systematic Weighted Mean Difference approach to the literature search, study selection, and data extraction and synthesis. The search was organized around the condition and interventions rather than the outcomes because it was an a priori search. Thus, the guideline developers had no control over the outcomes that the authors of the primary studies decided to measure (See Appendix 1 in the original guideline document for literature search results).

The library scientist expanded the search strategy to identify case control, cohort, and non-randomized studies and conducted the search in the electronic databases of MEDLINE, EMBASE, Current Contents, the Cumulative Index to Nursing and Allied Health (CINAHL), and the Cochrane Controlled Trials Register up to December 2004. She also searched the registries of the Cochrane Field of Rehabilitation and Related Therapies, the Cochrane Musculoskeletal Group, the Physiotherapy Evidence Database (PEDro), and the University of Ottawa EBCPGs Web site. Finally, she searched the reference lists of all of the included trials for relevant studies and contacted content experts for additional studies.

In the first round of study inclusion or exclusion, two trained independent reviewers appraised the titles and abstracts of the literature search, using a checklist with the a priori defined selection criteria (Table 1 in the original guideline document). For each pair of reviewers, individuals independently read the title and abstract of each article and created a list of all of the articles in the database along with a reason for either including or excluding each article. If the reviewers were uncertain about a particular article after having read the abstract, they ordered the article and read it in full before making a determination. Before deciding whether to include or exclude the article, a comparison of their individual lists was performed. A senior reviewer, a methodologist and a clinical expert, checked the two independent lists of articles and the reasons for inclusion or exclusion to determine potential inconsistencies. Seven percent of the abstracts needed the consultation of the senior reviewer and an additional review of the problematic article. For the second round of the inclusion and exclusion process, the pairs of reviewers retrieved articles selected for inclusion from the first round and independently assessed the full articles for inclusion or exclusion in the study. Using predetermined extraction forms, the pairs of reviewers independently extracted from included articles data on the population characteristics, details of the interventions, trial design, allocation concealment, and outcomes. The pairs of reviewers assessed the methodological quality of the studies using the Jadad Scale a 5-point scale with reported reliability and validity that assigns 2 points each for randomization and double blinding and 1 point for description of withdrawals. The reviewers resolved differences in data extraction and quality assessment through consensus with the senior reviewer. This consensus served to support the reliability of data obtained with the article selection process.

Study Inclusion/Exclusion Criteria

The inclusion/exclusion criteria were based upon previous criteria used by the Philadelphia Panel. This list of criteria, which had been created for multiple diagnoses, was adapted and approved by the Ottawa Methods Group (OMG) for use with patients post stroke (Table 1 in the original guideline document).

All original comparative controlled studies that evaluated relevant physical rehabilitation interventions in stroke patients were included: randomized controlled trials (RCTs), controlled clinical trials (CCTs),** cohort studies, and case-control studies. Crossover studies were included, but to avoid potential confounding carry-over effects the data from only the first part of the study (before crossing) was analyzed. Studies where patients served as their own controls were excluded. No limitations based on methodological quality were imposed a priori with regard to the selection of comparative controlled studies; however, the quality of the studies was considered when grading the recommendations resulting from our analysis.

Uncontrolled cohort studies (studies with no comparison group) and case series were excluded, as were eligible studies with greater than a 20% drop-out rate or a sample size of fewer than 5 patients per group. Trials published in languages other than French and English were not analyzed, because of the additional time and resources required for translation. Abstracts were excluded if they contained insufficient data for analysis and additional information could not be obtained from the authors. For further exclusion criteria, see Table 1 in the original guideline document.

*Haynes R, Wilczynski N, McKibbon KA, Walker CJ. Developing optimal search strategies for detecting clinically sound studies in MEDLINE. *J Am Med Inform Assoc*. 1994;1:447-458.

**Controlled clinical trials (CCTs) are considered the same as randomized control trials (RCTs). However, according to the Jadad Scale, CCTs are either not randomized or have not been appropriately randomized.

Number of Source Documents

56 articles were included.

Methods Used to Assess the Quality and Strength of the Evidence

Expert Consensus (Committee)

Weighting According to a Rating Scheme (Scheme Given)

Rating Scheme for the Strength of the Evidence

Level I: Randomized controlled trials

Level II: Nonrandomized studies

Methods Used to Analyze the Evidence

Meta-Analysis of Randomized Controlled Trials

Review of Published Meta-Analyses

Description of the Methods Used to Analyze the Evidence

The data were analyzed using Review Manager Software. Continuous data, "data with a potentially infinite number of possible values along a continuum," were analyzed using the weighted mean differences (WMDs) between the intervention and control groups at the end of the study, where the weight is the inverse of the variance. A WMD is "a method of meta-analysis used to combine measures on continuous scales (such as weight), where the mean, standard deviation and sample size in each group are known." Dichotomous data or data with only two classifications were analyzed using relative risks. According to Cochrane, the relative risk is "the ratio of risk in the intervention group to the risk in the control group. The risk (proportion, probability, or rate) is the ratio of people with an event in a group to the total in the group."

See the original guideline document for more information.

Methods Used to Formulate the Recommendations

Expert Consensus

Description of Methods Used to Formulate the Recommendations

The research staff reviewed articles and created draft evidence tables, which the nine clinical experts received in preparation for their consensus meeting with the Ottawa Methods Group (OMG). These tables were used as the basis for making the Ottawa Panel recommendations.

A methods group developed the draft guidelines and they were adopted by expert consensus.

Rating Scheme for the Strength of the Recommendations

Grade A: Evidence from one or more randomized controlled trials (RCTs) of a statistically significant, clinically important benefit (>15%)

Grade B: Statistically significant, clinically important benefit (>15%), if the evidence was from observational studies or controlled clinical trials (CCTs)

Grade C+: Evidence of clinical importance (>15%) but not statistical significance

Grade C: Interventions where an appropriate outcome was measured in a study that met the inclusion criteria, but no clinically important difference and no statistical significance were shown

Grade D: Evidence from one or more randomized controlled trials of a statistically significant benefit favoring the control group (<0%: favors controls)

Grade D+: Evidence of clinical importance (≤-15% for controls) without statistical significance

Grade D-: Evidence from one or more randomized controlled trials of a clinically important benefit (≤-15% for controls) that was statistically significant, where the number of participants in the study is equal to or higher than 100

Cost Analysis

A formal cost analysis was not performed and published cost analyses were not reviewed.

Method of Guideline Validation

External Peer Review

Internal Peer Review

Description of Method of Guideline Validation

The guidelines were sent to the external experts for review. To judge the clinical usefulness of the guidelines, the positive recommendations were also sent to practitioners for feedback. Practitioners were asked four questions for each guideline: whether the recommendation was clear, whether the practitioners agreed with the recommendation, whether they felt that the literature search on the different intervention of rehabilitation was relevant and complete, and whether the results of the trials in the guidelines were interpreted according to the practitioners' understanding of the data. Their questions and comments were carefully addressed to improve the clarity of the final guidelines.

Recommendations

Major Recommendations

The recommendations are graded by their level (I, II) and strength (A, B, C+, C, D, D+, D-) of evidence. Definitions for the level and strength of the recommendations are presented at the end of the "Major Recommendations" field.

Clinical Practice Guidelines for Intensity and Organization of Rehabilitation

Stroke unit versus general ward, level I (randomized controlled trial [RCT]) and level II (controlled clinical trial [CCT]): **Grade A** for length of stay at end of treatment, 2 weeks, and follow-up, 3 years (clinically important benefit demonstrated); **grade B** for mobility (number of patients able to walk long distances independently) at end of treatment, 6 weeks (clinically important benefit demonstrated); **grade C+** for functional status (number of patients with mild-moderate impairment) at follow-up, 1 year (clinically important benefit demonstrated without statistical significance); **grade C** for functional status (number of patients deteriorated in activities of daily living (ADL) score) at end of treatment, 3 months, and follow-up, 6 months, functional status (number of patients independent in ADL) at end of treatment, 6 weeks, length of stay (in days) at end of treatment, 6 weeks and 3 months, mobility (number of

patients independent in walking mobility) at end of treatment, 16 weeks, mobility (number of patients independent in walking [Barthel Index], number of patients independent in indoor and outdoor walking [Rivermead ADL Scale–self-care], number of patients independent in walking outside and climbing stairs [Rivermead ADL Scale–household]) at end of treatment, 3 and 6 months, motor function (number of patients independent in upper extremity and lower extremity function) at end of treatment, 16 weeks, efficiency at end of treatment, 2 weeks, postural status (number of patients sitting and standing) at follow-up, 6 weeks, functional status (ADL score) at end of treatment, 3 months, and follow-up, 9 months, and resource cost (total cost per patient in thousands of dollars) at follow-up, 1 year (no benefit demonstrated); **grade D** for mobility (number of patients able to walk short distances with or without aids) at end of treatment, 6 weeks, functional status (number of functional patients) at follow-up, 1 year, and resource cost (number of physician visits per patient) at follow-up, 1 year (no benefit demonstrated but favoring control); **grade D+** for functional status (ADL score) at end of treatment, 1 week (clinically important benefit favoring control demonstrated without statistical significance). Patients with acute, subacute, postacute, and chronic stroke.

Stroke unit versus home care, level I (RCT): **Grade A** for functional status (number of patients independent with Barthel) at follow-up, 9 months (clinically important benefit demonstrated); **grade C** for functional status (number of patients independent with Modified Rankin score) at end of treatment, 3 months, and follow-up, 9 months, and functional status (number of patients independent with Barthel) at end of treatment, 3 months (no benefit demonstrated). Patients with acute stroke.

Stroke unit (large artery stroke) versus general ward (large artery stroke), level I (RCT): **Grade A** for functional status at follow-up, 1 year, and quality of life at follow-up, 3 months (clinically important benefit demonstrated); **grade C** for functional status at follow-up, 3 months, and quality of life at follow-up, 3 months (no benefit demonstrated); **grade D** for length of stay at follow-up, 3 months (no benefit demonstrated but favoring control); **grade D-** for efficiency at follow-up, 3 months (clinically important benefit favoring control demonstrated with statistical significance). Patients with acute stroke.

Stroke unit (small artery stroke) versus general ward (small artery stroke), level I (RCT): **Grade A** for quality of life at follow-up, 3 months (clinically important benefit demonstrated); **grade C** for quality of life at follow-up, 1 year (no benefit demonstrated); **grade D** for functional status at follow-up, 3 months, and 1 year (no benefit demonstrated but favoring control); **grade D-** for length of stay and efficiency at follow-up, 3 months (clinically important benefit favoring control demonstrated with statistical significance). Patients with acute stroke.

Intensive outpatient physiotherapy rehabilitation program versus control group, level I (RCT): **Grade C+** for quality of life at end of treatment, 3 months (clinically important benefit demonstrated without statistical significance); **grade C** for functional status at end of treatment, 3 months (no benefit demonstrated); **grade D** for functional status at follow-up, 6 months (no benefit demonstrated but favoring control). Patients with chronic stroke.

Six days/week versus seven days/week treatment, level I (RCT): **Grade C+** for mobility at end of treatment, 3 weeks (clinically important benefit demonstrated without statistical significance); **grade C** for functional status and length of stay at end of treatment, 3 weeks (no benefit demonstrated). Patients with post-acute stroke.

Enhanced occupational therapy versus standard customary occupational therapy, level I (RCT): **Grade A** for functional status (number of patients improved in ADL) at end of treatment, 8 weeks and 6 months, life habit/leisure (overall leisure score) at end of treatment, 3 and 6 months, life habit/leisure (total leisure score) at end of treatment, 6 months, mobility (Nottingham Extended Activities of Daily Living [EADL] score for mobility) at end of treatment, 3 and 6 months, functional status (Nottingham EADL score) at end of treatment, 8 weeks, 3 months, and 6 months (clinically important benefit demonstrated); **grade C+** for quality of life (number of patients living independently) and functional status (functional independence measures [FIM] for upper extremity and lower extremity dressing) at end of treatment, 3 weeks, and functional status (EADL total score) at follow-up, 3 months (clinically important benefit demonstrated without statistical significance); **grade C** for life habit/leisure (total leisure score) and mobility (Nottingham Health Profile [NHP] score for mobility) at end of treatment, 6 months, functional status (Barthel Index score) at follow-up, 3 months (no benefit demonstrated); **grade D** for mobility (NHP score for mobility) at end of treatment, 3 months (no benefit demonstrated but favoring control); **grade D+** for pain relief at end of treatment, 3 months and 6 months, and quality of life (General Health Questionnaire) at follow-up, 3 months (clinically important benefit favoring control demonstrated without statistical significance). Patients with subacute stroke.

Enhanced occupational therapy versus no therapy, level I (RCT): **Grade A** for mobility (NHP score for mobility and Nottingham EADL for mobility) at end of treatment, 3 months and 6 months, life habit/leisure (overall leisure score and total leisure activity) at end of treatment, 3 and 6 months, functional status (number of patients improved in ADL) at follow-up, 6 months (clinically important benefit demonstrated); **grade C+** for activity involvement (Katz Adjustment Index: number of patients satisfied with their walking) at follow-up, 13 weeks, activity involvement (number of patients satisfied with their work in the yard) at end of treatment, 5 weeks, and functional status (EADL) at follow-up, 1 year (clinically important benefit demonstrated without statistical significance); **grade C** for functional status (Barthel ADL Index) at follow-up, 6 months and 1 year, functional status (EADL) at follow-up, 6 months, activity involvement (number of patients satisfied with their work in and around the house and number of patients satisfied with their walking) at end of treatment, 5 weeks, and activity involvement (number of patients satisfied with their work in the yard) at follow-up, 13 weeks (no benefit demonstrated); **grade D** for activity involvement (number of patient satisfied with their work in and around house) at follow-up, 13 weeks (no benefit demonstrated but favoring control); **grade D+** for pain relief at end of treatment, 3 and 6 months (clinically important benefit favoring control demonstrated without statistical significance). Patients with subacute stroke.

Standard customary occupational therapy versus no therapy, level I (RCT): **Grade A** for functional status (EADL score) at follow-up, 1 month (clinically important benefit demonstrated); **grade C+** for mobility (NHP for mobility) at end of treatment, 3 and 6 months, for pain relief at end of treatment, 3 months (clinically important benefit demonstrated without statistical significance); **grade C** for life habit/leisure (overall leisure score and total leisure activity score) at end of treatment, 3 and 6 months, for functional status (Barthel Index score) at follow-up, 1 month, pain relief at end of treatment, 6 months (no benefit demonstrated); **grade D** for quality of life at follow-up, 1 month (no benefit demonstrated but favoring control); **grade D+** for functional status (EADL score for mobility) at end of treatment, 3 months and 6 months (clinically important benefit favoring control demonstrated without statistical significance). Patients with subacute stroke.

Enhanced physiotherapy (60-minute treatment of physiotherapy) versus standard customary physiotherapy care (30 minutes), level I (RCT): **Grade C** for quality of life at end of treatment, 6 weeks (no benefit demonstrated); **grade D** for quality of life at end of treatment, 6 months (no benefit demonstrated but favoring control). Patients with chronic stroke.

Enhanced physiotherapy versus standard customary physiotherapy treatment, level I (RCT): **Grade A** for motor function (Action Research Arm Test [ARAT]) at follow-up, 21 weeks (clinically important benefit demonstrated); **grade C+** for functional status (Barthel Index) at follow-up, 3 and 16 weeks (clinically important benefit demonstrated without statistical significance); **grade C** for functional status (Barthel Index) at end of treatment, 5 weeks, and follow-up, 21 weeks, functional status (EADL score) at follow-up, 16 weeks and 21 weeks, motor function (Rivermead Motor Assessment−upper extremity) at end of treatment, 5 weeks, and follow-up, 21 weeks, motor function (Ten-Hole Peg Test) at end of treatment, 5 weeks, and follow-up, 16 weeks, and motor function (ARAT) at end of treatment, 5 weeks (no benefit demonstrated); **grade D** for functional status (EADL score) at end of treatment, 5 weeks (no benefit demonstrated but favoring control); **grade D+** for motor function (Rivermead Motor Assessment−gross function) at follow-up, 3 weeks, and grip strength (maximum grip) at follow-up, 16 weeks (clinically important benefit favoring control demonstrated without statistical significance); **grade D-** for motor function (Rivermead Motor Assessment-upper extremity) at follow-up, 3 weeks and 16 weeks, motor function (ARAT) at follow-up, 16 weeks, motor function (Rivermead Motor Assessment−gross function) at end of treatment, 5 weeks, and follow-up, 16 weeks, and grip strength (maximum grip) at end of treatment, 5 weeks, and follow-up, 3 weeks (clinically important benefit favoring control demonstrated with statistical significance). Patients with subacute stroke.

Enhanced assistant physiotherapist versus standard customary physiotherapy treatment, level I (RCT): **Grade A** for motor function (Rivermead Motor Assessment-upper extremity) at follow-up, 21 weeks, motor function (ARAT) at end of treatment, 5 weeks, and follow-up, 21 weeks (clinically important benefit demonstrated); **grade C+** for functional status (Barthel Index) at follow-up, 3 and 16 weeks, functional status (EADL) at end of treatment, 5 weeks, and follow-up, 21 weeks, motor function (ARAT) at follow-up, 16 weeks (clinically important benefit demonstrated without statistical significance); **grade C** for functional status (Barthel Index) at end of treatment, 5 weeks, functional status (EADL score) at follow-up, 16 weeks, motor function (Rivermead Motor Assessment-upper extremity) at end of treatment, 5 weeks, and follow-up, 16 weeks, motor function (Rivermead Motor Assessment−gross function) at follow-up, 3 and 16 weeks, motor function (Ten-Hole Peg Test) at end of treatment, 5 weeks, and follow-up, 16 weeks (no benefit demonstrated); **grade D** for functional status (Barthel Index) at follow-up, 21 weeks (no benefit demonstrated but favoring control); **grade D+** for motor function (Rivermead Motor Assessment-upper extremity) at follow-up, 3 weeks, and grip strength (maximum grip) at end of treatment, 5 weeks, and follow-up, 16 weeks (clinically important benefits favoring control demonstrated without statistical significance); **grade D-** for motor function (Rivermead Motor Assessment−gross function) at end of treatment, 5 weeks, and grip strength (maximum grip) at follow-up, 3 weeks (clinically important benefit favoring control demonstrated with statistical significance). Patients with subacute stroke.

Enhanced physiotherapy versus enhanced assistant physiotherapist treatment, level I (RCT): **Grade A** for motor function (Rivermead Motor Assessment−gross function) at end of treatment, 5 weeks, grip strength (maximum grip) at follow-up, 3 weeks, and motor function (ARAT) at follow-up, 21 weeks (clinically important benefit demonstrated); grade A favoring enhanced assistant physiotherapist for functional status (Barthel Index) at end of treatment, 5 weeks, motor function (Rivermead Motor Assessment−upper extremity) at follow-up, 16 weeks and 21 weeks, functional status (EADL score) at follow-up, 21 weeks, motor function (ARAT) at end of treatment, 5 weeks, and follow-up, 16 weeks (clinically important benefit demonstrated); **grade C+** for motor function (Rivermead Motor Assessment−gross function) at follow-up, 16 weeks (clinically important benefit demonstrated without statistical significance); **grade C+** favoring enhanced assistant physiotherapist for functional status (Barthel Index) at follow-up, 3 and 16 weeks, functional status (EADL) at end of treatment, 5 weeks, motor function (Rivermead Motor Assessment−upper extremity) at follow-up, 3 weeks, grip strength at end of treatment, 5 weeks, and follow-up, 16 weeks (clinically important benefit demonstrated without statistical significance); **grade C** for functional status (Barthel Index) at follow-up, 21 weeks, functional status (EADL score) at follow-up, 16 weeks, motor function (Rivermead Motor assessment−upper extremity) at end of treatment, 5 weeks, and motor function (Ten-Hole Peg Test) at end of treatment, 5 weeks, and follow-up, 16 weeks (no benefit demonstrated). Patients with subacute stroke.

Enhanced upper-extremity treatment versus interdisciplinary treatment, level I (RCT): **Grade A** for motor function (Frenchay Arm Test) and functional status (Barthel Index) at follow-up, 18 weeks (clinically important benefit demonstrated); **grade C** for motor function (Upper Limb Motricity Index and Frenchay Arm Test) at follow-up, 6 weeks, functional status (Nottingham EADL) at follow-up, 18 weeks, and functional status (Barthel Index) at follow-up, 6 weeks (no benefit demonstrated); **grade D** for motor function (Upper Limb Motricity Index) at follow-up, 18 weeks, functional status (Nottingham EADL) at follow-up, 6 weeks (no benefit demonstrated but favoring control); **grade D+** for motor function (ARAT) at follow-up, 6 and 18 weeks (clinically important benefit favoring control demonstrated without statistical significance). Patients with subacute stroke.

Enhanced therapy (severe stroke) versus standard customary care (severe stroke), level I (RCT): **Grade D** for mobility at end of treatment, 6 months (no benefit demonstrated). Patients with acute stroke.

Enhanced therapy (mild stroke) versus standard customary care (mild stroke), level I (RCT): **Grade D** for mobility at end of treatment, 6 months (no benefit demonstrated). Patients with acute stroke.

Home therapy (physiotherapy) versus standard customary care without home visits, level I (RCT): **Grade C+** for functional status (Instrumental Activities of Daily Living [IADL]−domestic activities) at follow-up, 6 months (clinically important benefit demonstrated without statistical significance); **grade C** for discharge disposition, functional status, mobility, and life habits/leisure at follow-up, 6 months (no benefit demonstrated). Patients with chronic stroke.

Home-based physiotherapy at high-intensity versus low-intensity physiotherapy control, level I (RCT): **Grade A** for motor function (STroke REhabilitation Assessment of Movement [STREAM] lower extremity) at follow-up, 11 weeks (clinically important benefit demonstrated); **grade C+** functional status and motor function (STREAM−upper extremity) at follow-up, 11 weeks (clinically important benefit demonstrated without statistical significance); **grade C** for mobility at follow-up, 11 weeks, functional status and motor function (STREAM−upper extremity) at follow-up, 22 weeks (no benefit demonstrated); **grade D** for mobility at follow-up, 22 weeks (no benefit demonstrated but favoring control); **grade D+** for motor function (STREAM−lower extremity) at follow-up, 22 weeks (clinically important benefit favoring control demonstrated without statistical significance). Patients with chronic stroke.

Home-based rehabilitation versus hospital-based rehabilitation, levels I and II (RCT, CCT): **Grade C** for resource cost at follow-up, 1 year, and mobility and functional status at end of treatment, 3 months (no benefit demonstrated). Patients with post-acute and chronic stroke.

Rehabilitation versus no rehabilitation group, level II (CCT): **Grade D** for motor function at end of treatment, 6 months (no benefit demonstrated but favoring control); **grade D+** for functional status at end of treatment, 6 months (clinically important benefit favoring control demonstrated without statistical significance). Patients with subacute stroke.

Home therapy (physician) versus standard customary care without home visits, level I (RCT): **Grade A** for decrease in hospital readmissions and functional status (Frenchay Activities Index [FAI]) at follow-up, 6 months (clinically important benefit demonstrated); **grade C** for functional status (Functional Quality of Movement Scale [FQM]) motor performance, Barthel Index, EADL−personal daily care, IADL−domestic activities), mobility and life habits/leisure at follow-up, 6 months (no benefit demonstrated); **grade D** for functional status (FQM quality of movement) at follow-up, 6 months (no benefit demonstrated but favoring control). Patients with chronic stroke.

Home therapy (physician) versus home therapy (physiotherapy), level I (RCT): **Grade C+** favoring home therapy (physiotherapy) for functional status (IADL−domestic activities) at follow-up, 6 months (clinically important benefit demonstrated without statistical significance); **grade C** for decrease in hospital readmission, functional status (Frenchay Activities Index, FQM motor performance, FQM quality of movement, Barthel Index, and EADL−personal daily care), mobility and life habits/leisure at follow-up, 6 months (no benefit demonstrated). Patients with chronic stroke.

Extended stroke unit service with early supported discharge versus ordinary stroke unit service, level I (RCT): **Grade A** for functional status (number of patients with Rankin score less than 2) at follow-up, 6 months (clinically important benefits demonstrated); **grade C+** for physical mobility at follow-up, 3 weeks and 1 year (clinically important benefits demonstrated without statistical significance); **grade C** for functional status (number of patients with Barthel Index score higher than 95) at follow-up, 3 weeks, 6 months, and 1 year, for discharge status and preventing mortality at follow-up, 1 year, for energy level and pain at follow-up, 3 weeks, 6 months, and 1 year, for global health status at follow-up, 1 year, and functional status (number of patients with Rankin score less than 2) at follow-up, 3 weeks and 1 year (no benefit demonstrated); **grade D** for global health status at follow-up, 3 weeks and 6 months (no benefit demonstrated but favoring control); **grade D+** for physical mobility at follow-up, 6 months (clinically important benefits demonstrated without statistical significance favoring control). Patients with acute stroke.

Early physiotherapy intervention versus control group, level I (RCT): **Grade C+** for functional status (Modified Barthel Index) and motor function (Fugl-Meyer score for lower extremity) at end of treatment, 1 month, and follow-up, 5 months, and motor function (Fugl-Meyer score for upper extremity) at end of treatment, 1 month (clinically important benefits demonstrated without statistical significance); **grade D** for motor function (Fugl-Meyer score for upper extremity) at follow-up, 5 months (no benefit demonstrated but favoring control). Patients with acute stroke.

Home-based exercise training versus control, level I (RCT): **Grade A** for change in gait speed, gait endurance, torque (change in knee isometric extensors), endurance, and cardiopulmonary function at end of treatment, 12 weeks; **grade C+** for motor function (change in Fugl-Meyer lower extremity), change in gait speed, gait endurance, functional status (Physical Function Index), and strength (change in grip strength) at end of treatment, 12 weeks (clinically important benefit demonstrated without statistical significance); **grade C** for motor function (change in Fugl-Meyer upper extremity and lower extremity), balance (Berg balance and change in Berg balance), functional status (IADL and Barthel ADL Index) at end of treatment, 12 weeks (no benefit demonstrated); **grade D+** for balance (Functional reach) at end of treatment, 12 weeks (clinically important benefit favoring control demonstrated without statistical significance); **grade D** for torque (change in ankle isometric dorsiflexors; no benefit demonstrated but favoring control). Patients with post-acute stroke.

Outpatient versus home exercise group, level I (RCT): **Grade C+** favoring home exercise group for gait speed at end of treatment, 6 months, and follow- up, 3 months (clinically important benefit demonstrated without statistical significance); **grade C** for single support time at end of treatment, 6 months, and follow-up, 3 months (no benefit demonstrated). Patients with chronic stroke.

Outpatient versus control, level I (RCT): **Grade D** for gait speed at follow-up, 3 months (no benefit demonstrated but favoring control); **grade D+** for gait speed at end of treatment, 6 months, and single support time at end of treatment, 6 months, and follow-up, 3 months (clinically important benefit demonstrated without statistical significance). Patients with chronic stroke.

Outpatient therapy versus home therapy, level I (RCT): **Grade C** for grip strength on affected side and motor assessment, functional status, and gait speed at end of treatment, 6 weeks and 3 months (no benefit demonstrated). Patients with subacute stroke.

Home physiotherapy versus day-hospital group, level I (RCT): **Grade A** for resource cost at end of treatment, 8 weeks (clinically important benefit demonstrated). Patients with subacute stroke.

Home-exercise versus control group, level I (RCT): **Grade C** for gait speed at end of treatment, 6 months, and follow-up, 3 months (no benefit demonstrated); **grade D** for single support time at end of treatment, 6 months, and follow-up, 3 months (no benefit demonstrated but favoring control). Patients with chronic stroke.

Home therapy versus control group, level II (CCT): **Grade C** for motor function at end of treatment, 9 weeks (no benefit demonstrated). Patients with subacute stroke.

Combined outpatients and home exercise versus control group, level I (RCT): **Grade C** for gait speed at end of treatment, 6 months, and follow-up, 3 months (no benefit demonstrated); **grade D** for single support time at end of treatment, 6 months, and follow-up, 3 months (no benefit demonstrated but favoring control). Patients with chronic stroke.

Early care versus standard customary care in stroke unit, level I (RCT): **Grade A** for length of stay at end of treatment, 6 weeks (clinically important benefit demonstrated); **grade C** for mobility and functional status at end of treatment, 6 weeks (no benefit demonstrated). Patients with acute stroke.

Early supported discharge with home rehabilitation versus standard customary rehabilitation, level I (RCT): **Grade A** for functional status (Older Americans Resource Scale for Instrumental ADL) at end of treatment, 1 and 3 months, and length of stay at follow-up, 3 months (clinically important benefit demonstrated); **grade C** for motor function and mobility at end of treatment, 1 and 3 months, quality of life at follow-up, 6 months, functional status (Barthel Index) and pain relief at end of treatment, 3 months (no benefit demonstrated); **grade D** for functional status (Nottingham EADL score) at end of treatment, 3 months, and follow-up, 6 months, quality of life at end of treatment, 3 months, pain relief and functional status (Barthel Index) at end of treatment, 1 month (no benefit demonstrated but favoring control). Patients with acute stroke.

Early supported discharge versus standard customary rehabilitation, level I (RCT): **Grade A** for length of stay and quality of life (Dartmouth Coop Global Health Status−total) at end of treatment, 3 months, and functional status (Nottingham EADL) at follow-up, 3 months (clinically important benefit demonstrated); **grade C** for motor function and

functional status (Rivermead ADL score) at follow-up, 9 months, gait speed and functional status (Barthel ADL Index) at end of treatment, 3 months, and follow-up, 9 months, and quality of life (Dartmouth Coop Global Health Status–physical fitness, daily activities, and pain relief) at end of treatment, 3 months (no benefit demonstrated); **grade D** for motor function and functional status (Nottingham ADL) at end of treatment, 3 months (no benefit demonstrated but favoring control); **grade D+** for functional status (Nottingham ADL) at follow-up, 9 months (clinically important benefit favoring control demonstrated without statistical significance). Patients with acute and post-acute stroke.

Home intervention (rehabilitation and nursing services) versus standard customary care, level I (RCT): **Grade A** for resource cost at follow-up, 3 months (clinically important benefit demonstrated); **grade C** for quality of life at follow-up, 3 months (no benefit demonstrated). Patients with subacute stroke.

Nursing early activation program versus no therapy, level I (RCT): **Grade C** for mobility and functional status at follow-up, 1 year (no benefit demonstrated). Patients with acute stroke.

Integrated care pathway versus standard customary multidisciplinary team care, level I (RCT): **Grade C** for functional status (number of patients with no problems with self-care, number of patients with no problems with usual activities) and pain relief at end of treatment, 6 months (no benefit demonstrated); **grade D** for mobility, functional status (number of patients with some problems with usual activities), and pain relief at end of treatment, 6 months (no benefits demonstrated but favoring control); **grade D+** for functional status (number of patients with some problems with washing and dressing) at end of treatment, 6 months (clinically important benefit favoring control demonstrated without statistical significance). Patients with acute stroke.

Full-time integrated treatment (FIT) versus standard customary rehabilitation, level II (CCT): **Grade C** for functional status at end of treatment, 4 weeks and 6 weeks, and length of stay at end of treatment, 4 weeks (no benefit demonstrated). Patients with acute stroke.

Critical path method versus standard customary care method, level I (RCT): **Grade C** for functional status (FIM motor subscale) at end of treatment, 1 month (no benefit demonstrated); **grade D** for functional status (FIM raw score) and length of stay at end of treatment, 1 month (no benefit demonstrated but favoring control). Patients with acute stroke.

Structured nursing intervention versus conventional rehabilitation, level I (RCT): **Grade C** for functional status (FIM and IADL) and self-perception of health at end of treatment, 3 months, and follow-up, 3 months (no benefit demonstrated). Patients with acute stroke.

Home hospitalization versus standard stroke care (inpatient), level I (RCT): **Grade D** for neurological status and functional status at follow-up, 6 months (no benefit demonstrated but favoring control). Patients with acute stroke.

Definitions:

Level of Evidence

Level I: Randomized controlled trials

Level II: Nonrandomized studies

Grade of Recommendation

Grade A: Evidence from one or more randomized controlled trials (RCTs) of a statistically significant, clinically important benefit (>15%)

Grade B: Statistically significant, clinically important benefit (>15%), if the evidence was from observational studies or controlled clinical trials (CCTs)

Grade C+: Evidence of clinical importance (>15%) but not statistical significance

Grade C: Interventions where an appropriate outcome was measured in a study that met the inclusion criteria, but no clinically important difference and no statistical significance were shown

Grade D: Evidence from one or more randomized controlled trials of a statistically significant benefit favoring the control group (<0%: favors controls)

Grade D+: Evidence of clinical importance (≤-15% for controls) without statistical significance

Grade D-: Evidence from one or more randomized controlled trials of a clinically important benefit (≤-15% for controls) that was statistically significant, where the number of participants in the study is equal to or higher than 100

Clinical Algorithm(s)

None provided

Evidence Supporting the Recommendations

Type of Evidence Supporting the Recommendations

The type of supporting evidence is specifically stated for each recommendation.

Benefits/Harms of Implementing the Guideline Recommendations

Potential Benefits

Post-stroke physical rehabilitation interventions have been used to reduce pain and spasticity, as well as to increase range of motion (ROM), muscle force, mobility, walking ability, functional status, physical fitness, and quality of life. Post-stroke physical rehabilitation interventions are mostly noninvasive interventions that present very few adverse side effects and contraindications as compared with a large number of pharmacologic interventions.

Potential Harms

Not stated

Qualifying Statements

Qualifying Statements

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Drug and dosage selection: The authors have exerted every effort to ensure that drug selection and dosage set forth in this text are in accord with recommendations and practice current at the time of publication. However, we suggest that appropriate information sources be consulted when dealing with new and unfamiliar drugs. It remains the responsibility of every practitioner to evaluate the appropriateness of a particular opinion in the context of the actual clinical situation and with due consideration to any new developments in the field.

Limitations

It is important to point out that the Ottawa Panel Evidence-Based Clinical Practice Guidelines (EBCPGs) are not without limitations. First of all, the strength of clinical practice guidelines depends upon the quality of the primary studies found in the literature. The clinical studies that met the Ottawa Panel's selection criteria rarely exceeded 3 out of 5 on the Jadad scale, and the sample sizes were generally small. These methodological issues limit the reliability of the reported outcomes and the overall quality of the evidence. For example, it is often difficult to achieve adequate blinding with physical treatments that produce cutaneous sensation. However, all guidelines developers face these same issues with regard to methodological considerations. Of additional note, heterogeneity with respect to interventions, treatment schedules, study populations, outcome measures, and comparators was frequently encountered, which reduced the comparability of individual trials. As a result, quantitative pooling of data through meta-analysis was not appropriate in most cases. Equally, the findings were sometimes inconsistent from one study or outcome measure to the next. Weighing the evidence in such situations inevitably involves value judgments and is subject to interpretation. Due to the absence of a clear consensus with regard to the relative importance of specific, validated outcome measures, individual study findings were not weighted according to the type of outcome assessed or measurement scale used.

The Ottawa Panel also faced other limitations with regard to the development of these guidelines. Articles in the scientific literature were only considered if they were written in English or French due to the additional time and resources required for translation. Moreover, the categorization of studies according to the type of intervention examined was not always straightforward, because in some cases a particular study could be applied to several categories. A decision was made as to which category of intervention a particular study best belonged in order to avoid duplication. This decision was inherently subjective and could contribute to potential variation in the Ottawa Panel's recommendations with other published clinical practice guidelines.

With regard to the calculation of treatment benefit, the Ottawa Panel considered a 15% improvement relative to control as clinically important. However, this criterion remains somewhat arbitrary and may not be applicable to all rehabilitation interventions or outcome measures. Interventions that showed clinically important benefits without statistical significance for validated outcomes (grade C+) were interpreted as worthy of consideration in the rehabilitation of stroke patients and were given positive recommendations. Most of the existing EBCPGs on stroke rehabilitation did not consider clinical significance in synthesizing the evidence, which may further account for any differences in recommendations made by other guideline development groups. In the calculations of clinical relevance, difficulties also arose when the variance of data was not directly provided in the published articles. As a result, the Ottawa Methods Group, working closely with a senior biostatistician, developed a standardized methodology to estimate the variance of data (Appendix 2 in the original guideline document). This was the best conservative approximation that could be used to produce the Ottawa Panel recommendations.

Finally, the Ottawa Panel did not formally assess the cost-effectiveness of the various interventions studied. It is recognized, however, that cost and resource availability are important factors in the individual clinician's decision-making process.

The recommendations of the Ottawa Panel cannot replace clinical judgment, which is critical for applying the available evidence appropriately to the care of individual patients under specific circumstances.

Implementation of the Guideline

Description of Implementation Strategy

An implementation strategy was not provided.

Institute of Medicine (IOM) National Healthcare Quality Report Categories

IOM Care Need
Getting Better

IOM Domain
Effectiveness

Identifying Information and Availability

Bibliographic Source(s)

Brosseau L, Wells GA, Finestone HM, Egan M, Dubouloz CJ, Graham I, Casimiro L, Robinson VA, Bilodeau M, McGowan J. Clinical practice guidelines for intensity and organization of rehabilitation. Top Stroke Rehabil 2006 Spring;13(2):68-97.

Adaptation

Not applicable: The guideline was not adapted from another source.

Date Released

2006

Guideline Developer(s)

Ottawa Panel - Independent Expert Panel

Source(s) of Funding

Ottawa Panel

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Financial Disclosures/Conflicts of Interest

Not stated

Guideline Status

This is the current release of the guideline.

Guideline Availability

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Print copies: Available from Thomas Land Publishers, Inc., Subscription Office, P.O. Box 361, Birmingham, AL 35201-0361; Email: TLPsubs@ebsco.com

Availability of Companion Documents

None available

Patient Resources

None available

NGC Status

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