CANADIAN STROKE BEST PRACTICE RECOMMENDATIONS

Rehabilitation, Recovery and Community Participation Following Stroke

Part Two: Delivery of Stroke Rehabilitation to Optimize Functional Recovery Evidence Tables

7th edition, update 2025

Nutritional Management

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Stroke Rehabilitation and Recovery Writing Group

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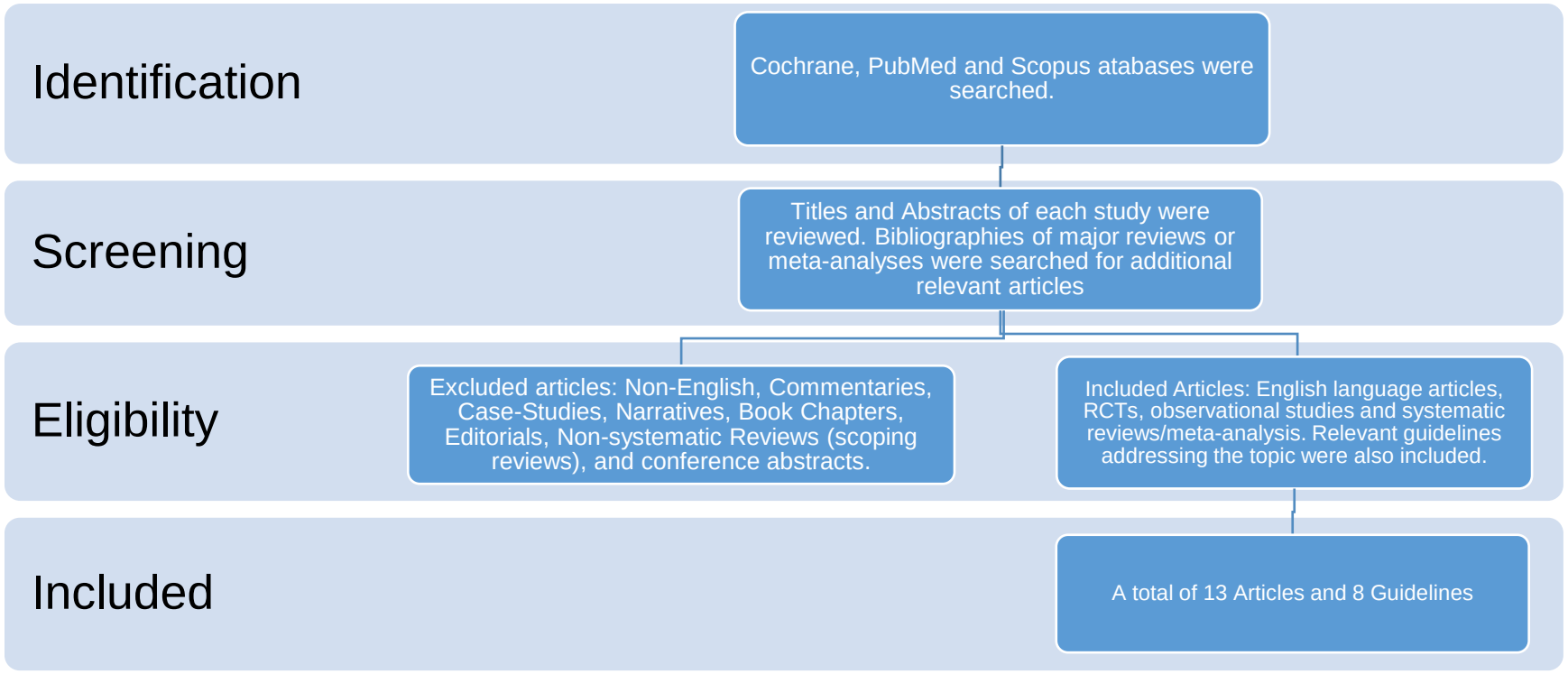
Search Strategy



Cochrane, PubMed, and Scopus databases using terms such as “stroke” and “nutrition” or “malnutrition” or “oral supplement” or “protein” or “energy”. 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. A total of 13 articles and 8 guidelines were included and separated into categories designed to answer specific questions.

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Published Guidelines

Guideline	Recommendations
National Clinical Guideline for Stroke for the UK and Ireland. London: Intercollegiate Stroke Working Party; 2023 May 4. **Available at:** www.strokeguideline.org**.** **(selected)**	Patients with acute stroke should be screened for the risk of malnutrition on admission and at least weekly thereafter. Screening should be conducted by trained staff using a structured, standardised, validated tool. Patients with stroke who are at risk of malnutrition should be offered nutritional support. This may include oral nutritional supplements, specialist dietary advice and/or tube feeding in accordance with their expressed wishes or, if the patient lacks mental capacity, in their best interests.
Clinical Guidelines for Stroke Management 2017. Melbourne (Australia): National Stroke Foundation. Chapter 3. Acute medical and surgical management	*Nutrition & Hydration* All stroke patients should have their hydration status assessed, monitored, and managed throughout their hospital admission. Where fluid support is required, crystalloid solution should be used in preference to colloid solutions as the first option to treat or prevent dehydration. Strong recommendation. All stroke patients should be screened for malnutrition at admission and on an ongoing basis (at least weekly) while in hospital. Strong recommendation For stroke patients whose nutrition status is poor or deteriorating, nutrition supplementation should be offered. Strong recommendation. For stroke patients who are adequately nourished, routine oral nutrition supplements are not recommended. Weak recommendation.
Dziewas R, Michou E, Trapl-Grundschober M, Lal A, Arsava EM, Bath PM et al. **European Stroke Organisation and European Society for Swallowing Disorders guideline for the diagnosis and treatment of post-stroke dysphagia.** ***Eur Stroke J*. 2021 Sep;6(3):LXXXIX-CXV.**	*Nutrition Screening* Expert opinion: There is consensus among the guideline group (15/15) that patients with acute stroke should be screened for nutritional risk within the first days after hospital admission using validated screening tools. Nutritional interventions In unselected stroke patients, we suggest to avoid routine use of oral nutritional supplementation. Quality of evidence: Moderate ⌖⌖⌖ Strength of recommendation: Weak against intervention ↓? In stroke patients who tolerate an oral diet and present with a risk of malnutrition or with manifest malnutrition, we suggest to consider the use of oral nutritional supplementation. Quality of evidence: Low ⌖⌖ Strength of recommendation: Weak for intervention ↑? In patients with post-stroke dysphagia and insufficient oral intake we suggest early enteral nutrition via a nasogastric tube. Quality of evidence: Moderate ⌖⌖⌖ Strength of recommendation: Weak for intervention ↑?
Nishioka S, Aragane H, Suzuki N, Yoshimura Y, Fujiwara D, Mori Tet al; Committee of Clinical Practice Guideline,	3.1. Patients with cerebrovascular disease Clinical question

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Guideline	Recommendations
Japanese Association of Rehabilitation Nutrition. **Clinical practice guidelines for rehabilitation nutrition in cerebrovascular disease, hip fracture, cancer, and acute illness: 2020 update.** ***Clin Nutr ESPEN*. 2021 Jun;43:90-103**	Should older adult patients with cerebrovascular disease undergoing rehabilitation receive enhanced nutritional care? Recommendation: We suggest enhanced nutritional care for patients with cerebrovascular disease undergoing rehabilitation to reduce complications related to infection and to improve activities of daily living (ADL) (certainty of evidence: low; recommendation level: weak). The appropriate dose and route of nutritional care should be selected according to individual conditions such as swallowing ability and intestinal functioning, and favourable types of enhanced nutritional care should include oral nutritional supplements, protein-rich foods, and other supplements.
Burgos R, Bretón I, Cereda E, Desport JC, Dziewas R, Genton L et al. **ESPEN guideline clinical nutrition in Neurology.** ***Clin Nutr.* 2018 Feb;37(1):354-396.** **(selected)**	*Nutrition Screening* Recommendation 54: The available evidence suggests that all stroke patients should be screened for risk of malnutrition on admission to hospital (within 48 h), and the Malnutrition Universal Screening Tool (MUST) can be used to identify patients who are more likely to benefit from medical nutrition therapy. Grade of recommendation: GPP strong consensus (100% agreement) *Oral Supplementation/Enteral Nutrition* Recommendation 57: In stroke patients who are able to eat and who have been identified to be malnourished or at risk of malnutrition oral nutrition strategies are recommended. Degree of recommendation: GPP: strong consensus (100% agreement)
Powers WJ, Rabinstein AA, Ackerson T, Adeoye OM, Bambakidis NC, Becker K et al; on behalf of the American Heart Association Stroke Council. **2018 Guidelines for the early management of patients with acute ischemic stroke: a guideline for healthcare professionals from the American Heart Association/American Stroke Association.** ***Stroke.* 2018; Mar;49(3):e46-e110**	Enteral diet should be started within 7 days of admission after an acute stroke. Class I; LOE B-R. Nutritional supplements are reasonable to consider for patients who are malnourished or at risk of malnourishment. Class IIa; LOE B-R.
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 Council on Quality of Care and Outcomes Research.	Nutritional supplements are reasonable to consider for patients who are malnourished or at risk of malnourishment. Class IIa, LOE B

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Guideline	Recommendations
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**	
Wirth R, Smoliner C, Jäger M, Warnecke T, Leischker AH, Dziewas R; DGEM Steering Committee. **Guideline clinical nutrition in patients with stroke.** ***Exp Transl Stroke Med*. 2013 Dec 1;5(1):14.** **(selected)**	Do patients with a decreased level of consciousness and mechanically ventilated stroke patients profit from tube feeding? Recommendation 12: Patients with a decreased level of consciousness and mechanical ventilation often require enteral nutrition for a longer period of time and tube feeding can therefore start early (C). When should nutrition therapy start in stroke patients with swallowing difficulties? Recommendation 14: Severe swallowing difficulties that do not allow sufficient oral food intake and are anticipated to persist for more than 1 week require early enteral nutrition via feeding tube (at least within 72 hours) (C). Which route of enteral feeding should be preferred? What are the indications of a PEG or a nasogastric tube? Recommendation 15: If a sufficient oral food intake is not possible during the acute phase of stroke, enteral nutrition shall be preferably given via a nasogastric tube (A). Recommendation 16: If enteral feeding is likely for a longer period of time (> 28 days), a PEG should be chosen and shall be placed in a stable clinical phase (after 14 – 28 days) (A). Recommendation 18: If a nasogastric tube is repeatedly removed accidentally by the patient and if artificial nutrition will probably be necessary for more than 14 days, early placement of a PEG should be considered (B). A nasal loop (bridle) is an effective alternative in this situation (B). Does duodenal or jejunal tube placement reduces aspiration risk in stroke patients? Recommendation 19: Feeding tubes should be inserted preferably in a gastric position (B). Should tube feed be delivered continuously or as a bolus? Recommendation 20: With a previous history of gastroesophageal reflux or when signs of gastroesophageal reflux with aspiration or a high risk of aspiration are present a continuous application of tube feed should be commenced. (B)

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Evidence Tables

Nutritional Status as a Predictor of Outcome

Study/Type	Quality Rating	Sample Description	Method	Outcomes	Key Findings and Recommendations
Felder et al. 2015 **Switzerland** **Retrospective study**	NA	3,186 acutely ill medical inpatients. Mean age was 71 years, 55.3% were men. 27.8% were at risk for malnutrition (Nutrition Risk Score-2002 [NRS]) ≥3. The most common reasons for admission were infections, cancers and immune disorders.	The association between nutritional risk and adverse clinical outcomes was examined using regression models. Analyses were adjusted for age, sex, comorbidities, and main diagnosis.	**Primary outcome:** Adverse outcomes including 30-day mortality. **Secondary outcomes:** Barthel Index (BI), QoL (EQ 5-D), LOS and 30-day readmission.	The risk of 30-day mortality was significantly increased in patients with an admission NRS ≥3, compared with those with scores <3 (7% vs. 33%, OR=4.76, 95% CI 3.60-6.30). The percentage of patients with a BI score ≤95 was significantly increased in patients with an admission NRS ≥3 (37% vs. 20.3%, OR=1.88, 95% CI 1.53-2.31). Median LOS was significantly longer in patients with NRS scores >3 vs. 3 vs. <3 (6, 8 and 10 days, respectively, p<0.001). Mean EQ-5S scores for the domains of mobility, self-care, usual activities and overall mean scores were higher in patients with NRS scores of <3 vs. scores of 3 and >3. There was no significant difference between groups for the domains of pain or anxiety. The risk of 30-day readmission was not significantly higher in patients with NRS scores ≥3 vs. <3 (adj OR=1.36, 95% CI 0.99-1.89, p=0.061).
Sorensen et al. 2008 **Belgium** **Prospective study *Undernutrition in Hospitals (EuroOOPS in Danish)***	NA	5,051 patients recruited from the surgery, internal medicine, oncology, intensive care, gastroenterology and geriatrics services at 26 hospitals. Mean age was 60 years, 53% were men.	NRS-2002 screening was performed at admission. A random selection of patients was followed during their hospital stay. The association between at-risk nutritional status (NRS-2002 ≥3) and clinical outcome was examined.	**Primary outcome:** Clinical outcome (complications, death, discharge destination, LOS)	32.6% of patients were defined as ‘at-risk’ by NRS-2002. 160 patients admitted with neurological vascular disease were identified as “at-risk”. Patients at nutrition risk had a higher frequency of infectious and non-infectious complications (30.6% vs. 11.3%, p<0.001). The frequency of death was higher in patients at nutrition risk (12% vs. 1%, p<0.001). Fewer ‘at-risk’ patients were discharged home, while patients not

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Study/Type	Quality Rating	Sample Description	Method	Outcomes	Key Findings and Recommendations
					at risk were more likely to be discharged home and were less likely to be discharged to a nursing home. Median LOS was longer in at-risk patients (9 vs. 6 days, p<0.001). In patients with a LOS <28 days, NRS-2002 score was an independent predictor.

Nutritional Therapy

Study/Type	Quality Rating	Sample Description	Method	Outcomes	Key Findings and Recommendations
Sakai et al. 2024 **Japan** **Cochrane Review**	Using the Cochrane RoB too, ≥25% of trials were at high risk of bias in the domains of blinding of personnel, outcome assessors and patients, and reporting bias. The risk of bias in other domains was low or unclear	52 RCTs including 11,926 participants recovering from ischemic, hemorrhagic and/or subarachnoid haemorrhage stroke, in the acute (n=36), subcute (n=10), acute/subacute stage (n=3) and chronic stage (n=3), regardless of baseline nutritional status. The mean/median age ranged from 48 to 80.8 years. Six trials included patients who were malnourished at baseline. Stroke severity was mild to moderate in most studies, assessed using the NIHSS.	Trials compared nutritional therapy vs. no therapy, usual care or other nutritional therapy. Nutritional interventions therapy included protein and energy supplementation (n=14), enteral feeding (n=9), parenteral supplements (n=2), parenteral or enteral supplements (n=2), and oral and parenteral supplements (n=1). In most trials, the duration of the interventions ranged from 1-3 months.	**Primary outcomes:** Disability, ADL **Secondary outcomes:** Gait speed, nutritional status, death, medical complications, and others	*Protein & energy oral supplements* Oral supplementation was not associated with a reduction in the odds of disability, defined as an mRS score of 0-2, at 6 months (OR=0.97, 95% CI 0.86 to 1.10; 1 trial [acute stage]: GRADE: low), or in the performance of ADL, assessed using FIM motor subscale, at 3.5 to 8 weeks follow-up (MD= 8.74, 95% CI 5.93 to 11.54, 2 studies; GRADE: very low). Gait speed was not assessed in any of the trials. Oral supplementation was not associated with an improvement in body weight at 21 to 30 days follow-up (MD=0.90 kg, 95% CI -0.23 to 1.58; 3 studies; GRADE: very low), reduced odds of death at 3-6 months (OR=0.57, 95% CI 0.14 to 2.28; 2 trials: GRADE: low) or medical complications at 12 weeks follow-up (OR=0.68, 95% CI 0.20 to 2.30; 1 trial; GRADE: very low). *Early enteral feeding* The odds of a good outcome (mRS 0-3) were not increased significantly with early enteral feeding (OR=1.37; 95% CI 0.76 to 2.46; 2 trials; GRADE: very low).

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Study/Type	Quality Rating	Sample Description	Method	Outcomes	Key Findings and Recommendations
					At the end of the intervention (3-4 weeks), early enteral feeding was not associated with a significant difference in ADL performance, assessed using the Barthel Index (MD=0.66, 95% CI −1.94 to 3.26; 2 trials; GRADE: very low).

Energy & Protein Oral Supplementation

Study/Type	Quality Rating	Sample Description	Method	Outcomes	Key Findings and Recommendations
Medical Inpatients +/- Stroke					
Deutz et al. 2016, Matheson et al. 2021 **USA** **RCT** ***Nutrition effect On Unplanned Readmissions and Survival in Hospitalized patients (NOURISH)***	CA: ☑ Blinding: Patient ☑ Assessor ☑ ITT: ☑	652 patients, recruited from 78 sites who were recently hospitalized with a primary diagnosis of chronic obstructive pulmonary disease exacerbation, pneumonia, congestive heart failure, or acute myocardial infarction and who were malnourished (SGA B/C). Mean age was 78 years, 46% were men. 83% were classified as SGA-B.	Patients were randomized 1:1 to receive standard nutritional care + an oral supplement providing 350 kcal, 20 g protein, 11 g fat, 44 g carbohydrate, and 1.5 g calcium-beta-hydroxy-methylbutyrate (HMB) twice daily or a placebo drink that contained 48 kcal, 12 g carbohydrate, and 10 mg vitamin C during their hospital stay and continuing up to 90 days following discharge.	**Primary outcome:** Composite of death or nonelective readmission within 90 days post discharge **Secondary outcomes:** Readmission, death, LOS, performance of activities of daily living (ADL), assessed using the Katz Index, handgrip strength (HGS) Assessments were conducted at baseline, 30, 60 and 90 days.	There was no significant difference between groups for the primary outcome (26.8% vs. 31.1%, p=0.214). There was no significant difference between groups in the percentage of patients who were readmitted (25.2% vs. 25.6%, p=0.749), although mortality was lower in the oral supplementation group (4.8% vs. 9.7%, p=0.018). There were no significant differences between groups in mean LOS or mean Katz ADL scores. A significantly higher percentage of patients were classified as SGA-A at 90 days in the oral supplementation group (45.5% vs. 30.0%). *2021 (additional outcome-handgrip strength)* There were 354 patients in the evaluable (compliant) cohort. Compliance was defined as an intake of ≥ 50% of the feeding protocol to within 42 days post-discharge). There was a significantly greater increase over the study period in HGS in the oral supplementation group from a baseline of 21.8 to 23.25 kg at 90 days vs. 20.9 to 22.63 kg, p=0.043).

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Study/Type	Quality Rating	Sample Description	Method	Outcomes	Key Findings and Recommendations
					In subgroup analysis, patients with mild-moderate malnutrition in the oral supplementation group had the greatest increase in HGS. Among all patients with increased HGS, 49% had improvements in nutritional status vs. 31% whose nutritional status was not improved.
Schuetz et al. 2019, Hersberger et al. 2020 **Switzerland** **RCT** ***Effect of early nutritional support on Frailty, Functional Outcomes, and Recovery of malnourished medical inpatients Trial (EFFORT)***	CA: ☑ Blinding: Patient ☒ Assessor ☑ ITT: ☑	2,088 patients recruited from 8 hospitals with a medical condition, a Nutrition Risk Score (NRS-2002) ≥3, able to consume food orally, and had an anticipated hospital stay of >4 days. Mean age was 72.6 years, 52% were men. The most common reasons for admission were infections, cancer and cardiovascular disease. 31% of patients had an NRS of 3, 38% of 4 and 31% of ≥5 points.	Patients were randomized (1:1) to receive either individualized nutritional support (intervention group) or standard hospital food (control group). The intervention group received an assessment by a dietitian and supplements (and enteral nutrition, if needed) +/- snacks to meet macronutrient goals for the duration of the hospital stay. On discharge, patients received dietary counselling and, if indicated, a prescription for oral nutritional supplements in the outpatient setting. Patients in the control group received a standard hospital diet.	**Primary outcome:** A composite of all-cause mortality, admission to the intensive care unit from the medical ward, non-elective hospital readmission after discharge, major complications as a new occurrence including adjudicated nosocomial infection, respiratory failure, a major cardiovascular event, or a decline in functional status ≥ 10% from admission to day 30, measured by the Barthel Index (BI) **Secondary outcomes:** Individual component of the primary endpoint, daily protein and caloric intake, LOS and short-term change in bodyweight	Patients in the intervention group achieved significantly higher mean daily caloric intake (1,501 kcal vs. 1,211 kcal, mean difference= 290 kcal, 95% CI 240–340), and protein intake (57 g vs. 47 g, mean difference=10 g, 95% CI 8–12) during their hospital stay. In the intervention group, 919 (91%) patients received oral nutritional supplements in combination with enriched hospital nutrition. 8 patients received enteral nutrition and 12 patients received parenteral nutrition. In the control group, 122 (12%) patients received some kind of nutritional support. At 30 days, the risk of primary outcome was significantly lower in the intervention group (23% vs. 27%, adj OR=0·79, 95% CI 0·64 to 0·97, p=0·023). Of the components of the primary outcome, only mortality was significantly lower in the intervention group (7% vs. 10%, OR=0·65, 95% CI 0·47 to 0·91, p=0·011). A lower percentage of patients in the intervention group experienced a decline of >10% in BI scores at days 30 (4% vs. 6%, OR=0·62, 95% CI 0·40 to 0·96, p=0·034). Mean LOS was similar between groups (9.5 vs. 9.6 days, p=0.46).

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Study/Type	Quality Rating	Sample Description	Method	Outcomes	Key Findings and Recommendations
					No patients were lost to follow-up. 35 patients in the intervention group and 25 in the control group withdrew consent. *2020 Long-term outcome* For each point increase in NRS-2002, the risk of 30-and 180-day mortality was increased significantly (adj HR=1.22, 95% CI 95% CI 1.00 to 1.48 and adj HR=1.37, 95% CI 1.22 to 1.55, respectively. Increasing NRS-2002 score was associated with decreased BI score at 180 days (adjusted decrease of 4.49 points per NRS point increase, (95%CI -6.54 to 2.45, p < 0.001).
Milne et al. 2009 **UK** **Cochrane Review**	The overall quality of trials was poor, particularly for blinding of outcome assessors, participants and treatment providers, and an absence of intention-to-treat	62 RCTs (n=10,187). Most participants (71%) were hospitalised in-patients admitted for acute conditions. 40 studies included older people with no specified disease or condition. Other studies included patients with hip fracture, stroke patients, (n=2) congestive heart failure, chronic obstructive pulmonary disease, older surgical patients and patients at home with diabetic foot ulcer. Mean age ranged from 65 to 88 years, 45% were men.	Interventions included commercial oral supplements or fortification of normal food with the intention of improving protein and energy intake using only the normal oral route. The control condition was usually routine feed (no supplement). The trials aimed to provide between 175 and 1350 additional kcal/ Day and an additional 10-50 g rams of protein/day. Therapy lasted from 10 days to 18 months (< 35 days in 17 trials, ≥ 35 days in 37 trials, from admission to discharge in 5 trials)	**Primary outcomes:** All-cause mortality, morbidity, number of people with complications, functional status, anthropometrics	Supplementation was not associated with a reduction in mortality (RR=0.92, 95% CI 0.81 to 1.04, p=0.20. Results from 40 trials included) Supplementation was associated with a reduction in mortality, when restricted to persons who were malnourished at study (RR=0.79, 95% CI 0.64 to 0.97, p=0.025. Results from 25 trials included). Supplementation was associated with a reduction in complications (RR=0.86, 95% CI 0.75 to 0.99, p=0.029. Results from 24 trials included). The pooled weighted mean difference for percentage weight change showed a benefit of supplementation (2.15%, 95% CI 1.80 to 2.49, p<0.0001. Results from 45 trials included). The pooled weighted mean difference for percentage AMC change showed a benefit of supplementation (1.2%, 95% CI 0.5 to 20, p= 0.0019. Results from 16 trials included). Supplementation was not associated with a reduced LOS (MD= -0.75, 95% CI -2.84 to 1.34, p=0.48. Results from 14 trials included).

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Study/Type	Quality Rating	Sample Description	Method	Outcomes	Key Findings and Recommendations
Following stroke					
Ha et al. 2010 **Norway** **RCT**	CA: ☑ Blinding: Patient ☒ Assessor ☑ ITT: ☒	124 acute stroke patients who were malnourished or at nutritional risk, identified by screening within 7 days of admission to hospital. Mean age was 79 years, 48% were men.	Patients were randomized to receive either individualized, nutritional care to prevent weight loss (n=58) or routine care (n=66) while in hospital Patients in the intervention group were prescribed oral supplements and tube feeding when appropriate. Education to prevent was also provided prior to hospital discharge. In the control group, patients received oral sip feedings or tube feeding at the discretion of the attending physician. There were no standardized procedures for the treatment of malnutrition. Patients remained in hospital an average of 11 days.	**Primary outcome:** Percentage of patients with weight loss ≥5% at 3 months. **Secondary outcomes**: QoL (EQ-5D), handgrip strength, length of hospital stay (LOS), energy and protein intake Assessments were conducted at baseline and at 3 months	At baseline, 5 patients (8.6%) in the intervention group and 3 (4.5%) patients in the control group were malnourished (p=0.47). Patients in the intervention group received significantly more calories: Mean ±sd Kj/kg/day 80±29 vs. 64±20, p=0.005, but not protein g/kg/day:0.8±0.3 vs. 0.7±0.3, p=0.34. The percentage of patients in the intervention and control groups with weight loss ≥5% at 3 months: 20.7% vs. 36.4%, p=0.055 EQ-5D: There were no significant differences between groups on any of the domains. Patients in the intervention group experienced significant improvement in means scores of mobility, self-care and usual activities. There was no significant improvement in scores on any of the dimensions for patient in the control group. There was significantly greater improvement in hand grip strength in the intervention group (mean difference=2.16 kg, 95% CI1.0 to 4.2, p=0.002). The median LOS was not significantly different between groups (12 vs. 13 days, p>0.05) Losses to follow-up/withdrawals: n=26 intervention group, n=20 control group
Dennis et al. 2005 **UK** **RCT** ***Feed or Ordinary Diet trial (FOOD)* (part 2- oral**	CA: ☑ Blinding: Patient ☒ Assessor ☑ ITT: ☑	4,023 non-dysphagic patients, recruited from 125 hospitals in 15 countries who were admitted within 7 days of first or recurrent stroke. Clinician unsure whether to provide supplements. Mean age was 71 years, 54% were men. 8% of	Patients were randomized to receive or not receive, an oral nutritional supplement (540 Kcals) in addition to a regular hospital diet, provided for the duration of their entire hospital stay (median duration of hospital stay was 34 days- 28% of patients stopped taking	**Primary outcome:** Death or disability (mRS score of 3-5) at 6 months **Secondary outcomes:** mRS, EUROQoL, place of residence at 6 months	Oral supplementation was not associated with a reduction in the odds of death (13% vs. 12%, OR=0.94, 95% CI 0.78 to 1.17, absolute difference in risk of death=0.7%, 95% CI -1.4 to 2.7) or death or poor outcome (58% vs. 59%, OR=1.03, 95% CI 0.91 to 1.17, absolute risk of death or poor outcome= 0.7%, 95% CI -2.3 to 3.8). In subgroup analysis, age, nutritional status (underweight/normal weight/overweight), stroke severity and early/late randomization were not

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Study/Type	Quality Rating	Sample Description	Method	Outcomes	Key Findings and Recommendations
supplementation)		patients malnourished at baseline.	supplements before discharge).		effect modifiers. Mean difference in EROQoL scores between groups at 6 months was not significant (MD=0.001, 95% CI -0.23 to 0.025). Losses to follow-up and drop-outs: n=7 (regular diet), n=4 (supplement) Adverse events: no significant differences in complications (pneumonia, urinary tract infections etc) between groups
Gariballa et al. 1998 **UK** **RCT**	CA: ☑ Blinding: Patient ☒ Assessor ☑ ITT: ☒	42 patients who were conscious during the first week of stroke onset with intact swallowing and showed anthropometric evidence of malnutrition> Mean age was 79 years, 50% were men.	Patients were randomized to receive a standard hospital diet or a standard diet plus an oral supplement supplying an additional 1,200 Kcals, 40g protein daily for 4 weeks.	**Primary outcome:** Change in nutritional indicators **Secondary outcomes:** Barthel Index (BI), infective complications, death within 3 months and discharge location Outcomes were assessed at baseline, and weeks 2, 4 and 12.	Patients in the supplemented group consumed significantly more calories and protein compared with those in the control group: 1,807 vs. 1,084 Kcals, p<0.001; protein 65.4 vs. 44.1 grams, p<0.001. There were no significant changes from baseline to week 12 between groups in: Weight (kg): 0.2 vs. -0.7, p>0.05 Tricep skinfold; (mm) -0.9 vs. -0.6, p>0.05 Mid-arm muscle circumference (cm): -0.3 vs. -0.3, p>0.05 Serum transferrin (g/L): 0.1 vs. -0.3, p>0.05 There was no significant difference between groups in median BI change (45 to 90 vs. vs. 35 to 75, p>0.05). Serum albumin (g/L) dropped significantly less in the supplemented group (-1.5 vs. -4.4, p=0.025) Serum iron (µmol/L) increased in the supplemented group and decreased in the control group (2.6 vs. -2.7, p=0.03). There were 9 infective complications in the supplement group and 11 in the control group, p>0.05. There were 2 deaths in the supplemented group and 7 in the control group (p=0.127).

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Study/Type	Quality Rating	Sample Description	Method	Outcomes	Key Findings and Recommendations
					There were 11 losses to follow-up

Abbreviations

BI: Barthel Index	CA: Concealed Allocation
CI: Confidence Interval	FIM: Functional Independence Measure
ITT: Intention to treat	LOS: length of stay
mRS: modified Rankin Scale	N/A: Not Assessed/not applicable
NIHSS: National Institutes of Health Stroke Scale	NG: nasogastric
OR: Odds Ratio	QoL: quality of life
RR: relative risk	RCT: Randomized Controlled Trial
RoB: Cochrane risk-of-bias tool	SGA: Subjective Global Assessment

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