National Institute for Health and Care Excellence

Draft for consultation

Rehabilitation for chronic neurological disorders including acquired brain injury

[I] Evidence reviews for clinical case management

NICE guideline <number>

Evidence reviews underpinning recommendations 1.2.1 and 1.11.6 and research recommendations in the NICE guideline

April 2025

Draft for consultation

This evidence review was developed by NICE

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Clinical case management

Review question

What is the effectiveness of clinical case management in the delivery of rehabilitation for people with chronic neurological disorders?

Introduction

The aim of this review was to determine the effectiveness of clinical case management in the delivery of rehabilitation for people with chronic neurological disorders.

People with chronic neurological disorders engage with professionals across multiple services with varying levels of specialist experience. A person may transition through inpatient care with consistent daily rehabilitation support to a less intensive or fragmented outpatient community-based service. This transition pattern may repeat throughout their lifetime. There are many challenges in achieving a seamless transition, such as regional variation in how services are offered, waiting times for services, and the handover of good quality information. The nature of some conditions, such as acquired brain injury and functional neurological disorder, present particular heterogeneous challenges that do not fit seamlessly into current provision and often involve multiple services across health and social care. It is important that professionals continue to strive to create seamless, equitable and holistic provision for all individuals with chronic neurological disorders to achieve a high-quality rehabilitation journey and ongoing support to maximise potential.

The objective of this review is to determine the best methods to deliver and coordinate rehabilitation services and social services for people with complex chronic neurological disorders across services and providing a service that is responsive to variable and changing levels of need.

Case Management has been suggested as a potential provision to ensure that services meet the continuity of needs of individuals throughout their lifetime and across services. It has also been suggested that this would align with the provision of specialist key-workers/co-ordinators within in-patient and specialist community based services to ensure appropriate and timely provision at discharge.

There is currently a paucity of research evidence with regard to the effectiveness of case management. The aim of this review was to determine whether case management could improve outcomes for adults with chronic neurological disorders.

Summary of the protocol

See Table 1 for a summary of the Population, Intervention, Comparison and Outcome (PICO) characteristics of this review.

Table 1: Summary of the protocol (PICO table)

Population	Adults and children with rehabilitation needs due to the following chronic neurological disorders: • Acquired brain injury • Acquired spinal cord injury • Acquired peripheral nerve disorders • Progressive neurological diseases • Functional neurological disorders
Intervention	Clinical case management in rehabilitation for people with chronic neurological disorders, categorised into 3 main levels: • Complex case management • Intermediate case management • Low intensity case management

Comparison	Interventions compared with others in the same level, in different levels or:
	• Placebo (placebo or sham)
	• Control (no intervention, waitlist, standard rehabilitation care alone, or 'usual care')
	• The same intervention (as listed under 'intervention') but varied in terms of:
	  ○ Frequency
	  ○ Intensity
	  ○ Timing
	  ○ Setting

Outcome	**Critical** • Physical and mental health related quality of life and social care related quality of life (assessed using validated, global measures, such as EQ5D - 3L; EQ5D - 5L; NeuroQOL; PedsQL; QUOLIBRI; SF-36; WHOQOL-100; WHO-QOL Brief; ASCOT; ICECAP-A) • Anxiety (assessed using anxiety sub scales from global quality of life measures or global measures of anxiety such as HADS-A) • Depression (assessed using depression sub scales from global quality of life measures or global measures of depression such as the PHQ-9 and HADS-D) **Important** • Service contacts (measured for example through appointment attendance) • Unplanned contacts (measured for example by Accident and Emergency attendance or emergency admissions)

For further details see the review protocol in appendix A.

Methods and process

This evidence review was developed using the methods and process described in Developing NICE guidelines: the manual. Methods specific to this review question are described in the review protocol in appendix A and the methods document (supplement 1)).

Declarations of interest were recorded according to NICE's conflicts of interest policy.

Effectiveness evidence

Included studies

A systematic review of the literature was conducted but no studies were identified which were applicable to this review question.

See the literature search strategy in appendix B and study selection flow chart in appendix C.

Excluded studies

Studies not included in this review are listed, and reasons for their exclusion are provided in appendix J.

Summary of included studies

No studies were identified which were applicable to this review question (and so there are no evidence tables in Appendix D). No meta-analysis was conducted for this review (and so there are no forest plots in Appendix E).

Summary of the evidence

No studies were identified which were applicable to this review question (and so there are no GRADE tables in Appendix F).

Economic evidence

Included studies

A systematic review of the economic literature was conducted but no economic studies were identified which were applicable to this review question.

See supplementary material 2 for details on the economic search undertaken for this guideline.

Excluded studies

Economic studies not included in this review are listed, and reasons for their exclusion are provided in appendix J.

Summary of included economic evidence

No economic studies were identified which were applicable to this review question.

Economic model

Objective

The committee noted the importance of clinical case management (CCM) for individuals with chronic neurological disorders (CND). They discussed that CCM is essential in enabling other rehabilitation interventions. For example, someone with CND reporting fatigue, low mood and anxiety, and lack of exercises would have deteriorating functioning and quality of life because nobody coordinated and integrated all of these different components. Interventions do not work if not integrated and CCM enables this.

However, the committee acknowledged a lack of evidence regarding its effectiveness and cost effectiveness to support their recommendations, which were mainly based on qualitative review findings. Due to the potential impact on resources and variation in practice, the committee decided that it would be helpful to conduct exploratory cost analysis in this area. Due to the lack of clinical effectiveness data on CCM, an exploratory threshold analysis was conducted to estimate the health benefits needed to justify the additional costs associated with CCM provision.

Analysis overview

The population of the analysis was adults with rehabilitation needs due to CND, including acquired brain injury, acquired spinal cord injury, acquired peripheral nerve disorders, progressive neurological diseases, functional neurological disorders, who require CCM. The analysis considered alternative CCM costings based on CCM hours and duration reported in published literature. Due to the exploratory nature of the analysis, lack of suitable data, and challenges in defining standard care for people with CND, the analysis assumed that currently people with CND do not receive CCM. The analysis estimated the required quality-adjusted life year (QALY) gains for CCM to be considered cost-effective, using NICE's lower cost-effectiveness threshold of £20,000 per QALY gained.

Methods

A systematic review of effectiveness and economic studies did not find relevant evidence on CCM in people with CND. The committee was consulted to identify studies that would help to estimate costs associated with CCM. They identified 1 UK study (Clark-Wilson 2016) reporting data on resources used for CCM, which helped to estimate intervention costs. Additionally, the committee identified 1 US study (Bruner-Canhoto 2016) reporting potential cost-offsets as a result of CCM, including reduced hospital admissions and A&E visits. These findings were used to estimate the incremental costs of CCM and the QALY gain necessary to achieve a cost-effectiveness ratio just below the NICE's lower threshold of £20,000 per QALY. The committee used their judgment to interpret the size of the required QALY gains for CCM to be cost effective. They also identified an Australian study (Arnold & Elder 2013) reporting resource use data related to CCM, which allowed alternative costings and the estimation of required QALY gains.

Results

Based on data from a study in the UK, the costs of CCM intervention ranged from £19,748 to £31,804 over an average CCM duration of 3.5 to 5.7 years, depending on the severity. The required QALY gains were 0.99 and 1.59, respectively, and would not be very feasible in practice. However, when potential reductions in hospital admissions and A&E visits were considered, the CCM costs decreased to £4,435 and £14,431, with the required QALY gains reduced to 0.22 and 0.72. This means that CCM would need to generate an additional 81 and 263 perfect health days over 3.5 and 5.7 years, respectively. Alternative costings from an Australian study supported these findings, indicating that CCM's cost-effectiveness depends on its intensity and duration, and at certain intensities, it would be a cost-effective use of NHS resources.

Conclusion

The threshold analysis showed that the required QALY gains needed for CCM to be cost effective using NICE lower cost-effectiveness threshold of £20,000 per QALY gained are large and may be unachievable for some CCM intensities. However, CCM has the potential to be cost effective when broader NHS cost reductions, such as reduced hospital admissions and A&E visits, are considered.

The full methods and results of the analysis can be found in the appendix I.

The committee's discussion and interpretation of the evidence

The outcomes that matter most

The quality of the evidence

No studies were identified which were applicable to this review question and therefore no evidence was identified.

Benefits and harms

No effectiveness evidence was identified for this review, and so the committee discussed and agreed to draft recommendations based on their expertise, experience, and the economic evidence.

In the committees' knowledge and experience, there are a number of people with chronic neurological disorders who may not be able to get the help they need via signposting and information. They noted that the current organisation of services can be confusing and disorganised, and a single point of contact is needed to both coordinate and navigate care. In the committees' knowledge and experience, the level of support required for an individual should be based on the matched care model whereby the levels of care provided are determined by the complexity of needs, with signposting and coordination forming the lowest-intensity model. The committee agreed that the single point of contact can be a key contact, key worker or a complex case manager depending on the needs of the individual. Case management is a clinical role, which can be undertaken by a number of different professional groups. Case management is proactive, responsive, personalised to that individual's needs, and that family's needs, which integrates the work of other clinicians, professionals, organisations and community resources. It is a longer-term therapeutic relationship that is proactively managed and supports individuals to engage with services, particularly when engagement is difficult to achieve. Furthermore, case management supports those who are considered more difficult to access to remain in contact with services and prevent deterioration and overuse of non-specialist services. A case manager can act as a single point of contact, key worker, or complex case manager. Due to the range of resources that might be needed, the committee agreed that the matched care model cannot be implemented without consideration and flexibility within a service delivery mode for the variety of support that will be required. They therefore agreed that this approach should start with commissioning first and therefore decided to add a recommendation to commission services so that people have access to a key contact, key worker, or a complex case manager.

The committee also discussed the need of a complex case manager for people with particularly complex and long-term rehabilitation needs. These people are more likely to need care that not only crosses rehabilitation services, but also straddles health and social care services. When these complicated scenarios are combined with symptoms such as lack of capacity or problems with insight, signposting and a basic care coordination approach will not suffice to meet the needs of these people. The committee noted an additional concern in this population, whereby people getting stuck in scheduled reviews without a case manager to aid referral. The committee agreed that people who experience difficulties with planning, organisation and initiating actions, those who are more executively impaired, people who are not able to advocate for themselves or where no one appropriate can effectively advocate for them, and those who face an increased risk of harms due to the neurobehavioral characteristics of their condition and co-morbidities would benefit more from a care approach that involves a clinical case manager. In the committees' experience some co-morbidities may put an individual at increased risk of harm (for example, uncontrolled diabetes or epilepsy can lead to altered behaviour). Furthermore, people who may experience neurobehavioral difficulties due to their condition could act with impulsiveness, disinhibition

and a lack of foresight, which puts them at further risk of harm. The committee went on to note that the role of clinical case managers would also fulfil the roles of a single points of access, referral and coordination that have been mentioned in previous recommendations.

See evidence reviews A and B for further rationale about recommendations in guideline section 1.11 about Assigning a single point of contact and assessing the person's ability to coordinate their own care.

Cost effectiveness and resource use

No existing economic evidence was identified for this review. The committee discussed that navigating the system is complex for people with chronic neurological disorders, who often have cognitive problems and lack the executive skills and decisional capacity to self-navigate. They may also struggle to access services independently. Therefore, there is a clinical need for service configurations that facilitate integrative working, access and engagement, and referral and re-referral, via a key contact, key worker, or complex case manager.

The committee noted that clinical case management can be expensive. However, it was explained that intervention costs tend to go down over time. For example, due to the support staff being upskilled, using the knowledge of the independent neurorehabilitation specialists.

While ideally everyone would benefit from clinical case management, a proportional approach to the complexity of needs is required to manage the potential resource impact on the NHS. The committee explained that key contact or key worker role could be undertaken by nominated practitioners within existing services and implemented within current budget constraints.

Currently there is variation in clinical case management availability. Some services have recently decommissioned it. Clinical case management is provided mainly by charities and voluntary organisations, primarily within private practice and litigation, and mainly for brain and spinal injuries. Provision for less intensive clinical case management, and for a shorter period, is also available in some less severe cases. Only a small group of people receive it within the NHS. Case managers for children and young people are rare.

Clinical case management includes signposting to appropriate rehabilitation and activities, collaboration with health practitioners (nurses, social workers) across services, and advocacy (supporting patients' needs across various services). The committee suggested that clinical case management could be delivered by senior practitioners or equivalent care managers (Band 7 professionals under the NHS Agenda for Change). The committee further explained that some individuals may require clinical case management temporarily to regain skills, adjust, and learn self-management, while others may need intense, prolonged support.

The committee was aware that implementing the clinical case management approach may result in significant resource impact due to high initial intervention costs. However, they limited their recommendation to the subset of people with severe, complex, and long-term rehabilitation needs, which may help mitigate some of the resource impact. Clinical case management may also not be necessary for everyone, such as those with Functional Neurological Disorder due to limited existing services.

The committee discussed the consequences of people not being able to access timely and integrated care, including increased use of unplanned care. This is supported by exploratory threshold analysis, which found that clinical case management required achievable quality-adjusted life-year (QALY) gains to compensate for the additional intervention costs when also considering cost reductions due to A&E visits and hospital admissions. The committee acknowledged several limitations in the analysis, particularly the lack of evidence on resource use data and the effectiveness of clinical case management, including potential cost offsets in other healthcare resource use and key assumptions based on US data. They

noted that clinical case management costings reflected the intensity and duration of complex case manager input. Despite limitations, they found the findings encouraging and consistent with their experience and used this evidence to support their recommendation for a complex case manager approach.

The committee identified several challenges in researching clinical case management. These included differing definitions of clinical case management and the intervention's complex nature. Measuring its effectiveness is particularly difficult. For example, clinical case management aims to support and facilitate the efficient, effective, and timely use of other services, such as physiotherapy, psychology, and occupational therapy, all of which are difficult to capture. The committee also discussed that clinical case management may potentially increase access to services and related costs. For example, people could use more speech and language therapists, psychologists etc., because they are being linked up to effective services and accessing them as they are needed. So, there could be a greater resource use as a result of clinical case management. However, clinical case management is expected to reduce costly unplanned care use. The committee noted that currently NHS is overstretched and anything that relieves the pressure on the NHS hospital resources would be invaluable.

The committee discussed many other potential benefits of clinical case management based on their experience. However, these benefits could not be quantified in the economic analysis due to insufficient data, leading to a substantial underestimation of its potential cost effectiveness. For example, the committee discussed that due to the lack of appropriate signposting and coordination, many people remain in costly, inappropriate care settings (for example, inpatient neurobehavioral units, residential care).

Clinical case management promotes efficient discharge planning and smooth transitions between inpatient rehabilitation and community services. By coordinating care and targeting services to better meet needs, clinical case management maximises outcomes and reduces costs, for example, by reducing ineffective use of services and duplication of care. Also, unpredictable disease courses place a significant burden on GPs, who are often unfamiliar with these conditions, causing breakdowns in care and leaving patients struggling to navigate the system and re-access services. This often leads to costly A&E visits, delays in treatment, and related healthcare costs, such as unplanned admissions due to exacerbated needs, missed GP appointments, unfilled prescriptions, and lost equipment. The committee also discussed insufficient support for families, especially those dealing with challenging behaviours, increases the likelihood of costly residential care admissions.

The committee also noted that clinical case management may indirectly reduce NHS costs by improving access to appropriate housing and social welfare benefits, which can improve physical health and further reduce NHS cost. Failing to access required services can lead to homelessness, criminal justice involvement, and vocational and educational failure. For example, the committee referred to the fact that approximately half of homeless people have a brain injury. Additionally, clinical case management may lower the risk of being sectioned under the Mental Health Act or subjected to Deprivation of Liberty under the Deprivation of Liberty Safeguards (DOLS) and Mental Capacity Act, and reduces the risk of drug addiction. The committee highlighted that all of these issues incur substantial costs to the NHS and the wider public sector, with potential cost savings realised over an individual's lifetime.

It was also discussed that clinical case management could have a positive impact on health inequalities. For example, clinical case management may facilitate access to benefits and welfare services and reduce poverty levels. As a result, those who are most disadvantaged would benefit the most from clinical case management.

The committee also referred to examples of services similar to clinical case management that already exist with the NHS. For example, multiple sclerosis nurses provide strong advocacy for people with multiple sclerosis, performing roles similar to clinical case managers. They highlighted the existing Neuro Case Management Service in Sheffield, a

specialist community team within the Long Term Conditions Service. This service supports people aged 16 or above and diagnosed with a neurological condition such as parkinson's, cerebral palsy, motor neurone disease, epilepsy, or an acquired/traumatic brain injury. The service aims to help people manage their condition and access appropriate services to lead a full and independent life. The committee discussed that using or expanding existing services could help reduce some of the resource needs required to implement clinical case management recommendations.

Recommendations supported by this evidence review

This evidence review supports recommendations 1.2.1 and 1.11.6 and the research recommendation on effectiveness of clinical case management in the delivery of rehabilitation for people with chronic neurological disorders.

References – included studies

Effectiveness

No studies were identified which were applicable to this review question.

Economic

Bruner-Canhoto 2016

Bruner-Canhoto L, Savageau J, Croucher D, Bradley K. Lessons from a care management pilot program for people with acquired brain injury. J Healthc Qual. 2016 Sep 1;38(5):255-63.

Clark-Wilson 2016

Clark-Wilson J, Giles GM, Seymour S, Tasker R, Baxter DM, Holloway M. Factors influencing community case management and care hours for clients with traumatic brain injury living in the UK. Brain Inj. 2016 Jun 6;30(7):872-82.

Other

[List any other references]

Appendices

Appendix A Review protocols

Review protocol for review question: What is the effectiveness of clinical case management in the delivery of rehabilitation for people with chronic neurological disorders?

Table 2: Review protocol

ID	Field	Content
0.	PROSPERO registration number	CRD42024531909
1.	Review title	Clinical case management in the delivery of rehabilitation for people with chronic neurological disorders
2.	Review question	What is the effectiveness of clinical case management in the delivery of rehabilitation for people with chronic neurological disorders?
3.	Objective	To determine the effectiveness of clinical case management in the delivery of rehabilitation for people with chronic neurological disorders.
4.	Searches	The following databases will be searched: • Medline All • Embase • Cochrane Central Register of Controlled Trials (CENTRAL) • Cochrane Database of Systematic Reviews (CDSR) • PsychInfo • Social Policy and Practice Searches will be restricted by: • Date: 2013 onwards • English language

ID	Field	Content
		• Human studies • Systematic Reviews • RCTs • Non-randomised studies Other searches: • Inclusion lists of systematic reviews With the agreement of the guideline committee the searches will be re-run 6 weeks before final submission of the review and further studies retrieved for inclusion. The full search strategies will be published in the final review.
5.	Condition or domain being studied	Clinical case management in the delivery of rehabilitation for people with chronic neurological disorders.
6.	Population	Inclusion: Adults and children with rehabilitation needs due to the following chronic neurological disorders: • Acquired brain injury • Acquired spinal cord injury • Acquired peripheral nerve disorders • Progressive neurological diseases • Functional neurological disorders Exclusion: • Conditions which do not fit one of the 5 categories of chronic neurological disorder as defined in the guideline scope. These exclusions will be by exception and examined on a case-by-case basis rather than whole disorder groups. For example, this guideline will not cover autonomic neuropathy or the acute stabilisation of conditions such as encephalitis or hydrocephalus and will not cover degenerative disc disorder as spinal discs do not form part of the spinal cord. • Disorders for which interventions are primarily focused on altering body structure and functions, for example isolated peripheral nerve injuries such as single nerve or plexus injuries.

ID	Field	Content
		• Surgical management of conditions (for example brain tumours, orthopaedic complications). • Conditions for which NICE rehabilitation and rehabilitation related recommendations already exist, including stroke in people aged 16 years and over, dementia including Alzheimer's disease, cerebral palsy, myalgic encephalomyelitis (or encephalopathy)/chronic fatigue syndrome and post-COVID-19 syndrome. • Early rehabilitation after spinal cord injury as this will be covered in the NICE guideline on rehabilitation after traumatic injury.
7.	Intervention	Clinical case management in rehabilitation for people with chronic neurological disorders, categorised into 3 main levels: • Complex case management – a pro-active, closely involved approach generally provided within the person's environment and across services by specialist nurses, AHPs or social workers, who may be members of BABICM (British Association of Brain Injury and Complex Case Management) or members of the Case Management Society UK (CMSUK). The model is generally funded and provided following insurance claims for injuries and is sometimes commissioned and funded by the NHS. Although it is not provided by advocates, this level (as opposed to the other 2 described here) is closest to an advocacy function and is holistic and longitudinal in provision. • Intermediate case management - this approach is generally carried out in NHS contexts by nurses or occupational therapists to support the transition between the acute and post-acute phase. As such, support usually starts in the inpatient setting although in some circumstances will continue or even start in a community setting. A neuro navigator understands the different support options suited to the person with CND and their family and can influence the support provided, for example negotiating with a receiving service about the person's needs or fit with the service and attending reviews. • Low intensity case management (for example, sign posting). Often provided by a social worker, specialist nurse or AHP, and best suited to people who are intact from an executive perspective. This means their needs are less intense and they're generally able to manage or organise their own appointments and correspondence. The practitioner involved in this model will provide the person with the tools or knowledge needed to self-manage.

8.	Comparator	Interventions compared with others in the same level, in different levels or:
		• Placebo (placebo or sham)
		• Control (no intervention, waitlist, standard rehabilitation care alone, or 'usual care')
		• The same intervention (as listed under 'intervention') but varied in terms of:
		  ○ Frequency
		  ○ Intensity
		  ○ Timing
		  ○ Setting

ID	Field	Content
9.	Types of study to be included	Include published full-text papers: • Systematic reviews of RCTs • Experimental studies with random assignment to intervention and control groups. If insufficient* RCT evidence is located to support decision making about children and young people, then experimental studies with non-random assignment to intervention and control groups (quasi-randomised controlled trials, non-randomised controlled trials and prospective and retrospective cohort studies) will also be considered, if a method of controlling for confounding variables is used. Systematic reviews of these studies will also be considered. *Sufficiency will be judged on issues such as the number and quality of the included studies; sample sizes, reported outcomes, and availability of data on subgroups of interest. **Studies must match or adjust for age and chronic neurological disorder. Other confounding factors are: • Sex • delivery setting, for instance whether community or inpatient.
10.	Other exclusion criteria	Inclusion: • Full text papers • Studies conducted in the UK, Australia, New Zealand and Canada and high-income European countries (according to the World Bank). Exclusion: • Conference abstracts/proceedings • Non-English language articles • Articles published before 2013 • Non-English language articles • Books, book chapters and theses.

ID	Field	Content
		• Papers that do not include methodological details will not be included as they do not provide sufficient information to evaluate risk of bias/study quality.
11.	Context	Recommendations will apply to all inpatient (excluding critical care units), outpatient and community settings, including tertiary settings and care homes in which either fully or partially NHS-funded rehabilitation interventions for chronic neurological disorders are provided.
12.	Primary outcomes (critical outcomes)	• Physical and mental health related quality of life and social care related quality of life (assessed using validated, global measures, such as EQ5D - 3L; EQ5D - 5L; NeuroQOL; PedsQL; QUOLIBRI; SF-36; WHOQOL-100; WHO-QOL Brief; ASCOT; ICECAP-A) • Anxiety (assessed using anxiety sub scales from global quality of life measures or global measures of anxiety such as HADS-A) • Depression (assessed using depression sub scales from global quality of life measures or global measures of depression such as the PHQ-9 and HADS-D)
13.	Secondary outcomes (important outcomes)	• Service contacts (measured for example through appointment attendance) • Unplanned contacts (measured for example by Accident and Emergency attendance or emergency admissions)
14.	Data extraction (selection and coding)	All references identified by the searches and from other sources will be uploaded into EPPI reviewer and de-duplicated. Titles and abstracts of the retrieved citations will be screened to identify studies that potentially meet the inclusion criteria outlined in the review protocol. Dual sifting will be performed on at least 10% of records (or 300 records, whichever is smaller); 90% agreement is required and disagreements will be resolved via discussion with the senior systematic reviewer. The full set of records will not be dual screened because the population, interventions and relevant study designs are relatively clear and should be readily identified from titles and abstracts. Full versions of the selected studies will be obtained for assessment. Studies that fail to meet the inclusion criteria once the full version has been checked will be excluded at this stage. Each study excluded after checking the full version will be listed, along with the reason for its exclusion.

ID	Field	Content
		The included and excluded studies lists will be circulated to the Topic Group for their comments. Resolution of disputes will be by discussion between the senior reviewer, Topic Advisor and Chair. A standardised form will be used to extract the following data from included studies: study details (reference, country where study was carried out, type and dates), participant characteristics, inclusion and exclusion criteria, details of the interventions if relevant, setting and follow-up, relevant outcome data and source of funding. This will be quality assessed by the senior reviewer.
15.	Risk of bias (quality) assessment	Quality assessment of individual studies will be performed using the following checklists: • ROBIS tool for systematic reviews • Cochrane RoB tool v.2 for RCTs • Cochrane ROBINS-I tool for non-randomised controlled trials. The quality assessment will be performed by one reviewer and this will be quality assessed by the senior reviewer.
16.	Strategy for data synthesis	Depending on the availability of the evidence, the findings will be summarised narratively or quantitatively. Where possible, pairwise meta-analyses will be conducted using Cochrane Review Manager software. A fixed effect meta-analysis will be conducted and data will be presented as odds ratios or risk ratios for dichotomous outcomes. Peto odds ratio will be used for outcomes with zero events. Mean differences or standardised mean differences will be calculated for continuous outcomes. Heterogeneity in the effect estimates of the individual studies will be assessed using the I^2 statistic. Alongside visual inspection of the point estimates and confidence intervals, I^2 values of greater than 50% and 80% will be considered as significant and very significant heterogeneity, respectively. Heterogeneity will be explored as appropriate using sensitivity analyses and pre-specified subgroup analyses. If heterogeneity cannot be explained through subgroup analysis then a random effects model will be used for meta-analysis, or the data will not be pooled. The confidence in the findings across all available evidence will be evaluated for each outcome using an adaptation of the 'Grading of Recommendations Assessment, Development and Evaluation (GRADE) toolbox' developed by the international GRADE working group: http://www.gradeworkinggroup.org/

ID	Field	Content

		Importance and imprecision of findings will be assessed against minimally important differences (MIDs). Default MIDs will be used for risk ratios and continuous outcomes only, unless the committee pre-specifies published or other MIDs for specific outcomes
		• For risk ratios: 0.8 and 1.25.
		• For continuous outcomes:
		  ○ MID is calculated by ranking the studies in order of SD in the control arms. The MID is calculated as +/- 0.5 times median SD.
		  ○ For studies that have been pooled using SMD (meta-analysed): +0.5 and -0.5 in the SMD scale are used as MID boundaries.

17.	Analysis of sub-groups	Evidence will be stratified by: • Age at time of intervention (children vs. adults). Children are classified as being aged 17 years or younger. • Functional neurological disorders as distinct from the 4 other categories of neurological disorder. Evidence will be subgrouped by the following only in the event that there is significant heterogeneity in outcomes: • The 4 disorder categories not separated out through a priori stratification (acquired brain injury, acquired spinal cord injury, acquired peripheral nerve disorders and progressive neurological diseases • Study design (RCT v. NRS) • Age (for the ≤17 years of age stratification only). Categories are <4 years, 4-11 years and >11 years. Where evidence is stratified or sub grouped the committee will consider on a case-by-case basis if separate recommendations should be made for distinct groups. Separate recommendations may be made where there is evidence of a differential effect of interventions in distinct groups. If there is a lack of evidence in one group, the committee will consider, based on their experience, whether it is reasonable to extrapolate and assume the interventions will have similar effects in that group compared with others.
18.	Type and method of review	☒ Intervention
		☐ Diagnostic
		☐ Prognostic
		☐ Qualitative

ID	Field	Content		
		☐ Epidemiologic		
		☐ Service Delivery		
		☐ Other (please specify)		
19.	Language	English		
20.	Country	England		
21.	Anticipated or actual start date	March 2024		
22.	Anticipated completion date	July 2024		
23.	Stage of review at time of this submission	Review stage	Started	Completed
		Preliminary searches	☑	☑
		Piloting of the study selection process	☑	☑
		Formal screening of search results against eligibility criteria	☑	☑
		Data extraction	☑	☑
		Risk of bias (quality) assessment	☑	☑
		Data analysis	☑	☑
24.	Named contact	5a Named contact NICE 5b Named contact e-mail rehabforcnd@nice.org.uk 5c Organisational affiliation of the review National Institute for Health and Care Excellence (NICE)		

ID	Field	Content
25.	Review team members	NICE Technical Team
26.	Funding sources/sponsor	This systematic review is being completed by NICE, which receives funding from the Department of Health and Social Care.
27.	Conflicts of interest	All guideline committee members and anyone who has direct input into NICE guidelines (including the evidence review team and expert witnesses) must declare any potential conflicts of interest in line with NICE's code of practice for declaring and dealing with conflicts of interest. Any relevant interests, or changes to interests, will also be declared publicly at the start of each guideline committee meeting. Before each meeting, any potential conflicts of interest will be considered by the guideline committee Chair and a senior member of the development team. Any decisions to exclude a person from all or part of a meeting will be documented. Any changes to a member's declaration of interests will be recorded in the minutes of the meeting. Declarations of interests will be published with the final guideline.
28.	Collaborators	Development of this systematic review will be overseen by an advisory committee who will use the review to inform the development of evidence-based recommendations in line with section 3 of Developing NICE guidelines: the manual. Members of the guideline committee are available on the NICE website: https://www.nice.org.uk/guidance/indevelopment/gid-ng10181
29.	Other registration details	Not applicable.
30.	Reference/URL for published protocol	crd.york.ac.uk/prospero/display_record.php?ID=CRD42024531909
31.	Dissemination plans	NICE may use a range of different methods to raise awareness of the guideline. These include standard approaches such as: • notifying registered stakeholders of publication • publicising the guideline through NICE's newsletter and alerts • issuing a press release or briefing as appropriate, posting news articles on the NICE website, using social media channels, and publicising the guideline within NICE.
32.	Keywords	Acquired brain injury; acquired spinal cord injury; neurological diseases; neurological disorders; peripheral nerve disorders; rehabilitation; clinical case management.
33.	Details of existing review of same topic by same authors	Not applicable.

ID	Field	Content	
34.	Current review status	☐	Ongoing
		☐	Completed but not published
		☒	Completed and published
		☐	Completed, published and being updated
		☐	Discontinued
35..	Additional information	Not applicable.	
36.	Details of final publication	www.nice.org.uk	

AHP: Allied Health Professionals; ASCOT: Adult Social Care Outcomes Toolkit; BABICM: British Association of Brain Injury and Complex Case Management; CDSR: Cochrane Database of Systematic Reviews; CENTRAL: Cochrane Central Register of Controlled Trials; CMSUK: Case Management Society UK; CND: Chronic Neurological Disorder; COVID-19: Coronavirus disease; EQ5D: Euro Quality of Life measure with 5 domains; GRADE: Grading of Recommendations Assessment, Development and Evaluation; HADS-A: Hospital Anxiety and Depression Scale - Anxiety; HADS-D: Hospital Anxiety and Depression Scale - Depression; ICECAP-A: ICEpop CAPability measure for Adults; INAHTA: International Network of Agencies for Health Technology Assessment; MEDLINE: Medical Literature Analysis and Retrieval System Online; MID: minimally important difference; NeuroQOL: Quality of Life in Neurological Disorders Measure; NICE: National Institute for Health and Care Excellence; NHS: National Health Service; NRS: non-randomised trials; PedsQL: Pediatric Quality of Life; PHQ-9: Patient Health Questionnaire; PRESS: Peer Review of Electronic Search Strategies; QUOLIBRI: Quality of Life after Brain Injury; RCT: randomised controlled trial; RoB: risk of bias; ROBINS-I: Risk Of Bias In Non-randomised Studies - of Interventions; ROBIS: risk of bias in systematic reviews; SF-36: 36-item Short Form Survey; SMD: standard mean deviation; SD: standard deviation; WHOQOL: World Health Organization Quality of Life.

Appendix B Literature search strategies

Literature search strategies for review question: What is the effectiveness of clinical case management in the delivery of rehabilitation for people with chronic neurological disorders?

Note: A single economic search was undertaken for all topics included in the scope of this guideline. Databases searched, and search strategies for the economic search are summarised in the Economics Supplement.

Databases: Medline all

Date of last search: 23/04/2024

#	Searches
1	(CRANIOCEREBRAL TRAUMA/ or brain injuries/ or exp brain hemorrhage, traumatic/ or exp brain injuries, diffuse/ or exp brain injuries, traumatic/ or exp brain injury, chronic/ or Shaken Baby Syndrome/ or HYPOXIA, BRAIN/ or Brain Damage, Chronic/ or exp INTRACRANIAL HEMORRHAGE, TRAUMATIC/ or exp BRAIN NEOPLASMS/ or BRAIN DISEASES/ or BRAIN ABSCESS/ or BRAIN DISEASES, METABOLIC/ or CEREBELLAR DISEASES/ or cerebrovascular disorders/ or basal ganglia cerebrovascular disease/ or cerebrovascular trauma/ or intracranial arteriovenous malformations/ or "intracranial embolism and thrombosis"/ or intracranial hemorrhages/ or vascular headaches/ or exp ENCEPHALITIS/ or exp HYDROCEPHALUS/) not (exp STROKE/ or dementia/)
2	((brain* or cereb* or craniocereb* or cranial or intracrani* or neurocognit*) adj2 (injur* or trauma* or damage* or disease*1 or disorder* or infect* or h?emorrhag* or neoplasm* or cancer* or tumo?r* or insult* or impair* or ischemi* or ischaemi* or infarcti* or hypoxi* or drown*)).ti,ab.
3	(chronic* adj1 trauma* adj2 encephalopath*).ti,ab.
4	((infratentorial* or supratentorial* or hypothalam* or pituitar* or choroid plexus) adj2 (neoplasm* or cancer* or tumo?r* or carcinom* or adenocarcinom*)).ti,ab.
5	(brain* adj2 abscess*).ti,ab.
6	(carotid arter* adj2 (disease* or injur*)).ti,ab.
7	("basal ganglia disease*" or encephalitis or meningoencephalitis or hydrocephal* or "paraneoplastic cereb* degenerat*" or "shak* baby syndrome*").ti,ab.
8	exp STROKE/ and (ADOLESCENT/ or MINORS/ or exp CHILD/ or exp INFANT/ or exp PEDIATRICS/ or exp PUBERTY/)
9	(stroke? adj3 (p?ediatric* or child* or adolescen* or kid or kids or youth* or youngster* or minor or minors or underage* or under-age* or "under age*" or teen or teens or teenager* or juvenile* or boy or boys or boyhood or girl or girls or girlhood or schoolchild* or "school age*" or schoolage* or "under 16" or "under sixteen*")).ti,ab.
10	exp SPINAL CORD INJURIES/ or exp SPINAL CORD NEOPLASMS/ or EPIDURAL ABSCESS/ or SPINAL CORD DISEASES/ or exp SPINAL CORD VASCULAR DISEASES/ or SPINAL CORD COMPRESSION/ or MYELITIS, TRANSVERSE/
11	((spinal* or spine?) adj2 (injur* or trauma* or tumo?r* or neoplasm* or cancer* or infect* or insult* or disease? or disorder* or degenrat* or compress* or vascular* or ischemi* or ischaemi* or infarct* or h?emorrhag*)).ti,ab.
12	(Central cord syndrome* or transverse myelitis).ti,ab.
13	(epidural* adj2 (neoplasm* or cancer* or tumo?r* or abscess*)).ti,ab.
14	((spinal* or spine?) adj2 (viral* or virus* or polio* or acquired immunodeficiency syndrome or AIDS or HIV or bacterial* or neurosyphili* or neuro-syphili* or tubercul*)).ti,ab.
15	PERIPHERAL NERVE INJURIES/ or exp CRANIAL NERVE INJURIES/ or PERIPHERAL NERVOUS SYSTEM NEOPLASMS/ or exp CRANIAL NERVE NEOPLASMS/ or exp PERIPHERAL NERVOUS SYSTEM DISEASES/ or exp CRANIAL NERVE DISEASES/
16	((periph* or cranial*) adj1 (nerve? or nervous system) adj2 (injur* or trauma* or disorder* or disease* or damage* or neoplasm* or cancer* or tumo?r* or inflamm* or autoimmun* or paraneoplastic* or neuropath* or syndrome?)).ti,ab.
17	(Guillain* adj1 Barr*).ti,ab.
18	((abducen* or accessory or facial or glossopharyngeal or hypoglossal or oculomotor or ocular motility or olfactory or optic* or trigeminal or trochlear or vestibulocochlear) adj1 nerve* adj1 injur*).ti,ab.
19	(optic* adj1 nerve* adj2 (neoplasm* or cancer* or tumo?r*)).ti,ab.
20	(brachial plexus adj1 (neuropath* or neuritis)).ti,ab.

#	Searches
21	(complex regional pain syndrome* or causalgia or mononeuropath* or nerve compression syndrome*).ti,ab.
22	((femoral or median or peroneal or radial or sciatic or tibial or ulnar) adj1 neuropath*).ti,ab.
23	((carpal-tunnel or piriformis-muscle or tarsal-tunnel or thoracic-outlet) adj1 syndrome*).ti,ab.
24	(pudendal neuralgia or polyneuropath* or polyradiculoneuropath* or polyradiculopath* or radiculopath*).ti,ab.
25	((abducen* or accessory or facial or glossopharyngeal or hypoglossal or oculomotor or ocular motility or olfactory or optic* or trigeminal or trochlear or vestibulocochlear) adj1 nerve* adj1 disease*).ti,ab.
26	(periph* adj2 neuropath*).ti,ab.
27	(((periph* or cranial*) adj2 (nerve? or nervous system)) and lupus).ti,ab.
28	((multi-focal* or multifocal*) adj2 motor adj1 neuropath*).ti,ab.
29	(((periph* or cranial*) adj2 (nerve? or nervous system)) and alcohol*).ti,ab.
30	exp MOTOR NEURON DISEASE/ or POSTPOLIOMYELITIS SYNDROME/ or exp PARKINSONIAN DISORDERS/ or MUSCULAR DYSTROPHY, DUCHENNE/ or exp MULTIPLE SCLEROSIS/ or NEUROMUSCULAR DISEASES/ or SPASTIC PARAPLEGIA, HEREDITARY/ or FRIEDREICH ATAXIA/ or exp MULTIPLE SYSTEM ATROPHY/ or SUPRANUCLEAR PALSY, PROGRESSIVE/ or CORTICOBASAL DEGENERATION/ or LEUKODYSTROPHY, METACHROMATIC/ or exp MITOCHONDRIAL MYOPATHIES/ or exp MUCOPOLYSACCHARIDOSES/ or WILLIAMS SYNDROME/ or GENETIC DISEASES, INBORN/ or RETT SYNDROME/ or FETAL ALCOHOL SPECTRUM DISORDERS/ or DYSTONIC DISORDERS/ or "HEREDITARY SENSORY AND MOTOR NEUROPATHY"/ or SPINAL DYSRAPHISM/
31	(neurolog* adj1 (condition* or disease* or damage* or disorder* or impair*)).ti,ab.
32	((motor-neuron* or gehrig* or charcott* or kennedy*) adj1 disease*).ti,ab.
33	((amyotroph* or primary) adj1 lateral* adj1 sclero*).ti,ab.
34	(bulbar adj1 pals*).ti,ab.
35	((muscular or muscle* or bulbo) adj1 atroph* adj1 spin*).ti,ab.
36	(progressiv* adj1 (muscular or muscle*) adj1 atroph*).ti,ab.
37	((postpolio* or post-polio*) adj1 syndrome?).ti,ab.
38	(Parkinson* or duchenne* or multiple scleros?s* or aphasia or creutzfeldt-jakob or huntington* or kluver-bucy).ti,ab.
39	(muscular adj1 dystroph*).ti,ab.
40	(neuromusc* adj1 (disease* or disorder?)).ti,ab.
41	(heredit* adj1 spastic* adj1 parapleg*).ti,ab.
42	"friedreich* ataxia*".ti,ab.
43	((multiple system or olivopontocerebellar) adj1 atroph*).ti,ab.
44	(shy-drager syndrome* or striatonigral degenerat* or batten* disease?).ti,ab.
45	(progressive adj1 supranuclear adj1 pals*).ti,ab.
46	(richardson* adj1 (disease? or syndrome?)).ti,ab.
47	((corticobasal or cortico basal) adj1 degenerat*).ti,ab.
48	(white adj1 matter adj1 disorder?).ti,ab.
49	(metachromatic leukodystroph* or mitochondrial myopath* or mucopolysaccharidos*).ti,ab.
50	(lysosomal adj1 storage adj1 disorder?).ti,ab.
51	((genetic or William* or catch-22 or rett* or congenital or f?etal alcohol) adj1 (syndrome or disorder*)).ti,ab.
52	(perinatal illness* or perinatal hypoxia*).ti,ab.
53	(primary adj1 dystonia?).ti,ab.
54	(heredit* adj1 motor* adj1 sens* adj1 neuropath*).ti,ab.
55	(spina bifida? or spinal dysraphism?).ti,ab.
56	MOVEMENT DISORDERS/ or MOTOR DISORDERS/ or CONVERSION DISORDER/
57	((functional* or psychogenic* or dissociative*) adj1 neurologic* adj1 (disorder* or dysfunction* or difficult*)).ti,ab.
58	((movement* or motor* or convers*) adj1 (disorder* or dysfunct*)).ti,ab.
59	((psychogenic or dissociative or non-epilep* or nonepilep*) adj1 (seizure* or convulsion* or fit or fits or spasm* or attack*)).ti,ab.
60	(pseudo-seizure* or pseudoseizure*).ti,ab.
61	(medical* adj1 (unexplain* or un-explain*) adj1 symptom?).ti,ab.
62	or/1-61

#	Searches
63	CASE MANAGEMENT/ or CASE MANAGERS/
64	(case? adj3 (manag* or co?ordinat*)).ti,ab.
65	"CONTINUITY OF PATIENT CARE"/
66	((continuity or continuum) adj3 care).ti,ab.
67	((rehab* or care or role? or service?) adj3 (co?ordinat* or manager?)).ti,ab.
68	(rehab* adj3 specialist?).ti,ab.
69	key worker?.ti,ab.
70	((named or assign*) adj3 (staff or lead? or contact* or worker* or therapist* or physiotherapist or clinician* or nurse* or practitioner*)).ti,ab.
71	((point or lead or named or assign*) adj3 contact?).ti,ab.
72	NURSE SPECIALISTS/
73	((special* or senior) adj3 nurse?).ti,ab.
74	ALLIED HEALTH PERSONNEL/
75	(allied health adj3 (personnel or professional?)).ti,ab.
76	PHYSICAL THERAPISTS/
77	(physiotherapist? or (physical adj3 therapist?)).ti.
78	(physiotherapist? or (physical adj3 therapist?)).ab. /freq=2
79	OCCUPATIONAL THERAPISTS/
80	(occupational adj3 therapist?).ti.
81	(occupational adj3 therapist?).ab. /freq=2
82	((speech or language) adj3 therapist?).ti.
83	((speech or language) adj3 therapist?).ab. /freq=2
84	SOCIAL WORKERS/
85	social worker?.ti,ab.
86	(advocate or advocates).ti.
87	(advocate or advocates).ab. /freq=2
88	(neuronavigator? or neuro navigator?).ti,ab.
89	(manag* adj3 (transition* or post?acute or inpatient? or outpatient? or communit* or discharg* or post?discharg* or pathway? or referr* or transfer*)).ti,ab.
90	((ensur* or provid* or assur* or arrang* or facilitat* or oversee*) adj1 (transition* or post?acute or inpatient? or outpatient? or communit* or discharg* or post?discharg* or pathway? or referr* or transfer*)).ti,ab.
91	((integrat* or blend*) adj3 care adj5 (transition* or post?acute or inpatient? or outpatient? or communit* or discharg* or post?discharg* or pathway? or referr* or transfer*)).ti,ab.
92	((transition* or post?acute or inpatient? or outpatient? or communit* or discharg* or post?discharg* or pathway? or referr* or transfer*) adj2 receiv* adj2 (servic* or care* or center* or centre* or therap*)).ti,ab.
93	sign?post*.ti,ab.
94	or/63-93
95	62 and 94
96	letter/
97	editorial/
98	news/
99	exp historical article/
100	Anecdotes as topic/
101	comment/
102	case reports/
103	(letter or comment*).ti.
104	or/96-103
105	randomized controlled trial/ or random*.ti,ab.
106	104 not 105
107	animals/ not humans/
108	exp Animals, Laboratory/
109	exp Animal Experimentation/

#	Searches
110	exp Models, Animal/
111	exp Rodentia/
112	(rat or rats or rodent* or mouse or mice).ti.
113	or/106-112
114	95 not 113
115	limit 114 to english language
116	limit 115 to yr="2013 -Current"
117	meta-analysis/
118	meta-analysis as topic/
119	(meta analy* or metanaly* or metaanaly*).ti,ab.
120	((systematic* or evidence*) adj2 (review* or overview*)).ti,ab.
121	(reference list* or bibliograph* or hand search* or manual search* or relevant journals).ab.
122	(search strategy or search criteria or systematic search or study selection or data extraction).ab.
123	(search* adj4 literature).ab.
124	(medline or pubmed or cochrane or embase or psychlit or psyclit or psychinfo or psycinfo or cinahl or science citation index or bids or cancerlit).ab.
125	cochrane.jw.
126	or/117-125
127	randomized controlled trial.pt.
128	controlled clinical trial.pt.
129	pragmatic clinical trial.pt.
130	randomi#ed.ab.
131	placebo.ab.
132	randomly.ab.
133	Clinical Trials as topic.sh.
134	trial.ti.
135	or/127-134
136	exp EPIDEMIOLOGIC STUDIES/ or exp CLINICAL TRIAL/ or COMPARATIVE STUDY/
137	(control and study).mp.
138	program.mp.
139	or/136-138
140	exp Infant/ or Infant Health/ or Infant Welfare/
141	(prematur* or pre-matur* or preterm* or pre-term* or infan* or newborn* or new-born* or perinat* or peri-nat* or neonat* or neo-nat* or baby* or babies or toddler*).ti,ab,in,jn.
142	exp Child/ or exp Child Behavior/ or Child Health/ or Child Welfare/
143	Minors/
144	(child* or minor or minors or boy* or girl* or kid or kids or young*).ti,ab,in,jn.
145	exp pediatrics/
146	(pediatric* or paediatric* or peadiatric*).ti,ab,in,jn.
147	Adolescent/ or Adolescent Behavior/ or Adolescent Health/
148	Puberty/
149	(adolescen* or pubescen* or prepubescen* or pre-pubescen* or pubert* or prepubert* or pre-pubert* or teen* or preteen* or pre-teen* or juvenil* or youth* or under*age*).ti,ab,in,jn.
150	Schools/
151	Child Day Care Centers/ or exp Nurseries/ or Schools, Nursery/
152	(pre-school* or preschool* or kindergar* or daycare or day-care or nurser* or school* or pupil* or student*).ti,ab,jn.
153	("under 18*" or "under eighteen*" or "under 25*" or "under twenty five*").ti,ab.
154	or/140-153
155	116 and (126 or 135)
156	116 and 139 and 154
157	or/155-156

Databases: Embase

Date of last search: 23/04/2024

#	Searches
1	(head injury/ or exp brain injury/ or chronic brain disease/ or brain hemorrhage/ or brain hypoxia/ or exp brain tumor/ or brain disease/ or brain abscess/ or metabolic encephalopathy/ or cerebellum disease/ or exp cerebrovascular disease/ or encephalitis/ or hydrocephalus/) not (exp cerebrovascular accident/ or dementia/)
2	((brain* or cereb* or craniocereb* or cranial or intracrani* or neurocognit*) adj2 (injur* or trauma* or damage* or disease*1 or disorder* or infect* or h?emorrhag* or neoplasm* or cancer* or tumo?r* or insult* or impair* or ischemi* or infarcti* or hypoxi* or drown*)).ti,ab.
3	(chronic* adj1 trauma* adj2 encephalopath*).ti,ab.
4	((infratentorial* or supratentorial* or hypothalam* or pituitar* or choroid plexus) adj2 (neoplasm* or cancer* or tumo?r* or carcinom* or adenocarcinom*)).ti,ab.
5	(brain* adj2 abscess*).ti,ab.
6	(carotid arter* adj2 (disease* or injur*)).ti,ab.
7	("basal ganglia disease*" or encephalitis or meningoencephalitis or hydrocephal* or "paraneoplastic cereb* degenerat*" or "shak* baby syndrome*").ti,ab.
8	exp cerebrovascular accident/ and (adolescent/ or "minor (person)"/ or exp child/ or exp infant/ or pediatrics/ or exp pediatrics/ or exp puberty/)
9	(stroke? adj3 (p?ediatric* or child* or adolescen* or kid or kids or youth* or youngster* or minor or minors or underage* or under-age* or "under age*" or teen or teens or teenager* or juvenile* or boy or boys or boyhood or girl or girls or girlhood or schoolchild* or "school age*" or schoolage* or "under 16" or "under sixteen*")).ti,ab.
10	exp spinal cord injury/ or exp spinal cord tumor/ or epidural abscess/ or spinal cord disease/ or exp spinal cord vascular disease/ or spinal cord compression/ or transverse myelitis/
11	((spinal* or spine?) adj2 (injur* or trauma* or tumo?r* or neoplasm* or cancer* or infect* or insult* or disease? or disorder* or degenrat* or compress* or vascular* or ischemi* or ischaemi* or infarct* or h?emorrhag*)).ti,ab.
12	(Central cord syndrome* or transverse myelitis).ti,ab.
13	(epidural* adj2 (neoplasm* or cancer* or tumo?r* or abscess*)).ti,ab.
14	((spinal* or spine?) adj2 (viral* or virus* or polio* or acquired immunodeficiency syndrome or AIDS or HIV or bacterial* or neurosyphili* or neuro-syphili* or tubercul*)).ti,ab.
15	peripheral nerve injury/ or exp cranial nerve injury/ or peripheral nerve tumor/ or exp cranial nerve tumor/ or exp peripheral neuropathy/ or exp cranial neuropathy/
16	((periph* or cranial*) adj1 (nerve? or nervous system) adj2 (injur* or trauma* or disorder* or disease* or damage* or neoplasm* or cancer* or tumo?r* or inflamm* or autoimmun* or paraneoplastic* or neuropath* or syndrome?)).ti,ab.
17	(Guillain* adj1 Barr*).ti,ab.
18	((abducen* or accessory or facial or glossopharyngeal or hypoglossal or oculomotor or ocular motility or olfactory or optic* or trigeminal or trochlear or vestibulocochlear) adj1 nerve* adj1 injur*).ti,ab.
19	(optic* adj1 nerve* adj2 (neoplasm* or cancer* or tumo?r*)).ti,ab.
20	(brachial plexus adj1 (neuropath* or neuritis)).ti,ab.
21	(complex regional pain syndrome* or causalgia or mononeuropath* or nerve compression syndrome*).ti,ab.
22	((femoral or median or peroneal or radial or sciatic or tibial or ulnar) adj1 neuropath*).ti,ab.
23	((carpal-tunnel or piriformis-muscle or tarsal-tunnel or thoracic-outlet) adj1 syndrome*).ti,ab.
24	(pudendal neuralgia or polyneuropath* or polyradiculoneuropath* or polyradiculopath* or radiculopath*).ti,ab.
25	((abducen* or accessory or facial or glossopharyngeal or hypoglossal or oculomotor or ocular motility or olfactory or optic* or trigeminal or trochlear or vestibulocochlear) adj1 nerve* adj1 disease*).ti,ab.
26	(periph* adj2 neuropath*).ti,ab.
27	(((periph* or cranial*) adj2 (nerve? or nervous system)) and lupus).ti,ab.
28	((multi-focal* or multifocal*) adj2 motor adj1 neuropath*).ti,ab.
29	(((periph* or cranial*) adj2 (nerve? or nervous system)) and alcohol*).ti,ab.
30	exp motor neuron disease/ or postpoliomyelitis syndrome/ or exp parkinsonism/ or Duchenne muscular dystrophy/ or exp multiple sclerosis/ or neuromuscular disease/ or hereditary motor sensory neuropathy/ or Friedreich ataxia/ or exp Shy Drager syndrome/ or progressive supranuclear palsy/ or corticobasal degeneration/ or metachromatic leukodystrophy/ or exp mitochondrial myopathy/ or exp mucopolysaccharidosis/ or Williams Beuren syndrome/ or genetic disorder/ or Rett syndrome/ or fetal alcohol syndrome/ or dystonic disorder/ or hereditary motor sensory neuropathy/ or spinal dysraphism/

#	Searches
31	(neurolog* adj1 (condition* or disease* or damage* or disorder* or impair*)).ti,ab.
32	((motor-neuron* or gehrig* or charcott* or kennedy*) adj1 disease*).ti,ab.
33	((amyotroph* or primary) adj1 lateral* adj1 sclero*).ti,ab.
34	(bulbar adj1 pals*).ti,ab.
35	((muscular or muscle* or bulbo) adj1 atroph* adj1 spin*).ti,ab.
36	(progressiv* adj1 (muscular or muscle*) adj1 atroph*).ti,ab.
37	((postpolio* or post-polio*) adj1 syndrome?).ti,ab.
38	(Parkinson* or duchenne* or multiple scleros?s* or aphasia or creutzfeldt-jakob or huntington* or kluver-bucy).ti,ab.
39	(muscular adj1 dystroph*).ti,ab.
40	(neuromusc* adj1 (disease* or disorder?)).ti,ab.
41	(heredit* adj1 spastic* adj1 parapleg*).ti,ab.
42	"friedreich* ataxia*".ti,ab.
43	((multiple system or olivopontocerebellar) adj1 atroph*).ti,ab.
44	(shy-drager syndrome* or striatonigral degenerat* or batten* disease?).ti,ab.
45	(progressive adj1 supranuclear adj1 pals*).ti,ab.
46	(richardson* adj1 (disease? or syndrome?)).ti,ab.
47	((corticobasal or cortico basal) adj1 degenerat*).ti,ab.
48	(white adj1 matter adj1 disorder?).ti,ab.
49	(metachromatic leukodystroph* or mitochondrial myopath* or mucopolysaccharidos*).ti,ab.
50	(lysosomal adj1 storage adj1 disorder?).ti,ab.
51	((genetic or William* or catch-22 or rett* or congenital or f?etal alcohol) adj1 (syndrome or disorder*)).ti,ab.
52	(perinatal illness* or perinatal hypoxia*).ti,ab.
53	(primary adj1 dystonia?).ti,ab.
54	(heredit* adj1 motor* adj1 sens* adj1 neuropath*).ti,ab.
55	(spina bifida? or spinal dysraphism?).ti,ab.
56	motor dysfunction/ or motor dysfunction/ or conversion disorder/
57	((functional* or psychogenic* or dissociative*) adj1 neurologic* adj1 (disorder* or dysfunction* or difficult*)).ti,ab.
58	((movement* or motor* or convers*) adj1 (disorder* or dysfunct*)).ti,ab.
59	((psychogenic or dissociative or non-epilep* or nonepilep*) adj1 (seizure* or convulsion* or fit or fits or spasm* or attack*)).ti,ab.
60	(pseudo-seizure* or pseudoseizure*).ti,ab.
61	(medical* adj1 (unexplain* or un-explain*) adj1 symptom?).ti,ab.
62	or/1-61
63	CASE MANAGEMENT/ or CASE MANAGER/
64	(case? adj3 (manag* or co?ordinat*)).ti,ab.
65	((continuity or continuum) adj3 care).ti,ab.
66	((rehab* or care or role? or service?) adj3 (co?ordinat* or manager?)).ti,ab.
67	(rehab* adj3 specialist?).ti,ab.
68	key worker?.ti,ab.
69	((named or assign*) adj3 (staff or lead? or contact* or worker* or therapist* or physiotherapist or clinician* or nurse* or practitioner*)).ti,ab.
70	((point or lead or named or assign*) adj3 contact?).ti,ab.
71	nurse specialist/ or clinical nurse specialist/
72	NURSE SPECIALIST/ or CLINICAL NURSE SPECIALIST/
73	((special* or senior) adj3 nurse?).ti,ab.
74	PARAMEDICAL PERSONNEL/
75	(allied health adj3 (personnel or professional?)).ti,ab.
76	PHYSIOTHERAPIST/
77	(physiotherapist? or (physical adj3 therapist?)).ti.
78	(physiotherapist? or (physical adj3 therapist?)).ab. /freq=2
79	OCCUPATIONAL THERAPIST/

#	Searches
80	(occupational adj3 therapist?).ti.
81	(occupational adj3 therapist?).ab. /freq=2
82	SPEECH LANGUAGE PATHOLOGIST/
83	((speech or language) adj3 therapist?).ti.
84	((speech or language) adj3 therapist?).ab. /freq=2
85	SOCIAL WORKER/
86	social worker?.ti,ab.
87	(advocate or advocates).ti.
88	(advocate or advocates).ab. /freq=2
89	(neuronavigator? or neuro navigator?).ti,ab.
90	(manag* adj3 (transition* or post?acute or inpatient? or outpatient? or communit* or discharg* or post?discharg* or pathway? or referr* or transfer*)).ti,ab.
91	((ensur* or provid* or assur* or arrang* or facilitat* or oversee*) adj1 (transition* or post?acute or inpatient? or outpatient? or communit* or discharg* or post?discharg* or pathway? or referr* or transfer*)).ti,ab.
92	((integrat* or blend*) adj3 care adj5 (transition* or post?acute or inpatient? or outpatient? or communit* or discharg* or post?discharg* or pathway? or referr* or transfer*)).ti,ab.
93	((transition* or post?acute or inpatient? or outpatient? or communit* or discharg* or post?discharg* or pathway? or referr* or transfer*) adj2 receiv* adj2 (servic* or care* or center* or centre* or therap*)).ti,ab.
94	sign?post*.ti,ab.
95	or/63-94
96	62 and 95
97	letter.pt. or letter/
98	note.pt.
99	editorial.pt.
100	case report/ or case study/
101	(letter or comment*).ti.
102	or/97-101
103	randomized controlled trial/ or random*.ti,ab.
104	102 not 103
105	animal/ not human/
106	nonhuman/
107	exp Animal Experiment/
108	exp Experimental Animal/
109	animal model/
110	exp Rodent/
111	(rat or rats or rodent* or mouse or mice).ti.
112	or/104-111
113	96 not 112
114	limit 113 to english language
115	limit 114 to yr="2013 -Current"
116	systematic review/
117	meta-analysis/
118	(meta analy* or metanaly* or metaanaly*).ti,ab.
119	((systematic or evidence) adj2 (review* or overview*)).ti,ab.
120	(reference list* or bibliograph* or hand search* or manual search* or relevant journals).ab.
121	(search strategy or search criteria or systematic search or study selection or data extraction).ab.
122	(search* adj4 literature).ab.
123	(medline or pubmed or cochrane or embase or psychlit or psyclit or psychinfo or psycinfo or cinahl or science citation index or bids or cancerlit).ab.
124	((pool* or combined) adj2 (data or trials or studies or results)).ab.
125	cochrane.jw.
126	or/116-125

#	Searches
127	random*.ti,ab.
128	factorial*.ti,ab.
129	(crossover* or cross over*).ti,ab.
130	((doubl* or singl*) adj blind*).ti,ab.
131	(assign* or allocat* or volunteer* or placebo*).ti,ab.
132	crossover procedure/
133	single blind procedure/
134	randomized controlled trial/
135	double blind procedure/
136	or/127-135
137	EPIDEMIOLOGY/ or CONTROLLED STUDY/ or exp CASE CONTROL STUDY/ or PROSPECTIVE STUDY/ or RETROSPECTIVE STUDY/ or COHORT ANALYSIS/ or FOLLOW UP/ or CROSS-SECTIONAL STUDY/ or exp CLINICAL TRIAL/ or COMPARATIVE STUDY/
138	(control and study).mp.
139	program.mp.
140	or/137-139
141	exp juvenile/ or Child Behavior/ or Child Welfare/ or Child Health/ or infant welfare/ or "minor (person)"/ or elementary student/
142	(prematur* or pre-matur* or preterm* or pre-term* or infan* or newborn* or new-born* or perinat* or peri-nat* or neonat* or neo-nat* or baby* or babies or toddler*).ti,ab,in,ad,jw.
143	(child* or minor or minors or boy* or girl* or kid or kids or young*).ti,ab,in,ad,jw.
144	exp pediatrics/
145	(pediatric* or paediatric* or peadiatric*).ti,ab,in,ad,jw.
146	exp adolescence/ or exp adolescent behavior/ or adolescent health/ or high school student/ or middle school student/
147	(adolescen* or pubescen* or prepubescen* or pre-pubescen* or pubert* or prepubert* or pre-pubert* or teen* or preteen* or pre-teen* or juvenil* or youth* or under*age*).ti,ab,in,ad,jw.
148	school/ or high school/ or kindergarten/ or middle school/ or primary school/ or nursery school/ or day care/
149	(pre-school* or preschool* or kindergar* or daycare or day-care or nurser* or school* or pupil* or student*).ti,ab,jw.
150	("under 18*" or "under eighteen*" or "under 25*" or "under twenty five*").ti,ab.
151	or/141-150
152	(conference abstract* or conference review or conference paper or conference proceeding).db,pt,su.
153	115 and (126 or 136)
154	115 and 140 and 151
155	or/153-154
156	(conference abstract* or conference review or conference paper or conference proceeding).db,pt,su.
157	155 not 156

Databases: Cochrane Central Register of Controlled Trials; and Cochrane Database of Systematic Reviews

Date of last search: 23/04/2024

#	Searches
#1	MeSH descriptor: [Craniocerebral Trauma] this term only
#2	MeSH descriptor: [Brain Injuries] this term only
#3	MeSH descriptor: [Brain Hemorrhage, Traumatic] explode all trees
#4	MeSH descriptor: [Brain Injuries, Diffuse] explode all trees
#5	MeSH descriptor: [Brain Injuries, Traumatic] explode all trees
#6	MeSH descriptor: [Brain Injury, Chronic] explode all trees
#7	MeSH descriptor: [Shaken Baby Syndrome] this term only
#8	MeSH descriptor: [Brain Damage, Chronic] this term only
#9	MeSH descriptor: [Hypoxia, Brain] this term only

#	Searches
#10	MeSH descriptor: [Intracranial Hemorrhage, Traumatic] explode all trees
#11	MeSH descriptor: [Brain Neoplasms] explode all trees
#12	MeSH descriptor: [Brain Diseases] this term only
#13	MeSH descriptor: [Brain Abscess] this term only
#14	MeSH descriptor: [Brain Diseases, Metabolic] this term only
#15	MeSH descriptor: [Cerebellar Diseases] this term only
#16	MeSH descriptor: [Cerebrovascular Disorders] this term only
#17	MeSH descriptor: [Basal Ganglia Cerebrovascular Disease] this term only
#18	MeSH descriptor: [Cerebrovascular Trauma] this term only
#19	MeSH descriptor: [Intracranial Arteriovenous Malformations] this term only
#20	MeSH descriptor: [Intracranial Embolism and Thrombosis] this term only
#21	MeSH descriptor: [Intracranial Hemorrhages] this term only
#22	MeSH descriptor: [Vascular Headaches] this term only
#23	MeSH descriptor: [Encephalitis] this term only
#24	MeSH descriptor: [Hydrocephalus] this term only
#25	#1 or #2 or #3 or #4 or #5 or #6 or #7 or #8 or #9 or #10 or #11 or #12 or #13 or #14 or #15 or #16 or #17 or #18 or #19 or #20 or #21 or #22 or #23 or #24
#26	MeSH descriptor: [Stroke] explode all trees
#27	MeSH descriptor: [Dementia] this term only
#28	#26 or #27
#29	#25 NOT #28
#30	((brain* or cereb* or craniocereb* or cranial or intracrani* or neurocognit*) NEAR/2 (injur* or trauma* or damage* or disease* or diseases* or disorder* or infect* or hemorrhag* or haemorrhag* or neoplasm* or cancer* or tumour* or tumor* or insult* or impair* or ischemi* or ischaemi* or infarcti* or hypoxi* or drown*)):ti,ab
#31	(chronic* NEAR/1 trauma* NEAR/2 encephalopath*):ti,ab
#32	((infratentorial* or supratentorial* or hypothalam* or pituitar* or "choroid plexus") NEAR/2 (neoplasm* or cancer* or tumour* or tumor* or carcinom* or adenocarcinom*)):ti,ab
#33	(brain* NEAR/2 abscess*):ti,ab
#34	(carotid arter* NEAR/2 (disease* or injur*)):ti,ab
#35	(("basal ganglia" next disease*) or encephalitis or meningoencephalitis or hydrocephal* or "paraneoplastic cerebellar" next degenerat* or "shaken baby" next syndrome* or "shaking baby" next syndrome*):ti,ab
#36	MeSH descriptor: [Stroke] explode all trees
#37	MeSH descriptor: [Adolescent] this term only
#38	MeSH descriptor: [Minors] this term only
#39	MeSH descriptor: [Child] explode all trees
#40	MeSH descriptor: [Infant] explode all trees
#41	MeSH descriptor: [Pediatrics] explode all trees
#42	MeSH descriptor: [Puberty] explode all trees
#43	#37 or #38 or #39 or #40 or #41 or #42
#44	#36 and #43
#45	((stroke or strokes) NEAR/3 (paediatric* or pediatric* or child* or adolescen* or kid or kids or youth* or youngster* or minor or minors or underage* or "under age" or "under ages" or "under aged" or teen or teens or teenager* or juvenile* or boy or boys or boyhood or girl or girls or girlhood or schoolchild* or "school ages" or "school age" or "school aged" or schoolage* or "under 16" or "under sixteen" or "under sixteens")):ti,ab
#46	MeSH descriptor: [Spinal Cord Injuries] explode all trees
#47	MeSH descriptor: [Spinal Cord Neoplasms] explode all trees
#48	MeSH descriptor: [Epidural Abscess] this term only
#49	MeSH descriptor: [Spinal Cord Diseases] this term only
#50	MeSH descriptor: [Spinal Cord Vascular Diseases] explode all trees
#51	MeSH descriptor: [Spinal Cord Compression] this term only
#52	MeSH descriptor: [Myelitis, Transverse] this term only

#	Searches
#53	((spinal* or spine or spines) NEAR/2 (injur* or trauma* or tumour* or tumor* or neoplasm* or cancer* or infect* or insult* or disease or diseases or disorder* or degenrat* or compress* or vascular* or ischemi* or ischaemi* or infarct* or hemorrhag* or haemorrhag*)):ti,ab
#54	("Central cord" next syndrome* or "transverse myelitis"):ti,ab
#55	(epidural* NEAR/2 (neoplasm* or cancer* or tumour* or tumor* or abscess*)):ti,ab
#56	((spinal* or spine or spines) NEAR/2 (viral* or virus* or polio* or "acquired immunodeficiency syndrome" or AIDS or HIV or bacterial* or neurosyphili* or neuro next syphili* or tubercul*)):ti,ab
#57	MeSH descriptor: [Peripheral Nerve Injuries] this term only
#58	MeSH descriptor: [Cranial Nerve Injuries] explode all trees
#59	MeSH descriptor: [Peripheral Nervous System Neoplasms] this term only
#60	MeSH descriptor: [Cranial Nerve Neoplasms] explode all trees
#61	MeSH descriptor: [Peripheral Nervous System Diseases] explode all trees
#62	MeSH descriptor: [Cranial Nerve Diseases] explode all trees
#63	((periph* or cranial*) NEAR/1 (nerve or nerves or "nervous system") NEAR/2 (injur* or trauma* or disorder* or disease* or damage* or neoplasm* or cancer* or tumour* or tumor* or inflamm* or autoimmun* or paraneoplastic* or neuropath* or syndrome*)):ti,ab
#64	(Guillain* NEAR/1 Barr*):ti,ab
#65	((abducen* or accessory or facial or glossopharyngeal or hypoglossal or oculomotor or "ocular motility" or olfactory or optic* or trigeminal or trochlear or vestibulocochlear) NEAR/1 nerve* NEAR/1 injur*):ti,ab
#66	(optic* NEAR/1 nerve* NEAR/2 (neoplasm* or cancer* or tumour* or tumor*)):ti,ab
#67	(brachial next plexus NEAR/1 (neuropath* or neuritis)):ti,ab
#68	("complex regional pain" next syndrome* or causalgia or mononeuropath* or "nerve compression" next syndrome*):ti,ab
#69	((femoral or median or peroneal or radial or sciatic or tibial or ulnar) NEAR/1 neuropath*):ti,ab
#70	((carpal next tunnel or piriformis next muscle or tarsal next tunnel or thoracic next outlet) NEAR/1 syndrome*):ti,ab
#71	((pudendal next neuralgia) or polyneuropath* or polyradiculoneuropath* or polyradiculopath* or radiculopath*):ti,ab
#72	((abducen* or accessory or facial or glossopharyngeal or hypoglossal or oculomotor or "ocular motility" or olfactory or optic* or trigeminal or trochlear or vestibulocochlear) NEAR/1 nerve* NEAR/1 disease*):ti,ab
#73	(periph* NEAR/2 neuropath*):ti,ab
#74	(((periph* or cranial*) NEAR/2 (nerve or nerves or "nervous system")) and lupus):ti,ab
#75	((multi next focal* or multifocal*) NEAR/2 motor NEAR/1 neuropath*):ti,ab
#76	(((periph* or cranial*) NEAR/2 (nerve or nerves or nervous system)) and alcohol*):ti,ab
#77	#29 or #30 or #31 or #32 or #33 or #34 or #35 or #44 or #45 or #46 or #47 or #48 or #49 or #50 or #51 or #52 or #53 or #54 or #55 or #56 or #57 or #58 or #59 or #60 or #61 or #62 or #63 or #64 or #65 or #66 or #67 or #68 or #69 or #70 or #71 or #72 or #73 or #74 or #75 or #76
#78	MeSH descriptor: [Motor Neuron Disease] explode all trees
#79	MeSH descriptor: [Postpoliomyelitis Syndrome] this term only
#80	MeSH descriptor: [Parkinsonian Disorders] explode all trees
#81	MeSH descriptor: [Muscular Dystrophy, Duchenne] this term only
#82	MeSH descriptor: [Multiple Sclerosis] explode all trees
#83	MeSH descriptor: [Neuromuscular Diseases] this term only
#84	MeSH descriptor: [Spastic Paraplegia, Hereditary] this term only
#85	MeSH descriptor: [Friedreich Ataxia] this term only
#86	MeSH descriptor: [Multiple System Atrophy] explode all trees
#87	MeSH descriptor: [Supranuclear Palsy, Progressive] this term only
#88	MeSH descriptor: [Corticobasal Degeneration] explode all trees
#89	MeSH descriptor: [Leukodystrophy, Metachromatic] this term only
#90	MeSH descriptor: [Mitochondrial Myopathies] explode all trees
#91	MeSH descriptor: [Mucopolysaccharidoses] explode all trees
#92	MeSH descriptor: [Williams Syndrome] this term only
#93	MeSH descriptor: [Genetic Diseases, Inborn] this term only
#94	MeSH descriptor: [Rett Syndrome] this term only
#95	MeSH descriptor: [Fetal Alcohol Spectrum Disorders] this term only

#	Searches
#96	MeSH descriptor: [Dystonic Disorders] this term only
#97	MeSH descriptor: [Hereditary Sensory and Motor Neuropathy] this term only
#98	MeSH descriptor: [Spinal Dysraphism] this term only
#99	(neurolog* NEAR/1 (condition* or disease* or damage* or disorder* or impair*)):ti,ab
#100	((motor next neuron* or gehrig* or charcott* or kennedy*) NEAR/1 disease*):ti,ab
#101	((amyotroph* or primary) NEAR/1 lateral* NEAR/1 sclero*):ti,ab
#102	(bulbar NEAR/1 pals*):ti,ab
#103	((muscular or muscle* or bulbo) NEAR/1 atroph* NEAR/1 spin*):ti,ab
#104	(progressiv* NEAR/1 (muscular or muscle*) NEAR/1 atroph*):ti,ab
#105	((postpolio* or post next polio*) NEAR/1 (syndrome*)):ti,ab
#106	(Parkinson* or duchenne* or multiple next scleros* or sclerosos* or aphasia or creutzfeldt next jakob or huntington* or kluver next bucy):ti,ab
#107	(muscular NEAR/1 dystroph*):ti,ab
#108	((neurolog*) near/1 (condition* or disease* or damage* or disorder* or impair*)):ti,ab
#109	(heredit* NEAR/1 spastic* NEAR/1 parapleg*):ti,ab
#110	(friedreich* next ataxia*):ti,ab
#111	(("multiple system" or olivopontocerebellar) NEAR/1 atroph*):ti,ab
#112	((shy next drager next syndrome*) or striatonigral next degenerat* or batten next disease*):ti,ab
#113	(progressive NEAR/1 supranuclear NEAR/1 pals*):ti,ab
#114	(richardson* NEAR/1 (disease* or syndrome*)):ti,ab
#115	((corticobasal or "cortico basal") NEAR/1 degenerat*):ti,ab
#116	("white matter" NEAR/1 (disorder*)):ti,ab
#117	(metachromatic next leukodystroph* or mitochondrial next myopath* or mucopolysaccharidos*):ti,ab
#118	(lysosomal NEAR/1 storage NEAR/1 disorder*):ti,ab
#119	((genetic or William* or "catch-22" or rett* or congenital or fetal or "foetal alcohol") NEAR/1 (syndrome* or disorder*)):ti,ab
#120	(perinatal NEAR/1 (illness* or hypoxia*)):ti,ab
#121	(primary NEAR/1 (dystonia or dystonias)):ti,ab
#122	(heredit* NEAR/1 motor* NEAR/1 sens* NEAR/1 neuropath*):ti,ab
#123	(spina next (bifida or bifidas) or spinal next (dysraphism or dysraphisms)):ti,ab
#124	MeSH descriptor: [Movement Disorders] this term only
#125	MeSH descriptor: [Motor Disorders] this term only
#126	MeSH descriptor: [Conversion Disorder] this term only
#127	((functional* or psychogenic* or dissociative*) NEAR/1 neurologic* NEAR/1 (disorder* or dysfunction* or difficult*)):ti,ab
#128	((movement* or motor* or convers*) NEAR/1 (disorder* or dysfunct*)):ti,ab
#129	((psychogenic or dissociative or non-epilep* or nonepilep*) NEAR/1 (seizure* or convulsion* or fit or fits or spasm* or attack*)):ti,ab
#130	(pseudo next seizure or pseudoseizure):ti,ab
#131	(medical* NEAR/1 (unexplain* or un next explain*) NEAR/1 (symptom*)):ti,ab
#132	#77 or #78 or #79 or #80 or #81 or #82 or #83 or #84 or #85 or #86 or #87 or #88 or #89 or #90 or #91 or #92 or #93 or #94 or #95 or #96 or #97 or #98 or #99 or #100 or #101 or #102 or #103 or #104 or #105 or #106 or #107 or #108 or #109 or #110 or #111 or #112 or #113 or #114 or #115 or #116 or #117 or #118 or #119 or #120 or #121 or #122 or #123 or #124 or #125 or #126 or #127 or #128 or #129 or #130 or #131
#133	MeSH descriptor: [Case Management] this term only
#134	MeSH descriptor: [Case Managers] this term only
#135	(case* NEAR/3 (manag* or coordinat* or co-ordinat*)):ti,ab
#136	MeSH descriptor: [Continuity of Patient Care] this term only
#137	((continuity or continuum) NEAR/3 care):ti,ab
#138	((rehab* or care or role* or service*) NEAR/3 (coordinat* or co-ordinat* or manager*)):ti,ab
#139	(rehab* NEAR/3 specialist*):ti,ab
#140	(key NEXT worker*):ti,ab
#141	((named or assign*) NEAR/3 (staff or lead or leads or contact* or worker* or therapist* or physiotherapist or clinician* or nurse* or practitioner*)):ti,ab

#	Searches
#142	((point or lead or named or assign*) NEAR/3 (contact or contacts)):ti,ab
#143	MeSH descriptor: [Nurse Specialists] this term only
#144	((special* or senior) NEAR/3 nurse*):ti,ab
#145	MeSH descriptor: [Allied Health Personnel] this term only
#146	("allied health" NEAR/3 (personnel or professional*)):ti,ab
#147	MeSH descriptor: [Physical Therapists] this term only
#148	(physiotherapist* or (physical NEAR/3 therapist*)):ti,ab
#149	MeSH descriptor: [Occupational Therapists] this term only
#150	(occupational NEAR/3 therapist*):ti,ab
#151	((speech or language) NEAR/3 therapist*):ti,ab
#152	MeSH descriptor: [Social Workers] this term only
#153	(social NEXT worker*):ti,ab
#154	(advocate or advocates):ti,ab
#155	(neuronavigator* or (neuro NEXT navigator*)):ti,ab
#156	(manag* NEAR/3 (transition* or postacute or post-acute or inpatient* or outpatient* or communit* or discharg* or postdischarg* or post-discharg* or pathway* or referr* or transfer*)):ti,ab
#157	((ensur* or provid* or assur* or arrang* or facilitat* or oversee*) NEAR/1 (transition* or postacute or post-acute or inpatient* or outpatient* or communit* or discharg* or postdischarg* or post-discharg* or pathway* or referr* or transfer*)):ti,ab
#158	((integrat* or blend*) NEAR/3 care NEAR/5 (transition* or postacute or post-acute or inpatient* or outpatient* or communit* or discharg* or postdischarg* or post-discharg* or pathway* or referr* or transfer*)):ti,ab
#159	((transition* or postacute or postacute or inpatient* or outpatient* or communit* or discharg* or postdischarg* or post-discharg* or pathway* or referr* or transfer*) NEAR/2 receiv* NEAR/2 (servic* or care* or center* or centre* or therap*)):ti,ab
#160	(signpost* or (sign NEXT post*)):ti,ab
#161	#133 or #134 or #135 or #136 or #137 or #138 or #139 or #140 or #141 or #142 or #143 or #144 or #145 or #146 or #147 or #148 or #149 or #150 or #151 or #152 or #153 or #154 or #155 or #156 or #157 or #158 or #159 or #160
#162	#132 and #161
#163	#132 and #161 with Cochrane Library publication date Between Jan 2013 and Apr 2024, in Cochrane Reviews
#164	((clinicaltrials or trialsearch* or trial-registry or trials-registry or clinicalstudies or trialsregister* or trialregister* or trial-number* or studyregister* or study-register* or controlled-trials-com or current-controlled-trial or AMCTR or ANZCTR or ChiCTR* or CRiS or CTIS or CTRI* or DRKS* or EU-CTR* or EUCTR* or EUDRACT* or ICTRP or IRCT* or JAPIC* or JMCTR* or JRCT or ISRCTN* or LBCTR* or NTR* or ReBec* or REPEC* or RPCEC* or SLCTR or TCTR* or UMIN*):so or (ctgov or ictrp)):an
#165	#162 not #164
#166	"conference":pt
#167	#165 not #166
#168	#165 not #166 with Publication Year from 2013 to 2024, in Trials

Databases: PsycInfo

Date of last search: 23/04/2024

#	Searches
1	(exp Brain Injuries/ or anoxia/ or exp brain disorders/ or exp cerebrovascular disorders/ or exp headache/) not (exp Dementia/ or Cerebrovascular Accidents/)
2	((brain* or cereb* or craniocereb* or cranial or intracrani* or neurocognit*) adj2 (injur* or trauma* or damage* or disease*1 or disorder* or infect* or h?emorrhag* or neoplasm* or cancer* or tumo?r* or insult* or impair* or ischemi* or ischaemi* or infarcti* or hypoxi* or drown*)).ti,ab.
3	(chronic* adj1 trauma* adj2 encephalopath*).ti,ab.
4	((infratentorial* or supratentorial* or hypothalam* or pituitar* or choroid plexus) adj2 (neoplasm* or cancer* or tumo?r* or carcinom* or adenocarcinom*)).ti,ab.
5	(brain* adj2 abscess*).ti,ab.
6	(carotid arter* adj2 (disease* or injur*)).ti,ab.

#	Searches
7	("basal ganglia disease*" or encephalitis or meningoencephalitis or hydrocephal* or "paraneoplastic cereb* degenerat*" or "shak* baby syndrome*").ti,ab.
8	Cerebrovascular Accidents/ and (exp childhood development/ or exp adolescent development/ or pediatrics/ or puberty/)
9	(stroke? adj3 (p?ediatric* or child* or adolescen* or kid or kids or youth* or youngster* or minor or minors or underage* or under-age* or "under age*" or teen or teens or teenager* or juvenile* or boy or boys or boyhood or girl or girls or girlhood or schoolchild* or "school age*" or schoolage* or "under 16" or "under sixteen*")).ti,ab.
10	spinal cord injuries/ or (Spinal Cord/ and neoplasms/) or (Cardiovascular Disorders/ and spinal cord/) or exp myelitis/
11	((spinal* or spine?) adj2 (injur* or trauma* or tumo?r* or neoplasm* or cancer* or infect* or insult* or disease? or disorder* or degenrat* or compress* or vascular* or ischemi* or ischaemi* or infarct* or h?emorrhag*)).ti,ab.
12	(Central cord syndrome* or transverse myelitis).ti,ab.
13	(epidural* adj2 (neoplasm* or cancer* or tumo?r* or abscess*)).ti,ab.
14	((spinal* or spine?) adj2 (viral* or virus* or polio* or acquired immunodeficiency syndrome or AIDS or HIV or bacterial* or neurosyphili* or neuro-syphili* or tubercul*)).ti,ab.
15	(exp Peripheral Nervous System/ and (Injuries/ or neoplasms/)) or nervous system disorders/
16	((periph* or cranial*) adj1 (nerve? or nervous system) adj2 (injur* or trauma* or disorder* or disease* or damage* or neoplasm* or cancer* or tumo?r* or inflamm* or autoimmun* or paraneoplastic* or neuropath* or syndrome?)).ti,ab.
17	(Guillain* adj1 Barr*).ti,ab.
18	((abducen* or accessory or facial or glossopharyngeal or hypoglossal or oculomotor or ocular motility or olfactory or optic* or trigeminal or trochlear or vestibulocochlear) adj1 nerve* adj1 injur*).ti,ab.
19	(optic* adj1 nerve* adj2 (neoplasm* or cancer* or tumo?r*)).ti,ab.
20	(brachial plexus adj1 (neuropath* or neuritis)).ti,ab.
21	(complex regional pain syndrome* or causalgia or mononeuropath* or nerve compression syndrome*).ti,ab.
22	((femoral or median or peroneal or radial or sciatic or tibial or ulnar) adj1 neuropath*).ti,ab.
23	((carpal-tunnel or piriformis-muscle or tarsal-tunnel or thoracic-outlet) adj1 syndrome*).ti,ab.
24	(pudendal neuralgia or polyneuropath* or polyradiculoneuropath* or polyradiculopath* or radiculopath*).ti,ab.
25	((abducen* or accessory or facial or glossopharyngeal or hypoglossal or oculomotor or ocular motility or olfactory or optic* or trigeminal or trochlear or vestibulocochlear) adj1 nerve* adj1 disease*).ti,ab.
26	(periph* adj2 neuropath*).ti,ab.
27	(((periph* or cranial*) adj2 (nerve? or nervous system)) and lupus).ti,ab.
28	((multi-focal* or multifocal*) adj2 motor adj1 neuropath*).ti,ab.
29	(((periph* or cranial*) adj2 (nerve? or nervous system)) and alcohol*).ti,ab.
30	motor neurons/ or exp muscular disorders/ or exp neuromuscular disorders/ or multiple sclerosis/ or neurodegenerative diseases/ or Progressive Supranuclear Palsy/ or corticobasal degeneration/ or Metabolism Disorders/ or Williams Syndrome/ or genetic disorders/ or rett syndrome/ or fetal alcohol syndrome/ or exp peripheral neuropathy/ or spina bifida/
31	(neurolog* adj1 (condition* or disease* or damage* or disorder* or impair*)).ti,ab.
32	((motor-neuron* or gehrig* or charcott* or kennedy*) adj1 disease*).ti,ab.
33	((amyotroph* or primary) adj1 lateral* adj1 sclero*).ti,ab.
34	(bulbar adj1 pals*).ti,ab.
35	((muscular or muscle* or bulbo) adj1 atroph* adj1 spin*).ti,ab.
36	(progressiv* adj1 (muscular or muscle*) adj1 atroph*).ti,ab.
37	((postpolio* or post-polio*) adj1 syndrome?).ti,ab.
38	(Parkinson* or duchenne* or multiple scleros?s* or aphasia or creutzfeldt-jakob or huntington* or kluver-bucy).ti,ab.
39	(muscular adj1 dystroph*).ti,ab.
40	(neuromusc* adj1 (disease* or disorder?)).ti,ab.
41	(heredit* adj1 spastic* adj1 parapleg*).ti,ab.
42	"friedreich* ataxia*".ti,ab.
43	((multiple system or olivopontocerebellar) adj1 atroph*).ti,ab.
44	(shy-drager syndrome* or striatonigral degenerat* or batten* disease?).ti,ab.
45	(progressive adj1 supranuclear adj1 pals*).ti,ab.

#	Searches
46	(richardson* adj1 (disease? or syndrome?)).ti,ab.
47	((corticobasal or cortico basal) adj1 degenerat*).ti,ab.
48	(white adj1 matter adj1 disorder?).ti,ab.
49	(metachromatic leukodystroph* or mitochondrial myopath* or mucopolysaccharidos*).ti,ab.
50	(lysosomal adj1 storage adj1 disorder?).ti,ab.
51	((genetic or William* or catch-22 or rett* or congenital or f?etal alcohol) adj1 (syndrome or disorder*)).ti,ab.
52	(perinatal illness* or perinatal hypoxia*).ti,ab.
53	(primary adj1 dystonia?).ti,ab.
54	(heredit* adj1 motor* adj1 sens* adj1 neuropath*).ti,ab.
55	(spina bifida? or spinal dysraphism?).ti,ab.
56	conversion disorder/
57	((functional* or psychogenic* or dissociative*) adj1 neurologic* adj1 (disorder* or dysfunction* or difficult*)).ti,ab.
58	((movement* or motor* or convers*) adj1 (disorder* or dysfunct*)).ti,ab.
59	((psychogenic or dissociative or non-epilep* or nonepilep*) adj1 (seizure* or convulsion* or fit or fits or spasm* or attack*)).ti,ab.
60	(pseudo-seizure* or pseudoseizure*).ti,ab.
61	(medical* adj1 (unexplain* or un-explain*) adj1 symptom?).ti,ab.
62	or/1-61
63	CASE MANAGEMENT/
64	(case? adj3 (manag* or co?ordinat*)).ti,ab.
65	"CONTINUUM OF CARE"/
66	((continuity or continuum) adj3 care).ti,ab.
67	((rehab* or care or role? or service?) adj3 (co?ordinat* or manager?)).ti,ab.
68	(rehab* adj3 specialist?).ti,ab.
69	key worker?.ti,ab.
70	((named or assign*) adj3 (staff or lead? or contact* or worker* or therapist* or physiotherapist or clinician* or nurse* or practitioner*)).ti,ab.
71	((point or lead or named or assign*) adj3 contact?).ti,ab.
72	((special* or senior) adj3 nurse?).ti,ab.
73	ALLIED HEALTH PERSONNEL/
74	(allied health adj3 (personnel or professional?)).ti,ab.
75	PHYSICAL THERAPISTS/
76	(physiotherapist? or (physical adj3 therapist?)).ti.
77	(physiotherapist? or (physical adj3 therapist?)).ab. /freq=2
78	OCCUPATIONAL THERAPISTS/
79	(occupational adj3 therapist?).ti.
80	(occupational adj3 therapist?).ab. /freq=2
81	SPEECH THERAPISTS/
82	((speech or language) adj3 therapist?).ti.
83	((speech or language) adj3 therapist?).ab. /freq=2
84	exp SOCIAL WORKERS/
85	social worker?.ti,ab.
86	(advocate or advocates).ti.
87	(advocate or advocates).ab. /freq=2
88	(neuronavigator? or neuro navigator?).ti,ab.
89	(manag* adj3 (transition* or post?acute or inpatient? or outpatient? or communit* or discharg* or post?discharg* or pathway? or referr* or transfer*)).ti,ab.
90	((ensur* or provid* or assur* or arrang* or facilitat* or oversee*) adj1 (transition* or post?acute or inpatient? or outpatient? or communit* or discharg* or post?discharg* or pathway? or referr* or transfer*)).ti,ab.
91	((integrat* or blend*) adj3 care adj5 (transition* or post?acute or inpatient? or outpatient? or communit* or discharg* or post?discharg* or pathway? or referr* or transfer*)).ti,ab.

#	Searches
92	((transition* or post?acute or inpatient? or outpatient? or communit* or discharg* or post?discharg* or pathway? or referr* or transfer*) adj2 receiv* adj2 (servic* or care* or center* or centre* or therap*)).ti,ab.
93	sign?post*.ti,ab.
94	or/63-93
95	62 and 94
96	(letter or editorial or comment reply).dt. or case report/
97	(letter or comment*).ti.
98	or/96-97
99	exp randomized controlled trial/
100	random*.ti,ab.
101	or/99-100
102	98 not 101
103	animal.po.
104	(rat or rats or rodent* or mouse or mice).ti.
105	or/102-104
106	95 not 105
107	limit 106 to english language
108	limit 107 to yr="2013 -Current"
109	(meta analysis or "systematic review").md.
110	META ANALYSIS/
111	SYSTEMATIC REVIEW/
112	(meta analy* or metanaly* or metaanaly*).ti,ab.
113	((systematic* or evidence*) adj2 (review* or overview*)).ti,ab.
114	(reference list* or bibliograph* or hand search* or manual search* or relevant journals).ab.
115	(search strategy or search criteria or systematic search or study selection or data extraction).ab.
116	(search* adj4 literature).ab.
117	((pool* or combined) adj2 (data or trials or studies or results)).ab.
118	(medline or pubmed or cochrane or embase or psychlit or psyclit or cinahl or science citation index or bids or cancerlit).ab.
119	or/109-118
120	clinical trial.md.
121	Clinical trials/
122	Randomized controlled trials/
123	Randomized clinical trials/
124	assign*.ti,ab.
125	allocat*.ti,ab.
126	crossover*.ti,ab.
127	cross over*.ti,ab.
128	((doubl* or singl*) adj blind*).ti,ab.
129	factorial*.ti,ab.
130	placebo*.ti,ab.
131	random*.ti,ab.
132	volunteer*.ti,ab.
133	trial?.ti,ab.
134	or/120-133
135	EPIDEMIOLOGY/ or PROSPECTIVE STUDIES/ or RETROSPECTIVE STUDIES/ or COHORT ANALYSIS/ or FOLLOWUP STUDIES/ or exp CLINICAL TRIALS/
136	(control and study).mp.
137	program.mp.
138	or/135-137
139	(adolescence 13 17 yrs or childhood birth 12 yrs or infancy 2 23 mo or neonatal birth 1 mo or preschool age 2 5 yrs or school age 6 12 yrs).ag.
140	Pediatrics/ or Puberty/ or Adolescence/

#	Searches
141	(child* or adolescen* or baby or babies or boy? or girl? or infan* or juvenile? or kid? or kindergar* or minors or neonat* or newborn? or p?ediatric* or prepubert* or pre pubert* or prepubescen* or pre pubescen* or preschool* or pre school* or preteen* or pre teen* or pubert* or pubescen* or schoolchild* or school age? or teen* or toddler* or young or youth?).ti,ab.
142	(child* or adolescen* or baby or babies or infan* or juvenile? or kindergar* or neonat* or newborn? or p?ediatric* or prepubert* or pre pubert* or pubert* or schoolchild* or school age?).jw.
143	or/139-142
144	108 and (119 or 134)
145	108 and 138 and 143
146	or/144-145
147	limit 146 to ("0100 journal" or "0110 peer-reviewed journal")

Databases: Social Policy and Practice

Date of last search: 23/04/2024

#	Searches
1	((brain* or cereb* or craniocereb* or cranial or intracrani* or neurocognit*) adj2 (injur* or trauma* or damage* or disease*1 or disorder* or infect* or h?emorrhag* or neoplasm* or cancer* or tumo?r* or insult* or impair* or ischemi* or infarcti* or hypoxi* or drown*)).ti,ab.
2	((brain* or cereb* or craniocereb* or cranial or intracrani* or neurocognit*) and (injur* or trauma* or damage* or disease* or disorder* or infect* or h?emorrhag* or neoplasm* or cancer* or tumo?r* or insult* or impair* or ischemi* or infarcti* or hypoxi* or drown*)).hw.
3	(chronic* adj1 trauma* adj2 encephalopath*).ti,ab.
4	(chronic* and trauma* and encephalopath*).hw.
5	((infratentorial* or supratentorial* or hypothalam* or pituitar* or choroid plexus) adj2 (neoplasm* or cancer* or tumo?r* or carcinom* or adenocarcinom*)).ti,ab.
6	((infratentorial* or supratentorial* or hypothalam* or pituitar* or choroid plexus) and (neoplasm* or cancer* or tumo?r* or carcinom* or adenocarcinom*)).hw.
7	(brain* adj2 abscess*).ti,ab.
8	(brain* and abscess*).hw.
9	(carotid arter* adj2 (disease* or injur*)).ti,ab.
10	(carotid arter* and (disease* or injur*)).hw.
11	("basal ganglia disease*" or encephalitis or meningoencephalitis or hydrocephal* or "paraneoplastic cereb* degenerat*" or "shak* baby syndrome*").ti,ab.
12	("basal ganglia disease*" or encephalitis or meningoencephalitis or hydrocephal* or "paraneoplastic cereb* degenerat*" or "shak* baby syndrome*").hw.
13	(stroke? adj3 (p?ediatric* or child* or adolescen* or kid or kids or youth* or youngster* or minor or minors or underage* or under-age* or "under age*" or teen or teens or teenager* or juvenile* or boy or boys or boyhood or girl or girls or girlhood or schoolchild* or "school age*" or schoolage* or "under 16" or "under sixteen*")).ti,ab.
14	(stroke? and (p?ediatric* or child* or adolescen* or kid or kids or youth* or youngster* or minor or minors or underage* or under-age* or "under age*" or teen or teens or teenager* or juvenile* or boy or boys or boyhood or girl or girls or girlhood or schoolchild* or "school age*" or schoolage* or "under 16" or "under sixteen*")).hw.
15	((spinal* or spine?) adj2 (injur* or trauma* or tumo?r* or neoplasm* or cancer* or infect* or insult* or disease? or disorder* or degenrat* or compress* or vascular* or ischemi* or ischaemi* or infarct* or h?emorrhag*)).ti,ab.
16	((spinal* or spine?) and (injur* or trauma* or tumo?r* or neoplasm* or cancer* or infect* or insult* or disease? or disorder* or degenrat* or compress* or vascular* or ischemi* or ischaemi* or infarct* or h?emorrhag*)).hw.
17	(Central cord syndrome* or transverse myelitis).ti,ab.
18	(Central cord syndrome* or transverse myelitis).hw.
19	(epidural* adj2 (neoplasm* or cancer* or tumo?r* or abscess*)).ti,ab.
20	(epidural* and (neoplasm* or cancer* or tumo?r* or abscess*)).hw.
21	((spinal* or spine?) adj2 (viral* or virus* or polio* or acquired immunodeficiency syndrome or AIDS or HIV or bacterial* or neurosyphili* or neuro-syphili* or tubercul*)).ti,ab.
22	((spinal* or spine?) and (viral* or virus* or polio* or acquired immunodeficiency syndrome or bacterial* or neurosyphili* or neuro-syphili* or tubercul*)).hw.

#	Searches
23	((periph* or cranial*) adj1 (nerve? or nervous system) adj2 (injur* or trauma* or disorder* or disease* or damage* or neoplasm* or cancer* or tumo?r* or inflamm* or autoimmun* or paraneoplastic* or neuropath* or syndrome?)).ti,ab.
24	((periph* or cranial*) and (nerve? or nervous system) and (injur* or trauma* or disorder* or disease* or damage* or neoplasm* or cancer* or tumo?r* or inflamm* or autoimmun* or paraneoplastic* or neuropath* or syndrome?)).hw.
25	(Guillain* adj1 Barr*).ti,ab.
26	(Guillain* and Barr*).hw.
27	((abducen* or accessory or facial or glossopharyngeal or hypoglossal or oculomotor or ocular motility or olfactory or optic* or trigeminal or trochlear or vestibulocochlear) adj1 nerve* adj1 injur*).ti,ab.
28	((abducen* or accessory or facial or glossopharyngeal or hypoglossal or oculomotor or ocular motility or olfactory or optic* or trigeminal or trochlear or vestibulocochlear) and nerve* and injur*).hw.
29	(optic* adj1 nerve* adj2 (neoplasm* or cancer* or tumo?r*)).ti,ab.
30	(optic* and nerve* and (neoplasm* or cancer* or tumo?r*)).hw.
31	(brachial plexus adj1 (neuropath* or neuritis)).ti,ab.
32	(brachial plexus and (neuropath* or neuritis)).hw.
33	(complex regional pain syndrome* or causalgia or mononeuropath* or nerve compression syndrome*).ti,ab.
34	(complex regional pain syndrome* or causalgia or mononeuropath* or nerve compression syndrome*).hw.
35	((femoral or median or peroneal or radial or sciatic or tibial or ulnar) adj1 neuropath*).ti,ab.
36	((femoral or median or peroneal or radial or sciatic or tibial or ulnar) and neuropath*).hw.
37	((carpal-tunnel or piriformis-muscle or tarsal-tunnel or thoracic-outlet) adj1 syndrome*).ti,ab.
38	((carpal-tunnel or piriformis-muscle or tarsal-tunnel or thoracic-outlet) and syndrome*).hw.
39	(pudendal neuralgia or polyneuropath* or polyradiculoneuropath* or polyradiculopath* or radiculopath*).ti,ab.
40	(pudendal neuralgia or polyneuropath* or polyradiculoneuropath* or polyradiculopath* or radiculopath*).hw.
41	((abducen* or accessory or facial or glossopharyngeal or hypoglossal or oculomotor or ocular motility or olfactory or optic* or trigeminal or trochlear or vestibulocochlear) adj1 nerve* adj1 disease*).ti,ab.
42	((abducen* or accessory or facial or glossopharyngeal or hypoglossal or oculomotor or ocular motility or olfactory or optic* or trigeminal or trochlear or vestibulocochlear) and nerve* and disease*).hw.
43	(periph* adj2 neuropath*).ti,ab.
44	(periph* and neuropath*).hw.
45	(((periph* or cranial*) adj2 (nerve? or nervous system)) and lupus).ti,ab.
46	((periph* or cranial*) and (nerve? or nervous system) and lupus).hw.
47	((multi-focal* or multifocal*) adj2 motor adj1 neuropath*).ti,ab.
48	((multi-focal* or multifocal*) and motor and neuropath*).hw.
49	(((periph* or cranial*) adj2 (nerve? or nervous system)) and alcohol*).ti,ab.
50	((periph* or cranial*) and (nerve? or nervous system) and alcohol*).hw.
51	(neurolog* adj1 (condition* or disease* or damage* or disorder* or impair*)).ti,ab.
52	(neurolog* and (condition* or disease* or damage* or disorder* or impair*)).hw.
53	((motor-neuron* or gehrig* or charcott* or kennedy*) adj1 disease*).ti,ab.
54	((motor-neuron* or gehrig* or charcott* or kennedy*) and disease*).hw.
55	((amyotroph* or primary) adj1 lateral* adj1 sclero*).ti,ab.
56	((amyotroph* or primary) and lateral* and sclero*).hw.
57	(bulbar adj1 pals*).ti,ab.
58	(bulbar and pals*).hw.
59	((muscular or muscle* or bulbo) adj1 atroph* adj1 spin*).ti,ab.
60	((muscular or muscle* or bulbo) and atroph* and spin*).hw.
61	(progressiv* adj1 (muscular or muscle*) adj1 atroph*).ti,ab.
62	(progressiv* and (muscular or muscle*) and atroph*).hw.
63	((postpolio* or post-polio*) adj1 syndrome?).ti,ab.
64	((postpolio* or post-polio*) and syndrome?).hw.
65	(Parkinson* or duchenne* or multiple scleros?s* or aphasia or creutzfeldt-jakob or huntington* or kluver-bucy).ti,ab.

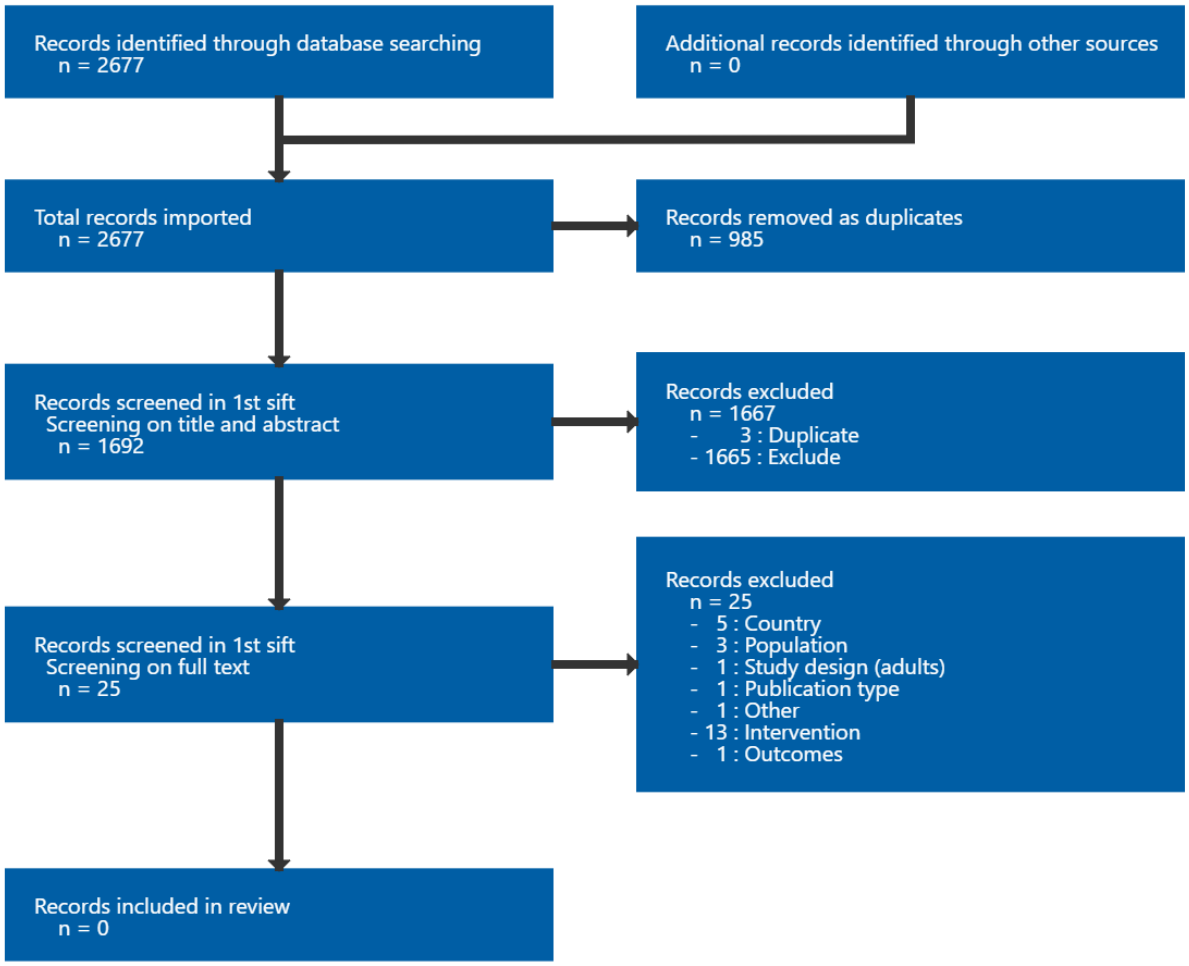
#	Searches
66	(Parkinson* or duchenne* or multiple scleros?s* or aphasia or creutzfeldt-jakob or huntington* or kluver-bucy).hw.
67	(muscular adj1 dystroph*).ti,ab.
68	(muscular and dystroph*).hw.
69	(neuromusc* adj1 (disease* or disorder?)).ti,ab.
70	(neuromusc* and (disease* or disorder?)).hw.
71	(heredit* adj1 spastic* adj1 parapleg*).ti,ab.
72	(heredit* and spastic* and parapleg*).hw.
73	"friedreich* ataxia*".ti,ab.
74	"friedreich* ataxia*".hw.
75	((multiple system or olivopontocerebellar) adj1 atroph*).ti,ab.
76	((multiple system or olivopontocerebellar) and atroph*).hw.
77	(shy-drager syndrome* or striatonigral degenerat* or batten* disease?).ti,ab.
78	(shy-drager syndrome* or striatonigral degenerat* or batten* disease?).hw.
79	(progressive adj1 supranuclear adj1 pals*).ti,ab.
80	(progressive and supranuclear and pals*).hw.
81	(richardson* adj1 (disease? or syndrome?)).ti,ab.
82	(richardson* and (disease? or syndrome?)).hw.
83	((corticobasal or cortico basal) adj1 degenerat*).ti,ab.
84	((corticobasal or cortico basal) and degenerat*).hw.
85	(white adj1 matter adj1 disorder?).ti,ab.
86	(white and matter and disorder?).hw.
87	(metachromatic leukodystroph* or mitochondrial myopath* or mucopolysaccharidos*).ti,ab.
88	(metachromatic leukodystroph* or mitochondrial myopath* or mucopolysaccharidos*).hw.
89	(lysosomal adj1 storage adj1 disorder?).ti,ab.
90	(lysosomal and storage and disorder?).hw.
91	((genetic or William* or catch-22 or rett* or congenital or f?etal alcohol) adj1 (syndrome or disorder*)).ti,ab.
92	((genetic or William* or congenital or f?etal alcohol) and (syndrome or disorder*)).hw.
93	(perinatal illness* or perinatal hypoxia*).ti,ab.
94	(perinatal illness* or perinatal hypoxia*).hw.
95	(primary adj1 dystonia?).ti,ab.
96	(primary and dystonia?).hw.
97	(heredit* adj1 motor* adj1 sens* adj1 neuropath*).ti,ab.
98	(heredit* and motor* and sens* and neuropath*).hw.
99	(spina bifida? or spinal dysraphism?).ti,ab.
100	(spina bifida? or spinal dysraphism?).hw.
101	((functional* or psychogenic* or dissociative*) adj1 neurologic* adj1 (disorder* or dysfunction* or difficult*)).ti,ab.
102	((functional* or psychogenic* or dissociative*) and neurologic* and (disorder* or dysfunction* or difficult*)).hw.
103	((movement* or motor* or convers*) adj1 (disorder* or dysfunct*)).ti,ab.
104	((movement* or motor* or convers*) and (disorder* or dysfunct*)).hw.
105	((psychogenic or dissociative or non-epilep* or nonepilep*) adj1 (seizure* or convulsion* or fit or fits or spasm* or attack*)).ti,ab.
106	((psychogenic or dissociative or non-epilep* or nonepilep*) and (seizure* or convulsion* or fit or fits or spasm* or attack*)).hw.
107	(pseudo-seizure* or pseudoseizure*).ti,ab.
108	(pseudo-seizure* or pseudoseizure*).hw.
109	(medical* adj1 (unexplain* or un-explain*) adj1 symptom?).ti,ab.
110	(medical* and (unexplain* or un-explain*) and symptom?).hw.
111	or/1-110
112	(case? adj3 (manag* or co?ordinat*)).ti,ab.
113	(case? and (manag* or co?ordinat*)).hw.

#	Searches
114	((continuity or continuum) adj3 care).ti,ab.
115	((continuity or continuum) and care).hw.
116	((rehab* or care or role? or service?) adj3 (co?ordinat* or manager?)).ti,ab.
117	((rehab* or care or role? or service?) and (co?ordinat* or manager?)).hw.
118	(rehab* adj3 specialist?).ti,ab.
119	(rehab* and specialist?).hw.
120	key worker?.ti,ab.
121	key worker?.hw.
122	((named or assign*) adj3 (staff or lead? or contact* or worker* or therapist* or physiotherapist or clinician* or nurse* or practitioner*)).ti,ab.
123	((named or assign*) and (staff or lead? or contact* or worker* or therapist* or physiotherapist or clinician* or nurse* or practitioner*)).hw.
124	((point or lead or named or assign*) adj3 contact?).ti,ab.
125	((point or lead or named or assign*) and contact?).hw.
126	((special* or senior) adj3 nurse?).ti,ab.
127	((special* or senior) and nurse?).hw.
128	(allied health adj3 (personnel or professional?)).ti,ab.
129	(allied health and (personnel or professional?)).hw.
130	(physiotherapist? or (physical adj3 therapist?)).ti,ab.
131	(physiotherapist? or (physical and therapist?)).hw.
132	(occupational adj3 therapist?).ti,ab.
133	(occupational and therapist?).hw.
134	((speech or language) adj3 therapist?).ti,ab.
135	((speech or language) and therapist?).hw.
136	social worker?.ti,ab.
137	social worker?.hw.
138	(advocate or advocates).ti,ab.
139	(advocate or advocates).hw.
140	(neuronavigator? or neuro navigator?).ti,ab.
141	(neuronavigator? or neuro navigator?).hw.
142	(manag* adj3 (transition* or post?acute or inpatient? or outpatient? or communit* or discharg* or post?discharg* or pathway? or referr* or transfer*)).ti,ab.
143	(manag* and (transition* or post?acute or inpatient? or outpatient? or communit* or discharg* or post?discharg* or pathway? or referr* or transfer*)).hw.
144	((ensur* or provid* or assur* or arrang* or facilitat* or oversee*) adj1 (transition* or post?acute or inpatient? or outpatient? or communit* or discharg* or post?discharg* or pathway? or referr* or transfer*)).ti,ab.
145	((ensur* or provid* or assur* or arrang* or facilitat* or oversee*) and (transition* or post?acute or inpatient? or outpatient? or communit* or discharg* or post?discharg* or pathway? or referr* or transfer*)).hw.
146	((integrat* or blend*) adj3 care adj5 (transition* or post?acute or inpatient? or outpatient? or communit* or discharg* or post?discharg* or pathway? or referr* or transfer*)).ti,ab.
147	((integrat* or blend*) and care and (transition* or post?acute or inpatient? or outpatient? or communit* or discharg* or post?discharg* or pathway? or referr* or transfer*)).hw.
148	((transition* or post?acute or inpatient? or outpatient? or communit* or discharg* or post?discharg* or pathway? or referr* or transfer*) adj2 receiv* adj2 (servic* or care* or center* or centre* or therap*)).ti,ab.
149	((transition* or post?acute or inpatient? or outpatient? or communit* or discharg* or post?discharg* or pathway? or referr* or transfer*) and receiv* and (servic* or care* or center* or centre* or therap*)).hw.
150	sign?post*.ti,ab.
151	sign?post*.hw.
152	or/112-151
153	111 and 152
154	limit 153 to yr="2013 -Current"

Appendix C Effectiveness evidence study selection

Study selection for: What is the effectiveness of clinical case management in the delivery of rehabilitation for people with chronic neurological disorders?

Figure 1: Study selection flow chart



Appendix D Evidence tables

Evidence tables for review question: What is the effectiveness of clinical case management in the delivery of rehabilitation for people with chronic neurological disorders?

No evidence was identified which was applicable to this review question.

Appendix E Forest plots

Forest plots for review question: What is the effectiveness of clinical case management in the delivery of rehabilitation for people with chronic neurological disorders?

No meta-analysis was conducted for this review question and so there are no forest plots.

Appendix F GRADE tables

GRADE tables for review question: What is the effectiveness of clinical case management in the delivery of rehabilitation for people with chronic neurological disorders?

No meta-analysis was conducted for this review question and so there are no GRADE tables.

Appendix G Economic evidence study selection

Study selection for: What is the effectiveness of clinical case management in the delivery of rehabilitation for people with chronic neurological disorders?

Please see Supplement 2 for details on search that was undertaken and study selection.

Appendix H Economic evidence tables

Economic evidence tables for review question: What is the effectiveness of clinical case management in the delivery of rehabilitation for people with chronic neurological disorders?

No evidence was identified which was applicable to this review question.

Appendix I Economic model

Economic model for review question: What is the effectiveness of clinical case management in the delivery of rehabilitation for people with chronic neurological disorders?

Introduction

The committee noted the importance of clinical case management (CCM) for individuals with chronic neurological disorders (CND). They discussed that CCM is essential in enabling other interventions. For example, someone with CND reporting fatigue, low mood and anxiety, and lack of exercises would have deteriorating functioning and quality of life because nobody coordinated and integrated all of these different components. Interventions do not work if not integrated and CCM enables this.

However, the committee acknowledged a lack of evidence regarding its effectiveness and cost effectiveness to support their recommendations, which were based on qualitative evidence and their collective experiences. Due to the potential impact on resources and variation in practice, the committee decided that it would be helpful to conduct exploratory cost analysis in this area. Due to the lack of clinical effectiveness data on CCM, an exploratory threshold analysis was conducted to estimate the health benefits needed to justify the additional costs associated with CCM provision.

Methods

Analysis overview

A threshold analysis was undertaken where the required quality-adjusted life years (QALYs) were estimated for CCM to be considered cost effective using the lower NICE cost-effectiveness threshold of £20,000 per QALY gained.

Comparators

The analysis did not include any comparators. It was assumed that currently people with CND do not receive any CCM. This assumption was due to insufficient data, a highly heterogeneous population, and challenges in defining standard care.

Population

The population of the analysis was adults with rehabilitation needs due to CND, including:

- acquired brain injury,
- acquired spinal cord injury,
- acquired peripheral nerve disorders,
- progressive neurological diseases,
- functional neurological disorders.

Approach to costings

Systematic review of effectiveness and economic studies did not find any relevant evidence on CCM in people with CND. The topic sub-group were consulted to identify any studies that would allow to estimate CCM intervention costs. Three studies were found that reported useful data for CCM costings. This included:

- One UK study (Clark-Wilson 2016) and one Australian study (Arnold & Elder 2013) which reported resources use data associated with CCM which allowed to estimate CCM intervention costs.
- One US study (Bruner-Canhoto 2016) which reported potential reduction in hospital admissions and A&E visits, as a result of CCM.

The widely used cost-effectiveness metric is the incremental cost-effectiveness ratio (ICER). This is calculated by dividing the difference in costs associated with 2 alternatives by the difference in QALYs. The decision rule then applied is that if the ICER falls below a given cost per QALY threshold the result is considered to be cost effective.

$$ICER = \frac{Costs(B) - Costs(A)}{QALYs(B) - QALYs(A)}$$ Where: Costs(A) = total costs for option A; QALYs(A) = total QALYs for option A	Cost effective if: • ICER < Threshold

NICE sets out the principles that committees should consider when judging whether an intervention offers good value for money. In general, if the intervention costs less than £20,000 per QALY gained compared with the next best strategy it would be seen as a cost-effective option (NICE 2014). Therefore, if we know the incremental costs associated with CCM and the cost-effectiveness threshold, we can estimate the QALY gain required to result in an ICER < Threshold. The committee will need to use their judgment to interpret the size of the required QALY gains for CCM to be cost-effective. All future costs were discounted at a recommended rate of 3.5% (NICE 2014).

Analysis inputs

Resource use: CCM intervention

Systematic review of effectiveness and economic evidence undertaken for the guideline did not find any relevant evidence. Therefore, the resource use data inputs were based on studies identified by the committee.

Clark-Wilson 2016

The Clark-Wilson (2016) was a prospective descriptive study that gathered data from 18 case managers across the UK (referred to as Group 1), as well as a single case management service in Southeast England (Head First, Kent, UK, referred to as Group 2). The study focused on people living in the community, over 12 years old at the time of assessment, who had experienced a traumatic brain injury (TBI). There were no significant differences between the groups in terms of age, age at time of injury or gender. People in Group 2, however, were significantly further post-injury, were less likely to be employed or in education and, at the time of the assessment, had received more years of CCM.

The study provided details about the hours of CCM, categorised in ranges for both groups. It was found that Group 2 (consisting of 65 people) had more severe injuries, longer periods of time since their injury, and less family support compared to Group 1 (which included 76 people). The study further reported that the mean duration of CCM was 3.5 years in Group 1 and 5.7 years in Group 2.

The CCM hour frequency is summarised in Table 3 below.

Table 3: CCM hour frequency

CCM annual hours (range)	Group 1 (less severe)	Group 2 (more severe)
<50	29%	28%
51-100	32%	18%
101-150	21%	11%
151-250	12%	9%
>250	6%	34%

Abbreviations: CCM = Clinical Case Management

CCM delivery

Cark-Wilson (2015) conducted a review of the CCM approach in the UK. The review suggests that CCM intervention could be provided by occupational therapists, nurses, social workers, physiotherapists, speech and language therapists, and psychologists. The committee further advised that delivering CCM requires senior practitioners or equivalent care managers. According to the committee's expert opinion, a Band 7 practitioner was used for cost estimation purposes.

The cost per working hour, which includes wage/salary, salary overheads, management, admin, and estates staff overheads, capital overheads, and travel, was £63 for Band 7 Agenda for Change community-based scientific and professional staff (PSSRU 2023). The estimated working time per year for Band 7 was 1570 hours, and the annualised qualification costs ranged from £5,858 to £9,956, with an average of £4.73 qualification costs per working hour. This resulted in an average unit cost of £67.73 which was used for the purposes of costings.

Threshold analysis (without cost-offsets)

Using the distribution of CCM hours in Clark-Wilson 2016, the weighted mean hours of CCM were 97 for Group 1 and 137 for Group 2. When combined with the unit cost data, this resulted in annual CCM costs of £6,100 for Group 1 and £8,659 for Group 2. Using the lower NICE cost-effectiveness threshold of £20,000 per QALY gained, the required QALY gains were 0.30 for Group 1 and 0.43 for Group 2. The required QALY gains were equivalent to CCM having to generate an additional 111 and 158 perfect days of health. These results are summarised in Table 4 below.

Table 4: Annual CCM costs, QALY gains and perfect health days

	Group 1 (less severe)	Group 2 (more severe)
Mean weighted average CCM hours (estimated using midpoints)	97	137
Annual CCM costs	£6,100	£8,659
Required QALY gain (ICER<£20k/QALY)	0.30	0.43
CCM needs to generate ‘perfect health’ days	111	158

Abbreviations: CCM=Clinical Case Management, ICER = Incremental Cost Effectiveness Ratio, k=Thousand, QALY = Quality Adjusted Life Years

Howe (2022) assessed the effectiveness and cost effectiveness of cognitive and vocational rehabilitation in people with TBI. In this study, the authors reported annual QALY gains in the range of 0.009 to 0.042 (3 to 15 perfect days of health). The authors also reported a baseline health-related quality of life score of 0.65 to 0.71, measured using the EQ-5D-5L. Given this

baseline HRQoL it would be infeasible for CCM to generate such large health gains over 12 months, given the mean EQ-5D-3L population norm of 0.857 in England (Janssen 2019).

Based on the average CCM duration from the Clark-Wilson 2016 report, the discounted CCM costs were £19,748 for Group 1 over 3.5 years and £44,025 for Group 2 over 5.7 years. Similarly, using the lower NICE cost-effectiveness threshold of £20,000 per QALY gained, the required QALY gains were 0.99 for Group 1 and 2.20 for Group 2. These required QALY gains were equivalent to CCM having to generate an additional 360 and 803 perfect days of health over 3.5 and 5.7 years, respectively. These results are summarised in Table 5 below.

Table 5: CCM costs, QALY gains and perfect health days over the mean duration of CCM

	Group 1 (less severe, CCM duration: 3.5 years)	Group 2 (more severe, CCM duration: 5.7 years)
CCM intervention costs (discounted)	£19,748	£44,025
Required QALY gain (ICER<£20k/QALY)	0.99	2.20
CCM needs to generate 'perfect health' days	360	803

Abbreviations: CCM=Clinical Case Management, ICER= Incremental Cost Effectiveness Ratio, k = Thousand, QALY = Quality Adjusted Life Years

Potential cost-offsets

Reduction in hospital admissions and A&E visits

Bruner-Canhoto (2016) conducted a review of 30 people participating in case management in Massachusetts from November 2010 to August 2013. The participants had acquired brain injuries and were transitioning from long-term care to community living. The study utilised secondary data analysis, interviews, and surveys.

The authors reported on hospital admissions and A&E visits for three periods: pre-case management, during case management, and post-case management. The care managers assessed severity based on intervention time, workload, and research. The severity level distribution was as follows: Level 1 (16.7%), Level 2 (20%), Level 3 (10%), Level 4 (26.7%), and Level 5 (26.7%). This was confirmed by the Assistant Program Director.

The review found that over an average duration of 183.6 days of case management, there was a reduction of 0.5 hospital admissions and 0.6 A&E visits. Assuming the same rate of reduction, this is equal to a reduction of 0.99 hospital admissions and 1.19 A&E visits over 12 months.

Unit cost data

Unit cost data for hospital admissions and A&E visits were obtained from the National Schedule of NHS Costs (2022/23) for all NHS and foundation trusts (NHS England 2024). People with CND could be admitted for various reasons. For hospital admissions, an average NHS cost of £4,184 was used for Cerebral Degenerations or Miscellaneous Nervous System Disorders (CC Scores 14+), which included elective, non-elective long stay, non-elective short stay, day case, and regular day/night admissions (HRG codes AA25C). After consultation with the committee an upper-end estimate was used to reflect for the complexity of people with CND who require CCM.

For A&E costs, after consulting the committee, one of the most common cost categories was used, that is, Emergency Medicine, Category 3 Investigation with Category 1-3 Treatment (HRG Code VB03Z), at £479 per attendance.

It was modelled that the same number of admissions and A&E visits will be averted annually for the duration of CCM, following committee consultation on costings.

Threshold analysis (with potential cost-offsets)

Combining the above reductions in A&E visits and hospital admissions, along with the unit cost data, it was found that in Group 1, over 3.5 years under CCM, the estimated value of prevented hospital admissions was £13,463, and the value of prevented A&E visits was £1,849. The combined discounted value of prevented A&E visits and hospital admissions was £15,313. In this group, CCM resulted in incremental costs of £4,435. The required QALY gain for an ICER to be just below NICE's lower cost-effectiveness threshold of £20,000 per QALY gained would need to be 0.22 or 81 additional days of perfect health. The committee was of the view that this QALY gain was more achievable.

In Group 2 (people with more severe CND), it was found that over 5.7 years under CCM, the estimated value of prevented hospital admissions was £21,145, and the value of prevented A&E visits was £2,905. The combined discounted value of prevented A&E visits and hospital admissions was £24,050. In this group, CCM resulted in incremental costs of £19,976. The required QALY gain for an ICER to be just below NICE's lower cost-effectiveness threshold of £20,000 per QALY gained would need to be 1.00 or 365 additional days of perfect health. The committee was of the view that this QALY gain was more achievable over 5.7 years.

The results of the above analyses are summarised in Table 6.

Table 6: CCM costs, QALYs and offsets over the mean duration of CCM

	Group 1 (less severe, CCM duration: 3.5 years)	Group 2 (more severe, CCM duration: 5.7 years)
CCM intervention costs (discounted)	£19,748	£44,025
Required QALY gain (ICER<£20k/QALY)	0.99	2.20
CCM needs to generate 'perfect health' days	360	803
Cost-offsets		
Value of hospital admissions averted (discounted)	£13,463	£21,145
Value of A&E visits averted (discounted)	£1,849	£2,905
Total value of offsets	£15,313	£24,050
Results including offsets		
Incremental cost of CCM	£4,435	£19,976
Required QALY gain (ICER<£20k/QALY)	0.22	1.00
CCM needs to generate 'perfect health' days	81	365

Abbreviations: A&E = Accident and Emergency, CCM=Clinical Case Management, ICER= Incremental Cost Effectiveness Ratio, k=Thousand, QALY = Quality Adjusted Life Years

Alternative CCM costings

Arnold & Elder 2013

Arnold & Elder (2013) conducted a review of people with TBI in Australia who were referred for CCM between 2002 and 2009. They defined TBI severity using posttraumatic amnesia duration with the mean of between 2 and 7 days indicating severe TBI, and the mode of between 1 and 4 weeks indicating very severe TBI. The severity was also assessed using the Cognitive and Affective Neurological Examination (CANS) Scale, with a mean score of 4.1 indicating that people could be left alone for a few days per week, and a mode score of 6 indicating that people required 12–19 hours of care assistance per day.

The mean duration of CCM was 18 months, varying from 3 months to 8 years. The mean number of CCM hours was 2.46 per case per month, ranging from 0.25 to 15.5 hours per month. Based on the unit cost data provided above, the average annual costs of CCM were estimated to be £2,865 per case. The cost estimates for different combinations of CCM hours and CCM durations are summarised in Table 7.

Table 7: CCM costs, QALYs and perfect health days

	Min hours (0.25 per month)	Mean hours (2.46 per month)	Max hours (15.5 per month)
Discounted CCM intervention costs over:			
Minimum duration of CCM (3 months)	£51	£500	£3,149
Mean duration of CCM (18 months)	£291	£2,865	£18,051
Maximum duration of CCM (8 years)	£1,397	£13,743	£86,592
Required QALY gain (ICER<£20k/QALY)			
Minimum duration of CCM (3 months)	0.003	0.025	0.157
Mean duration of CCM (18 months)	0.015	0.143	0.903
Maximum duration of CCM (8 years)	0.070	0.687	4.330
CCM needs to generate 'perfect health' days			
Minimum duration of CCM (3 months)	0.93	9.12	57.47
Mean duration of CCM (18 months)	5.31	52.28	329.43
Maximum duration of CCM (8 years)	25.49	250.81	1580.30

Abbreviations: CCM=Clinical Case Management, k=Thousand, QALY = Quality Adjusted Life Years

The findings indicate that when we assume the maximum CCM hours (15.5 hours per month per case), the necessary QALY gains for CCM to be considered cost effective are very high, based on the lower NICE cost-effectiveness threshold of £20,000 per QALY gained. However, when using the mean and minimum assumptions of CCM hours, the required QALY gains were lower, making them more achievable according to the committee.

Discussion

Summary of results

This costing analysis shows that the required QALY gains needed for CCM to be cost effective using NICE lower cost-effectiveness threshold of £20,000 per QALY gained are large and may be unachievable for some CCM intensities. However, CCM has the potential to be cost effective when broader NHS cost reductions, such as reduced hospital admissions and A&E visits, are considered.

Limitations and interpretation

This analysis has many limitations, mainly the lack of evidence on resource use data and the effectiveness of CCM, including any potential cost offsets in terms of other healthcare resource use. The committee identified several challenges in researching CCM. These included differing definitions of CCM and the intervention's complex nature. Measuring its effectiveness is particularly difficult. For example, CCM aims to support and facilitate the efficient, effective, and timely use of other services, such as physiotherapy, psychology, and occupational therapy, all of which are difficult to capture. The committee also discussed that CCM may potentially increase access to services and related costs. For example, people could use more speech and language therapists, psychologists etc., because they are being linked up to effective services and accessing them as they are needed. So, there could be a greater resource use as a result of CCM. However, CCM is expected to reduce costly unplanned care use.

The committee noted that reduced A&E visits and hospital admissions are only proxies for changes in healthcare resource use due to CCM. People with CND who need CCM are also more likely to have missed GP appointments, unfilled/missed prescriptions, difficulties accessing services, losing equipment, experiencing housing instability, and so on. The committee explained that all of these factors incur substantial costs to the NHS and the wider public sector.

The committee acknowledged that the decrease in hospital admissions and A&E visits was from a study conducted in the US. However, they didn't see any reason why CCM would not result in similar reductions in the UK's NHS. Additionally, due to the greater accessibility of care in the UK due the NHS being free at the point of delivery, it is possible that reductions in unplanned care would be even greater. The committee noted that currently NHS is overstretched and anything that relieves the pressure on the NHS hospital resources would be invaluable. It was also discussed that CCM may indirectly impact NHS costs. For example, by improving access to appropriate housing and social welfare benefits, which in turn may impact physical health and lead to further reductions in the NHS costs.

Due to the lack of long-term data, the analysis assumed the same level of reductions in A&E visits and hospital admissions, each year for the duration of CCM. The committee found this assumption plausible. The US study suggested that the benefits of CCM are sustained even after the intervention. Also, it is in line with their experience that the CCM benefits may continue even after CCM stops because of the learning that has taken place and the lasting impact of CCM. Overall, people are generally in a more stable condition, have secure support systems, experience better quality of life, are more independent, and are set up in safer environments. Also, due to the lack of data, the costings assumed constant annual CCM costs. However, the committee explained that CCM costs tend to go down over time. For example, due to the support staff being upskilled, using the knowledge of the independent neurorehabilitation specialists.

The committee discussed many other potential benefits associated with CCM based on their experience. These benefits could not be quantified due to the lack of suitable data. For example, they mentioned that CCM reduces family distress and the risk of family or

relationship breakup. CCM also promotes efficient discharge planning and smooth transitions between inpatient rehabilitation and community services. By coordinating care and targeting services to meet needs better, CCM maximises outcomes and reduces costs, for example by reducing ineffective use of services. Additionally, CCM improves vocational outcomes, lowers the risk of being sectioned under the Mental Health Act or being subjected to Deprivation of Liberty under the Deprivation of Liberty Safeguards (DOLS) and Mental Capacity Act, and lowers the risk of drug addiction. The committee also discussed that potential cost savings would be over the lifetime of an individual.

It was also discussed that CCM could have a positive impact on health inequalities. For example, CCM may facilitate access to benefits and welfare services and reduce poverty levels. As a result, those who are most disadvantaged would benefit the most from CCM. The committee noted that without access to CCM, people with CND could potentially become homeless. They referred to the fact that approximately half of homeless people have a brain injury. Also, may people without CCM would be in costly residential settings for many years.

The committee discussed that the provision for lifelong independent CCM is now routinely considered within litigation where injuries are severe and longstanding. Provision for less intensive CCM, and for a shorter period, is also available in less severe cases. Currently, many CCM activities are delivered by charities and voluntary organisations. Most providers are outside of the NHS and statutory services, and CCM is generally charged for by the hour and is spot purchased. Current provision with the NHS is variable with some services decommissioning CCM. There is also a trend in some services for non-clinical staff to undertake CCM, even where the impact may be clinical. They also acknowledged implementation issues, such as the lack of qualified personnel, particularly specialists, that must be considered to determine what is achievable for the NHS.

Conclusions

The committee noted the challenges posed by the diversity of people with CND, their differing social and family environments, and their stages in the journey of managing their condition. This diversity makes it challenging to estimate and interpret an average cost and QALY gain. However, when considering the potential decrease in unplanned care due to CMM, it was encouraging to see that modest QALY gains were required for CCM to be considered cost effective using NICE lower cost-effectiveness threshold of £20,000 per QALY gained.

Implications for future research

The committee discussed the need for future research to explore the benefits and cost effectiveness of CCM. However, they have acknowledged the methodological challenges in assessing its effectiveness and cost effectiveness. For example, CCM is highly personalised and enables other interventions, making it challenging to assess its effectiveness. Additionally, CCM may improve access to care and increase NHS costs, which is a positive outcome, but it may penalise its cost effectiveness.

References

Arnold & Elder 2013

Arnold S, Elder M. Case management: The allocation of hours and influencing factors in the management of survivors of traumatic brain injury. Care Management Journals. 2013 Apr 1;14(1):2.

Bruner-Canhoto 2016

Bruner-Canhoto L, Savageau J, Croucher D, Bradley K. Lessons from a care management pilot program for people with acquired brain injury. The Journal for Healthcare Quality (JHQ). 2016 Sep 1;38(5):255-63.

Cark-Wilson 2015

Clark-Wilson J, Holloway M. Life care planning and long-term care for individuals with brain injury in the UK. NeuroRehabilitation. 2015 Jan 1;36(3):289-300.

Clark-Wilson 2016

Clark-Wilson J, Giles GM, Seymour S, Tasker R, Baxter DM, Holloway M. Factors influencing community case management and care hours for clients with traumatic brain injury living in the UK. Brain Injury. 2016 Jun 6;30(7):872-82.

NICE 2014

National Institute for Health and Care Excellence. Developing NICE guidelines: the manual. NICE process and methods [PMG20]. Published: 31 October 2014. Last updated: 29 May 2024.

PSSRU 2023

Jones KC, Weatherly H, Birch S, Castelli A, Chalkley M, Dargan A, et al. Unit Costs of Health and Social Care 2023 Manual. Technical report. Personal Social Services Research Unit, University of Kent, & Centre for Health Economics, University of York; 2024. Kent, UK. doi:10.22024/UniKent/01.02.105685. (KAR id:105685)

Howe 2022

Howe EI, Andelic N, Fure SC, Røe C, Søberg HL, Hellstrøm T, et al. Cost-effectiveness analysis of combined cognitive and vocational rehabilitation in patients with mild-to-moderate TBI: results from a randomized controlled trial. BMC Health Services Research. 2022 Feb 12;22(1):185.

Janssen 2019

Janssen MF, Szende A, Cabases J, Ramos-Goñi JM, Vilagut G, König HH. Population norms for the EQ-5D-3L: a cross-country analysis of population surveys for 20 countries. The European Journal of Health Economics. 2019 Mar 15;20:205-16.

NHS England 2024

NHS England. 2022/23 National Cost Collection Data Publication. Published 9 July 2024.

Appendix J Excluded studies

Excluded studies for review question: What is the effectiveness of clinical case management in the delivery of rehabilitation for people with chronic neurological disorders?

Excluded effectiveness studies

Table 8: Excluded studies and reasons for their exclusion

Study	Reason for exclusion
Bailey, Christopher, Meyer, Jessica, Briskin, Susannah et al. (2019) Multidisciplinary Concussion Management: A Model for Outpatient Concussion Management in the Acute and Post-Acute Settings. The Journal of head trauma rehabilitation 34(6): 375-384	- Country Study conducted in the US
Bombardier, Charles H, Fann, Jesse R, Ehde, Dawn M et al. (2023) Collaborative Care Versus Usual Care to Improve Quality of Life, Pain, Depression, and Physical Activity in Outpatients With Spinal Cord Injury: The SCI-CARE Randomized Controlled Clinical Trial. Journal of neurotrauma 40(2324): 2667-2679	- Country Study conducted in the US
Brasure, M., Lamberty, G.J., Sayer, N.A. et al. (2013) Participation after multidisciplinary rehabilitation for moderate to severe traumatic brain injury in adults: A systematic review. Archives of Physical Medicine and Rehabilitation 94(7): 1398-1420	-Publication date Systematic review with 12 included studies. No studies checked against protocol criteria as did not include any studies published 2013 onwards
Browne, AL, Appleton, S, Fong, K et al. (2013) A pilot randomized controlled trial of an early multidisciplinary model to prevent disability following traumatic injury. Disability and rehabilitation 35(14): 1149-1163	- Population Participants began the intervention 1-month post injury, which does not meet the guideline definition of chronic (3 months since diagnosis or injury)
Connor, Karen I, Siebens, Hilary C, Mittman, Brian S et al. (2020) Quality and extent of implementation of a nurse-led care management intervention: care coordination for health promotion and activities in Parkinson's disease (CHAPS). BMC health services research 20(1): 732	- Country Study conducted in the US
Connor, Karen I, Siebens, Hilary C, Mittman, Brian S et al. (2022) Implementation fidelity of a nurse-led RCT-tested complex intervention, care coordination for health promotion and activities in Parkinson's disease (CHAPS) in meeting challenges in care management. BMC neurology 22(1): 36	- Country Study conducted in the US
Creemers, Huub, Veldink, Jan H, Grupstra, Hepke et al. (2014) Cluster RCT of case management on patients' quality of life and caregiver strain in ALS. Neurology 82(1): 23-31	- Outcomes No relevant outcomes reported. Report measures emotional functioning, caregiver strain index, quality of care, and disease progression.
Di Tella, Sonia, Pagliari, Chiara, Blasi, Valeria et al. (2020) Integrated telerehabilitation approach in multiple sclerosis: A systematic review and	- Intervention Systematic review with 9 included studies. No studies checked against protocol criteria as

Study	Reason for exclusion
meta-analysis. Journal of telemedicine and telecare 26(78): 385-399	interventions were not relevant (9/9 interventions were about telerehabilitation not clinical case management).
Eggers, Carsten, Dano, R, Schill, J et al. (2018) Patient-centered integrated healthcare improves quality of life in Parkinson's disease patients: a randomized controlled trial. Journal of neurology 265(4): 764-773	- Intervention Multi-disciplinary rehabilitation intervention not clinical case management
Fabbri, Margherita, Caldas, Ana Castro, Ramos, Joana B et al. (2020) Moving towards home-based community-centred integrated care in Parkinson's disease. Parkinsonism & Related Disorders 78: 21-26	- Study design (adults) Opinion piece
Franz, Shiney, Muser, Jurgen, Thielhorn, Ulrike et al. (2020) Inter-professional communication and interaction in the neurological rehabilitation team: a literature review. Disability and rehabilitation 42(11): 1607-1615	- Intervention Systematic review with 17 included studies. No studies checked against protocol criteria as 15 studies were qualitative, 4 were published prior to 2013, 1 was a case report
Gage, Heather, Grainger, Linda, Ting, Sharlene et al. (2014) Specialist rehabilitation for people with Parkinson's disease in the community: a randomised controlled trial.	- Intervention Multi-disciplinary rehabilitation intervention not clinical case management
Geerlings, Angelika D, Janssen Daalen, Jules M, Ypinga, Jan H L et al. (2023) Case management interventions in chronic disease reduce anxiety and depressive symptoms: A systematic review and meta-analysis. PloS one 18(4): e0282590	- Population Systematic review with 27 included studies. No studies checked against protocol criteria as population was not relevant (6/26 people with heart failure, 4/26 people with COPD, 1/26 people with breast cancer, 1/26 people with colorectal cancer, 9/26 people with diabetes, 3/26 people with cancer, 1/26 people with Alzheimer disease, 1/26 people with rheumatoid arthritis), and studies were conducted in the US (n=1).
Janssens, Astrid I W A, Ruytings, Marijke, Al-Chalabi, Ammar et al. (2016) A mapping review of international guidance on the management and care of amyotrophic lateral sclerosis (ALS). Amyotrophic lateral sclerosis & frontotemporal degeneration 17(56): 325-36	- Intervention Systematic review with 10 included studies. No studies checked against protocol criteria as studies were published prior to 2013 (n=7), and studies were conducted in the US (n=3)
Karol, R.L. (2014) Team models in neurorehabilitation: Structure, function, and culture change. NeuroRehabilitation 34(4): 655-669	- Other Evidence review, not a systematic review
Lannin, Natasha A, Laver, Kate, Henry, Kareena et al. (2014) Effects of case management after brain injury: a systematic review. NeuroRehabilitation 35(4): 635-41	- Intervention Systematic review with 6 included studies. No studies checked against protocol criteria as all studies were published prior to 2013
Laver, Kate, Lannin, Natasha A, Bragge, Peter et al. (2014) Organising health care services for people with an acquired brain injury: an overview of systematic reviews and randomised controlled trials. BMC health services research 14: 397	- Intervention Systematic review with 26 included studies. No studies checked against protocol criteria as all studies were published prior to 2013
PLESS, Sam; VAN HOOTEGEM, Geert; DESSERS, Ezra (2018) Advancing a systemic	- Intervention

Study	Reason for exclusion
perspective on multidisciplinary teams: a comparative case study of work organisation in four multiple sclerosis hospitals. International Journal of Integrated Care 18(3)	Multidisciplinary rehabilitation intervention not clinical case management
Rajan, Roopa, Brennan, Laura, Bloem, Bastiaan R et al. (2020) Integrated Care in Parkinson's Disease: A Systematic Review and Meta-Analysis. Movement disorders : official journal of the Movement Disorder Society 35(9): 1509-1531	- Intervention Systematic review with 37 included studies. 2 studies were checked against the protocol and not included as they included multidisciplinary interventions, not clinical case management. 35 studies were not checked against protocol criteria as studies were nonexperimental (n=10), not RCTs (n=19), studies were already included in the full text assessment (n=3), and studies were published prior to 2013 (n=3)
Seeralan, Tharanya, Magaard, Julia L, Engels, Alexander et al. (2023) Effectiveness of a coordinated ambulatory care program for patients with mental disorders or multiple sclerosis: results of a prospective non-randomized controlled trial in South Germany. Frontiers in psychiatry 14: 1183710	- Population Mix of participants (affective disorders, anxiety disorders, adjustment disorder, somatoform disorders, alcohol abuse disorders, schizophrenia, and multiple sclerosis). Study does not report the number of participants for each condition and does not present results separately for target population
Seid, A.A., Demirdel, E., Aychiluhm, S.B. et al. (2022) Multidisciplinary Rehabilitation for People with Parkinson's Disease: A Systematic Review and Meta-Analysis. Parkinson's Disease 2022: 2355781	- Intervention Systematic review with 6 included studies. 4 studies were checked against the protocol and not included as they included multidisciplinary interventions not clinical case management. 2 studies were not checked against protocol criteria as the study was published prior to 2013 (n=1), and the study was already included in the full text assessment (n=1),and studies were published prior to 2013 (n=3)
van der Marck, Marjolein A, Bloem, Bastiaan R, Borm, George F et al. (2013) Effectiveness of multidisciplinary care for Parkinson's disease: a randomized, controlled trial. Movement disorders : official journal of the Movement Disorder Society 28(5): 605-11	- Intervention Multi-disciplinary rehabilitation intervention not clinical case management
Wei, Hongying; Sun, Dongxiu; Liu, Meiping (2017) Implementation of a standardized out-of-hospital management method for Parkinson dysphagia. Revista da Associacao Medica Brasileira (1992) 63(12): 1076-1081	- Country Study conducted in China
Xia, Y.; Wang, J.; Wang, P. (2022) Systematic Nursing Interventions Combined with Continuity of Care in Patients with a Spinal Fracture Complicated with a Spinal Cord Injury and Its Effect on Recovery and Satisfaction. Evidence-based Complementary and Alternative Medicine 2022: 3771144	- Publication type Paper was retracted by journal
Ye, C., Browne, G., Beyene, J. et al. (2013) A sensitivity analysis of the children's treatment network trial: A randomized controlled trial of integrated services versus usual care for children with special health care needs. Clinical Epidemiology 5(1): 373-385	- Population Mix of participants out of protocol (201/445 children with mental and developmental disorders, 104/445 children with diseases of the nervous system, 73/445 children with congenital

Study	Reason for exclusion
	abnormalities, and 67/445 children with other unspecified diseases).

Excluded economic studies

See Supplement 2 for the list of excluded studies across all reviews.

Appendix K Research recommendations – full details

Research recommendations for review question: What is the effectiveness of clinical case management in the delivery of rehabilitation for people with chronic neurological disorders?

K.1.1 Research recommendation

What is the effectiveness and cost-effectiveness of complex case management in the delivery of rehabilitation for people with chronic neurological disorders?

K.1.2 Why this is important

The organisation of multidisciplinary neurorehabilitation and other associated health and social care services is known to be complex. Complex rehabilitation is even more difficult to manage for people with acquired brain injury and chronic neurological disorders due to the impact of an individual's capacity to manage this effectively for themselves. There is little evidence and data about the possible effectiveness of varying models of case management to support this process.

K.1.3 Rationale for research recommendation

Table 9: Research recommendation rationale

Importance to 'patients' or the population	Patients report difficulty in accessing, organising and coordinating appropriate rehabilitation. This is especially challenging for those with complex needs which fluctuate in presentation and priority over time. There is significant evidence for over-representation of individuals with acquired brain injury and chronic neurological disorders in prison and in the homeless populations. A failure to be supported to access relevant rehabilitation is of significant concern to the patients, their families, and wider society.
Relevance to NICE guidance	The organisation of rehabilitation, and the use of varying levels and intensities of case management was considered in this guideline.
Relevance to the NHS	The outcome would impact upon how rehabilitation services were coordinated. Interventions could be optimised by co-ordinated scheduling, or a reduction in individuals lost to follow up, or those inappropriately channelled towards less effective non-specialist services.
National priorities	High
Current evidence base	Extremely limited. A systematic review is in and undergoing corrections with international journal Brain Injury but not yet published.
Equality considerations	Individuals with acquired brain injury and chronic neurological disorders may be considered disabled under the Equality Act if they have a physical or mental impairment that has a substantial and long-term negative effect on their ability to do normal daily activities. A failure to support people with disabilities to access services, on account of the impact of their

	disabilities may mean that “service as usual” (anticipating that an individual can manage their interactions with rehabilitation services without specialist support) is likely discriminatory.

Insert abbreviations

K.1.4 Modified PICO table

Table 10: Research recommendation modified PICO table

Population	Adults and children with rehabilitation needs due to the following chronic neurological disorders: • Acquired brain injury • Acquired spinal cord injury • Acquired peripheral nerve disorders • Progressive neurological diseases • Functional neurological disorders
Intervention	Complex case management – a pro-active, closely involved approach generally provided within the person’s environment and across services by specialist nurses, allied health professionals or social workers, who may be members of BABICM (British Association of Brain Injury and Complex Case Management) or members of the Case Management Society UK (CMSUK). The model is generally funded and provided following insurance claims for injuries and is sometimes commissioned and funded by the NHS.

Comparator	• Placebo (placebo or sham)
	• Control (no intervention, waitlist, standard rehabilitation care alone, or ‘usual care’)
	• The same intervention (as listed under ‘intervention’) but varied in terms of:
	  ○ Frequency
	  ○ Intensity
	  ○ Timing
	  ○ Setting

Outcome	• Physical and mental health related quality of life and social care related quality of life • Anxiety • Depression • Service contacts • Unplanned contacts • Cost-effectiveness (including resource use measurements and QALY estimations using a validated preference-based measure such as the EQ-5D or SF-6D)
Study design	• Experimental study with random assignment to intervention and control groups. • Experimental study with non-random assignment to intervention and control groups (quasi-randomised controlled trials, non-randomised controlled trials and prospective and retrospective cohort studies)

	• Non-experimental study, collating data from specialist service providers, social care/work services, family members, and individuals with acquired brain injury and chronic neurological disorders comparing experience of case managed vs non-case managed interventions and more broad outcomes • Delphi study of specialist case managers to define the process and role and tasks. • Retrospective study of individuals, families, and case managers who have been working together over many years/decades.This
Timeframe	Long term (across a life course)
Additional information	Heterogeneity of the population, the very long-term time frames required, and the need to ensure that the impact (and costs) associated with managed individuals vs unmanaged ones will require considerable thought to prevent any methodology being an over-simplification of a complex problem. Attributing the effect may in fact require more of a mixed methods approach, looking at the experience of actors within the process, not just agreed outcome measure. The outcome measures will need to be relevant for the population and not overly simplified.

BABICM: British Association of Brain Injury and Complex Case Management; CMSUK: Case Management Society UK EQ-5D: EuroQol 5-dimensions; SF-6D: short-form 6-dimension; QALY: quality-adjusted life years