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Exercise and Physiotherapy for Cancer-Related Cognitive Impairment: A Function Oriented Narrative Review

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Abstract:
Background: Cancer-related cognitive impairment (CRCI) includes perceived or objectively measured changes in attention, processing speed, memory and executive function before, during or after cancer treatment. These problems may restrict mobility, employment, self-management and participation. Objective: To synthesize evidence published from 2012 through 2021 and develop a cautious physiotherapy framework combining exercise, functional training and compensatory strategies. Methods: A structured narrative review considered English-language peer-reviewed studies, systematic reviews, clinical guidance and relevant randomized trials published between January 2012 and December 2021. Results: Aerobic and combined exercise are biologically plausible and feasible approaches, but direct evidence for cognitive benefit in cancer populations remained limited and heterogeneous by 2021. Exercise may also improve fatigue, mood, sleep and physical function, which influence cognitive complaints. Physiotherapy can screen functional consequences, prescribe individualized activity, use dual-task training selectively, simplify motor learning and coordinate referral for neuropsychological or medical assessment. Conclusion: Exercise should be offered as part of comprehensive survivorship rehabilitation without being presented as a proven cure for CRCI. Safety, symptom fluctuation, treatment toxicity and meaningful participation goals should guide dose and progression.

Keywords: cancer-related cognitive impairment; exercise; physiotherapy; cognitive rehabilitation; dual task; survivorship

Introduction

Cancer survival has improved, but many people experience persistent effects that are not visible during routine examination. Cancer-related cognitive impairment (CRCI), often described informally as "chemo brain," includes difficulty concentrating, remembering information, finding words, organizing tasks or thinking quickly. The term is broader than chemotherapy because cognitive change may be present before treatment and may relate to surgery, radiotherapy, endocrine therapy, inflammation, fatigue, distress, sleep disruption and other factors (Lange et al., 2019).

The functional consequences can be substantial even when formal test scores remain within population norms. A person may forget a sequence of instructions, lose track during a busy environment, require more time to plan travel or struggle to combine walking with conversation. These problems can affect medication management, return to work, driving decisions, parenting and confidence. They also interact with fatigue and physical deconditioning, creating a complex rehabilitation presentation.

Physiotherapists do not diagnose the cause of cognitive impairment, but they frequently observe its effects during exercise instruction, gait training and self-management education. The profession can contribute by screening function, adapting communication, prescribing exercise safely and referring when symptoms require specialist assessment. Exercise is attractive because it may influence vascular health, neuroplasticity, inflammation, mood, sleep and fatigue. However, cancer-specific evidence was still developing by 2021, and clinical claims should remain proportionate to that evidence (Campbell et al., 2020).

This review examines CRCI through a physiotherapy and participation lens. It emphasizes what can be done responsibly when direct evidence is incomplete: identify functional impact, address modifiable contributors, use individualized exercise, integrate cognitive demands gradually and evaluate outcomes that matter to the patient.

Review Aim and Method

The review aimed to synthesize literature from 2012 to 2021 concerning exercise, physical activity and rehabilitation for CRCI in adolescents and adults with non-central nervous system cancers. The clinical questions were: how should cognitive complaints be recognized; what mechanisms and associated symptoms are relevant to physiotherapy; what evidence supports exercise; how can dual-task and functional training be introduced; and when is referral required?

A structured narrative approach was used because interventions, populations and outcome measures were too heterogeneous for a new quantitative synthesis. PubMed-indexed reviews, trials, observational studies and consensus guidance were prioritized. Searches combined terms for cancer, cognition, chemotherapy, exercise, physical activity, rehabilitation, survivorship, dual task and cognitive training. Eligible publications were in English and dated from January 2012 through December 2021. Studies devoted exclusively to primary brain tumours were not central because tumour location and neuro-oncology treatment create distinct rehabilitation needs.

Evidence was interpreted clinically rather than converted into a universal protocol. Greater weight was given to systematic reviews, randomized studies and established exercise guidance, while mechanistic explanations were treated as plausible rather than definitive. The review involved no original patient data, statistical analysis or fabricated clinical outcomes.

Nature and Clinical Presentation of CRCI

CRCI is multidimensional. Commonly affected domains include attention, working memory, learning, processing speed and executive function. Patients may describe entering a room and forgetting the purpose, rereading material, losing words or becoming overwhelmed by several simultaneous demands. The severity may fluctuate across a treatment cycle and with sleep, pain, fatigue or emotional stress.

Subjective complaints and objective neuropsychological performance correlate imperfectly. A patient can experience meaningful difficulty despite scores in the normal range, partly because pretreatment ability is unknown or testing occurs in a quiet environment unlike daily life. Conversely, an abnormal score may not translate directly into unsafe function. Rehabilitation therefore needs both standardized information and an account of real-world activity.

The label “chemo brain” can validate experience, but it can also oversimplify causation. Cognitive symptoms may precede chemotherapy, and endocrine treatment, anaemia, infection, medication, menopause, cardiometabolic disease and depression can contribute. Ageing and lower cognitive reserve may increase vulnerability, while education, social support and compensatory habits can influence adaptation. A careful clinician avoids attributing every complaint to treatment without assessment.

The trajectory is variable. Some patients improve after treatment, others report persistent symptoms, and a smaller group experiences progressive difficulty. Lange et al. (2019) emphasized the complexity of mechanisms and the importance of cognitive rehabilitation. The clinical task is not to predict an individual course with certainty, but to monitor change, reduce avoidable disability and escalate unexpected deterioration.

Mechanisms Relevant to Exercise

Proposed mechanisms of CRCI include neuroinflammation, oxidative stress, altered cerebral blood flow, hormonal change, DNA damage and reduced neurogenesis. Cancer and systemic treatments may interact with vascular risk and ageing. Imaging studies have described changes in brain structure and connectivity, but findings are not sufficiently specific for routine diagnosis (Lange et al., 2019).

Exercise could influence several pathways. Aerobic activity improves cardiorespiratory fitness and vascular function, while repeated training can alter inflammatory and neurotrophic signalling. In non-cancer populations, physical activity is associated with cognitive and brain-health benefits. These observations provide a rationale for trials in cancer survivors, not proof that the same effect size or mechanism applies during cancer treatment.

Indirect pathways may be equally important. Fatigue, poor sleep, anxiety and depression can impair concentration and perceived memory. Exercise has stronger cancer-specific evidence for improving fatigue, physical function, mood and quality of life than for cognition itself (Campbell et al., 2019). A patient may therefore report clearer thinking because sleep, confidence or energy improves, even if a neuropsychological domain changes little.

Motor learning also depends on attention and memory. When cognitive load is high, complex exercise instructions may fail, adherence may decline and fall risk may rise. Physiotherapy can modify the learning environment through repetition, demonstration, external cues and written prompts. This is a direct rehabilitation contribution independent of whether exercise produces a neurobiological cognitive effect.

Screening and Assessment

Assessment begins by asking whether the person has noticed a change from their previous cognitive function and how it interferes with daily life. Useful questions concern remembering appointments, following conversations, learning new tasks, planning travel, managing medication, returning to work and walking safely in distracting settings. The clinician should establish onset, treatment phase, fluctuation and associated symptoms.

Brief questionnaires can document perceived cognitive difficulty, but they are not diagnostic. Objective screening may identify a need for further evaluation, yet many general tools lack sensitivity to subtle cancer-related changes. When cognition has major occupational, educational, legal or safety implications, referral for neuropsychological assessment is appropriate. Physiotherapy documentation should describe observed function rather than assign an unsupported diagnosis.

Physical assessment includes gait speed, balance, endurance, strength and transfers. Dual-task observation may be relevant when the patient reports difficulty walking while talking, navigating or carrying objects. The therapist can compare single-task walking with a simple concurrent task, watching for reduced speed, instability, stopping or loss of accuracy. Testing must be safe and interpreted cautiously because fatigue, neuropathy, pain and unfamiliarity can affect performance.

Contributors require systematic consideration. Medication review, blood counts, endocrine status, sleep, pain, mood, nutrition, vision, hearing and cardiopulmonary symptoms may reveal treatable problems. Sudden confusion, focal neurological signs, seizure, rapidly worsening cognition, severe headache or altered consciousness requires urgent medical evaluation. A slow persistent complaint still warrants communication with the oncology or primary-care team when it affects independence.

Outcome selection should match goals. A global cognitive score alone may miss benefit. Relevant measures include fatigue interference, physical activity, walking capacity, balance confidence, ability to follow a home programme, return-to-work tasks and attainment of an individualized participation goal. Reassessment should use similar time of day and treatment-cycle context where possible.

Evidence for Exercise and Physical Activity

By 2021, direct evidence that exercise improves CRCI was promising but insufficient for a definitive cognitive prescription. Campbell et al. (2020) reviewed exercise and cancer-related cognitive functioning and highlighted small samples, varied cancer populations, different exercise doses and inconsistent cognitive measures. The 2019 international exercise guidelines similarly judged evidence for cognitive outcomes uncertain even while supporting exercise for several other cancer-related outcomes (Campbell et al., 2019).

Observational research has linked greater physical activity with better perceived or measured cognition in some breast cancer survivors. Marinac et al. (2015) used objectively measured activity and reported associations with cognitive functioning. Such studies strengthen plausibility but cannot establish causation because healthier or less symptomatic survivors may be more active.

Acute exercise may produce temporary cognitive effects. Salerno et al. (2019) examined an aerobic exercise bout in breast cancer survivors using a randomized crossover design. Acute responses are clinically interesting, particularly for timing cognitively demanding tasks, but they do not establish that long-term training reverses persistent CRCI.

Trials of broader rehabilitation provide useful context. Hartman et al. developed the Memory & Motion programme to test increased physical activity in breast cancer survivors. Yoga research has reported reductions in self-reported cognitive complaints, although changes may be mediated by sleep, stress or fatigue and cannot automatically be generalized to all cancers (Derry et al., 2015). Cognitive rehabilitation trials, such as the group intervention evaluated by Ercoli et al. (2015), indicate that strategy training can help selected survivors and may complement physical rehabilitation.

The appropriate conclusion is balanced. Exercise is generally recommended for cancer survivors because of established benefits beyond cognition and may help CRCI directly or indirectly. It should not be advertised as a guaranteed treatment for memory impairment. Informed consent includes explaining the uncertainty and agreeing on outcomes that can be observed in the patient's daily life.

Aerobic Exercise Prescription

Aerobic exercise is the most biologically plausible starting mode because it influences cardiovascular fitness and can be adjusted across a wide ability range. Walking, stationary cycling and low-impact aerobic activity are practical options. Mode selection accounts for neuropathy, balance, joint pain, bone health, cardiotoxicity, environment and preference.

Cancer-survivor guidance supports avoiding inactivity and progressing toward regular moderate activity when safe (Campbell et al., 2019). For a deconditioned patient with cognitive complaints, the initial dose may be five to ten minutes at a light perceived exertion, repeated across the day. Accumulated bouts reduce planning burden and allow the patient to learn a reliable routine. Duration can increase before intensity.

The talk test and rating of perceived exertion are useful when heart-rate response is altered by medication or autonomic dysfunction. Instructions should be simple: mode, number of days, duration range, effort range and stop rules. A written calendar or phone reminder can reduce prospective-memory demands. Recording only a few variables prevents the diary itself from becoming burdensome.

Progression should change one main variable at a time. If the patient completes the planned dose with acceptable next-day recovery, duration may rise in small increments. During chemotherapy, the programme can follow predictable symptom cycles: shorter activity after infusion and longer sessions on more stable days. Missed sessions are followed by a lower restart dose rather than an attempt to compensate.

The cognitive goal can be integrated carefully. Early sessions occur in a quiet environment with one instruction at a time. Later, the person may practise route finding, pace adjustment or recalling a simple plan, provided gait remains safe. Cognitive challenge should never distract from red flags or turn ordinary exercise into an unsafe test.

Resistance, Balance and Functional Training

Resistance training addresses weakness and the high relative effort of daily activity. When transfers, stairs and carrying require less of maximum capacity, more attentional resources may remain available for planning and environmental awareness. Large-muscle exercises can be performed with body weight, bands, machines or free weights according to safety and skill.

An initial programme commonly uses one set of controlled repetitions for major movement patterns. Technique is taught through demonstration, short cues and consistent exercise order. The patient can use

a printed card with photographs or a checklist. Progression emphasizes accuracy before load. Complex circuits with frequent rule changes may overwhelm a person experiencing CRCI and are not inherently superior.

Balance assessment is important when cognitive symptoms coexist with neuropathy, vestibular problems, weakness or fear of falling. Static and dynamic tasks progress from supported to less-supported conditions. Environmental scanning and obstacle negotiation may be introduced after basic stability is established. The therapist should remain close enough to guard whenever divided attention changes safety.

Functional training links exercise to participation. A return-to-work goal may require sustained standing, carrying, route planning and recovery between tasks. Home independence may require sequencing a transfer, walking to another room and remembering an item. Breaking the activity into components identifies whether the leading limitation is strength, endurance, cognition, pain or confidence.

Motor-learning adaptations include blocked practice initially, repeated wording, external visual targets, errorless learning when appropriate and teach-back. The patient is asked to demonstrate the activity and explain precautions. Family assistance may support consistency, but cues should promote independence rather than replace the patient's decisions.

Dual-Task Training

Dual-task training combines a motor task with a concurrent cognitive or secondary motor demand. It is relevant because community mobility often requires walking while conversing, locating signs, avoiding obstacles or carrying objects. A person with CRCI may slow markedly, stop walking or make errors when attention is divided.

The intervention begins only after single-task safety is established. A simple hierarchy might progress from walking while naming categories, to following route cues, to carrying a light object in a controlled environment. Task difficulty is adjusted through walking speed, support, environmental complexity and cognitive demand. The therapist observes both motor and cognitive performance rather than accepting deterioration in one task to improve the other.

There was little direct cancer-specific evidence by 2021 for a standardized dual-task protocol. Evidence from older adults and neurological rehabilitation cannot be transferred uncritically. Therefore, dual-task practice should be framed as task-specific functional rehabilitation, not a proven method for repairing cancer-related brain change. It is most defensible when assessment demonstrates a real participation problem under divided attention.

Safety rules are explicit. The patient may stop walking to complete a difficult cognitive task; this can be an adaptive strategy in hazardous situations. Training does not aim to eliminate every cautious behaviour. Outdoor progression considers traffic, uneven surfaces, heat, fatigue and neuropathy. Driving-related cognitive complaints are referred for appropriate assessment rather than simulated casually during gait therapy.

Outcomes include fewer stops, improved stability, better task accuracy, reduced fear and successful completion of a meaningful route. A faster dual-task gait speed is useful only if it accompanies safe movement and accurate secondary-task performance.

Cognitive and Behavioural Strategies Within Physiotherapy

Physiotherapy sessions can reduce cognitive load through structure. The therapist states the agenda, limits the number of new exercises, uses consistent terminology and provides a concise written plan. Important precautions appear prominently rather than being buried in text. Teach-back checks understanding without blaming the patient.

External compensation is often more immediately useful than trying to restore memory through repetition alone. Calendars, alarms, pill organizers, labelled exercise bands and fixed exercise locations can support action. A home programme may be linked to an established routine, such as walking after breakfast. These methods conserve cognitive resources for tasks that cannot be automated.

Pacing is relevant when fatigue amplifies cognitive difficulty. The patient identifies the time of day when thinking is clearest and schedules demanding tasks accordingly. Physical and cognitive workloads are considered together. A long medical appointment may require a lighter exercise session, while a brief walk may improve alertness before desk work for some patients.

Goal setting should be specific and non-stigmatizing. Rather than "improve memory," a goal may be to complete a 20-minute walk using a planned route and return with all required items. Small successes rebuild confidence. Excessive monitoring can increase anxiety, so records should collect only information that changes decisions.

When formal cognitive rehabilitation is indicated, physiotherapy coordinates with occupational therapy, psychology, speech-language therapy or neuropsychology. Ercoli et al. (2015) demonstrated potential benefit from group cognitive rehabilitation in breast cancer survivors. Combining disciplines allows physical capacity, strategy use and work participation to be addressed without implying that one profession owns every aspect of CRCI.

Exercise Across the Cancer-Care Continuum

Before and during treatment, the priority is to preserve function while avoiding excessive burden. Baseline education can normalize reporting of cognitive change and establish simple exercise habits. During chemotherapy or radiotherapy, dose fluctuates with symptoms, blood counts, infection risk, nausea, pain and sleep. A stable routine may be more valuable than aggressive progression.

After treatment, survivors may face expectations to return immediately to previous roles. Persistent cognitive complaints can make work and family responsibilities exhausting. Rehabilitation can use graded conditioning, task simulation and planned recovery. Exercise is integrated with workplace modification when attention and stamina limit a full schedule.

During endocrine therapy, symptoms may evolve over months or years. Periodic review is preferable to assuming a static problem. Older survivors require consideration of baseline cognitive change, frailty, falls and multimorbidity. Exercise selection must remain age-appropriate without treating age itself as a contraindication.

Adolescents and young adults face educational, vocational and social consequences across a long survivorship period. Digital reminders and activity tools may fit their routines, but privacy, access and cognitive burden should be considered. Pediatric cancer survivors may have distinct developmental and treatment-related needs; programmes require coordination with paediatric and educational services.

In advanced cancer, goals shift toward comfort, safe mobility, caregiver burden and participation in valued activities. Cognitive fluctuation may relate to medication, metabolic disturbance or disease

progression and requires medical attention. Short familiar activities, consistent cues and caregiver education may support independence. Fitness targets are secondary to safety and quality of life.

Safety, Red Flags and Referral

Exercise begins with medical stability and relevant cancer precautions. Chest pain, syncope, acute breathlessness, fever, uncontrolled bleeding, suspected thrombosis, new neurological deficit or rapidly altered mental status requires escalation. Bone metastases, severe cytopenia, cardiotoxicity, neuropathy and recent surgery modify testing and exercise.

Cognitive difficulty can itself create risk. A patient may forget weight restrictions, repeat a set, misunderstand an intensity target or become disoriented outdoors. Supervision level therefore depends not only on physical findings but also on the ability to follow precautions and respond to symptoms. Written prompts and caregiver involvement are useful when consented and proportionate.

New focal weakness, speech change, seizure, severe headache, sudden confusion or loss of consciousness is not managed as routine CRCI. These signs require urgent medical evaluation. Gradual worsening, unsafe medication management or major occupational impairment also warrants referral, although urgency differs.

Exercise should be paused or reduced when symptoms rise substantially and remain worse into the next day. Mild short-lived tiredness may be acceptable, but prolonged deterioration suggests excessive dose or a medical contributor. The patient should know whom to contact and which symptoms require immediate care.

Scope of practice must remain clear. Physiotherapists can observe cognition in movement, adapt learning, prescribe exercise and address participation. They should not promise neurocognitive recovery, interpret complex cognitive tests beyond training or determine driving fitness without appropriate expertise.

Service Delivery, Equity and Adherence

CRCI services can be delivered in oncology clinics, rehabilitation departments, community programmes or homes. A stepped model offers basic education and activity advice broadly, supervised rehabilitation for people with functional limitation or higher risk, and specialist cognitive assessment for complex presentations.

Access is influenced by transport, treatment schedules, employment, cost, language and digital connectivity. Cognitive impairment can make complex referral pathways especially difficult. A single written plan, named contact and coordinated appointments reduce burden. Remote sessions may help people living far from cancer centres, but they cannot replace in-person examination when balance, neurological status or exercise safety is uncertain.

Adherence improves when exercise is enjoyable, convenient and linked to a valued role. Generic step targets may be inappropriate during treatment fluctuations. The therapist and patient agree on a minimum plan for difficult days and a fuller plan for stable days. This preserves continuity without creating guilt.

Family members can support reminders and accompany activity, but patient autonomy remains central. Education should explain that CRCI is not laziness or lack of motivation. Employers and educators may

need recommendations for graded return, reduced multitasking, written instructions and scheduled breaks.

Quality indicators can include screening for cognitive interference, documentation of red flags, provision of an individualized exercise plan, appropriate referral and review of a participation outcome. These processes can improve care even before the research evidence identifies an optimal cognitive exercise dose.

Clinical Decision-Making Framework

A practical pathway starts with four questions: Is the presentation medically stable? What activity is limited? Which physical and cognitive factors contribute? What level of supervision is required? The answers determine whether the immediate action is medical referral, specialist cognitive assessment, physiotherapy intervention or a combination.

For a stable survivor reporting mild forgetfulness without functional loss, education, general exercise guidance and monitoring may be sufficient. A person who repeatedly loses balance while talking, cannot follow a home programme or is unable to resume work needs detailed functional assessment. A person with sudden confusion or focal signs needs urgent medical care, not exercise testing.

The prescription defines frequency, intensity, time, type, progression and symptom rules. It also specifies how instructions will be remembered. For example, a survivor with moderate fatigue and attention difficulty may begin with four ten-minute walks and two short resistance sessions weekly. A calendar prompt and fixed route reduce planning demands. After two stable weeks, walking duration increases. Dual-task practice is added only if single-task walking is safe and community participation requires it.

Clinical review examines adherence, adverse symptoms, next-day recovery, physical performance and the target activity. If fatigue improves but memory complaints remain disabling, the programme is not labelled a failure; referral and compensatory strategies are strengthened. If cognition feels clearer but physical capacity is unchanged, exercise dose and other impairments are reassessed.

Documentation records treatment status, cognitive complaint, observed functional effect, precautions, goals, prescribed dose, cueing method and escalation advice. Clear reasoning supports continuity across oncology and community services. The patient receives an understandable version rather than a technical copy.

Shared decision-making is essential because evidence is uncertain. The therapist explains that exercise has broad health benefits and may help cognition directly or through associated symptoms, but individual response cannot be guaranteed. The patient chooses acceptable modes and meaningful outcomes. This honest approach protects trust and supports sustained participation.

Implementation in a Typical Clinical Episode

A physiotherapy episode can be organized into assessment, supported practice, consolidation and transition. The first visit identifies red flags, treatment-related precautions, the patient's cognitive concern and one participation priority. The therapist then observes how the patient learns and performs a simple movement sequence. This reveals whether demonstration, written cues, reduced distraction or additional repetition is needed.

Early sessions establish a small number of exercises in a consistent order. The patient receives a one-page plan containing the weekly dose, effort target, modification options and stop rules. The therapist uses teach-back and asks the patient to demonstrate the plan. If a caregiver is involved, the patient's consent and preferred level of assistance are documented.

Supported practice focuses on reliable completion and acceptable recovery. Progression is based on observed response rather than a rigid calendar. Cognitive challenge is introduced only when it represents a real goal and does not compromise physical safety. For example, route finding may be added to walking for a survivor preparing to use public transport, whereas an unrelated word game may add burden without improving participation.

Consolidation reduces supervision while preserving access to review. The patient practises restarting after a treatment interruption, selecting the reduced plan on a difficult day and recognizing symptoms that require contact with the clinical team. A follow-up appointment tests whether the strategy works outside the clinic.

Transition planning states the long-term exercise target, community or home option, cueing tools and referral pathway. Discharge is appropriate when the patient can perform and modify the programme safely, not merely when a fixed number of visits has elapsed. If cognitive or neurological symptoms progress, discharge to independent exercise is deferred and medical or specialist assessment takes priority.

Patient Education Message

Education should begin by validating that cognitive change can occur and that reporting it is appropriate. The therapist explains that symptoms have several possible contributors and that assessment is intended to identify treatable problems, safety concerns and practical strategies. Exercise is presented as part of overall rehabilitation, with established benefits for fitness and function and possible, but not guaranteed, cognitive benefit.

The patient should leave with a concise action plan. It identifies the selected activities, the minimum dose for difficult days, the progression rule, warning signs and the person to contact. Information is divided into short sections and reviewed verbally. Teach-back confirms that the plan is usable rather than testing the patient's intelligence.

Language should avoid blame. Difficulty adhering to a complex programme may reflect the very impairment being treated. Simplifying the plan is a clinical adaptation, not a lowering of expectations. The therapist also discourages unproven supplements or excessively intense exercise promoted as a rapid cure. Realistic messages protect patients from financial cost, disappointment and avoidable risk while supporting active self-management.

Limitations and Research Priorities

The evidence base through 2021 was limited by small samples, breast-cancer predominance, varied treatment histories and inconsistent definitions of CRCI. Studies used subjective complaints, different neuropsychological tests or global measures, making comparison difficult. Exercise mode, intensity, supervision and duration also varied.

Subjective and objective outcomes should both be retained because they answer different questions. Future trials need baseline assessment, adequate power, longer follow-up and transparent reporting of

adherence and adverse events. Treatment phase, cancer type, age, sex, menopausal status and comorbidity should be considered.

Research should identify whether aerobic, resistance, combined or cognitively enriched exercise produces different effects and whether benefit is mediated through fatigue, sleep, mood, fitness or neurobiological change. Pragmatic studies are needed in advanced cancer, rural settings, low-resource services, men, older adults and culturally diverse populations.

Dual-task physiotherapy requires specific evaluation in cancer survivors. Trials should measure both task components, falls, participation and transfer to daily life rather than only laboratory performance. Economic evaluation and implementation research would clarify how cognitive and physical rehabilitation can be integrated into survivorship care.

Until stronger evidence is available, recommendations should distinguish established general exercise benefits from uncertain cognitive effects. This prevents overstatement while allowing patients access to safe, potentially helpful rehabilitation.

Conclusion

CRCI is a real and potentially disabling consequence of cancer and its treatment, although causes and trajectories vary. It affects attention, memory, processing speed and executive function and may disrupt mobility, work, self-management and social participation.

Exercise is supported for the general health and function of cancer survivors, but direct evidence for a specific CRCI prescription remained incomplete through 2021. Physiotherapists can nevertheless make a valuable contribution by identifying functional consequences, addressing deconditioning, adapting motor learning, using compensatory supports and introducing dual-task practice when clinically relevant and safe.

Care should be individualized across treatment, survivorship and advanced disease. Medical contributors and neurological red flags require timely referral. Outcomes should include meaningful activity and participation, not cognition alone. The most defensible clinical message is that exercise may support cognitive and overall recovery as one component of comprehensive rehabilitation; it should not be promoted as a guaranteed cure.

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