



An Evidence Check

Allied health service levels in chronic condition management: An Evidence Check (Phase 2)

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Executive summary

Introduction

Chronic conditions account for most of the disease burden in Australia, with about one in two Australians living with at least one chronic condition and an estimated 4.4 million years of healthy life lost to chronic illness in 2023. Most people with chronic conditions are managed in primary care and approximately 70% of GP encounters are primarily for chronic condition management. Since the introduction of the Enhanced Primary Care package and subsequent GP Management Plans (GPMP) and Team Care Arrangements (TCAs), Medicare-subsidised Chronic Condition Management (CCM) items have been used to support longer GP consultations and multidisciplinary care, including up to five subsidised allied health visits per year for eligible patients and up to 10 visits for Aboriginal and Torres Strait Islander patients. The use of CCM allied health items has risen steadily, particularly among older individuals and those with diabetes, functional limitations and lower socioeconomic status. There is emerging evidence that GPMP- and TCA-based care can improve outcomes and reduce hospitalisations for some chronic conditions. However, it remains unclear whether the current cap of five allied health sessions per year is optimal, especially given multimorbidity and the possibility that a single condition may consume all sessions.

The Department of Health, Disability and Ageing ('the Department'), through the Medicare Benefits Schedule Review Advisory Committee (MRAC), commissioned this Evidence Check to assess whether current Medicare Benefits Schedule (MBS) funded allied health chronic condition management services are structured in a way that supports patient outcomes. The Evidence Check was designed to inform decisions about the number and duration of allied health services that should be subsidised through the MBS for people with chronic conditions. The Evidence Check focused on the chronic conditions of stroke (post/sub-acute and chronic), Parkinson's disease and diabetes (types 1 and 2) in Phase 1, and cardiovascular disease (hypertension, coronary heart disease, heart failure), musculoskeletal conditions (osteoarthritis, back pain), and chronic respiratory disease (chronic obstructive pulmonary disease (COPD), bronchiectasis, asthma) in Phase 2. The review aimed to examine whether there is a relationship between allied health consultation dose—defined as the number and/or length of individual consultations—and health-related outcomes, and whether this relationship differs by allied health profession or condition.

Methods

We conducted a rapid Evidence Check review of peer-reviewed and grey literature, with Phase 2 focusing on three chronic conditions: cardiovascular disease, musculoskeletal conditions and chronic respiratory disease. Two reviewers independently searched and screened three databases, with disagreements resolved by a third reviewer. Systematic reviews of allied health interventions were included. Data were extracted on study design, intervention type, allied health profession, consultation

number and duration, and health-related outcomes. We assessed the strength of evidence using the designs of underlying primary studies, alongside appraisal of the risk of bias of primary studies as reported within the reviews. Completeness of dose reporting for consultation number and duration was rated as good or poor. Stakeholder organisations were invited to submit additional peer-reviewed and grey literature, which we screened using similar processes.

Findings

This Evidence Check identified 58 systematic reviews examining allied health interventions for adults with musculoskeletal conditions (chronic low back pain and osteoarthritis; $n=52$), chronic respiratory disease (COPD and asthma; $n=4$), and cardiovascular disease (hypertension; $n=2$). Most reviews focused on exercise-based or multimodal interventions, with allied health care commonly delivered by physiotherapists, often within multidisciplinary teams that included dietitians, occupational therapists, psychologists, exercise physiologists and other allied health professionals. Outcomes were dominated by measures of pain, physical function, mobility and health-related quality of life, with fewer reviews examining psychological or system-level outcomes.

Overall, the strength of the evidence was high. Nearly all reviews were rated as strong based on their inclusion of randomised controlled trials, and most reported low or moderate risk of bias in the underlying studies. Reporting of consultation dose was generally good: almost all reviews provided extractable information on the number of consultations, and about four in five reported consultation duration, allowing descriptive analysis of dose patterns across conditions.

Across conditions, allied health care was rarely delivered as a single consultation. Instead, interventions were typically structured as multi-session programs, delivered over weeks or months. Session duration was relatively consistent, with most interventions using consultations of approximately 40–44 minutes, aligning with standard allied health practice. In contrast, the total number of consultations varied widely both within and between conditions. Typical midpoints were about 18–19 consultations for musculoskeletal conditions, approximately 30 consultations for chronic respiratory disease and about 18 consultations for hypertension, although cardiovascular evidence was limited and should be interpreted cautiously.

Only a small subset of reviews ($n=8$) explicitly examined dose–outcome relationships. These reviews suggest very low doses or one-off consultations are unlikely to produce meaningful clinical improvements. Some evidence indicated that greater intensity or volume of care, such as higher weekly exercise doses or programs delivered several times per week, was associated with larger short-term improvements in outcomes such as pain, gait, balance or function. However, findings were heterogeneous and several reviews suggested diminishing returns beyond certain thresholds. Overall, the evidence was insufficient to define a single optimal number or length of consultations for any condition or profession.

Stakeholder submissions and grey literature reinforced these findings, consistently describing allied health chronic disease care as multidisciplinary, multi-session and ongoing, rather than episodic. These sources also highlighted that the dose of care delivered in practice is strongly shaped by funding arrangements, workforce capacity and equity considerations, with current Medicare session caps commonly cited as a constraint on delivering clinically appropriate care.

Taken together, the evidence indicates that while greater exposure to allied health interventions is generally associated with better outcomes up to a point, the current literature does not support specifying a universal optimal dose. Instead, it suggests that flexible condition-responsive models that allow delivery of multi-session care using standard-length consultations are more consistent with both the evidence base and contemporary clinical practice than a uniform low annual cap on allied health services.

Considerations

Several clear themes emerged in this Evidence Check that should be taken into consideration when determining whether the current MBS-funded allied health chronic condition management services are appropriately structured to support improved patient outcomes. We present these as considerations here and in the final section of the report:

1. Increase the cap on Medicare-subsidised allied health sessions:
 - The current limit of five sessions per year under MBS Chronic Condition Management items is insufficient for clinically meaningful outcomes for people with musculoskeletal, chronic respiratory and cardiovascular conditions.
 - Evidence shows effective allied health interventions for chronic respiratory disease typically involve a greater number of sessions (31), while people with musculoskeletal and cardiovascular disease require fewer sessions (18, 19).
 - A solution might be to implement condition-specific caps or flexible models that allow higher session numbers for people with more complex long-term conditions.
2. Review consultation length:
 - Most effective interventions use consultations of 40–44 minutes for musculoskeletal conditions and 35–54 minutes for chronic respiratory and cardiovascular conditions; very short sessions (<20 minutes) are rarely sufficient.
 - Align MBS item descriptors with standard clinical practice (45–60 minutes) and consider differential rebates for longer initial assessments.
3. Support multidisciplinary multi-session care:
 - Outcomes improve when multidisciplinary teams deliver care.
 - Review MBS allied health items so they do not restrict access across professions and consider separate caps per profession rather than a shared pool, particularly for people with multimorbidity.
4. More is not always better for some conditions:
 - Enable a flexible approach that includes a review of progress at an appropriate point during a course of treatment, to support decisions about access to further sessions.
 - This review may draw on clinical assessment and validated outcome measures where indicated.

Introduction

Half of the top 10 leading causes of early death and disability worldwide are chronic diseases.¹ One in two Australians has at least one chronic condition, and in 2023 Australians lost an estimated 4.4 million years of healthy life from chronic conditions, equivalent to 85% of the total disease burden in that year.² The most prevalent chronic conditions in the latest National Health Survey were mental and behavioural, musculoskeletal (e.g. back problems), arthritis, asthma, diabetes and cardiovascular conditions (heart, stroke and vascular diseases).³

Most people with chronic conditions are managed by their general practitioner (GP), with approximately 70% of Australian GP encounters primarily associated with the management of chronic conditions.⁴ Primary care in Australia is healthcare that people seek in the community from a GP, allied health professional, Aboriginal and Torres Strait Islander primary healthcare professional or nurse. The Enhanced Primary Care (EPC) package was introduced in 1999 and extended in 2005 with the introduction of the GP Management Plan (GPMP) and Team Care Arrangement (TCA) to support Australian GPs to better manage people with chronic conditions. On 1 July 2025, the requirement for a TCA was removed, and the GPMP was renamed the GP Chronic Condition Management Plan (GPCCMP). These plans aimed to facilitate longer Medicare-subsidised appointments and multidisciplinary team care, including up to five health visits per year with allied and primary health professionals such as Aboriginal and Torres Strait Islander health workers, Aboriginal and Torres Strait Islander health practitioners, audiologists, chiropractors, diabetes educators, dietitians, exercise physiologists, mental health nurses, occupational therapists, osteopaths, physiotherapists, podiatrists, psychologists, social workers and speech pathologists.⁵

The use of MBS Chronic Condition Management (CCM) items has increased across all population subgroups, with the largest increase seen among older persons, particularly those aged 80–84 years. The rapid rise in use of allied health MBS CDM items over time, supported by both the number of claims per year and the increasing proportion of the population using these items, likely reflects a previous gap in access to care for people with chronic conditions.⁶ In 2021–22, 37% of Australians had claimed a Medicare-subsidised allied health service. Physiotherapy and podiatry have had the highest uptake of the allied health CCM services, particularly for those aged 80–84, with diabetes, with more severe physical limitations, and from low socioeconomic status backgrounds.^{6–8} There is evidence for better patient outcomes and reduced hospital admissions in some conditions being managed by GPMPs. Outcomes include reducing the risk of falls in older people⁹, delayed time to next potentially preventable hospitalisation in patients with heart failure¹⁰, and significant improvements in glycaemic control in patients with poorly controlled diabetes¹¹, as well as general improved access to allied health professionals through primary care settings.^{5,8}

It is not known whether the current maximum number of five sessions with an allied health professional per calendar year is optimal for patient and health system outcomes, particularly when all sessions may be required for one condition¹² and since many people with chronic conditions often have more than one condition at the same time (multimorbidity).³ Therefore, the Department of Health, Disability and Ageing ('the Department'), through the Medicare Benefits Schedule Review

Advisory Committee (MRAC), sought to assess whether current MBS-funded allied health chronic condition management services are appropriately structured to support improved patient outcomes for all chronic conditions. Phase 2 of this Evidence Check review was intended to inform decisions about the optimal number and duration of services that should be subsidised through the MBS for patients with the chronic conditions of cardiovascular disease (hypertension, coronary heart disease, heart failure), musculoskeletal conditions (osteoarthritis, back pain) and chronic respiratory disease (chronic obstructive pulmonary disease (COPD), bronchiectasis, asthma), and aimed to address the following question.

Evidence Check question

Is there a relationship between allied health consultation dose (i.e. the number of individual service consultations and/or length of service consultation) and health-related outcomes for people experiencing one or more chronic conditions? Does this differ by profession or health condition?

Methods

Peer-reviewed literature

Search

Databases

We developed a search strategy using the three-step methodological approach originally proposed by Arksey and O'Malley and further refined by the Joanna Briggs Institute (JBI).^{13,14} First, we conducted a pilot search in MEDLINE via Ovid on 6 August 2025. Second, we reviewed the results from the pilot search and the search terms from an umbrella review on a similar topic⁵ to refine search terms with input from a University of Sydney School of Public Health librarian. Third, we translated the final search strategy for additional databases using the keywords and subject headings from the MEDLINE search to include the same keywords, and we searched for similar subject headings in the Embase database via Ovid and the Cochrane Database of Systematic Reviews.

The final systematic searches were conducted in the Cochrane Database of Systematic Reviews on 12 August 2025 and Ovid MEDLINE and Embase via Ovid on 19 August. The search terms and strings are detailed in Appendices 1 and 2. Results (n=1932) were imported into Covidence systematic review management software, where duplicates were removed.¹⁵

Screening

The full eligibility criteria, including the exclusions, are provided in Appendix 3. Study selection methods were undertaken and reported as part of Phase 1 of the project. Briefly, study designs were limited to systematic reviews where at least 50% of included primary studies met the full eligibility criteria of the Evidence Check. Title and abstract screening using the predefined eligibility criteria, with a subset (10%) double-screened to assess inter-rater reliability, followed by single-reviewer screening of remaining records. Full-text screening was similarly quality-checked through initial double screening and reviewer consensus processes. These procedures resulted in more than 300 studies being identified as eligible for review across Phase 1 and Phase 2.

Given the volume of evidence, studies reporting on stroke, Parkinson's disease and diabetes were included in Phase 1 of this Evidence Check, which has already been completed¹⁶, while chronic respiratory disease, cardiovascular disease and musculoskeletal conditions were addressed in Phase 2. Systematic reviews of exercise interventions for cardiovascular disease and COPD were excluded, as these topics were recently examined in an umbrella review conducted by author SD, which focused on group exercise interventions.⁵ Because the author advised that these interventions can feasibly be delivered as one-to-one interventions without changes to session frequency, session duration or total intervention length, exercise interventions for chronic cardiovascular and chronic

respiratory conditions were not re-examined in this Evidence Check. Instead, summary statements of findings from the previous umbrella review are presented in the Discussion. The PRISMA flow diagram is provided in Appendix 4.

Data extraction

To assist with data extraction of eligible papers, we used AI-assisted bulk data extraction tools Elicit and Outread.ai (see supplementary files*). To ensure accuracy, rigorous human checks were conducted throughout the extraction process. To support consistent data extraction across reviews, we developed standardised definitions to classify primary allied health intervention type and outcomes for each review (Tables 1 and 2).

Table 1—Definitions for intervention category

Primary intervention type	Definition	Examples from extracted data
Exercise	Interventions where the main focus was structured physical exercise prescribed or supervised by an allied health professional.	Aerobic and resistance training; balance and gait training; treadmill or cycle ergometry; task-oriented exercise circuits; home or clinic-based programs led by physiotherapists or exercise physiologists.
Psychological / emotional support	Interventions where the main focus was psychological or emotional support, using structured counselling or psychological techniques.	Cognitive-behavioural therapy; counselling for depression or anxiety; stress-management programs; motivational interviewing; psychologically informed behaviour-change support.
Multimodal	Interventions where there were two or more primary intervention types (e.g. exercise, education, psychological support) delivered together.	Combined exercise and lifestyle/self-management education; exercise plus psychological or motivational support; exercise plus functional/task-specific training; multidisciplinary chronic disease programs including exercise, education and psychosocial components.
Other	Interventions that did not clearly fit the categories above or where the primary intervention was not clear.	Stand-alone lifestyle or self-management education; case-management or coordinated care models; service or pathway redesign; allied-health clinics with poorly described or mixed consultation content.

* Available on request

Table 2—Outcome domains

Outcome domain	Definition	Examples from extracted data
Physical	Measures of impairment at the body/impairment level—changes in symptoms, motor performance, fitness or biomedical risk factors targeted by the intervention.	Motor symptom scales (e.g. UPDRS motor score, Fugl–Meyer), balance and gait measures (e.g. Berg Balance Scale, Timed Up-and-Go, 10-metre walk speed), walking capacity (e.g. 6-minute walk test), strength or endurance tests, cardiometabolic markers (e.g. blood pressure, BMI), pain intensity scores.
Psychological / emotional	Outcomes capturing emotional wellbeing, mental health symptoms or psychological responses to living with a chronic condition.	Depression and anxiety scales (e.g. HADS, PHQ-9, GAD-7), psychological distress, fear of falling, stress, self-efficacy or confidence ratings, mental health subscales of generic quality-of-life instruments.
Functional	Activity-level outcomes describing what people can do in everyday life— independence, mobility and ability to carry out daily tasks or roles.	Activities of daily living and functional independence measures (e.g. Barthel Index, Functional Independence Measure), mobility and transfer scales, instrumental ADLs, return-to-work or role participation, performance-based functional tests (e.g. sit-to-stand, stair climbing).
Other	Outcomes not primarily physical, psychological or functional but relevant to the impact of care or wider system effects.	Health-related quality of life composite scores (e.g. SF-36, EQ-5D, PDQ-39 total score), patient satisfaction with care, treatment adherence or self-management behaviours, disease knowledge, healthcare use (e.g. hospitalisations, ED presentations, primary care consultations).

Evidence appraisal and risk of bias assessment

Strength of evidence

Our classification system for rating the strength of evidence used the strength of the study design(s) included in each systematic review to rate the overall strength of the evidence. This approach assumes that stronger designs, such as randomised controlled trials (RCTs) and well-designed quasi-experimental studies, are deliberately structured to minimise bias; that is, systematic errors in how a study is conducted or analysed that can lead to misleading conclusions about whether an intervention works. High-quality designs reduce bias by making comparison groups as similar as possible except

for the intervention being tested, so that observed differences in outcomes are more likely to reflect the intervention itself rather than other factors, thereby providing greater confidence in the findings. Table 3 summarises the strength-of-evidence rating categories.

Table 3—Strength of evidence ratings

Rating	Criteria
 Strong	The systematic review included mostly high-quality experimental designs, such as RCTs, cluster RCTs, or robust quasi-experimental designs (e.g. interrupted time series with appropriate controls). These designs minimise bias and allow stronger causal inference.
 Moderate	The systematic review included mostly non-randomised controlled studies or prospective/retrospective cohort studies. These designs offer useful comparative information but are more susceptible to bias than fully randomised or robust quasi-experimental designs. Certainty is moderate.
 Weak	The systematic review relied primarily on lower-rigour observational designs, including pre–post studies without control groups, cross-sectional studies, or case–control studies. These designs have substantial risk of bias and provide low certainty.

Risk of bias

We extracted the risk of bias appraisals conducted by the reviews on the primary studies they included. One author (NP) checked these for each review while assessing the overall risk of bias using the criteria in Table 4 and selecting the appropriate rating. Where ratings were distributed across categories without a clear majority, we applied a conservative rating. Reviews that did not report risk of bias appraisals were recorded as not reported (NR).

Where reviews used more than one tool to assess risk of bias (e.g. a domain-based tool and a numerical scoring tool), the overall classification provided by the domain-based tool was used to inform the Table 4 rating. Domain-based tools provide an explicit overall judgement, whereas numerical scoring systems generate summary scores that may combine heterogeneous methodological features; we therefore gave preference to the overall qualitative risk classification. While the overall rating is reported in Table 4, all original qualitative and numerical assessments are available in the data extraction table in the supplementary files.[†]

[†] Available on request

Table 4—Risk of bias appraisal of included studies

Rating	Criteria
 Low	The systematic review included >50% of studies assessed as being at low risk of bias or high methodological quality using a validated tool.
 Moderate	The systematic review included >50% of studies assessed as being at moderate risk of bias or moderate methodological quality using a validated tool.
 High	The systematic review included >50% of studies assessed as being at high risk of bias or low methodological quality using a validated tool.

Data completeness

To assess the completeness and usability of dose and duration reporting across included systematic reviews, we applied a structured data completeness classification for the number of consultations and consultation duration. Completeness was assessed per systematic review, based on the level of detail provided in the review's description of the primary studies it synthesised (Table 5). This classification was applied independently for each of the dose variables to provide a consistent assessment of reporting completeness across systematic reviews.

Consultation dose was summarised by calculating a study-level midpoint for the number and/or duration of consultations reported in each review, using the average of the lower and upper bounds and excluding non-numeric values. Midpoints were then summarised within each condition group using the median and interquartile range to describe typical dose, with overall minima and maxima reported for context.

Table 5—Data completeness categories

Completeness category	Definition	Examples
 Good	Clear, extractable quantitative information allowing a meaningful numeric range to be derived.	'4–12 weeks'; '1–12 consultations'; '20–60 minutes'.
 Poor	Incomplete information or no information reported for the variable.	'Not reported'; missing data; no mention of dose or duration.

Literature provided via stakeholder submission

Organisations listed in Appendix 5.1 received a formal email from the Department inviting them to provide relevant literature for consideration in the Evidence Check via 'stakeholder submission'. All organisations agreed to participate. Following this, the review team at the Sax Institute sent a follow-up email thanking organisations for their support, outlining the Evidence Check questions and providing guidance on the types of literature to submit (see Appendix 5.1).

Materials received from organisations included peer-reviewed publications and grey literature as well as stakeholder submissions and position/advocacy documents. All materials were logged on receipt and screened against the inclusion criteria in Appendix 3. Author NP created a narrative synthesis of high-level contextual issues from stakeholder submissions for inclusion in the findings and discussion for Phase 2 of this project.

Documents that met the inclusion criteria were included in the evidence base for data extraction and synthesis, while documents that did not (e.g. position statements and narrative evidence summaries without eligible evaluative studies) were treated as stakeholder submissions. The latter were not included in the evidence synthesis or applied to infer dose–outcome relationships but used to: (i) identify high-level contextual issues relevant to interpretation; and/or (ii) identify potentially eligible studies cited within submissions ('reference harvesting'), which were then screened independently against the inclusion criteria. A description of the volume of literature provided by each stakeholder, reasons for exclusion, information on any included literature, plus (in some cases) other information relevant to the stakeholder group included in the Evidence Check, is in Appendix 5.2.

Findings

Peer-reviewed literature

Overview of the evidence base

This Evidence Check included 58 systematic reviews reporting on allied health interventions for adults with musculoskeletal conditions (chronic low back pain and osteoarthritis; n=52), chronic respiratory diseases (COPD and asthma; n=4), and cardiovascular conditions (hypertension; n=2). Interventions were primarily exercise-based, although many reviews also examined multimodal programs incorporating lifestyle education, psychological or behavioural therapies and a wide range of adjunct modalities (e.g. manual therapy, electrotherapy, biofeedback and virtual reality-based rehabilitation). Across studies reporting provider professions, physiotherapists were the most frequently specified allied health professionals, followed by chiropractors, osteopaths, occupational therapists, psychologists, dietitians, exercise physiologists and podiatrists, often working within multidisciplinary teams. The most frequently reported outcomes related to pain, physical function, mobility and muscle strength, with many reviews also assessing health-related quality of life, cardiorespiratory fitness and psychological outcomes such as self-efficacy, kinesiophobia and mood. See Appendix 6 for a complete overview of included studies.

Strength of evidence, risk of bias assessment and data completeness

The strength of the evidence, risk of bias and data completeness for each included study are colour-coded in Appendix 7 and fully described in the supplemental files.

We rated the strength of evidence in each review using the study designs of the underlying primary studies, with RCTs considered stronger designs than observational or uncontrolled studies. Across the 58 systematic reviews, 57 (98%) were rated as *strong*, as they only included RCTs; and one review (2%) was rated as *moderate*, because it combined RCTs with experimental studies without randomisation, case studies, randomised controlled pilot studies and controlled clinical studies. Appendix 7 provides detailed information for each review.

We conducted an overall assessment of the risk of bias reported by the included reviews for their primary studies. Of the 58 reviews, 35 (60%) judged most (i.e. >50%) of their included studies to be at low or moderate risk of bias. Specifically, 17 reviews (29%) assessed most of their included studies as being at low risk of bias, 18 (31%) as at moderate risk, and 21 (36%) as at high risk. Two reviews (3%) did not report any risk-of-bias assessment for their included studies.

Two dose variables were examined: the total number of consultations and consultation duration (i.e. the length of each session). For the number of consultations, 56 of the 58 reviews (97%) were rated as having good completeness, defined as reporting a clear numeric range. For consultation duration, 46 reviews (79%) met this criterion.

Overall, 44 reviews (76%) demonstrated good completeness for both dose variables, while eight reviews explicitly examined dose–response relationships in their analyses (either as the primary aim and/or with specific analyses to examine this).

As a result, the findings below draw on three overlapping sources of evidence:

- The subset of reviews with good completeness for both dose variables
- The eight systematic reviews that explicitly examined dose–outcome relationships
- Broader patterns from reviews with partial dose reporting, which are used cautiously and interpreted as descriptive rather than definitive.

Descriptive patterns in consultation dose

Across the 44 high-completeness subset of reviews, interventions were most commonly delivered as multi-session programs, frequently involving allied health professionals working either alone or within multidisciplinary teams. For musculoskeletal conditions, physiotherapists were the most frequently identified providers, often delivering exercise-based programs and, in some reviews, working alongside other professionals such as occupational therapists, psychologists, chiropractors, osteopaths or exercise physiologists as part of multimodal care. For respiratory and cardiovascular conditions, the reviews described structured programs delivered over multiple sessions by allied health professionals, sometimes within multidisciplinary teams. Respiratory interventions were most often led by physiotherapists, dietitians and exercise professionals, and typically combined exercise-based or pulmonary rehabilitation with education, lifestyle and self-management support, and occasionally psychological or motivational components. Evidence for cardiovascular conditions was limited to hypertension, where interventions focused on behavioural or psychological strategies or dietitian-led interventions delivered across multiple sessions.

When viewed by condition, reviews related to musculoskeletal conditions showed a wide spread in both the number and duration of consultations. Reported dose ranged from as few as one consultation to as many as 168, although the typical midpoint in the reported ranges was approximately 18–19 consultations, with most programs falling between roughly 14 and 33 consultations.^{17–21} Session durations also spanned a broad range, from brief 3–10-minute contacts, which largely come from manual or adjunctive components (e.g. ultrasound, visceral techniques), to extended sessions of up to 180 minutes. However, the majority clustered around standard appointment lengths, with a typical midpoint of ~40 minutes and most programs falling between 35 and 50 minutes.^{19–21} Overall, this pattern suggests that while musculoskeletal programs vary substantially in intensity and duration, most are delivered as multi-session programs structured around standard-length appointments.

In reviews related to chronic respiratory conditions (asthma and COPD), fewer studies reported complete dose information, but those that did described structured multi-session programs delivered over several weeks to months.^{22–25} Reported consultation numbers ranged from one to 624, although the upper bound was driven by a single asthma review²⁵, likely reflecting a long-running exercise maintenance program rather than a discrete clinical intervention and should be interpreted cautiously. Excluding this likely outlier, the remaining reviews reported ranges of 1–84 consultations. The typical midpoint across all respiratory reviews was ~37 consultations, or ~31 consultations when Valkenborghs et al. (2022)²⁵ is excluded. Session durations ranged from 5–120 minutes, with a typical

midpoint of ~43 minutes and a central band between roughly 36 and 54 minutes, consistent with standard allied health appointment lengths.

Across the reviews on cardiovascular conditions (hypertension), the number of consultations ranged from two to 48, with midpoints of 10 and 26 and a typical midpoint of ~18 consultations.^{26,27} Session duration data were available for one review only²⁶, which reported a range of 12–75 minutes, corresponding to a midpoint of ~44 minutes; with only a single data point, no central band for duration can be estimated. While these findings suggest multi-session programs delivered in broadly standard appointment lengths, the small evidence base means cardiovascular dose estimates should be interpreted with caution.

Considered together, these reviews reveal a broadly coherent pattern across conditions. Session duration was notably more consistent than the total number of consultations, with midpoints typically around 40–44 minutes across musculoskeletal, respiratory and cardiovascular reviews and central bands generally falling within ~35–54 minutes, consistent with standard allied health appointments. By contrast, the total number of consultations varied considerably, from single-session programs to intensive long-running interventions. The typical midpoint was 19 consultations for musculoskeletal conditions, 31 consultations for chronic respiratory disease and 18 consultations for the two cardiovascular reviews. Overall, allied health interventions for chronic musculoskeletal, respiratory and cardiovascular conditions are typically structured as multi-session programs built around broadly standard consultation lengths, but with marked variation in total volume of care depending on condition group and program design.

Relationship between dose and outcomes

Only eight reviews explicitly examined dose–outcome relationships between the amount of allied health intervention provided and patient outcomes as the main aim of the study and/or included statistical analyses to report findings on this.^{17–21,24,28,29} Across these reviews, there was some suggestion that more intensive interventions were associated with better outcomes, but the evidence was inconsistent and not sufficient to define an optimal dose.

Seven dose–outcome reviews focused on musculoskeletal conditions (chronic low back pain and osteoarthritis)^{17–21,28,29}, with one review on paediatric asthma.²⁴ Across the musculoskeletal reviews, exercise-based interventions delivered over multiple sessions were generally associated with improvements in pain and function, but dose–outcome patterns were not uniform.^{17–21,28,29} For example, in osteoarthritis, the benefits of exercise were consistent at 12 weeks across outcomes (pain, stiffness and function), and effect estimates suggested that timing and program characteristics influenced the magnitude of benefit (i.e. improvements peaked within the early weeks and differed by exercise modality).²⁸ In chronic low back pain, quantitative dose–response modelling indicated that pain reduction increased with greater weekly exercise volume up to a point, with the strongest response observed around a higher exposure band and a minimum weekly dose required to achieve clinically meaningful pain improvement; Pilates (more specifically, physiotherapist-supervised stabilisation and core-control programs or ‘clinical Pilates’) was identified as particularly effective within the dose–response estimates.¹⁸ Similarly, reviews of stabilisation and motor control exercise for chronic low back pain reported that exercise was associated with reductions in pain and disability, with the largest effects most often observed within a ‘moderate’ session-duration band rather than at the extremes, suggesting an inverted U-shaped dose–response relationship.^{19,20}

Disability outcomes showed weaker or less consistent dose–response patterns than pain in several reviews, particularly for longer-term disability outcomes, with some analyses finding little additional benefit beyond a certain level of exposure.^{18–20} By contrast, where dose was examined more explicitly, some reviews identified thresholds or optimal exposure bands, most often for pain or short-term functional outcomes rather than sustained disability.^{18,19,29,30} These thresholds included minimum total program durations (e.g. >500 minutes of accumulated exercise), weekly exercise volumes (e.g. approximately 900–1000 MET-minutes per week), or session-level characteristics such as durations of 20–30 minutes delivered several times per week. However, even in reviews identifying such thresholds, evidence as to the best weekly frequency or longer-term sustainability of effects remained inconsistent.^{19,20}

In the respiratory review (paediatric asthma), exercise-based pulmonary rehabilitation delivered across a wide range of session counts and durations was associated with improvements in pulmonary function outcomes (e.g. FVC and some flow measures) and quality of life, although not all spirometric outcomes improved consistently.²⁴

Overall, these dose–outcome reviews suggest that allied health programs delivered over repeated sessions can improve patient outcomes, and that higher or more sustained exposure was sometimes associated with larger improvements; however, the shape of the dose–response relationship varied by intervention type and outcome, and ‘more’ was not always clearly better across all measures or time points.

Literature provided via stakeholder submission

Of the 16 allied health and primary care peak organisations consulted, 13 contributed grey literature (n=62) and peer-reviewed publications (n=367). Of the 429 references provided by the stakeholders, 42 peer-reviewed documents were screened for inclusion in the section above, and no grey literature documents were eligible for inclusion. Appendix 5.2 provides a descriptive summary of the volume and type of literature provided by each stakeholder and their reasons for exclusion.

Common themes from the literature provided via stakeholder submission

Consistent with Phase 1 of the project, several overarching themes emerged across the excluded grey literature regarding how allied health interventions for people with chronic conditions are conceptualised and delivered.

Multidisciplinary multi-session models are a cornerstone of chronic disease management

Care for clients with musculoskeletal conditions, cardiovascular conditions and chronic respiratory conditions was consistently described as requiring input from multiple allied health professions rather than a single discipline. It was highlighted that although multidisciplinary care is a cornerstone of chronic disease management, individual allied health professions also make distinct contributions to care, providing expertise at different points in the care pathway as well as contributing unique clinical skills to different chronic diseases. The typical model described was not a single consultation, but a block of repeated consultations over weeks or months, often involving several professions working in

parallel or in sequence and the need for coordinated medical, psychological and lifestyle-focused support was highlighted.

Chronic condition management plans need to be individualised and flexible

Several stakeholders noted that a limitation of this Evidence Check's central question on dose-outcome relationships is that for most conditions there is no clear consensus as to the number of sessions or the length of sessions. Several peak allied health organisations emphasised the need for a longer initial consult to enable personalising the care plan, with some stating that there needs to be a separate billing item for a longer initial consult to cover this. They also highlighted the need to consider some flexible mechanisms for increasing the number of sessions, particularly for individuals with complex needs, such as those with multimorbidity, often referring to other funding models that incorporate such flexibility.

Emphasis on sufficient intensity, timing and maintenance

Many documents stressed that people are unlikely to achieve meaningful or sustained gains with very low doses of therapy. At the same time, several sources acknowledged that initial gains may diminish without ongoing input, highlighting the perceived importance of review, maintenance or booster sessions rather than one-off or very short episodes of care. The need for mechanisms in funding models to increase the number of consultations for complex patients with co-morbidities was a common theme across stakeholder feedback. Telehealth and hybrid models were often presented as legitimate ways to deliver this dose, especially for people who have difficulty accessing in-person specialist services.

Funding, pricing and equity shape access to dose

Another theme concerned the role of funding and pricing structures in determining the dose of allied healthcare that people can receive. Reports addressing Medicare, NDIS and other funding arrangements described how fee schedules, session caps and price limits influenced the number and length of consultations that services can provide. Within this broader context, some professional bodies explicitly framed dose as an equity issue, arguing that current rebates and session limits restrict access to adequate psychological care and impose higher out-of-pocket costs in particular groups, including women and young people, as well as people living in regional and rural areas. Recommendations included increasing rebates, allowing more flexible session limits for people with complex or high-impact conditions, and strengthening safety-net arrangements for those at greatest financial risk.

Taken together, the grey literature portrays allied health care for chronic conditions as multidisciplinary, multi-session and often high intensity, while also recognising that what is delivered is constrained by funding models, workforce availability and access barriers. These sources strongly imply that adequate dose matters for outcomes, but they do so largely through service models, professional standards and equity arguments, rather than through formal evaluations of different numbers or lengths of consultations.

Discussion

This Evidence Check examined whether there is a relationship between allied health consultation dose, defined as the number and/or length of individual consultations, and health-related outcomes for adults with musculoskeletal conditions, chronic respiratory disease or cardiovascular disease, and whether any such relationship differs by profession or condition. From the 58 included systematic reviews, we extracted information on study design, intervention type, allied health profession, dose variables and outcomes. We applied a pragmatic framework to rate the strength of evidence (based on the study design of underlying primary studies), provided a risk of bias rating, and assessed the completeness of reporting for the number and duration of consultations. We also considered all background documents (62 grey literature documents, 367 peer-reviewed documents) provided by the allied health and healthcare organisations to understand how consultation dose is conceptualised in contemporary practice and policy.

In this Evidence Check, the most direct evidence of relationships of intervention dosage with patient outcomes came from eight reviews that had a primary aim and/or statistical analyses that focused on dose–outcome relationships.^{17–21,24,28,29} Seven of these focused on musculoskeletal conditions (chronic lower back pain and osteoarthritis)^{17–21,28,29} and one focused on paediatric asthma.²⁴ These studies used statistical techniques that formally examined whether different doses were associated with different outcomes, such as meta-analyses with subgroup analyses comparing higher and lower dose categories, meta-regression examining linear dose–response associations, and Bayesian network meta-analyses using models to compare multiple dose or modality combinations. These reviews suggested that allied health programs delivered over repeated sessions can improve patient outcomes, and that higher or more sustained session doses were sometimes associated with larger improvements. However, more was not always better across all measures or time points, and there was no clear evidence identifying thresholds at which higher doses resulted in diminishing improvements in patient outcomes. Given the large number of meta-analyses identified in this Evidence Check, and the suitability of meta-analysis for examining dose–outcome relationships, future studies of this kind should be able to provide more consistent and increasingly definitive evidence for allied health interventions across additional chronic conditions.

The reviews with high completeness of information on dose–outcome relationships suggest a relatively consistent level of allied health intervention dose across the three conditions. Interventions were rarely delivered as single or standalone consultations. Instead, they were structured as multi-session programs delivered by multidisciplinary allied health teams. Session lengths were most commonly 40–44 minutes across musculoskeletal, respiratory and cardiovascular reviews, with central ranges generally falling within 35–54 minutes, consistent with standard allied health appointments. In contrast, the total number of consultations varied widely, with chronic respiratory disease typically involving a greater number (31) compared with musculoskeletal (19) and cardiovascular disease (18). However, it should be noted that reviews of novel mobile phone-based (i.e. m-health)³¹ and virtual reality health interventions, and exergames^{17,32,33} may be designed to supplement treatment with home-based exercise(s) which patients can perform independently with

review by the allied health professional(s) and/or monitoring via m-health applications. This could reduce the need for in-person sessions with the allied health professionals while still maintaining a sufficient treatment dose to achieve positive health outcomes for patients.

Although they did not meet the strict inclusion criteria for grey and peer-reviewed literature, some of the documents provided by stakeholders did contribute information about service time limits and session numbers. For example, Speech Pathology Australia referenced the NDIS Annual Pricing Review, which includes case studies with service time limits.³⁴ A peer-reviewed article provided by Dietitians Australia describing Medicare-subsidised dietetic services echoes our finding that the current cap of five sessions per calendar year is a barrier to access, particularly when shared across all allied health professions.³⁵

Stakeholder submissions and related documents from peak allied health organisations consistently highlighted structural factors that shape 'dose' in practice. These included perceived misalignment between some MBS item descriptors and typical clinical delivery (e.g. longer initial assessments and shorter follow-ups) than implied by a single short descriptor, and the fact that the annual session cap is shared across professions, reducing the number of sessions available for any one discipline. Submissions also emphasised that funding and out-of-pocket costs can materially constrain the dose that people can feasibly receive, with implications for equity of access. In contrast to the Evidence Check's attempt to identify quantitative information on relationships of session doses with patient outcomes, a common theme from the contextual information provided by stakeholders was that chronic condition management plans need to be individualised and flexible, and funding models should consider mechanisms that support this, such as a funding item for longer initial consultations to individualise consults and a mechanism for increasing the number of sessions for individuals with complex care needs from multiple co-morbidities.

Taken together, the peer-reviewed systematic reviews and grey literature do not provide sufficient evidence to recommend a specific number or length of individual consultations as 'optimal' for cardiovascular disease, chronic respiratory disease or musculoskeletal conditions. Instead, they suggest that a higher cap on annual visits is needed and that this varies by condition, with chronic respiratory disease requiring high session numbers. This is consistent with the findings of a recent qualitative study that found multidisciplinary multi-session care was the norm, particularly for patients with co-morbidities and chronic conditions.³⁶ On service length, the same qualitative study reported that *"Most allied health professionals are already providing CCM sessions beyond the 20-minute duration (typically 40–60 minutes)"*³⁶, while this Evidence Check found the session lengths in studies with complete data were typically 40–44 minutes. The study provided recommendations for increasing the number of sessions either by increasing limits per calendar year or by taking a flexible patient-centred approach and using a session-tiered model with 20-, 40- and 60-minute sessions, and then longer initial or shorter follow-up consultations as necessary.

Strengths and limitations

Key strengths of this Evidence Check include its breadth of scope across three major chronic conditions and multiple allied health professions. The use of explicit and transparent frameworks to classify strength and quality of evidence, as well as dose completeness, which found high proportions of included studies provided strong evidence, low risk of bias and high data completeness, adds

confidence to the overall findings from the peer-reviewed literature. The stakeholder consultations added to the comprehensiveness of the literature considered, and the integration of peer-reviewed and grey literature added depth to the findings and reduced publication bias.

Nonetheless, several limitations mean the findings should be interpreted with caution. First, even where dose variables were reported with sufficient detail to be classified as 'good', they were often presented as broad ranges across heterogeneous interventions and populations, with limited standardisation of how dose was defined or summarised. Only eight reviews undertook formal analyses of dose–outcome relationships, and these were based on small numbers of trials with differing designs and outcome measures, limiting the ability to make any firm conclusions on dose–outcome relationships. Data about the length of initial and follow-up sessions was not reported in many studies, so we did not include it.

Second, because of the volume of peer-reviewed literature identified by the database searches and stakeholder consultations we made a pragmatic decision to exclude exercise interventions for cardiovascular disease and chronic respiratory conditions since these had been covered in a previous umbrella review, which also described intervention doses and patient outcomes.⁵ While this umbrella review focused on group interventions, the interventions could feasibly be delivered in one-to-one sessions, and the midpoints of session times and total number of sessions for these same conditions were similar to those in the present Evidence Check.

Third, provider and setting information were variably reported, requiring pragmatic assumptions about which professions were involved and whether interventions could be delivered in community or ambulatory settings (e.g. whether they were delivered in a clinical, hospital, research facility, home or community-based environment). In certain studies it was not always clear whether the intervention was delivered to individuals or groups. If there was an indication that the intervention was most likely delivered in a group setting (e.g. group therapy or group-based educational consultations), it was excluded from the analysis. This decision was made to maintain consistency and to focus on interventions that are more likely to be individually tailored or designed for one-on-one engagement.

Furthermore, in interpreting these findings, it is important to note that we have not appraised all 58 systematic reviews using a tool such as AMSTAR 2.³⁷ At the time of writing, this work was being undertaken as a higher-degree research student placement project supervised by author SD and will be incorporated at a later date. Instead, we used the study designs included within each review as an indicator of the strength of evidence, supplemented by the risk of bias assessments of primary studies conducted by the review authors themselves.

While we sought to provide a consistent and pragmatic gauge of overall evidence quality across a large body of reviews, this approach may introduce variability from the differences in how individual reviews applied their appraisal methods. Although most primary studies were rated as having low or moderate risk of bias, bias may have been introduced where reviews did not take steps to minimise risk. However, most reviews reported following the PRISMA guidelines³⁸ for reporting systematic reviews and meta-analyses, suggesting many key steps to reduce bias were undertaken.

While this Evidence Check attempted to provide good coverage of interventions delivered by a range of allied health and healthcare professions by not limiting the study designs included within reviews beyond quantitative studies with prospective designs, this resulted in a large volume of reviews for inclusion, which necessitated splitting it into two phases to deliver some results to the Department within the agreed time lines. This likely decreased the professions represented in Phase 2, as the only

included chronic conditions were cardiovascular disease, chronic respiratory disease and musculoskeletal conditions. However, when taken together with Phase 1, the coverage of professions increased.

Finally, the grey literature provided via the stakeholder consultations drew on a targeted profession-focused sample of documents that, while informative about practice and policy context, were predominantly advocacy-oriented and not designed to provide effect estimates. For this reason, similarly strict inclusion criteria to the peer-reviewed literature were applied to the grey literature, which stipulated findings on the dose–outcome relationships must be included and that they also must include some assessment of the strength and/or quality of included studies. However, the informative context was retained in high-level thematic findings and woven into the discussion.

In summary, this Evidence Check provides a structured overview of how allied health consultation dose is currently reported and configured in the literature for cardiovascular disease, chronic respiratory disease and musculoskeletal conditions, and clarifies what the existing evidence can, and cannot, say about relationships between dose and outcomes.

Considerations

Several clear themes emerged in this Evidence Check that should be taken into consideration when determining whether the current MBS-funded allied health chronic condition management services are appropriately structured to support improved patient outcomes. We have presented these as considerations below:

1. Increase the cap on Medicare-subsidised allied health sessions:
 - The current limit of five sessions per year under MBS Chronic Condition Management items is insufficient for clinically meaningful outcomes for people with musculoskeletal, chronic respiratory and cardiovascular conditions.
 - Evidence shows effective allied health interventions for chronic respiratory disease typically involve a greater number (31) of sessions, while people with musculoskeletal conditions and cardiovascular disease require fewer sessions (18, 19).
 - A solution might be to implement condition-specific caps or flexible models that allow higher session numbers for people with more complex long-term conditions.
2. Review consultation length:
 - Most effective interventions use consultations of 40–44 minutes for musculoskeletal conditions and 35–54 minutes for chronic respiratory and cardiovascular conditions; very short sessions (<20 minutes) are rarely sufficient.
 - Align MBS item descriptors with standard clinical practice (45–60 minutes) and consider differential rebates for longer initial assessments.
3. Support multidisciplinary multi-session care:
 - Outcomes improve when care is delivered by multidisciplinary teams.

- Review MBS allied health items so they do not restrict access across professions and consider separate caps per profession rather than a shared pool, particularly for people with multimorbidity.
4. More is not always better for some conditions:
- Enable a flexible approach that includes a review of progress at an appropriate point during a course of treatment, to support decisions about access to further sessions.
 - This review may draw on clinical assessment and validated outcome measures where indicated.

Appendices

Appendix 1—Search terms

PICO element	Description that guided search terms and syntax
Population	Community-dwelling adults and children* experiencing one or more chronic conditions (from the eligibility for Medicare-subsidised GPMP and TCA) on a Chronic Disease Management Plan (CDMP). Relevant chronic conditions in the Phase 2 Evidence Check for this project are: • Cardiovascular disease (hypertension, coronary heart disease, heart failure) • Musculoskeletal conditions (osteoarthritis, back pain) • Chronic respiratory disease (chronic obstructive pulmonary disease, bronchiectasis, asthma) *Children who experience asthma
Intervention	An individual allied health service from the following professions: • Aboriginal and Torres Strait Islander health practitioner/worker • Audiologist • Chiropractor • Diabetes educator • Dietitian • Exercise physiologist • Mental health nurse • Occupational therapist • Osteopath • Physiotherapist • Podiatrist • Psychologist • Social worker • Speech pathologist Where available, reviewers should also extract information about delivery and implementation details, including: • Setting/location • Frequency of consultations (e.g. weekly, monthly) • Duration of the treatment course (e.g. number of weeks or months) • Intensity of the intervention (e.g. length of each consultation).
Comparator	• Where available, comparisons against usual care, alternative therapies, placebo, or no intervention.

PICO element	Description that guided search terms and syntax
Outcomes	• Primary and secondary outcomes for interventions delivered to the chronic conditions, above.

Appendix 2—Search strings and outputs

Summary of the three database search dates and yields

Search dates: 19/08/25 for MEDLINE and Embase and 12/08/25 for Cochrane Database of Systematic Reviews (CDSR)

Yields: MEDLINE = 918, Embase 944, CDSR 26.

SEARCH INPUTS

DATABASE 1: Ovid MEDLINE(R) ALL, August 19, 2025

Results = 918

- 1 exp "Back Pain"/ 48280
- 2 "arthritis"/ or exp "arthritis, experimental"/ or "arthritis, rheumatoid"/ or "osteoarthritis"/ 191037
- 3 exp "Pulmonary Disease, Chronic Obstructive"/ 73078
- 4 exp "Asthma"/ 149576
- 5 exp "Hypertension"/ 333488
- 6 exp "Hyperlipidemias"/ 72913
- 7 exp "Osteoporosis"/ 67736
- 8 exp "Bronchiectasis"/ 10884
- 9 exp "Stroke"/ 193371
- 10 exp "Parkinson's disease"/ 91320
- 11 ("Coronary* disease*" or "heart failure*" or "asthma*" or "Chronic obstructive pulmonary disease*" or "COPD" or "diabet*" or "arthritis*" or "hypertension*" or "hyperlipidemias*" or "osteoporosis*" or "bronchiectasis*" or "stroke*" or "parkinson's disease" or "back pain*").tw,kw. 2541190
- 12 1 or 2 or 3 or 4 or 5 or 6 or 7 or 8 or 9 or 11 2849572
- 13 exp "Allied Health Personnel"/ 56630
- 14 "Aboriginal health worker".tw. 47
- 15 exp "Chiropractic"/ 3572
- 16 exp "nutritionists"/ or exp "occupational therapists"/ or exp "physical therapists"/ 6955
- 17 exp "exercise therapy"/ 71845
- 18 exp "Speech-Language Pathology"/ 4194
- 19 exp "Manipulation, Osteopathic"/ or exp "Osteopathic Medicine"/ 4553

20 exp "Podiatry"/ 2502

21 exp "Psychologist"/ 34

22 ("Aboriginal Health Worker*" or "Aboriginal and Torres Strait Islander Health*" or "Chiropractor*" or "Diabetes Educator*" or "Dietitian*" or "Exercise Physiologist*" or "Occupational Therapist*" or "Osteopath*" or "Physiotherapist*" or "Podiatrist*" or "Psychologist*" or "Speech Pathologist*").tw,kw. 63044

23 13 or 14 or 15 or 16 or 17 or 18 or 19 or 20 or 22201273

24 12 and 23 28991

25 limit 24 to english language [Limit not valid in CDSR; records were retained] 26527

26 limit 25 to yr="2020 -Current" 7655

27 (((("systematic review" or "systematic literature review" or "systematic scoping review" or "systematic evidence review" or "systematic quantitative review" or "systematic meta-review" or "systematic critical review" or "systematic mixed studies review" or "systematic mapping review" or "systematic cochrane review" or "systematic search") and review) or "systematic integrative review").ti. not comment.pt. not (protocol or protocols).ti. 292521

28 "meta analysis*".mp. or exp "Meta-Analysis"/ 347371

29 27 or 28 490774

30 "animal"/ 7715853

31 "human"/ 22888707

32 31 not 30 20502870

33 26 and 29 and 32 920

34 remove duplicates from 33 **918**

DATABASE 2: Embase Classic+Embase, August 19, 2025**Results: 944**

- 1 exp coronary artery disease/dm, pc, rh, th [Disease Management, Prevention, Rehabilitation, Therapy] 53625
- 2 exp asthma/dm, pc, rh, th [Disease Management, Prevention, Rehabilitation, Therapy] 25653
- 3 exp lung disease/dm, pc, rh, th [Disease Management, Prevention, Rehabilitation, Therapy] 169039
- 4 exp chronic obstructive lung disease/dm, pc, rh, th [Disease Management, Prevention, Rehabilitation, Therapy] 18151
- 5 exp diabetes mellitus/dm, pc, rh, th [Disease Management, Prevention, Rehabilitation, Therapy] 87155
- 6 exp insulin dependent diabetes mellitus/ or exp non insulin dependent diabetes mellitus/ 551391
- 7 exp arthritis/dm, pc, rh, th [Disease Management, Prevention, Rehabilitation, Therapy] 41862
- 8 spinal osteoarthritis/ or exp knee osteoarthritis/ or exp hip osteoarthritis/ or exp hand osteoarthritis/ or exp "Western Ontario and McMaster Universities Osteoarthritis Index"/ or exp osteoarthritis/ 204549
- 9 exp spinal osteoarthritis/ or exp knee osteoarthritis/ or exp hip osteoarthritis/ or exp hand osteoarthritis/ or exp osteoarthritis/ 201709
- 10 exp hypertension/dm, pc, rh, th [Disease Management, Prevention, Rehabilitation, Therapy] 42520
- 11 exp hyperlipidemia/dm, pc, rh, th [Disease Management, Prevention, Rehabilitation, Therapy] 10766
- 12 exp parkinson's disease/dm, pc, rh, th [Disease Management, Prevention, Rehabilitation, Therapy] 17224
- 13 ("Coronary* disease*" or "heart failure*" or "asthma*" or "Chronic obstructive pulmonary disease*" or "COPD" or "diabet*" or "arthritis*" or "hypertension*" or "hyperlipidemias*" or "osteoporosis*" or "bronchiectasis*" or stroke* or "back pain*" or "parkinson's disease").tw,kw. 4093961
- 14 1 or 2 or 3 or 4 or 5 or 6 or 7 or 8 or 9 or 11 or 13 4507474
- 15 exp paramedical personnel/ 703047
- 16 "Aboriginal health worker".tw,kw. 71
- 17 exp chiropractic/ 6051
- 18 exp dietitian/ 23924

- 19 exp occupational therapy/ 34565
- 20 exp physiotherapist/ 38823
- 21 exp exercise physiology/ 1814
- 22 exp kinesiotherapy/ 129239
- 23 speech therapy/20048
- 24 exp podiatry/ 3638
- 25 osteopathic medicine/ 6235
- 26 exp psychologist/ 23892
- 27 ("Aboriginal Health Worker*" or "Aboriginal and Torres Strait Islander Health*" or "Chiropractor*" or "Diabetes Educator*" or "Dietitian*" or "Exercise Physiologist*" or "Occupational Therapist*" or "Osteopath*" or "Physiotherapist*" or "Podiatrist*" or "Psychologist" or "Speech Pathologist*").tw,kw. 91158
- 28 15 or 16 or 17 or 18 or 19 or 20 or 23 or 24 or 25 or 27 800512
- 29 limit 28 to (english language and yr="2020 -Current") 209393
- 30 (((("systematic review" or "systematic literature review" or "systematic scoping review" or "systematic evidence review" or "systematic quantitative review" or "systematic meta-review" or "systematic critical review" or "systematic mixed studies review" or "systematic mapping review" or "systematic cochrane review" or "systematic search") and review) or "systematic integrative review").ti. not comment.pt. not (protocol or protocols).ti. 344796
- 31 "meta analysis*".mp. or exp "Meta-Analysis"/ 513236
- 32 30 or 31 668803
- 33 14 and 29 and 32 **944**

DATABASE 3: Cochrane Database of Systematic Reviews, August 12, 2025**Results: 26**

ID	Search Hits
#1	[mh "Back Pain"] 7894
#2	[mh ^arthritis] OR [mh "arthritis, experimental"] OR [mh ^"arthritis, rheumatoid"] OR [mh ^osteoarthritis] 13913
#3	[mh "Pulmonary Disease, Chronic Obstructive"] 8131
#4	[mh Asthma] 14707
#5	[mh Hypertension] 25423
#6	[mh Hyperlipidemias] 7973
#7	[mh Osteoporosis] 5531
#8	[mh Bronchiectasis] 500
#9	[mh Stroke] 18293
#10	((Coronary* NEXT disease*):ti,ab,kw OR ("heart" NEXT failure*):ti,ab,kw OR asthma*:ti,ab,kw OR ("Chronic obstructive pulmonary" NEXT disease*):ti,ab,kw OR COPD:ti,ab,kw OR diabet*:ti,ab,kw OR arthritis*:ti,ab,kw OR hypertension*:ti,ab,kw OR hyperlipidemias*:ti,ab,kw OR osteoporosis*:ti,ab,kw OR bronchiectasis*:ti,ab,kw OR stroke*:ti,ab,kw OR ("back" NEXT pain*):ti,ab,kw) 406357
#11	#1 OR #2 OR #3 OR #4 OR #5 OR #6 OR #7 OR #8 OR #9 OR #10 416067
#12	[mh "Allied Health Personnel"] 1833
#13	"Aboriginal health worker":ti,ab 6
#14	[mh Chiropractic] 197
#15	[mh nutritionists] OR [mh "occupational therapists"] OR [mh "physical therapists"] 384
#16	[mh "exercise therapy"] 23123
#17	[mh "Speech-Language Pathology"] 127
#18	[mh "Manipulation, Osteopathic"] OR [mh "Osteopathic Medicine"] 257
#19	[mh Podiatry] 51
#20	((("Aboriginal Health" NEXT Worker*):ti,ab,kw OR ("Aboriginal and Torres Strait Islander" NEXT Health*):ti,ab,kw OR Chiropractor*:ti,ab,kw OR ("Diabetes" NEXT Educator*):ti,ab,kw OR Dietitian*:ti,ab,kw OR ("Exercise" NEXT Physiologist*):ti,ab,kw OR ("Occupational" NEXT Therapist*):ti,ab,kw OR Osteopath*:ti,ab,kw OR Physiotherapist*:ti,ab,kw OR Podiatrist*:ti,ab,kw OR ("Speech" NEXT Pathologist*):ti,ab,kw) 15872

#21 #12 OR #13 OR #14 OR #15 OR #16 OR #17 OR #18 OR #19 OR #20 with Cochrane Library publication date Between Jan 2020 and Aug 2025, in Cochrane Reviews 78

#22 (((("systematic review":ti OR "systematic literature review":ti OR "systematic scoping review":ti OR "systematic narrative review":ti OR "systematic qualitative review":ti OR "systematic evidence review":ti OR "systematic quantitative review":ti OR "systematic meta-review":ti OR "systematic critical review":ti OR "systematic mixed studies review":ti OR "systematic mapping review":ti OR "systematic cochrane review":ti OR "systematic search":ti) AND review:ti) OR "systematic integrative review":ti) NOT comment:pt NOT (protocol:ti OR protocols:ti) 631

#23 ("meta" NEXT analysis*):ti,ab,kw OR [mh "Meta-Analysis"] 21492

#24 #22 OR #23 21617

#25 [mh ^animal] 17044

#26 [mh ^human] 899417

#27 #26 NOT #25 883674

#28 #21 AND #24 AND #27 **26**

Appendix 3—Inclusion and exclusion criteria

Population

Include	Exclude
- Intervention population living in community receiving treatment from allied health and Aboriginal and Torres Strait Islander Primary health care professionals listed below for one or more of the following chronic conditions: Cardiovascular disease (hypertension, coronary heart disease, heart failure) Musculoskeletal conditions (osteoarthritis, back pain) Chronic respiratory disease (chronic obstructive pulmonary disease (COPD), bronchiectasis, asthma)	- Children (unless asthma) - Adults living in residential aged care or children living in specialised care facilities - Currently admitted to hospital - If receiving treatment (i.e. not comparator), they will be excluded if the main treatment condition is other than the inclusion list (see opposite) - Specific populations (e.g. athletes)

Intervention/exposure

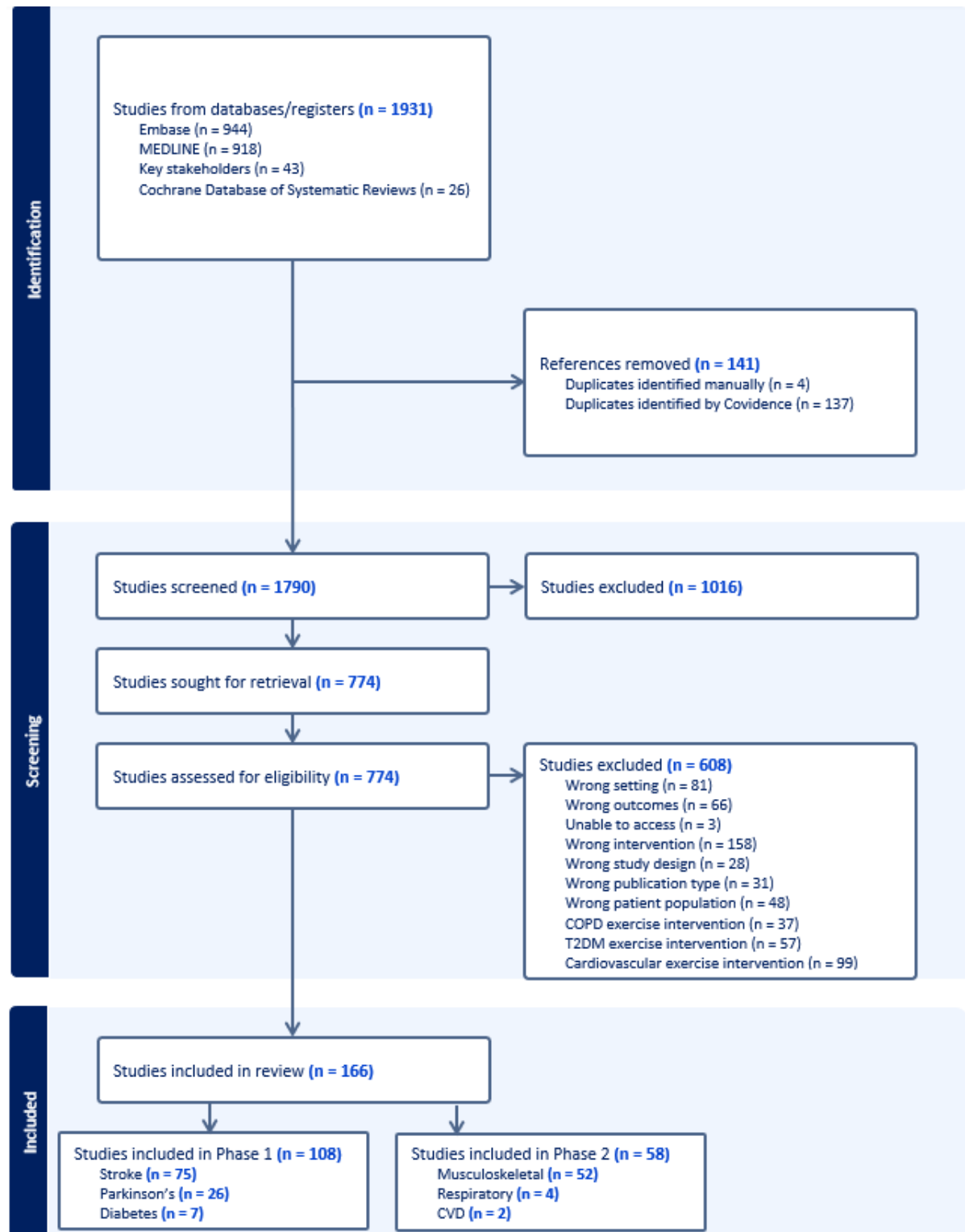
Include	Exclude
- An intervention that was or could be delivered by an appropriately credentialed allied health or Aboriginal and Torres Strait Islander Primary health care professional - Individual therapy – face-to-face or online - An intervention delivered by an allied health or Aboriginal and Torres Strait Islander Primary health care professional who was eligible to provide Medicare subsidised services for people with chronic conditions (as listed above in “Population” in Australia, such as: - Aboriginal and Torres Strait Islander health worker / Aboriginal and Torres Strait Islander health practitioner - Chiropractor - Diabetes educator - Dietitian - Exercise physiologist - Mental health nurse - Occupational therapist - Osteopath - Physiotherapist - Podiatrist - Psychologist - Social worker - Speech pathologist - Exercise therapy even if not specified exactly who delivers it.	- An intervention provided in an in-patient setting - or was a home-based program. - Group therapy (exclude even if unclear but most likely delivered in group setting) - An intervention or comparator provided by a pharmacist (because these are funded by different schemes in Australia). - An intervention or comparator provided by a psychologist, where the intervention is not related to treatment of one of the three conditions listed above. - An exercise intervention for CVD (hypertension, coronary heart disease and heart failure) - An exercise intervention for COPD - Experimental or early-stage interventions such as pilot studies or feasibility studies of innovative new approaches.

Comparator/context

Include	Exclude
---------	---------

- Where available, comparisons against usual care, alternative therapies, placebo or no intervention - Any comparator, including group therapy.	
Outcome	
Include	Exclude
- Primary outcomes related to allied health treatment for chronic conditions listed above - Reports on intervention dosage in detail: i.e. number of consultations / total duration (needs to be reported in >50% of included studies) - Reports on dose outcome relationship.	- Outcomes related to other chronic conditions that are not specified under the population - Where the other chronic conditions are comorbidities, the included chronic conditions and related outcomes must be the focus of the study.
Study characteristics	
Include	Exclude
- Systematic reviews and meta-analyses that include quantitative studies with prospective designs in the first instance - Systematic reviews where >50% of included studies meet the above criteria.	- Systematic reviews where <50% of included studies meet the above criteria, or where it is unclear whether >50% meet the above criteria - Systematic reviews only including cross-sectional or qualitative studies - Systematic review protocols - Cross-sectional studies - Qualitative studies.
Other	
Include	Exclude
- English - For SRs include all unless there are few primary studies from countries with primary care systems like Australia's 2020 onward.	- Languages other than English - All other countries - Prior to 2020.

Appendix 4—Flow of peer-reviewed literature



Appendix 5.1—Allied health organisations

Invited organisations

Allied health professions and primary healthcare-specific organisations

Audiology Australia

Australian Association of Psychologist Inc

Australian Association of Social Workers

Australian Chiropractors Association

Australian College of Mental Health Nurses

Australian Diabetes Educators Association

Australian Physiotherapy Association

Australian Podiatry Association

Australian Psychological Society

Chiropractic Australia

Dietitians Australia

Exercise and Sports Science Australia

National Association of Aboriginal and Torres Strait Islander Health Workers and Practitioners

Occupational Therapy Australia

Osteopathy Australia

Speech Pathology Australia

Communication

An email was sent from members of the Evidence Check team from the Sax Institute, which thanked the key contacts from the above organisations for agreeing to contribute, outlined the Evidence Check questions and provided the following guidance as to what literature to contribute:

1. For both **peer-reviewed** and **grey literature**, we are seeking studies that meet the following criteria:

- Reviews or primary studies which report on quantitative experimental or quasi-experimental designs examining the effect of individual treatment (i.e. not group therapy as a previously commissioned umbrella review is informing this element)

- The treatment is within the scope of practice of the allied health professions listed in Appendix 3.
- Include data/findings on the number and/or length of treatment consultations
- Are published from 2020 onwards (will make exceptions to these criteria if you think it is a particularly important paper and explain why)
- Report on treatment outcomes for the following chronic conditions*:

For adults in primary care settings:

1. Chronic respiratory diseases (COPD, bronchiectasis, asthma)
2. Cardiovascular diseases (hypertension, coronary heart disease, heart failure)
3. Stroke
4. Diabetes (type 1 and type 2)
5. Musculoskeletal conditions (osteoarthritis, back pain)
6. Parkinson's disease.

For children in primary care settings:

- Chronic conditions including asthma and/or type 1 diabetes mellitus.

*Please note that for the purposes of the Evidence Check rapid review, it has been necessary to limit the in-scope chronic conditions to ensure it remains feasible within the project budget and time lines. These have been selected to provide good coverage of common chronic conditions and associated allied health providers for individual services. Selection was informed by MBS service counts by provider profession, the most prevalent chronic conditions as described in the 2022 National Health Survey, and the umbrella review of group therapy services.

2. Peer-reviewed literature may include:

- Systematic reviews and meta-analyses
- Intervention studies using experimental or quasi-experimental designs, such as:
 - Randomised controlled trials (RCTs)
 - Natural experiments
 - Cohort studies
 - Controlled trials.

3. Grey literature from reputable sources may include:

- Unpublished intervention evaluations*
- Treatment guidelines**
- Position statements and recommendations**
- Any documents that include information about the number and length of treatment consultations for the chronic conditions listed above***
- Reports on treatment data.***

*The same quantitative study designs and other inclusion criteria as for peer-reviewed literature apply.

**Only where it is clearly evident, they have been assessed and graded for the level of evidence (NHMRC hierarchy) and the evidence has been quality-appraised.

***Such evidence from practice will only be considered for use as context in the introduction and/or discussion sections of the report.

Appendix 5.2—Overview of literature provided via stakeholder submissions

This appendix provides a descriptive summary of the volume and type of literature provided by each stakeholder, their reasons for exclusion, the number included and, in some instances, information about studies from other sources (e.g. database searches) relevant to that professional group.

Audiology Australia provided a brief response to the Evidence Check question, which was referenced. In total, the document included 11 studies that were screened, yet none met the inclusion criteria for Phase 2, mostly because the patient populations did not meet the eligibility.

The Australian Association of Social Workers provided a narrative summary of literature by the elements of the review question for this Evidence Check, which included 121 references. From the peer-reviewed references, 11 were screened in Covidence, and from the grey literature, three were screened for inclusion. No grey literature met the inclusion criteria. However, the narrative summary did influence the high-level contextual issues summarised in the findings and discussed.

The Australian Chiropractors Association and Chiropractic Australia prepared a targeted research brief, focusing on chiropractic treatment and patient management of musculoskeletal conditions and including 45 references, one of which was screened in Covidence. Three pieces of grey literature were reviewed and considered for the high-level contextual issues summarised in the findings and discussed: a clinical practice guideline that summarises recommendations about non-surgical interventions for chronic primary low back pain in adults; a fact sheet with regulatory guidance from the Chiropractic Board of Australia on duration and frequency of care; and the Australian Institute of Health and Welfare (AIHW) 'Back problems' chronic musculoskeletal condition profile, which provides descriptive epidemiology and health system context.

The Australian College of Mental Health Nurses provided two pieces of grey literature, a submission letter and a position paper on men's suicide. Although mental health is not an included condition in either Phase 1 or Phase 2 of the Evidence Check, it is acknowledged that mental health conditions are some of the most prevalent chronic conditions in Australia and they often co-occur with other chronic conditions.

The Australian Diabetes Educator Association provided 15 references. Two peer-reviewed papers were sent to Covidence for further screening, and one piece of grey literature from the AIHW website was considered as background information in the introduction for general information on chronic disease management and allied health Medicare services.

The Australian Physiotherapy Association contributed 58 references for consideration, of which seven peer-reviewed articles were imported to Covidence for further screening and one was considered in the grey literature. Notably, there was a predominance of exercise/physical therapy-based interventions included in the Evidence Check, and many of these had a lead profession type of physiotherapist or exercise physiologist. The written summary of evidence by condition was also considered and information such as non-transferable clinical competencies was noted in the high-level contextual issues summarised in the Evidence Check findings and discussion.

The Australian Podiatry Association provided 13 peer-reviewed references and no grey literature. One systematic review was sent to Covidence for further screening. Although it is noted in the introduction

to the report that podiatry services related to diabetic neuropathy are one of the most common claims under MBS chronic condition management plans, it is surprising that no references for interventions where podiatry was the lead allied health profession delivering the intervention were included.

The Australian Psychological Society provided 19 references, of which six peer-reviewed papers were imported into Covidence and screened for inclusion. Although the grey literature provided was not included, it is acknowledged that mental health conditions are some of the most prevalent chronic conditions in Australia and they often co-occur with other chronic conditions. We encourage the MBS PHC team to consider these documents and other mental-health-related literature.

Dietitians Australia provided a list of 25 references and a recommendation that the Sax Institute search for specific authors' papers. One grey literature document was included in the discussion section of the report. The specific author-name-search was not included in the search strategy for the Sax Institute since the requested delay of the consultations with peak allied health organisations made this impractical within the time frame of the Evidence Check.

Exercise and Sports Science Australia provided a letter with summary recommendations of an overview of why current MBS models for chronic disease management are failing and a summary of evidence of effect of exercise and sports science interventions on outcomes for relevant conditions and a total of 32 references for consideration. Three of these were systematic reviews, which were imported into Covidence for screening. It should be noted that there was a predominance of exercise-based interventions included in the Evidence Check. The narrative summary in the letter did contribute to the high-level contextual issues summarised in the findings and discussed in the Evidence Check.

Occupational Therapy Australia provided 22 references to literature to support the Evidence Check of MBS-funded allied health chronic condition management services. Of these, five peer-reviewed publications were imported into Covidence for further screening and two grey literature references were screened. Occupational therapists were also included as one of the allied health professionals who could have delivered the intervention in 28 included peer-reviewed papers. The narrative summary provided identified the limited scope of our Evidence Check in terms of chronic conditions, strongly encouraging dementia care and chronic pain. The suggested emphasis of tailoring care to individuals was noted in the high-level contextual issues summarised in the findings and discussed in the Evidence Check.

Osteopathy Australia provided 41 references for consideration in the Evidence Check. Four were imported into Covidence, two related to conditions relevant to Phase 1 and two were relevant to Phase 2. The latter were considered in the Phase 2 report. The organisation provided grey literature about state fee schedules and a model of care for lower back pain treatment, which they stated supports the need for initial assessments and which was considered in the high-level contextual issues summarised in the findings and discussed in the Evidence Check.

Speech Pathology Australia (SPA) provided an 'evidence listing' summary by chronic conditions relevant to Phase 1 and Phase 2 of the Evidence Check. The preface to this highlighted some important caveats to consider, which did influence the high-level contextual issues summarised in the findings and discussed in the Evidence Check. SPA also provided an evidence briefing. In total, these included 25 references, of which one peer-reviewed paper was sent to Covidence for further screening for inclusion. The background in the briefing and one grey literature document were included in the discussion.

Appendix 6—Study details and outcomes

Author year	Aim(s)	Condition	Allied health profession(s)	Intervention type	Range of number / duration of consultations	Outcomes
Studies examining dose–outcome relationship(s) as a main aim or via their analysis (n=8)						
Bordeleau 2022 ¹⁷	To systematically review the existing evidence for the current application of interventions across the extended reality (XR) spectrum in improving pain and motor function outcomes in individuals with back pain.	Musculoskeletal conditions (back pain)	Physiotherapist	Multimodal	3–40 / NR	Physical: Pain intensity; significant improvement with VR interventions; Mean Difference: –0.67; 95% CI: –1.12 to –0.23; I ² = 85%. Physical: Motor function; trend towards positive effect with VR interventions.
Han 2024 ²⁸	To establish a pharmacodynamic model to quantitatively evaluate the time point and magnitude of peak effectiveness of exercise and compare the effects of various exercise modalities for osteoarthritis symptoms, and to identify factors (significant predictors from population characteristics and intervention properties) that significantly affect the effectiveness of exercise.	Musculoskeletal conditions (osteoarthritis)	NR	Exercise	NR / 30–70 mins	Physical: Consistent benefits of exercise at 12 weeks: WOMAC total decreased by 11.4 units (95% Uncertainty Interval [UI] 9.6–13.1), an improvement 7.5 units greater than control (95% UI 5.4–9.6), marginally below the MCID of 9.0. WOMAC pain decreased by 2.5 units (95% UI 2.2–2.7), 1.7 units more than control (95% UI 1.3–2.1), close to the MCID of 1.6. WOMAC stiffness decreased by 1.2 units (95% UI 0.9–1.4), 1.0 unit greater than control (95% UI 0.7–1.3), exceeding the MCID of 0.8. WOMAC function decreased by 7.6 units (95% UI 6.9–8.3), 5.4 units more than control (95% UI 4.3–6.4), meeting the MCID of 5.4. Pain VAS decreased by 2.0 units (95% UI 1.7–2.2), 1.2 units greater than control (95% UI 0.6–1.8), exceeding the MCID of 0.9. Effectiveness peaked between 1.6 and 7.2 weeks (1.6 for WOMAC total, 7.2 for pain, 4.4 for stiffness, 3.6 for function, 3.2 for VAS pain). Local exercise was most effective (WOMAC pain –3.4 units, 42.5% improvement), with whole-body and combined whole-body+local exercise showing moderate benefits (–2.6 units, 32.5%; and –2.5 units, 31.2%). Control showed the smallest change (–0.9 units, 10.6%). Adding local water-based exercise to strengthening and flexibility training produced additional improvements of 7.9 (total), 0.5 (pain), 0.7 (stiffness) and 8.2 units (function) at 12 weeks. Better responses were associated with greater baseline severity (baseline WOMAC total 20, 40, 60 improved by 7.9, 11.1, 13.6), younger age (ages 50, 60, 70 improved by 13.1, 11.1, 9.7), higher BMI (>30 kg/m ² : function –9.0 vs –7.6), female-majority samples, knee vs hip OA, and greater baseline WOMAC pain.
Liang 2024 ¹⁸	To quantify the dose–response relationship between overall and specific exercise modalities and pain in patients with nonspecific chronic low back pain, investigate the best exercise approaches for reducing pain, and estimate the minimum dose for each exercise type to achieve the minimal clinically important difference in alleviating nonspecific chronic low back pain.	Musculoskeletal conditions (back pain)	Physiotherapist	Multimodal	4–28 / 25–80 mins	Physical: Pain relief – The maximum significant response was observed at 920 MET minutes (standardised mean difference = –1.74; 95% credible intervals: –2.43, –1.04). The minimal clinically important difference for achieving meaningful pain improvement was 520 MET minutes per week. The dose to achieve a minimal clinically important difference varied by type of exercise; Pilates was the most effective.

Author year	Aim(s)	Condition	Allied health profession(s)	Intervention type	Range of number / duration of consultations	Outcomes
Ma 2025 ²⁴	To comprehensively evaluate the effects of aerobic exercise-based pulmonary rehabilitation on pulmonary function and quality of life in paediatric asthma patients.	Chronic respiratory disease (asthma)	NR	Exercise	2–84 / 5–60 mins	Physical: FVC (% predicted), significant improvement in exercise group, SMD = 0.30, 95% CI: 0.13–0.48, P < 0.01, 11 studies; FEF25–75 (% predicted), significant improvement in exercise group, SMD = 0.31, 95% CI: 0.03–0.58, P < 0.01, 7 studies; PEF (% predicted), no significant improvement, SMD = 0.18, 95% CI: 0.04–0.41, P = 0.11, 6 studies; FEV1 (% predicted), no significant improvement overall, SMD = 0.18, 95% CI: –0.14–0.50, P = 0.27, 16 studies; FEV1 (% predicted) in conventional control subgroup, significant improvement, SMD = 0.30, 95% CI: 0.01–0.59; FEV1/FVC (% predicted), no significant improvement overall, SMD = 0.23, 95% CI: –0.09–0.56, P = 0.16, 7 studies; FEV1/FVC (% predicted) in conventional control subgroup, significant improvement, SMD = 0.39, 95% CI: 0.08–0.70; PEF (L/s), no significant improvement, SMD = 1.02, 95% CI: –0.28–2.32, P = 0.12, 4 studies; FEF25–75 (L/min), no significant improvement, SMD = 0.35, 95% CI: –0.10–0.81, P = 0.13, 3 studies; FVC (L), no significant improvement, SMD = 0.04, 95% CI: –0.23–0.31, P = 0.77, 6 studies; FEV1 (L), no significant improvement, SMD = 0.40, 95% CI: –0.29–1.09, P = 0.26, 7 studies; FEV1/FVC (ratio), no significant improvement, SMD = 0.01, 95% CI: –0.27–0.30, P = 0.92, 4 studies. Functional: PAQLQ (quality of life score), significant increase in exercise group, SMD = 0.70, 95% CI: 0.14–1.26, P < 0.01, 12 studies; Quality of life in interventions >8 weeks duration, significant improvement, SMD = 0.66, 95% CI: 0.01–1.30; Quality of life in conventional control group trials, significant improvement, SMD = 1.0, 95% CI: 0.38–1.62.
Mueller 2020 ¹⁹	To (1) delineate the dose–response-relationship of stabilisation exercises and (2) derive recommendations for the stabilisation exercises' training specifics that could maximise the reduction of pain and disability in chronic, non-specific low back pain patients.	Musculoskeletal conditions (back pain)	Physiotherapist	Exercise	6–96 / 15–90 mins	Physical: Pain intensity; moderate quality evidence indicates a training duration of 20–30 minutes elicits the largest effect, mean effect size d = 1.80; low quality evidence suggests training 3–5 times per week leads to the largest effect, inverted U-shaped association. Functional: Disability; moderate quality evidence indicates a training duration of 20–30 minutes elicits the largest effect, mean effect size d = 1.70; low quality evidence suggests training 3–5 times per week leads to the largest effect, inverted U-shaped association.
Niederer 2020 ²⁰	To systematically review and delineate the existing evidence on the sustainability effects of motor control exercises on pain intensity and disability in chronic low back pain patients when compared with an inactive or passive control group or with other exercises. Secondary aims were to reveal whether moderating factors like the time after intervention completion, the study quality and the training characteristics affect the potential sustainability effects.	Musculoskeletal conditions (back pain)	NR	Exercise	2–96 / 30–90 mins	Physical: Pain intensity; low to moderate quality evidence shows a sustainable positive effect (SMD = –.46, Z = 2.9, p < .001). Functional: Disability; low to moderate quality evidence shows a sustainable positive effect (SMD = –.44, Z = 2.5, p < .001).

Author year	Aim(s)	Condition	Allied health profession(s)	Intervention type	Range of number / duration of consultations	Outcomes
Zhai 2024 ²⁹	To compile and summarise the results of randomised controlled trials on the effectiveness of respiratory exercises in reducing low back pain and explore the dose–response relationship, with findings intended to provide valuable insights and guidance for the health management of the general public, active individuals and athletes.	Musculoskeletal conditions (back pain)	NR	Exercise	4–56 / 10–60 mins	Physical: Breathing exercises effectively reduced LBP; SMD = -0.87 (95% CI: -1.18 to -0.56; Z = 5.53; P < .00001); measured using QVAS and NRS scales; most effective with breathing resistance exercise (SMD = -0.96, P = .007) and total duration > 500 minutes (SMD = -1.35, P < .00001). Functional: Breathing exercises effectively improved physical disability in LBP patients; SMD = -0.79 (95% CI: -1.09 to -0.50; Z = 5.27; P < .00001); measured using ODI and RMQ; most effective with breathing relaxation techniques (SMD = -1.42, P < .0001) and total duration > 500 minutes (SMD = -0.94, P < .0001); optimal program: 30–50 minutes per session, 3–5 times per week, > 4 weeks duration.
Zhang 2023 ²¹	To compare the efficacy of different exercise therapy modes on chronic low back pain, dysfunction, quality of life and mobility in the elderly.	Musculoskeletal conditions (back pain)	Physiotherapist; exercise physiologist (inferred)	Exercise	12–84 / 25–90 mins	Physical: Pain (VAS); Exercise therapy reduced pain compared with control; WMD = -1.75, 95% CI [-2.59, -0.92], p < 0.05, I ² = 93.0% (n=651, 11/12 studies); Walking test (TUG); Exercise tended to improve TUG but no statistically significant difference; WMD = -0.92, 95% CI [-2.22, 0.38], p < 0.05, I ² = 85.3% (n=115, 3 studies). Functional: Disability (ODI); Exercise therapy reduced disability compared with control; WMD = -9.42, 95% CI [-15.04, -3.79], p < 0.05, I ² = 98.0% (n=407, 8/9 studies); Quality of Life—Physical Component (SF-36 PCS); Exercise therapy improved physical quality of life; WMD = 7.07, 95% CI [1.01, 13.14], p < 0.05, I ² = 89.8% (n=377, 4/5 studies); Quality of Life—Mental Component (SF-36 MCS); Exercise therapy improved mental quality of life; WMD = 7.88, 95% CI [0.09, 15.67], p < 0.05, I ² = 93.7% (n=377, 4/5 studies).
Studies including information on dose and reported outcomes for relevant chronic conditions, yet may not have specifically examined the dose–outcome relationship(s)						
Akinrolie 2025 ³⁹	To determine the effect of motivational interviewing (MI) and exercise on pain in individuals with chronic low back pain.	Musculoskeletal conditions (back pain)	Physiotherapist; occupational therapist	Multimodal	4–12 / 15–30 mins	Physical: Pain intensity, no significant reduction (SMD -0.23, 95% CI -0.55 to 0.09, I ² = 0%, p = 0.16, low level of evidence); Physical function, no difference between groups (SMD 0.00, 95% CI -1.31 to 1.32, I ² = 93%, p = 0.99). Functional: Disability, no significant reduction (MD -1.80, 95% CI -4.55 to 0.94, I ² = 85%, p = 0.20, very low level of evidence).
Alam 2025 ⁴⁰	To evaluate the effects of podiatric interventions on pain and disability in patients having chronic low back pain with pronated foot, specifically investigating the effects of interventions targeting foot pronation, either in isolation or in conjunction with strategies aimed at rehabilitating the lower back.	Musculoskeletal conditions (back pain)	Physiotherapist (inferred); podiatrist (inferred)	Exercise	12–42 / NR	Physical: Pain (VAS, 100mm scale), significant reduction in experimental group, MD = -2.43 (95% CI -2.73 to -2.13, p < .001), n=221 from 4 RCTs, improvement exceeded minimum detectable change of 18–19 mm for chronic low back pain; Pain (VAS), individual study results showed p < .001 with ES 4.10 after exercise program, p = .001 with ES 0.77 after 4 weeks' foot orthosis, p < .001 with ES 0.63 after 6 weeks' intervention. Functional: Disability (ODIQ), significant decrease in experimental group, MD = -6.69 (95% CI -8.04 to -5.33, p < .001), n=185 from 3 RCTs; Disability (RMDQ), significant improvement p < .001 with ES 2.97 after exercise program; Disability (ODIQ), individual study results showed p = .001 with ES 0.77 after 4 weeks' foot orthosis, p < .001 with ES 0.43 after 6 weeks' intervention with significant improvement in SFE and SFE+TPT groups (p < .001) but not in control group.
Arcanjo 2022 ⁴¹	To analyse published randomised controlled clinical trials that investigated the efficacy of proprioceptive neuromuscular facilitation (PNF) in decreasing pain and improving disability in patients with LBP.	Musculoskeletal conditions (back pain)	Physiotherapist (inferred)	Exercise	12–42 / NR	Physical: Pain reduction; PNF training improved pain (SMD: -2.6; 95% CI: -4.2 to -0.9, n = 174); PNF training yielded a greater benefit for pain reduction (MD: -1.8, 95% CI: -2.2 to -0.3, n = 177); Reduction in pain in the PNF group was greater than 20%. Functional: Disability improvement; PNF training improved disability (SMD: -3.29; 95% CI: -5.3 to -1.3, n = 144); PNF training yielded a greater benefit for disability improvement (MD: -6.6, 95% CI: -9.3 to -3.8, n = 113); Magnitude of improvement with PNF (mean change: -3.3) was superior to control interventions (mean change: -1.97).

Author year	Aim(s)	Condition	Allied health profession(s)	Intervention type	Range of number / duration of consultations	Outcomes
Bagagiolo 2025 ⁴²	To evaluate whether manual therapies, including osteopathic manipulation and chiropractic care, are effective in improving quality of life, pain intensity and function in older adults with musculoskeletal disorders, and to assess their benefits, risks and safety, taking into account the unique physiological vulnerabilities of this population.	Musculoskeletal conditions (back pain)	Chiropractor; osteopath	Multimodal	4–20 / 10–60 mins	Physical: Pain intensity (neck pain), Statistically significant reduction at 12 weeks for SMT+HE vs HE alone (ES=-0.90, 95% CI -1.46 to -0.34, p=0.002) but MCID not reached; no significant differences at 26 weeks (p=0.20) or 52 weeks (p=0.75); Pain intensity (low back pain), Statistically significant reduction at 12 weeks for SMT+HE vs HE (ES=-0.79, 95% CI -1.39 to -0.19, p=0.010) but MCID not reached; no significant differences at 26 weeks (p=0.70) or 52 weeks (p=0.67); Pain intensity (chronic pain with dizziness), No statistically significant results; Balance (BBS for chronic pain), Assessed but no statistically significant results reported; Dizziness (DHI for chronic pain), Assessed but no statistically significant results reported. Functional: Functionality (NDI for neck pain), No statistically significant improvement at 12 weeks (p=0.13), 26 weeks (p=0.12) or 52 weeks (p=0.19); Functionality (MRS for low back pain), No statistically significant improvement at 12 weeks (p=0.97); Functionality (ODI for low back pain), Assessed but not statistically significant; Quality of life (SF-36 physical component for neck pain), No statistically significant improvement at 12 weeks (p=0.18); Quality of life (SF-36 physical component for low back pain), No statistically significant improvement at 12 weeks (p=0.60); Quality of life (SF-36 mental component for low back pain), No statistically significant improvement at 12 weeks (p=0.91); Quality of life (SF-12 for neck pain), Assessed but no statistically significant results reported. Psychological/emotional: Geriatric depression (GDS for chronic pain), Assessed but no statistically significant results reported; Mood (DASS-21 for neck pain), Assessed but no statistically significant results reported; Cognitive function (MoCA for neck pain), Assessed but no statistically significant results reported. Other: Satisfaction with care (neck pain), Statistically significant improvement at 12 and 26 weeks for SMT+HE; Global improvement (neck pain), Statistically significant improvement at 12, 26 and 52 weeks for SMT+HE; Duration of medication use (neck pain), Statistically significant improvement at 52 weeks for SMT+HE vs supervised rehabilitative exercise + HE; Falls (chronic pain), Assessed but no statistically significant results reported; Concerns of falling (FES-I for neck pain), Assessed but no statistically significant results reported; Physical function/mobility (TUG for neck pain and low back pain), Assessed but no statistically significant results reported; Adverse events, No serious treatment-related AEs except one patient with radius fracture during supervised exercises (unrelated to intervention); mild AEs including aggravation of neck symptoms, muscle soreness, joint pain, back pain and stiffness.
Barbari 2020 ⁴³	To investigate the effectiveness of communicative and educative strategies (or interventions that included communicative and educative strategies) on 1) patients' low back pain awareness/knowledge, 2) maladaptive behaviour modification and 3) compliance with exercise in patients with chronic low back pain.	Musculoskeletal conditions (back pain)	Occupational therapist; physiotherapist; psychologist. Other: medical doctors, senior psychologist and local experts.	Multimodal	1–26 / NR	Physical: Compliance with exercise; significant improvements in compliance with exercise in multimodal interventions and coaching-based techniques; low-quality evidence in favour of multimodal interventions in the long term. Psychological/emotional: LBP awareness/knowledge; significant improvements in LBP awareness/knowledge with pain science education and multimodal interventions; no specific statistical results mentioned.
Baumbach 2024 ⁴⁴	To provide an overview of existing full economic evaluations of interventions for patients with musculoskeletal conditions offered by physiotherapists, shed light on the cost-effectiveness of physiotherapeutic interventions for specific musculoskeletal	Musculoskeletal conditions (back pain, osteoarthritis)	Physiotherapist; chiropractor. Other: medical doctor	Multimodal	1–46 / 20–120 mins	Other: Physiotherapeutic interventions are cost-effective.

Author year	Aim(s)	Condition	Allied health profession(s)	Intervention type	Range of number / duration of consultations	Outcomes
	health conditions, and highlight for which health conditions further research is needed.					
Bell 2024 ²²	Based on results from randomised clinical trials, in a population of adults with COPD, do tailored dietary advice and/or dietary counselling interventions improve outcomes when compared with control populations?	Chronic respiratory disease (COPD); Other (acute myocardial infarction)	Dietitian	Multimodal	3–52 (8 most common) / 30–120 mins	Physical: Increased 6MWT distance (13.3 m, SE=5.6, p=0.02 to 59 m, p=0.0002), better MRC dyspnea scores (0.21, SE=0.1, p=0.048 to 1, p=0.03), longer cycle endurance time (221 sec, SE=104, p=0.04 to 525 sec, SE=195, p=0.013), higher Wmax (6 W, SE=2.3, p=0.01 to 12 W, SE=5, p=0.036), increased PAL (+1030 steps/day, p<0.05), improved CPET and plasma nutrient levels (no values reported), greater body weight (+1 to 3.1 kg, p<0.001–0.02), improved FFMI at 4 months only, higher protein (+11.8 to 50 g/day, p<0.001) and energy intake (+194 to +945 kcal/day, p<0.001–0.02), and better SGA status (17 improved vs 1 control), while handgrip, fat mass, fat-free mass, exacerbations and several other physical measures showed no significant differences and smoking results were mixed. Functional: Mixed quality-of-life effects, with five studies reporting significant SGRQ improvements (2.6, SE=1.3, p=0.045 to 10.1, p=0.02, plus a 30% improvement in one study) and four showing none, while self-efficacy and self-care improved significantly (e.g., +45.3, p<0.001), and other QoL tools showed no differences. Other: Economic outcomes showed no QALY differences, costs ranging from ≤€625 to €2751, and ICER cost-effectiveness probabilities of 27–33% (€20k/QALY), 67% (€50k/QALY), and 59–82% (€80k/QALY); PFMT-specific results showed reduced pain severity (MD=−0.61, 95%CI −0.91 to −0.31, p<0.001) but no significant effect on physical function (MD=−0.87, 95%CI −3.21 to 1.46, p=0.46).
Bernard 2021 ³⁰	To systematically review whether adding pelvic floor muscle training (PFMT) to another exercise intervention can be more effective at improving pain and function in people with nonspecific low back pain than the same intervention without PFMT.	Musculoskeletal conditions (back pain)	Physiotherapist	Multimodal	19–72 / 20-60 mins	Physical: Pain severity; Lower pain severity with PFMT; MD: −0.61, 95%CI: [−0.91, −0.31], P < 0.001; Physical function; No significant difference; MD: −0.87, 95%CI: [−3.21, 1.46], P = 0.46.
Canzone 2024 ⁴⁵	To determine how physical activity programs can be classified and customised to align with the stages of knee osteoarthritis according to the Kellgren-Lawrence (KL) classification. This research aims to fill the gap in understanding the relationship between the type and intensity of PA and the stages of OA as defined by the KL classification.	Musculoskeletal conditions (osteoarthritis)	NR	Exercise	9–156 / 20–55 mins	Physical: Pain reduction; knee function improvement. Psychological/emotional: Quality of life improvement . Functional: Quality of life improvement.

Author year	Aim(s)	Condition	Allied health profession(s)	Intervention type	Range of number / duration of consultations	Outcomes
Capel-Alcaraz 2023 ⁴⁶	To assess whether motor control exercises consisting of the methodology described by Richardson and Hodges improve the pain and disability of patients with nonspecific low back pain, and to determine whether these basic motor control exercises alleviate symptoms of chronic nonspecific low back pain, such as pain and disability, in addition to improving the patient's physical activity.	Musculoskeletal conditions (back pain)	Physiotherapist	Exercise	6–30 / 14–90 mins	Physical: Pain intensity (VAS/NRS, 0–100 scale, 0=no pain), Motor control exercises vs other interventions showed MD –6.71 (95% CI –14.99 to –1.58) at postintervention (4–8 weeks, 972 participants, 13 RCTs, moderate quality), not statistically significant; Motor control exercises vs inactive control/placebo/minimal intervention showed MD –18.10 (95% CI –30.79 to –5.41, P=0.008) at postintervention (261 participants, 3 RCTs, moderate quality), statistically significant and clinically important; Motor control exercises vs general exercises showed MD –9.60 (95% CI –21.39 to 2.19) at postintervention (441 participants, 6 RCTs, very low quality), not statistically significant; Long-term pain (9–12 months) MD –3.93 (95% CI –13.31 to 5.46, 211 participants, 3 RCTs, very low quality), not statistically significant. Functional: Disability (Roland-Morris Disability Questionnaire/Oswestry Disability Index, 0–100 scale, 0=no disability), Motor control exercises vs other interventions showed MD –3.13 (95% CI –5.87 to –0.38, P=0.03) at postintervention (4–8 weeks, 722 participants, 10 RCTs, moderate quality), statistically significant but high heterogeneity (I²=97%), not clinically important; Motor control exercises vs general exercises showed MD –12.70 (95% CI –20.80 to –4.60, P=0.002) at postintervention (441 participants, 6 RCTs, moderate quality), statistically significant and clinically important; Long-term disability (9–12 months) MD –0.86 (95% CI –9.85 to 8.12, 211 participants, 3 RCTs, very low quality), not statistically significant; Physical activity (0–100 scale, 0=no physical activity), MD –0.98 (95% CI –2.85 to 0.90) at postintervention (4–8 weeks, 245 participants, 2 RCTs, moderate quality), not statistically significant; Functional capacity measured using Patient-Specific Functional Scale in 638 individuals across 5 studies, could not be meta-analysed; Quality of life measured using SF-36 in 141 individuals across 2 studies, results not reported. Other: Muscle thickness measured using nuclear magnetic resonance and real-time ultrasound in 186 individuals, results not reported; Transversus abdominis activation capacity measured, results not reported; Self-efficacy measured, results not reported; Physical activity measured in 149 individuals across 3 studies using 5 tests (isometric lift, prone bridge, side bridge, Biering-Sorensen test and movement control test), Fear-Avoidance Beliefs Questionnaire, and walk, results not reported.
Ceballos-Laita 2023_1 ⁴⁷	To assess the effectiveness of visceral osteopathy in improving pain intensity, disability and physical function in patients with low back pain through systematic review and meta-analysis.	Musculoskeletal conditions (back pain)	Osteopath	Multimodal	1–12 / 3–10 mins	Physical: Pain intensity; No significant improvement; SMD = –0.53; 95% CI = –1.09, 0.03; I² = 78%; Disability; No significant improvement; SMD = –0.08; 95% CI = –0.44, 0.27; I² = 0%; Physical function; No significant improvement; SMD = –0.26; 95% CI = –0.62, 0.10; I² = 0%.
Ceballos-Laita 2023_2 ⁴⁸	To evaluate the effectiveness of hip interventions (in isolation or in combination with low back pain interventions) compared with specific low back interventions on pain and disability in patients with low back pain in the short, medium and long term.	Musculoskeletal conditions (back pain)	Physiotherapist (inferred)	Multimodal	10–24 / 20–60 mins	Physical: Pain intensity, statistically significant but clinically unimportant improvement in short term (MD = –0.66; 95% CI –0.86, –0.48; I² : 0%; 3 studies, 153 participants), (MD = –0.55; 95% CI –1.02, –0.08; 1 study, 32 participants). Functional: Disability, large improvement in short term (SMD = –0.81; 95% CI –1.53, –0.10; I² : 80%; 4 studies, 220 participants), (SMD = –1.03; 95% CI –1.82, –0.25; 1 study, 32 participants).
Chen 2021 ⁴⁹	To quantitatively examine the effects of myofascial release technique on pain intensity, back disability, lumbar range of motion, and quality of life in patients with low back pain.	Musculoskeletal conditions (back pain)	NR	Multimodal	4–24 / 40–60 mins	Physical: Pain intensity; non-significant decrease; SMD = –0.12, 95 % CI = –0.35, 0.11, P = 0.32; lumbar range of motion; non-significant improvement; Flexion SMD = 0.57, 95 % CI = –0.09, 1.24, P = 0.09; Extension SMD = 0.68, 95 % CI = –0.72, 2.08, P = 0.34; Right flexion SMD = 0.05, 95 % CI = –0.90, 0.99, P = 0.92; Left flexion SMD = 0.14, 95 % CI = –0.59, 0.88, P = 0.70. Functional: Back disability; significant decrease; SMD = –0.35, 95 % CI = –0.68, –

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						0.02, P = 0.04; quality of life; non-significant improvement; SMD = -0.09, 95 % CI = -0.46, 0.28, P = 0.62.
Dal Farra 2021 ⁵⁰	To assess the effectiveness of osteopathic interventions in decreasing pain levels and improving functional status in nonspecific chronic low back pain; to specifically evaluate the impact of each different osteopathic modality (including OMT, MFR, CST and OVM); and to assess the effectiveness over a medium- or long-term period.	Musculoskeletal conditions (back pain)	Osteopath	Other (osteopathic manipulative treatment)	1–24 / 15–60 mins	Physical: Significant reduction in pain levels; ES: -0.59; 95% CI: -0.81, -0.36; P < 0.00,001. Functional: Significant improvement in functional status; ES: -0.42; 95% CI: -0.68, -0.15; P = 0.002. Psychological/emotional: Fear-avoidance beliefs; significant changes in FABQ scores.
Dal Farra 2022 ⁵¹	To verify whether literature has increased over years, then summarise evidence as to the effectiveness of osteopathic interventions in patients with NS-NP for pain reduction and functional status improvement. The study also evaluated which kind of osteopathic manipulation performed better than the others and if the improvements lasted over a medium- or long-term period.	Musculoskeletal conditions (neck pain)	Osteopath	Multimodal	4–9 / 15–60 mins	Physical: Pain intensity (NRS/VAS), All studies showed statistically significant reduction in favour of OMT with between-group differences of -1.73 (p=0.017), -1.4 (p<0.007), -1.02 (p=0.005) on NRS and -21.0mm (p<0.001), -26.2mm (p=0.001) on VAS post-treatment; Follow-up at 3 months showed -1.77 (p=0.009) and at 20 weeks -16.8mm (p=0.003); Effect sizes ranged from small to large (0.49–1.02); Meta-analysis effect size -1.57 [95% CI: -2.50, -0.65], p=0.0008, I ² =89%, very low quality evidence; Adverse events, Mild to moderate adverse events reported in 3 studies (transient headache, increased neck pain, dizziness, tiredness, tingling sensations) resolving spontaneously within few days; One serious event of persistent rib pain reported; OMT proved substantially safe. Functional: Functional status/disability (Neck Disability Index), All studies showed statistically significant improvement in favour of OMT with between-group differences of -9 (p=0.045), -7.20 (p=0.005), -3.8 (p=0.01), -8.4 (p<0.001) on NDI; All RCTs showed minimal clinical important changes in NDI; Effect sizes ranged from small to moderate (0.2–0.73); Meta-analysis effect size -1.71 [95% CI: -3.12, -0.31], p=0.02, I ² =95%, very low quality evidence.
De Jesus 2020 ⁵²	To examine the effectiveness of hip-strengthening exercises in reducing pain and disability in persons with low back pain. The purpose is to analyse published randomised controlled clinical trials that have investigated the efficacy of adding specific hip strengthening exercises to conventional rehabilitation therapy in reducing pain and/or disability in persons with low back pain.	Musculoskeletal conditions (back pain)	NR	Exercise	6–30 / NR	Physical: Hip strengthening exercises improved pain (MD -5.4 mm, 95% CI: -8.9 to -1.8 mm). Functional: Hip strengthening exercises improved disability (MD -2.9; 95% CI: -5.6 to -0.1) in persons with low back pain compared with interventions in which hip strengthening was not used.

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Devonshire 2023 ⁵³	To evaluate whether cognitive functional therapy (CFT) is an effective treatment for adults with chronic low back pain (LBP). The specific research questions were: (1) What is the effect of CFT compared with usual care, wait-list control, or placebo on pain and disability in adults with chronic LBP? (2) Is CFT safe? (3) What is the effect of CFT compared with usual care, wait-list control, or placebo on psychological status, patient satisfaction, and global improvement in adults with chronic LBP?	Musculoskeletal conditions (back pain)	Physiotherapist; other: manual therapist	Multimodal	4–24 / 30–60 mins	Physical: Very low certainty for the effectiveness of CFT compared with manual therapy plus core exercises for reducing pain intensity (mean difference: –1.02/10, 95% confidence interval: –14.75, 12.70) and disability (mean difference: –6.95/100, 95% confidence interval: –58.58, 44.68).
Diao 2023 ⁵⁴	To investigate the effects of repetitive peripheral magnetic stimulation (rPMS) on pain intensity, functional mobility, and kinesiophobia in individuals with low back pain (LBP), with the aims of supporting the treatment of LBP and providing reliable suggestions for clinical practice.	Musculoskeletal conditions (back pain)	NR	Multimodal	1–10 / 10–20 mins	Physical: Pain intensity (VAS), MD –1.89 (95% CI –3.32 to –0.47), $P < 0.05$, very low-quality evidence—rPMS showed significant efficacy in reducing pain intensity compared with sham rPMS or other therapy. Functional: Functional disability (Oswestry Disability Index), MD –8.39 (95% CI –13.65 to –3.12), $P < 0.001$, low-quality evidence—rPMS showed significant efficacy in improving functional mobility/disability; Quality of life (SF-36), rPMS effective in improving function in patients with LBP. Psychological/emotional: Kinesiophobia (Tampa Scale of Kinesiophobia), MD –1.81 (95% CI –7.60 to 3.98), $P > 0.05$, very low-quality evidence—no statistically significant between-group difference on kinesiophobia; Mood (depression, anxiety and fatigue), SMS resulted in significant improvement in mood associated with lumbar spondylosis.
Dos Santos 2021 ⁵⁵	To verify the effects of low-intensity resistance training with blood flow restriction (LIRTBFR) on muscle strength, muscle mass and functionality in rheumatoid arthritis and osteoarthritis patients.	Musculoskeletal conditions (osteoarthritis; rheumatoid arthritis)	NR	Exercise	24–36 / NR	Physical: Muscle strength (quadriceps strength); No significant difference between LIRTBFR and MIRT/HIRT (SMD = –0.01, 95% CI –0.57 to 0.54, $P = 0.96$, $I^2 = 58\%$); measured in kg and Nm; Muscle strength (knee extension); LIRTBFR superior to LIRT (+23% vs +7%, $P = 0.0342$ in one study); Muscle mass; Similar gains between LIRTBFR and HIRT (LIRTBFR +7–9.5%, HIRT +8–10.8%, both $P < 0.0001$); measured in mm ² by CT; both superior to LIRT or untrained groups. Functional: Walking pattern tests; No significant difference between LIRTBFR and MIRT/HIRT (SMD = –0.04, 95% CI –0.39 to 0.31, $P = 0.82$, $I^2 = 0\%$); measured by TUG (seconds), TST (repetitions), 400m walk gait speed (m/s), LLFDI (score); Quality of life measures; Assessed by HAQ, Lequesne, and WOMAC scores; improvements shown within groups but no between-group statistical comparisons reported in meta-analysis.
Drummond 2024 ⁵⁶	To assess the effectiveness of sling exercise therapy (SET) in individuals with chronic low back pain, specifically to determine whether SET is more effective than usual care in decreasing pain and disability and increasing core musculature activation.	Musculoskeletal conditions (back pain)	Physiotherapist	Exercise	4–36 / 30–60 mins	Physical: Pain; significant effect favouring SET over motor control training/lumbar stabilisation (MD 24.13; 95% CI: 27.82 to 20.45), significant effect favouring SET over no treatment (MD 21.05; 95% CI: 22.82 to 20.71), significant effect favouring SET plus modalities over modalities alone (MD 21.19; 95% CI: 21.48 to 20.89); Muscle activation; significant effect favouring SET over no treatment; Muscle strength; significant effect favouring SET over general exercise and no treatment; Muscle thickness; significant effect favouring SET over general exercise and no treatment; Muscle activity onset; significant effect favouring SET over general exercise and motor control training/lumbar stabilisation. Functional: Disability; significant effect favouring SET over motor control training/lumbar stabilisation (MD 23.19; 95% CI: 24.63 to 21.76), nonsignificant effect for SET plus modalities vs modalities alone (MD 26.67; 95% CI: 217.25 to 3.92).

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Ebadi 2020 ⁵⁷	To determine the effectiveness of therapeutic ultrasound in the management of chronic nonspecific low back pain (LBP). A secondary objective was to determine the most effective dosage and intensity of therapeutic ultrasound for chronic LBP.	Musculoskeletal conditions (back pain)	Physiotherapist; osteopath; chiropractor; other: physicians	Multimodal	6–18 / 5–10 mins	Physical: The mean pain intensity in the intervention groups was 7.12 points lower (17.99 lower to 3.75 higher); MD –7.12 mm (–17.99 to 3.75). Functional: The mean back-specific functional status in the intervention groups was 1.07 points lower (1.89 lower to 0.26 lower); SMD –0.29 (–0.51 to –0.07). Psychological/emotional: The mean wellbeing score in the intervention groups was 2.71 points lower (9.85 lower to 4.44 higher); MD –2.71 (–9.85 to 4.44).
Fernández-Rodríguez 2022 ⁵⁸	To determine which type of exercise is best for reducing pain and disability in adults with chronic low back pain.	Musculoskeletal conditions (back pain)	NR	Exercise	3–18 / NR	Physical: Pain (measured by VAS or NRS), Pilates most effective with 93% SUCRA probability, SMD –0.83 (95% CI: –1.08, –0.58) vs control; Mind-body exercises SMD –0.97 (95% CI: –1.27, –0.66) vs control; Core-based exercises SMD –0.76 (95% CI: –0.96, –0.57) vs control; Strength exercises SMD –0.74 (95% CI: –0.97, –0.52) vs control; Combined exercises SMD –0.55 (95% CI: –0.76, –0.34) vs control; McKenzie method SMD –0.50 (95% CI: –0.9, –0.03) vs control; Aerobic exercises SMD –0.35 (95% CI: –0.59, –0.11) vs control; Stretching exercises SMD –0.26 (95% CI: –0.61, 0.09) vs control (not statistically significant). Functional: Disability (measured by RMDQ, ODI, or Patient-Specific Functional Scale), Pilates most effective with 98% SUCRA probability, SMD –0.60 (95% CI: –0.82, –0.38) vs control; Strength exercises SMD –0.61 (95% CI: –0.80, –0.41) vs control; Core-based exercises SMD –0.50 (95% CI: –0.67, –0.32) vs control; Mind-body exercises SMD –0.45 (95% CI: –0.73, –0.18) vs control; McKenzie method SMD –0.44 (95% CI: –0.91, 0.04) vs control (not statistically significant); Aerobic exercises SMD –0.40 (95% CI: –0.64, –0.15) vs control; Combined exercises SMD –0.35 (95% CI: –0.52, –0.17) vs control; Stretching exercises SMD –0.34 (95% CI: –0.62, –0.05) vs control.
Fleckenstein 2022 ⁵⁹	To qualify and quantify the effects of individualised exercises as monotherapies, or in combination with cognitive or behavioural types of psychological interventions, on pain intensity and disability in patients with chronic nonspecific low back pain, with sensitivity analyses to distinguish active and passive controls and to differentiate the type of individualised exercise.	Musculoskeletal conditions (back pain)	NR	Multimodal	1–130 / 35–60 mins	Physical: Pain intensity (VAS 0–10 scale), Individualised exercise reduced pain vs active comparators at 12 weeks (SMD –0.28, 95% CI –0.42 to –0.14, mean difference –0.55 cm VAS, not clinically important) but not at 52 weeks (SMD –0.10, 95% CI –0.21 to 0.01); vs passive/control at 12 weeks (SMD –0.40, 95% CI –0.58 to –0.22, mean difference –0.86 cm VAS, not clinically important) and 52 weeks (SMD –0.14, 95% CI –0.22 to –0.07, mean difference –0.28 cm VAS, not clinically important); Baseline pain 4.90 (SD 1.38) in individualised groups reduced to 2.88 (1.25) at 12 weeks and 3.15 (1.09) at 52 weeks. Functional: Disability (VAS 0–10 scale, measured with RMDQ or ODI), Individualised exercise reduced disability vs active comparators at 12 weeks (SMD –0.17, 95% CI –0.31 to –0.02, mean difference –0.22 cm VAS, not clinically important) but not at 52 weeks (SMD –0.12, 95% CI –0.27 to 0.03); vs passive/control not significant at 12 weeks (SMD –0.09, 95% CI –0.18 to 0.01) but significant at 52 weeks (SMD –0.20, 95% CI –0.30 to –0.10, mean difference –0.09 VAS, not clinically important); Baseline disability 3.53 (1.42) in individualised groups reduced to 2.41 (1.48) at 12 weeks and 2.47 (1.39) at 52 weeks.

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Gao 2022 ⁶⁰	To evaluate the evidence as to the effect of proprioceptive neuromuscular facilitation on pain, waist function, pulmonary function and dynamic balance in patients with chronic low back pain.	Musculoskeletal conditions (back pain)	Physiotherapist	Exercise	12–30 / NR	Physical: Pain intensity (VAS/NRS/Borg Back Pain Intensity Scale), PNF vs control showed significant pain relief (SMD = −1.17; 95% CI: −1.50 to −0.84; p < 0.00001), with effects at within 4 weeks (SMD = −1.30; 95% CI: −1.84 to −0.75; p < 0.00001), 6–8 weeks (SMD = −1.01; 95% CI: −1.55 to −0.46; p = 0.0003), and 12-week follow-up (SMD = −1.37; 95% CI: −1.89 to −0.85; p < 0.00001); Pulmonary function (FEV1), PNF showed significant improvement (MD = 0.65; 95% CI: 0.26 to 1.03; p = 0.001); Dynamic balance (FRT, TUG), PNF showed no significant improvement overall (MD = −0.04; 95% CI: −2.16 to 2.08; p = 0.97), FRT (MD = 0.91; 95% CI: −2.32 to 4.15; p = 0.58), TUG (MD = −1.65; 95% CI: −5.33 to 2.03; p = 0.38). Functional: Waist functional disability (ODI, RMDQ), PNF vs control showed significant improvement (MD = −1.63; 95% CI: −1.89 to −1.37; p < 0.00001), with effects at within 4 weeks (MD = −1.50; 95% CI: −1.92 to −1.08; p < 0.00001), 6–8 weeks (MD = −1.60; 95% CI: −2.02 to −1.18; p < 0.00001), and 12-week follow-up (MD = −1.93; 95% CI: −2.35 to −1.51; p < 0.00001).
Garagorri - Gutiérrez 2022 ²³	To critically evaluate the available evidence as to the effectiveness of different physiotherapy interventions in asthmatic patients, and to validate the hypothesis that physiotherapy techniques are able to reduce the frequency of asthmatic spells and the intensity of their symptoms.	Chronic respiratory disease (asthma)	Physiotherapist	Multimodal	1–60 / 5–90 mins	Physical: PEF improved by 16.9%; FEV1 improved significantly with Buteyko technique; FVC improved in home pulmonary rehabilitation program; Thoracic expansion increased by 2%. Psychological/emotional: Anxiety and depression reduced as measured by HADS. Functional: Quality of life improved as assessed by AQLQ and SGRQ; Asthma control improved as measured by ACQ. Other: Reduced use of salbutamol from 12 to 6 inhalations; Improved asthma control with reduced symptoms.
Gilliam 2023 ⁶¹	To assess the effectiveness of mind–body exercise interventions provided by physical therapists for reducing pain and disability in people with low back pain, specifically examining both short-term and long-term outcomes.	Musculoskeletal conditions (back pain)	Physiotherapist	Exercise	6–24 / 30–60 mins	Physical: Pain, Mind-body (MB) exercise more effective than control interventions in short term (pooled SMD: −0.93; 95% CI: −1.65 to −0.21, p<0.01, n=558, 8 trials); Pilates not more effective than control at long-term follow-up (pooled SMD: −0.60; 95% CI: −1.43 to 0.23, n=296, 4 trials); Pilates more effective than non-exercise controls in short term (pooled SMD: −1.56; 95% CI: −2.69 to −0.42, n=348, 4 trials); MB exercise more effective than alternative exercise in short term (SMD: −0.26; 95% CI: −0.46 to −0.07, n=210, 4 trials); Individual trials showed between-group differences favouring Pilates with NRS difference of 2.2 (p<0.01), VAS differences of 2.8 and 2.4 at 6 and 12 weeks, and large effect sizes (d=1.46); Some trials showed no significant between-group differences. Functional: Disability, MB exercise more effective than control interventions in short term (pooled SMD: −0.74; 95% CI: −1.36 to −0.12, n=437, 6 trials); Pilates not more effective than control at long-term follow-up (pooled SMD: −1.05; 95% CI: −3.51 to 1.41, n=296, 4 trials); MB exercise not more effective than non-exercise controls in short term (SMD: −1.15; 95% CI: −2.49 to 0.18, n=251, 3 trials); MB exercise not more effective than alternative exercise in short term (pooled SMD: −0.27; 95% CI: −0.59 to 0.05, n=186, 3 trials); Individual trials showed between-group differences favouring Pilates with RMDQ difference of 2.7 (p<0.01) and 4.0 at 6 and 12 weeks; Some trials showed no significant between-group differences or favoured general exercise over Pilates.

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González-Gómez 2025 ⁶²	To compare the efficacy of exercise therapy (ET) vs manual therapy (MT) in people with chronic low back pain through a systematic review with meta-analysis and meta-regression of randomised controlled trials, evaluating pre- and post-intervention differences in pain intensity, disability and physical function outcomes.	Musculoskeletal conditions (back pain)	Chiropractor; osteopath; physiotherapist	Multimodal	5°24 / 10–60 mins	Physical: Pain intensity (VAS/NPRS), No statistically significant differences between ET and MT groups at 0–3 months (SMD=0.31, 95% CI [–0.03, 0.65], p=0.07), 3–6 months (SMD=0.10, 95% CI [–0.08, 0.28], p=0.26), >6 months (SMD=–0.03, 95% CI [–0.21, 0.15], p=0.76), or overall (SMD=0.14, 95% CI [–0.02, 0.30], p=0.09); Secondary analysis showed small effect favouring MT at 0–3 months (SMD=0.23, 95% CI [0.02, 0.43], p=0.03); Overall improvement 0.27%, not clinically relevant. Functional: Disability (ODI and RM questionnaire), No statistically significant differences at 0–3 months (SMD=0.17, 95% CI [–0.13, 0.46], p=0.27) and 3–6 months (SMD=–0.11, 95% CI [–0.29, 0.07], p=0.22); Statistically significant small effect favouring ET at >6 months (SMD=–0.25, 95% CI [–0.43, –0.07], p=0.007); No significant difference overall (SMD=–0.04, 95% CI [–0.19, 0.12], p=0.63); Physical function (SF-36 PCS), No statistically significant differences between ET and MT at 0–3 months (SMD=0.06, 95% CI [–0.14, 0.26], p=0.57), 3–6 months (SMD=–0.13, 95% CI [–0.37, 0.11], p=0.30), >6 months (SMD=–0.14, 95% CI [–0.38, 0.10], p=0.26), or overall (SMD=–0.05, 95% CI [–0.18, 0.08], p=0.42); Overall improvement 0.57%, not clinically relevant.
Guede-Rojas 2025 ⁶³	To analyse the effects of non-immersive exergames on relevant outcomes of the rehabilitation process in patients with osteoarthritis.	Musculoskeletal conditions (osteoarthritis)	NR	Exercise	8–60 / 15–60 mins	Physical: Exergames significantly improved static balance variables (postural sway reduction with both open and closed eyes) compared with controls; p < 0.05; Exergames significantly improved dynamic balance variables (limits of stability, functional reach test performance) compared with controls; p < 0.05; Exergames significantly improved hip isometric strength (abductors, adductors, flexors, extensors) and knee isometric strength (flexors, extensors) in 1 of 3 studies; p < 0.05; No significant differences reported for cervical isometric muscle strength; Exergames significantly improved knee proprioception (position sense at 30° and 60°) in both studies that measured it; p < 0.05; Exergames significantly improved 10-m walking time and stair ascent time in 1 of 2 studies; p < 0.05; Exergames significantly improved active knee flexion and extension mobility; p < 0.05; Exergames significantly reduced pain intensity (VAS scores, including rest, activity and night pain) in 4 of 5 studies; p < 0.05; Exergames significantly improved functional reach test in 1 of 2 studies; p < 0.05. Psychological/emotional: Exergames significantly improved depression level (SGDS-K score) in 1 of 2 studies; p < 0.05; Exergames significantly improved kinesiophobia level (TSK score); p < 0.05; No significant differences between exergames and control in fatigue. Functional: Exergames significantly improved functional status (total WOMAC score, including pain, stiffness and physical function subscales) in 4 of 6 studies; p < 0.05; Exergames did not show significant improvement in neck disability (NDI) compared with controls in 1 study; Exergames significantly improved quality of life (global health perspective and physical domain) in 2 of 3 studies; p < 0.05; No significant differences between exergames and controls in work ability; No significant differences between exergames and control in chronic pain and disability (CPGQ); p > 0.05.
Jenkins 2024 ²⁶	To assess the effectiveness of biofeedback on blood pressure in hypertensive patients, with the main outcome assessed being a change in blood pressure.	Cardiovascular disease (hypertension)	Psychologist	Other (biofeedback)	4–48 (8, 16 most common) / 12–75 mins	Physical: Systolic blood pressure; Significant reduction with biofeedback intervention; Mean difference –4.52 mmHg (Z=2.31, P=0.02, 95% CI [–8.35, –0.69]); Pooled blood pressure difference in biofeedback groups was –9.5 mmHg SBP compared with –3.4 mmHg SBP in control groups; Diastolic blood pressure; Significant reduction with biofeedback intervention; Mean difference –5.19 mmHg (Z=3.54, P=0.0004, 95% CI [–8.07, –2.32]); Pooled blood pressure difference in biofeedback groups was –6.7 mmHg DBP compared with –1.9 mmHg DBP in control groups.

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Kazeminia 2023 ⁶⁴	To estimate the results of randomised clinical trials investigating the effect of pelvic floor muscle-strengthening exercises on reducing low back pain intensity.	Musculoskeletal conditions (back pain)	NR	Exercise	NA / 5–30 mins	Physical: Low back pain intensity, significantly reduced in intervention group compared with control group, SMD -1.261 (95% CI: -1.679 to -0.843), $P < 0.001$, $I^2 = 87.60\%$; Low back pain intensity in postpartum women subgroup, reduced by SMD -1.614 (95% CI: -1.926 to -1.302), $P = 0.000$, $I^2 = 84.69\%$; Low back pain intensity in pregnant women subgroup, reduced by SMD -1.282 (95% CI: -1.761 to -0.803), $P = 0.007$, $I^2 = 83.97\%$; Low back pain intensity in patients with lower back pain subgroup, reduced by SMD -0.782 (95% CI: -1.162 to -0.402), $P = 0.040$, $I^2 = 89.49\%$.
Kull 2025 ⁶⁵	To search for randomised controlled trials that investigated the effectiveness of PEMF therapy in patients with nonspecific back pain for enhancing physical function and reducing pain.	Musculoskeletal conditions (back pain)	Osteopath; physiotherapist	Other (PEMF therapy; conventional physical therapy; High-Intensity Laser Therapy (HILT); osteopathic manipulative treatment (OMT))	9–168 / 10–30 mins	Physical: Pain (VAS/NRS), statistically significant reduction in 5 of 9 studies ($p < 0.05$), with 2 studies showing significance at some timepoints and 2 studies showing no significant reduction; Range of Motion (ROM), assessed in multiple studies with significant improvements reported in PEMF groups. Functional: Physical function/disability (ODI or modified ODI in 7 studies, RMDQ in 2 studies), statistically significant improvement in 5 of 9 studies ($p < 0.05$), with 1 study showing significance at one of four timepoints and 3 studies showing no significant difference; Quality of life (SF-36), significant differences in favour of PEMF group at 4 weeks; Quality of life (SF-12), no significant differences between groups ($p > 0.05$); Quality of life (EuroQol), no significant differences between groups ($p > 0.05$); Fingertip-to-Floor distance (FtF), no significant differences between groups ($p > 0.05$); Modified Schober test, significant differences in favour of PEMF group ($p < 0.05$). Psychological/emotional: Sleep quality (PSQI), no significant difference between groups; Depression, anxiety and stress (DASS-21), no significant difference between groups. Other: Pain Disability Index (PDI), PEMF therapy superior to control group after 8 weeks ($p < 0.05$); Oswestry Disability Scale (ODS), PEMF + CPT group significantly superior to conventional therapy alone at 6 and 12 weeks ($p < 0.05$).
Liao 2020 ⁶⁶	This study investigated the effectiveness of protein supplementation combined with exercise training (PS + ET) in improving muscle mass and functional outcomes in older adults with lower-limb osteoarthritis.	Musculoskeletal conditions (osteoarthritis)	Physiotherapist	Multimodal	21–56 / NR	Physical: The PS + ET group exhibited significant improvements in muscle mass (standard mean difference [SMD] = 1.13 , $p < 0.00001$), pain (SMD = 1.36 , $p < 0.00001$), and muscle strength (SMD = 0.44 , $p = 0.04$). Functional: PS + ET improved walking capability (SMD = 0.75 , $p = 0.003$), timed up-and-go performance (SMD = 0.66 , $p = 0.01$); and stair climbing performance (SMD = 0.84 , $p = 0.002$). Psychological/emotional: PS + ET provided significantly greater improvements to global functioning (SMD = 0.65 , 95% CI: 0.20 – 1.10 , $p = 0.004$). Other: PS + ET improved CRP outcomes (weighted MD = 0.16 mg/L, $p = 0.04$).
Lo 2024 ³³	To assess the effectiveness of VR-assisted active training vs conventional exercise or physiotherapy for chronic musculoskeletal pain in different regions and to analyse the effects of immersive vs non-immersive VR on validated pain outcomes.	Musculoskeletal conditions (back pain, osteoarthritis)	Physiotherapist	Exercise	1–36 / 10–45 mins	Physical: Pain intensity (low back pain, non-immersive VR), Short term: SMD -1.79 (95% CI -2.72 to -0.87), $P < 0.001$, favouring non-immersive VR over conventional active training; Intermediate term: SMD -8.15 (95% CI -15.29 to -1.01), $P = 0.03$, favouring non-immersive VR; Pain intensity (low back pain, immersive VR), Short term: SMD 0.04 (95% CI -1.10 to 1.19), $P = 0.94$, no significant difference; Pain intensity (neck pain, immersive VR), Short term: SMD -0.55 (95% CI -1.02 to -0.08), $P = 0.02$, favouring immersive VR; Pain intensity (knee pain, non-immersive VR), Short term: SMD -0.74 (95% CI -1.86 to 0.37), $P = 0.19$, no significant difference. Psychological/emotional: Kinesiophobia (low back pain, non-immersive VR), Short term: SMD -2.94 (95% CI -5.20 to -0.68), $P = 0.01$, favouring non-immersive VR; Intermediate term: SMD -4.28 (95% CI -8.12 to -0.44), $P = 0.03$, favouring non-immersive VR; Kinesiophobia (low back pain, immersive VR), Short term: SMD -1.17 (95% CI -2.59 to 0.26), $P = 0.11$, no significant effect; Kinesiophobia (neck pain, immersive VR), Short term: SMD -0.09 (95% CI -0.40 to 0.23), $P = 0.59$, no significant effect. Functional: Functional disability (low back pain, non-immersive VR), Short term: SMD -0.44 (95% CI -0.72 to -0.16), $P = 0.002$, favouring non-immersive VR;

Author year	Aim(s)	Condition	Allied health profession(s)	Intervention type	Range of number / duration of consultations	Outcomes
						Functional disability (neck pain, immersive VR), Short term: MD –2.59 (95% CI –3.51 to –1.67), $P < 0.001$, favouring immersive VR; Functional disability (knee pain, non-immersive VR), Short term: MD –11.36 (95% CI –33.95 to 11.23), $P = 0.32$, no significant difference.
Ma 2024 ⁶⁷	To investigate the effect of pain neuroscience education (PNE) alone and combined with physical therapy or exercise for chronic low back pain, and to examine the dose effect of PNE intervention on improving chronic low back pain.	Musculoskeletal conditions (back pain)	Physiotherapist	Multimodal	1–16 / 5–180 mins	Physical: Significant reduction in short-term pain with PNE plus exercise and physiotherapy; MD –1.14 [–1.55, –0.72], MD –1.15 [–1.67, –0.64]; significant reduction in short-term disability with PNE plus exercise and physiotherapy; SMD –0.80 [–1.13, –0.47], SMD –0.85 [–1.29, –0.40]. Meta-regression showed that only single PNE session duration was associated with a greater reduction in pain ($P < .05$). Subgroup results showed that a single PNE session exceeding 60 minutes (MD –2.04), 4 to 8 sessions (MD –1.34), intervention for 7 to 12 weeks (MD –1.32), and a group-based approach (MD –1.76) may be more beneficial. Psychological/emotional: Significant reduction in kinesiophobia; SMD –1.18 [–1.43, –0.92]; significant reduction in pain catastrophising; MD –7.21 [–10.38, –4.04].
Mapinduzi 2025 ³¹	To investigate the effectiveness of mHealth-supported active exercise interventions to reduce pain intensity and disability level in persons with hip or knee osteoarthritis.	Musculoskeletal conditions (osteoarthritis)	Physiotherapist	Multimodal	6–84 / 15–60 mins	Physical: Pain intensity; mHealth-supported active exercises combined with patient education showed significant reduction (SMD= –0.42; 95% CI, –0.61 to –0.22; $P < .01$); disability; mHealth-supported active exercises combined with patient education showed significant reduction (SMD= –0.27; 95% CI, –0.46 to –0.08; $P < .01$).
Mauri 2025 ⁶⁸	To evidence the role of exercise on pain reduction and the effectiveness of one type of training over another in terms of pain, functional capacity and inflammatory biomarkers in osteoarthritis, with a focus on identifying which type of exercise is the most effective in reducing pain while also considering the effects on functional capacity and inflammatory processes in people with osteoarthritis.	Musculoskeletal conditions (osteoarthritis)	NR	Exercise	6–62 / 15–30 mins	Physical: Pain; neuromuscular training showed a larger effect size (–2.26, 95% CI –4.37 to –0.14).
Morone 2024 ³²	To investigate the efficacy of VR rehabilitation therapy, monitored by sensors, on patients with CNS-LBP, and to evaluate the impact of technology based on inertial sensors with biofeedback or exergaming in patients with chronic nonspecific low back pain.	Musculoskeletal conditions (back pain)	Physiotherapist	Multimodal	1–36 / 30–60 mins	Physical: VR and exergaming interventions reduced pain intensity more than controls, with large, short-term effects (e.g. pain decreasing from 6.62 ± 1.04 to 1.00 ± 0.60 after 12 sessions, $p < 0.05$; hypoalgesia during exercise $d = 1.29$ and immediately after $d = 0.85$). Between-group differences favoured VR for pain ($\beta = -1.07$, 95% CI –2.11 to –0.03, $p = 0.04$). Structural and biological changes were reported in selected studies, including increased multifidus cross-sectional area ($p < 0.001$) and improvements in inflammatory biomarkers (e.g. TNF, interleukins; $p < 0.001$) and stress-related hormones ($p < 0.05$). Kinematic and balance outcomes were inconsistent: no group differences were found for anterior–posterior sway ($W = 99$; $p = 0.36$; $r = 0.07$), while a small reduction in compensatory upper-trunk extension/flexion was observed ($4.4^\circ \pm 4.4^\circ$ to $3.5^\circ \pm 1.29^\circ$; $p = 0.02$; $d = 0.20$). Functional: Functional disability improved substantially in several studies, with VR groups showing larger reductions in MODI/RMDQ scores (e.g. 69.16 ± 9.13 to 16.04 ± 6.82 ; $p < 0.05$, and $p < 0.001$). Patient-specific function improved post-intervention ($\beta = 1.21$, 95% CI 0.10–2.33, $p = 0.03$), and pain self-efficacy increased at 6-month follow-up ($\beta = 5.17$, 95% CI 0.52–9.82, $p = 0.03$) but not earlier. Quality-of-life domains related to physical functioning, pain, vitality and social participation improved ($p < 0.05$), with about 90% of participants reporting overall benefit in one study. Other: Time spent thinking about pain reduced with VR distraction (Cohen's $d = 1.31$).

Author year	Aim(s)	Condition	Allied health profession(s)	Intervention type	Range of number / duration of consultations	Outcomes
Pitsillides 2021 ⁶⁹	To identify the effect of combining exercise and cognitive behavioural therapy (CBT) when delivered by a physical therapist in knee osteoarthritis pain, specifically to reveal the effectiveness of this combination in reducing KOA pain.	Musculoskeletal conditions (osteoarthritis)	Physiotherapist	Multimodal	4–16 / 25–90 mins	Physical: WOMAC pain subscale reduction of -1.42 (95% CI: $-1.76, -1.09$; I ² =58%); centre-based intervention reduction of -1.62 (95% CI: $-1.97, -1.27$; I ² =0%); distance-delivered intervention reduction of -1.28 (95% CI: $-1.75, -0.81$; I ² =73%); NRS score decrease from 4.2 ± 1.5 to 2.8 ± 1.6 ; VAS score decrease from 58.4 ± 12.8 to 26.4 ± 18.4 ; Lequesne pain subscale decrease from 4.93 ± 1.33 to 2.60 ± 1.55 Psychological/emotional: SF-36 pain subscale scores; ASES pain subscore increased from 6.1 ± 1.8 to 7.6 ± 2.0 .
Prat-Luri 2023 ⁷⁰	To analyse the effect of trunk-focused exercise programs (TEPs) and moderator factors on chronic nonspecific low back pain (LBP), specifically assessing: (1) the effect of TEPs on pain, disability and quality of life in people with nonspecific chronic LBP, (2) how moderator factors related to training programs and patient characteristics modulated their effects, and (3) the effect of TEPs on trunk strength, endurance and range of motion.	Musculoskeletal conditions (back pain)	NR	Exercise	4–45 / 20–90 mins	Physical: Pain; large effect in favour of TEPs compared with control (95% PI, -0.5 to 3.2), small effect compared with GEPs; disability; large effect in favour of TEPs compared with control (SMD 0.90 SD higher), small effect compared with GEPs; trunk strength; large effect in favour of TEPs compared with control (SMD 0.91 SD higher); trunk extension endurance; large effect in favour of TEPs compared with control (SMD 2.46 SD higher); trunk and/or hip range of motion; large effect in favour of TEPs compared with control (SMD 0.93 SD higher). Functional: Quality of life; large effect in favour of TEPs compared with control (SMD 0.82 SD higher). Other: Lower BMI associated with higher pain improvements.
Raghava Neelapala 2020 ⁷¹	To systematically summarise the current evidence as to the effectiveness of hip muscle strengthening on knee pain, lower extremity function and biomechanical measures of the knee in persons with knee osteoarthritis.	Musculoskeletal conditions (osteoarthritis)	NR	Exercise	24–72 / 30–45 mins	Physical: Knee pain reduction; hip muscle strength improvement; range of motion improvement; endurance improvement. Functional: Self-reported function improvement (6MWT) improvement; step test improvement; stair ascent and descent test improvement; walking distance improvement; gait velocity improvement; quality-of-life (SF-36) improvement.
Rampazo 2023 ⁷²	To investigate the effectiveness of IC in patients with chronic nonspecific low back pain.	Musculoskeletal conditions (back pain)	Physiotherapist	Other (interferential current, transcutaneous electrical nerve stimulation)	1–20 / 20–30 minutes	Physical: IC probably reduces pain intensity compared with placebo immediately post-treatment; MD = -1.57 points; 95% CI $-2.17, -0.98$; IC may reduce pain intensity compared with TENS immediately post-treatment; SMD = -0.32 ; 95% CI $-0.61, -0.03$. Functional: IC probably reduces disability compared with placebo immediately post-treatment; MD = -1.51 points; 95% CI $-2.57, -0.46$; IC may not reduce disability compared with TENS immediately post-treatment; MD = -0.67 points; 95% CI $-3.72, 2.38$.
Reyes-Ferrada 2023 ⁷³	To determine the effects of isokinetic trunk training in nonspecific low back pain patients on pain intensity, disability, and trunk flexor and extensor isokinetic strength.	Musculoskeletal conditions (back pain)	NR	Exercise	6–24 / NR	Physical: Pain intensity decreases immediately post-intervention (MD -1.50 (95% CI: $-2.60, -0.39$)), at one-month follow-up (MD -1.97 (95% CI: $-2.92, -1.03$)), and at six-month follow-up (MD -2.48 (95% CI: $-2.77, -2.19$)); Isokinetic trunk strength increases, but with scant evidence. Functional: Disability decreases, but with scant evidence.

Author year	Aim(s)	Condition	Allied health profession(s)	Intervention type	Range of number / duration of consultations	Outcomes
Sany 2023 ⁷⁴	To assess the effectiveness of different aerobic exercises to reduce pain intensity and functional disability in patients with chronic low back pain.	Musculoskeletal conditions (back pain)	NR	Multimodal	10–42 / 10–50 mins	Physical: Pain intensity measured by VAS/NRS/MPQ, reduced across studies with walking exercise showing reductions ranging from 18.25% to 59.4% depending on intervention type and comparison group; stationary cycling combined with back school showed 27% reduction in NRS vs 13.14% in control group. Functional: Disability measured by ODI/RMDQ/ALBPS, reduced across studies with walking exercise showing reductions ranging from 9.4% to 48.9%; stationary cycling combined with back school showed 25.58% reduction in RMDQ vs 10.3% in control group; specific trunk exercise showed 40.9% reduction in ODI vs 16.3% with cycling exercise at post-intervention; minimal clinically important difference (MCID) in ODI achieved by 48% of walking group vs 31% of usual care group in one study, and MCID in NRS achieved by 44% of walking group vs 37% of usual care group.
Senkus 2024 ²⁷	To examine the effect of medical nutrition therapy (MNT) provided by a dietitian on blood pressure (BP), hypertension incidence, medication use, anthropometrics and cardiovascular disease (CVD) risk and events in adults with prehypertension or hypertension compared with standard care or no intervention.	Cardiovascular disease (hypertension)	Dietitian; exercise physiologist. Other: registered nurses, personal trainers, physicians and exercise specialists.	Multimodal	2–18 / NR	Physical: MNT reduces: systolic BP by 3.63 mmHg (95% CI: –4.35, –2.91 mmHg; P < 0.001) and diastolic BP by 2.02 mmHg (95% CI: –2.56, –1.49 mmHg; P < 0.001); body weight by 1.84 kg (95% CI: –2.72, –0.96 kg; P < 0.001); waist circumference by 1.04 cm (95% CI: –2.04, –0.04 cm; P = 0.04); arterial stiffness (SMD: –0.45; 95% CI: –0.71, –0.19; P = 0.008); risk of stroke (RR: 0.34; 95% CI: 0.14, 0.81; P = 0.02); CVD risk score (SMD: –0.20; 95% CI: –0.30, –0.09; P < 0.001). Functional: The relationship between MNT and quality of life is unclear. Other: MNT likely improves antihypertensive medication usage; MNT may result in improved cost-effectiveness; MNT may not have an effect on total mortality.
Trybulski 2025 ⁷⁵	To evaluate and summarise the effects of ILEX in alleviating pain, reducing disability, and improving physical functionality in adults with chronic LBP.	Musculoskeletal conditions (back pain)	NR	Exercise	12–24 / NR	Physical: Pain-related outcomes, ILEX vs true control showed significant favourable effect with ES = –0.633, 95% CI –1.06 to –0.20, p = 0.004, I ² = 19%, n = 123; ILEX group improvements ranged from –14.7% to –64.8% while control group ranged from –31.5% improvement to 34.9% increase in pain; measured using NPRS, WHYMPI and VAS scales; Isometric strength outcomes (maximal voluntary isometric torque in lumbar extensors), ILEX vs true control showed non-significant effect with ES = 0.967, 95% CI –0.35 to 2.28, p = 0.150, I ² = 93%, n = 172; ILEX group showed strength gains ranging from 5.6% to 78.2% while control group showed improvements of 16.5% to declines of –2.4%; measured using MVIT. Functional: Disability-related outcomes, ILEX vs true control showed non-significant effect with ES = –0.292, 95% CI –0.73 to 0.14, p = 0.190, I ² = 20%, n = 111; ILEX group showed improvements ranging from –26.3% to –59.0% while control group showed improvements from –55.7% to declines of approximately 3.4%; measured using ODI and RDQ scales.
Tsokanos 2021 ⁷⁶	To evaluate the short- and long-term efficacy of manual therapy (MT) in patients with knee osteoarthritis (OA) in terms of decreasing pain and improving knee range of motion (ROM) and functionality.	Musculoskeletal conditions (osteoarthritis)	Chiropractor; physiotherapist	Multimodal	3–12 / 10–90 mins	Physical: Pain reduction; short-term reduction in pain; increase in knee ROM and functionality. Functional: Improvement in knee functionality; increase in functionality.
Usman 2023 ⁷⁷	To evaluate the effectiveness of respiratory interventions in chronic low back pain (CLBP), specifically to ascertain whether respiratory interventions such as breathing exercises can decrease pain and improve function in CLBP and whether they can be used as an effective	Musculoskeletal conditions (back pain)	NR	Exercise	7–30 / 10–60 mins	Physical: Pain; significant changes with large effect size (d = 1.5); Maximum Inspiratory Pressure (MIP); significant changes with large effect size (d = 1.38); Balance; significant changes; Proprioception; significant changes; Maximum Expiratory Pressure (MEP); significant changes; Minute Volume Ventilation (MVV); significant changes with small effect size; Peak Inspiratory Flow (PIF); significant changes; Forced Vital Capacity (FVC); significant changes with large effect size; Forced Expiratory Volume in 1 s (FEV1); significant changes with small effect size; Diaphragm thickness; significant changes with small to medium effect size.

Author year	Aim(s)	Condition	Allied health profession(s)	Intervention type	Range of number / duration of consultations	Outcomes
	adjunct tool in the management of CLBP.					
Valkenborghs 2022 ²⁵	To identify the characteristics and determine the effects of exercise interventions on improving health-related physical fitness in adults with asthma.	Chronic respiratory disease (asthma)	Physiotherapist; exercise physiologist; other: physicians and exercise instructors, a respiratory therapist	Multimodal	2–624 (~36 most common) / 30–45 mins	Physical: Significant improvements in cardiorespiratory fitness (VO ₂ peak): MD 3.1 mL/kg/min, 95% CI, 1.9–4.3, functional fitness (walking distance): MD 41 m, 95% CI, 27–54, and overall health-related physical fitness: SMD 0.67, 95% CI, 0.46–0.89 in favour of groups who underwent experimental exercise training interventions. Aerobic exercise elicited superior improvements in health-related physical fitness compared with breathing/stretching exercise (SMD 0.47, 95% CI, 0.14–0.81).
Veillon 2024 ⁷⁸	To determine the effectiveness of physiotherapist-led cognitive behavioural interventions (CBI) with or without physiotherapy in comparison with physiotherapy alone on quality of life, disabilities and catastrophising.	Musculoskeletal conditions (back pain)	Physiotherapist	Multimodal	3–36 (5–24 most common) / 10–90 mins	Functional: Quality of life; No significant difference; SMD 0.02 (95% CI –0.17 to 0.21) for mental subscore, SMD 0.07 (95% CI –0.12 to 0.26) for physical subscore at 3 months; Disability; No significant difference; SMD –0.40 (95% CI –0.80 to 0.01) at 3 months, SMD –0.18 (95% CI –0.41 to 0.05) at 6 months, SMD –0.24 (95% CI –0.48 to 0.00) at 12 months.
Zhang 2022 ⁷⁹	To systematically review evaluations of the effects of exercises on pain symptoms and activities of daily living (ADL) in middle-aged and elderly patients with low back pain (LBP). The hypothesis was that exercise can effectively improve LBP in middle-aged and elderly participants.	Musculoskeletal conditions (back pain)	NR	Exercise	8–96 (most 12–36) / 15–90 minutes (mostly 30–60 minutes)	Physical: Pain (VAS scores), Exercise significantly reduced perceived low back pain, SMD = –0.91, 95% CI: [–1.30, –0.52], $p < 0.00001$; Resistance exercise showed largest effect (SMD = –1.25, $p < 0.05$), followed by aerobic exercise (SMD = –1.23, $p < 0.01$), and conventional exercise (SMD = –0.99, $p < 0.01$); Effects were greater with ≥ 12 weeks' duration (SMD = –1.25, $p < 0.05$), ≥ 3 times/week frequency (SMD = –1.11, $p < 0.05$), in males (SMD = –1.52, $p < 0.05$), and in elderly >65 years (SMD = –0.50, $p < 0.05$). Functional: Activities of Daily Living (ODI scores), Exercise significantly improved ADL capacity, SMD = –2.07, 95% CI: [–3.19, –0.96], $p = 0.0003$; Resistance exercise showed largest effect (SMD = –2.76, $p < 0.05$), followed by aerobic exercise (SMD = –2.48, $p < 0.05$); Effects were greater with ≥ 12 weeks' duration (SMD = –2.52, $p < 0.05$), ≥ 3 times/week frequency (SMD = –2.33, $p < 0.05$), in males (SMD = –5.37, $p < 0.00001$), and in elderly >65 years (SMD = –1.88, $p < 0.05$).

6MWT: 6-min walk test, ADL: activities of daily living, AMI: acute myocardial infarction, ASES: Arthritis Self-Efficacy Scale, ASM: appendicular skeletal muscle mass, BBS: Berg Balance Scale, BMC: bone mineral content, BMI: body mass index, BREQ-2: Behavioural Regulation in Exercise Questionnaire-2, CAT: COPD Assessment Test, CBT: cognitive behavioural therapy, CET: cycle endurance time, CFT: cognitive functional therapy, CG: control group, CHO: carbohydrate, CI: confidence interval or chiropractic intervention, CLBP: chronic low back pain, CNS-LBP: chronic nonspecific low back pain, COPD: chronic obstructive pulmonary disease, CPET: cardiopulmonary exercise testing, CRP: C-reactive protein, CSA: cross-sectional area, CSES: COPD Self-Efficacy Scale, DASS-21: Depression Anxiety and Stress Scale, DHA: docosahexaenoic acid, DHI: Dizziness Handicap Inventory, DI: disability index, DU: detuned ultrasound, EG: exercise group, EPA: eicosapentaenoic acid, EQ-5D-3L: EuroQol Five-Dimensions Questionnaire, ESCA: self-care competence scale, ESWT: endurance shuttle walk test, ET: exercise therapy, FABQ: Fear-Avoidance Beliefs Questionnaire, FEV₁: forced expiratory volume in one second, FVC: forced vital capacity, FFMI: fat-free mass index, GDS: Geriatric Depression Scale, GEP: general exercise program, GOLD: Global Initiative for Chronic Obstructive Lung Disease, GS: grip strength, HADS: Hospital Anxiety and Depression Scale, HE: home exercise, HEP: home exercise program, HGS: hand grip strength, HVLA: high-velocity low-amplitude, IC: interferential current, ICER: incremental cost-effectiveness ratio, IG: intervention group, ILEX: isolated lumbar extension, ISWT: incremental shuttle walk test, KOA: knee osteoarthritis, KOOS: Knee Injury and Osteoarthritis Outcome Score, LBP: low back pain, LIRTBFR: low-intensity resistance training with blood-flow restriction, MAC: mid-arm circumference, MAMC: mid-arm muscle circumference, MCID: minimum clinically important difference, MET: metabolic equivalent, MFR: myofascial release, MI: myocardial infarction or motivational interviewing, MIP: maximal inspiratory pressure, mMRC: modified Medical Research Council scale, MNT: medical nutrition therapy, MoCA: Montreal Cognitive Assessment, MRS: Modified Roland Scale, MT: manual therapy, NDI: Neck Disability Index, NRS: Numerical Rating Scale, OA: osteoarthritis, ODI: Oswestry Disability Index, OMT: osteopathic manipulative treatment, ONS: oral nutrition supplement, PA: physical activity, PAL: physical activity level, PEF: peak expiratory flow, PEMF: pulsed electromagnetic field, PFMT: pelvic floor muscle training, PNE: pain neuroscience education, PNF: Proprioceptive Neuromuscular Facilitation, PR: pulmonary rehabilitation, PRNS: pulmonary rehabilitation and nutrition support, PSQI: Pittsburgh Sleep Quality Index, PUFA: polyunsaturated fatty acid, QALY: quality-adjusted life year, QAP: quadriceps average power, QMS: quadriceps muscle strength, QOL: quality of life, QPT: isometric quadriceps peak torque, QVAS: Quadruple Visual Analogue Scale, rPMS: repetitive peripheral magnetic stimulation, REBS: Regulation of Eating Behaviour Scale, RMDQ: Roland–Morris Disability Questionnaire, ROM: range of motion, SD: standard deviation, SEP: supervised exercise program, SET: sling exercise therapy, SF-12: Short Form 12-item Health Survey, SF-36: Short Form 36-item Health Survey, SGA: subjective global assessment, SGRQ: St George's Respiratory Questionnaire, SMD: standardised mean difference, SMT: spinal manipulative treatment, SNIP: sniff nasal inspiratory pressure, SRE: supervised rehabilitative exercise, TENS: transcutaneous electrical nerve stimulation, TEP: trunk-focused exercise program, TUG: Timed Up and Go, UI: Uncertainty Interval, VAS: Visual Analogue Scale, VR: virtual reality, WHYMPI: West Haven–Yale Multidimensional Pain Inventory, Wmax: peak exercise capacity, WMD: weighted mean difference, WOMAC: Western Ontario and McMaster Universities Osteoarthritis Index, XR: extended reality.

Appendix 7—Data completeness, strength of evidence and risk of bias

Author year	Study—including design(s)	Data completeness		Evidence strength	Risk of bias
		No. of consults	Duration		
Studies examining dose–outcome relationship(s) as a main aim or via their analysis (n=8)					
Bordeleau 2022 ¹⁷	Primarily RCTs (15), controlled (4) and uncontrolled (3) before–after studies, case series study (3)				
Han 2024 ²⁸	RCTs only				NR
Liang 2024 ¹⁸	RCTs only				
Ma 2025 ²⁴	RCTs only				
Mueller 2020 ¹⁹	RCTs only				
Niederer 2020 ²⁰	RCTs and longitudinal studies with controls				
Zhai 2024 ²⁹	RCTs only				
Zhang 2023 ²¹	RCTs only				
Studies including information on dose and reported outcomes for relevant chronic conditions, yet may not have specifically examined the dose–outcome relationship(s)					
Akinrolie 2025 ³⁹	RCTs only				
Alam 2025 ⁴⁰	RCTs only				
Arcanjo 2022 ⁴¹	RCTs only				

Author year	Study—including design(s)	Data completeness		Evidence strength	Risk of bias
		No. of consults	Duration		
Bagagiolo 2025 ⁴²	RCTs only				
Barbari 2020 ⁴³	RCTs only				
Baumbach 2024 ⁴⁴	Almost all RCTs, retrospective and prospective cohort studies				
Bell 2024 ²²	RCTs only				
Bernard 2021 ³⁰	RCTs only				
Canzone 2024 ⁴⁵	Primarily RCTs, comparative studies and quasi-experimental design				
Capel-Alcaraz ⁴⁶ 2023	RCTs only				
Ceballos-Laita 2023_1 ⁴⁷	RCTs only				
Ceballos-Laita 2023_2 ⁴⁸	RCTs only				
Chen 2021 ⁴⁹	RCTs only				
Dal Farra 2021 ⁵⁰	RCTs only				
Dal Farra 2022 ⁵¹	RCTs only				
De Jesus 2020 ⁵²	RCTs only				
Devonshire 2023 ⁵³	RCTs only				

Author year	Study—including design(s)	Data completeness		Evidence strength	Risk of bias
		No. of consults	Duration		
Diao 2023 ⁵⁴	RCTs only				
Dos Santos 2021 ⁵⁵	RCTs only				
Drummond 2024 ⁵⁶	RCTs and longitudinal studies with controls				
Ebadi 2020 ⁵⁷	RCTs only				
Fernández-Rodríguez 2022 ⁵⁸	RCTs only				
Fleckenstein 2022 ⁵⁹	RCTs only				
Gao 2022 ⁶⁰	RCTs only				
Garagorri-Gutiérrez 2022 ²³	RCTs, experimental studies, case studies, randomised controlled pilot studies and controlled clinical studies				
Gilliam 2023 ⁶¹	RCTs only				
González-Gómez 2025 ⁶²	RCTs only				
Guede-Rojas 2025 ⁶³	RCTs only				
Jenkins 2024 ²⁶	RCTs only				
Kazeminia 2023 ⁶⁴	RCTs only	NA			
Kull 2025 ⁶⁵	RCTs only				

Author year	Study—included design(s)	Data completeness		Evidence strength	Risk of bias
		No. of consults	Duration		
Liao 2020 ⁶⁶	RCTs only				
Lo 2024 ³³	RCTs only				
Ma 2024 ⁶⁷	RCTs only				
Mapinduzi 2025 ³¹	RCTs only				
Mauri 2025 ⁶⁸	RCTs only				NR
Morone 2024 ³²	Primarily RCTs, cross-over study, feasibility study, proof-of-concept study				
Pitsillides 2021 ⁶⁹	RCTs only				
Prat-Luri 2023 ⁷⁰	RCTs only				
Raghava Neelapala 2020 ⁷¹	RCTs only				
Rampazo 2023 ⁷²	RCTs only				
Reyes-Ferrada 2023 ⁷³	RCTs only				
Sany 2023 ⁷⁴	RCTs only				
Senkus 2024 ²⁷	RCTs only				
Trybulski 2025 ⁷⁵	RCTs only				

Author year	Study—including design(s)	Data completeness		Evidence strength	Risk of bias
		No. of consults	Duration		
Tsokanos 2021 ⁷⁶	RCTs only				
Usman 2023 ⁷⁷	RCTs only				
Valkenborghs 2022 ²⁵	RCTs, quasi-experimental designs, pre-/post-experimental studies				
Veillon 2024 ⁷⁸	RCTs only				
Zhang 2022 ⁷⁹	RCTs only				

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