National Institute for Health and Care Excellence

Final

Workplace health: long-term sickness absence and capability to work

Evidence reviews for workplace health: cost effectiveness outcomes

NICE guideline NG146

Evidence reviews

November 2019

Final

These evidence reviews were developed by York Health Economics Consortium

Disclaimer

The recommendations in this guideline represent the view of NICE, arrived at after careful consideration of the evidence available. When exercising their judgement, professionals are expected to take this guideline fully into account, alongside the individual needs, preferences and values of their patients or service users. The recommendations in this guideline are not mandatory and the guideline does not override the responsibility of healthcare professionals to make decisions appropriate to the circumstances of the individual patient, in consultation with the patient and/or their carer or guardian.

Local commissioners and/or providers have a responsibility to enable the guideline to be applied when individual health professionals and their patients or service users wish to use it. They should do so in the context of local and national priorities for funding and developing services, and in light of their duties to have due regard to the need to eliminate unlawful discrimination, to advance equality of opportunity and to reduce health inequalities. Nothing in this guideline should be interpreted in a way that would be inconsistent with compliance with those duties.

NICE guidelines cover health and care in England. Decisions on how they apply in other UK countries are made by ministers in the Welsh Government, Scottish Government, and Northern Ireland Executive. All NICE guidance is subject to regular review and may be updated or withdrawn.

ISBN: 978-1-4731-3597-0

Contents

Preventing recurring short-term sickness absence (RQ 1a)

Review question

Review question 1a - What interventions, programmes, policies or strategies are cost-effective in preventing or reducing recurrence of short-term sickness absence among employees?

Introduction

Frequent absence may indicate general ill health which requires medical investigation and, if continued, may indicate work stress or lack of capability to do the job. Repeated absence for short periods is likely both to undermine the individual employee's own performance and cause disruption for colleagues and the wider organisation, including:

- the need to find temporary replacement cover (sometimes for quite specialist tasks);
- increasing the workload of others;
- general disruption of the remaining workforce and workflow;
- other employees feeling resentful if they think an individual's repeated absences are not being addressed;
- reduction in employee morale;
- the risk that a culture of frequent absenteeism may develop across the wider workforce.

PICO table

Table 1: PICO inclusion criteria for interventions to prevent or reduce recurrent short-term sickness absence

Population	Adult employees (≥16 years; full- or part-time; paid or unpaid) who: • have experienced 4 or more episodes of short-term sickness absence in a 12 month period (each episode lasting less than 4 weeks) *or* • are currently absent from work for less than 4 weeks due to sickness (with a minimum study follow-up of 12 months to enable patterns of recurrent absence to be identified) Organisational level All employers in the public, private and 'not-for-profit' sectors
Interventions	Any intervention to prevent or reduce recurring short-term sickness absence (4 or more episodes in a 12-month period, each episode lasting <4 weeks). Where interventions are not delivered in a workplace or primary care setting, there should be some element of employer or primary care involvement in the design, content, implementation or funding of the intervention.

Comparator	• No work-related intervention (includes 'usual care' or usual sickness absence practice / guidance) • Any other active comparator for managing sickness absence or return to work • Other active workplace comparator (intervention, programme, policy or strategy) • Time
Outcomes	Effectiveness studies (review question 1a) *Primary outcome* • Short-term sickness absence, as measured and reported by the authors *Secondary outcomes* • Health-related quality of life - using validated patient-report measures, for example EQ-5D • Psychological and/or social functioning - using any patient-report measure • Adverse / unintended effects: - Self-reported presenteeism or work performance (individual-level studies); - Job satisfaction (individual or organisational-level) - Rate of staff turnover (organisational-level studies) - Number of grievances (organisational-level studies) Qualitative studies (review question 1b) Participant views on: • Intervention acceptability (including preferences for content, frequency, location, etc.) • Barriers and facilitators to successful intervention delivery

Methods and process

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

Declarations of interest were recorded according to NICE's 2014 conflicts of interest policy.

Economic evidence

Included studies

8,040 records were assessed against the eligibility criteria.

7,974 records were excluded based on information in the title and abstract. One reviewer assessed all of the records and a second reviewer blind-screened 10% of the records. The level of agreement between the two reviewers was 100%.

The full-text papers of 66 documents were retrieved and assessed and 0 studies were assessed as meeting the eligibility criteria for research question 1a. One reviewer assessed all of the full texts and a second reviewer blind-screened 10% of the records. The level of

agreement between the two reviewers was 100%. For review question 1a, no studies were included.

Excluded studies

66 full text documents were excluded for this question. The documents and the reasons for their exclusion are listed in Appendix K – Excluded studies. Documents were excluded for the following reasons: ineligible patient population (n=27), ineligible outcomes (n=15), ineligible study design (n=12), ineligible intervention (n=5), ineligible outcomes (n=4) and ineligible setting (n=3). The selection process is shown in Appendix G.

Evidence statements

No eligible studies were identified.

The committee's discussion of the evidence

Cost effectiveness and resource use

No cost-effectiveness studies were identified that met the inclusion criteria for review question 1 – interventions to prevent or reduce recurrent short-term sickness absence.

A health economic model was developed to determine how cost-effective an intervention will be in helping employees on sickness absence to return to work. Because the interventions and size and type of organisation vary greatly and a myriad of factors can impact sickness absence and return to work, the model adopted a generalised approach and multiple sensitivity analyses were carried out which showed the results varied greatly by key model inputs such as the cost and effectiveness of the intervention, reduction in absenteeism and baseline rate of absenteeism. The committed noted that in general a company with high turnover costs or costs of absenteeism will likely benefit from an intervention to reduce sickness absence, particularly if the intervention is effective and less expensive than the overall costs of absenteeism or replacing a worker. The reverse is also true. For example, an organisation with low baseline turnover costs or low levels of absenteeism will find it more difficult to realise cost savings by implementing an intervention aimed at reducing sickness absence, though this does not mean that other factors could not also benefit the organisation. The committee appreciated employers may be interested in factors other than pure cost savings. The overall willingness to pay for an intervention by an organisation is important: there is no requirement for the intervention to be cost saving if the organisation is willing to pay for an intervention that will benefit the workers and the organisation itself.

Reducing movement from short-term to long-term sickness (RQ 2a)

Review question

Review question 2a - What interventions, programmes, policies or strategies are cost effective in reducing the number of employees who move from short- to long-term sickness absence?

Introduction

There is substantial evidence that work is beneficial for physical and mental health, whereas unemployment and long-term sickness absence often have a harmful impact (Marmot and Bell 2012). Data have shown that those who had been unemployed for more than six months had lower wellbeing than those who had been unemployed for less time (DH 2008). Reducing the extent of sickness absence in the UK, and in particular long-term sickness absence (defined as a period of four weeks or more) has therefore been a policy priority for at least the last ten years.

PICO table

Table 2: PICO inclusion criteria for interventions to reduce movement from short- to long-term sickness absence

Population	Individual level Adult employees (≥16 years; full- or part-time; paid or unpaid) who are currently absent from work for less than 4 consecutive weeks due to sickness. Organisation level All employers in the public, private and 'not-for-profit' sectors
Interventions	Any intervention that aims to reduce the risk of employees progressing from short-term to long-term absence (that is, lasting ≥4 consecutive weeks).
Comparator	• No work-related intervention (includes 'usual care' or usual sickness absence practice / guidance) • Any other active comparator for managing sickness absence or return to work • Other active workplace comparator (intervention, programme, policy or strategy) • Time
Outcomes	Effectiveness studies (review question 2a) *Primary outcome* • Return to work. Measured as any of: - Proportion returning to work within 4 weeks of start of absence - Time taken to return to work *or*

- Sickness absence, as reported by the authors, including:
  - Proportion with any long-term sickness absence (≥4 consecutive weeks duration)
  - Total number of sickness absence days

Secondary outcomes

- Health-related quality of life - using validated patient-report measures, for example EQ-5D
- Psychological and/or social functioning - using any patient-report measure
- Adverse / unintended effects:
  - Self-reported 'presenteeism' or work performance (individual-level studies)
  - Job satisfaction (individual or organisational-level)
  - Rate of staff turnover (organisational-level studies)
  - Number of grievances (organisational-level studies)

Qualitative studies (review question 2b)

Participant views on:

- Sickness absence recurrence following RTW (individual-level studies)
- Intervention acceptability (including preferences for content, frequency, location, etc.)
- Barriers and facilitators to successful intervention delivery

Methods and process

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

Declarations of interest were recorded according to NICE's 2014 conflicts of interest policy.

Economic evidence

Included studies

8,040 records were assessed against the eligibility criteria.

7,974 records were excluded based on information in the title and abstract. One reviewer assessed all of the records and a second reviewer blind-screened 10% of the records. The level of agreement between the two reviewers was 100%.

The full-text papers of 66 documents were retrieved and assessed and 1 study was assessed as meeting the eligibility criteria for research question 2a. One reviewer assessed all of the full texts and a second reviewer blind-screened 10% of the records. The level of agreement between the two reviewers was 100%.

One economic study was eligible for inclusion for review question 2a [1]. This study is summarised in the health economic evidence profile in appendix I and the health economic evidence tables below in Table 3 and in appendix H.

Excluded studies

65 full text documents were excluded for this question. The documents and the reasons for their exclusion are listed in Appendix K – Excluded studies. Documents were excluded for the following reasons: ineligible patient population (n=27), ineligible outcomes (n=14),

ineligible study design (n=12), ineligible intervention (n=5), ineligible outcomes (n=4) and ineligible setting (n=3). The selection process is shown in Appendix G.

Summary of studies included in the economic evidence review

Table 3: Summary of the study included in the economic evidence review for reducing movement from short-term to long-term sickness absence – RQ 2a

Study	Limitations	Applicability	Other comments	Costs	Effects	Incremental cost	Incremental effects	Cost-effectiveness	Uncertainty
van Oostrom 2009 (Netherlands) Population: Workers on sick leave for 2 to 8 weeks due to distress Interventions: Workplace intervention (WI): a stepwise communication process to identify and solve obstacles to return to work (RTW).[a] Comparators: Usual care (UC): treatment by an	Potentially serious limitations [c]	Partially applicable [d]	None	Mean total costs, over 12 months Societal perspective WI: €3,201 UC: €2,758 Employer perspective WI: €1,386 UC: €802	Mean duration of sick leave, over 12 months Cost Effectiveness Analysis (CEA) WI: 133 days UC: 134 days Cost utility analysis (CUA) WI: 0.77 UC: 0.78	Mean cost difference, over 12 months Societal perspective WI vs UC: €443 more costly (not statistically significant) Employer perspective WI vs UC: €583 more costly (not statistically significant)	Mean duration of sick leave, over 12 months WI vs UC: 1 day fewer (not statistically significant) QALYs WI vs UC: 0.01 less (not statistically significant)	CEA WI vs UC ICER: €627 per sick day avoided Neither change in costs or change in sick days were statistically different between WI and UC CBA Net monetary benefit with WI was -€1,987 with human capital approach (HCA) and -€1,700 with friction cost	The base case was a bootstrapped analysis to account for stochastic uncertainty. Cost effectiveness planes showed substantial uncertainty in results which reflects the statistical uncertainty in the point estimates of cost differences and effectiveness measures between WI and UC. Subgroup analysis suggested WI may be most cost-effective for patients with an

Study	Limitations	Applicability	Other comments	Costs	Effects	Incremental cost	Incremental effects	Cost-effectiveness	Uncertainty
occupational physician, according to the Dutch Guidelines. [b]								approach (FCA) WI was statistically significantly more costly than UC and changes in costs of productivity loss favoured UC but were not statistically significant regardless of productivity measure. CUA WI vs UC, incremental cost-utility ratio (ICUR) (HCA): -€184,562 per QALY gained (HCA) WI vs UC, ICER (FCA): -€155,850 UC dominates WI but neither cost differences with WI or	intention to return to work but findings were still limited in statistical significance.

Study	Limitations	Applicability	Other comments	Costs	Effects	Incremental cost	Incremental effects	Cost-effectiveness	Uncertainty
								QALY gains were statistically significant	

CEA: cost-effectiveness analysis; CUA: cost-utility analysis; FCA: frictional cost approach; HCA: human capital approach; ICER: incremental cost-effectiveness ratio; ICUR: incremental cost-utility ratio; RtW: return to work; QALY: quality-adjusted life year; UC: usual care; VAS: visual analogue scale; WI: workplace intervention

(a) Three meetings were planned to take place within 2 weeks. The purpose of the first meeting between the sick-listed employee and the RTW coordinator was to identify obstacles for RTW from the perspective of the employee. The second meeting was between the supervisor and the RTW coordinator, where obstacles to the employee's RTW were identified from the supervisor's perspective. In the third meeting, which was generally the longest, the employee, supervisor and RTW coordinator discussed solutions and formulated a consensus-based plan for their implementation.

(b) According to the evidence-based guideline of the Dutch Association of Occupational Physicians (NVAB) published in 2000 and updated in 2007. This guideline aims to facilitate the optimal functioning of employees with mental health problems and to prevent long-term sick leave and frequent recurrences. An early start to the treatment by occupational physicians is recommended. Occupational physicians act as motivating counsellors using cognitive behavioural elements to enhance the problem-solving capacity of employees. In addition, the Improved Gatekeeper Act requires that both the employer and employee take responsibility for a RTW plan.

(c) Only a 12 month time horizon, so insufficient to capture sustainability of outcomes.

(d) This study included people with 2 to 4 weeks of sick leave. The study was in the Netherlands where the occupational support offered is differently organised to the UK. EQ-5D VAS, rather than 5 level health state instrument, was used for utility values.

Evidence statements

- One cost-effectiveness, cost-benefit and cost-utility analysis (van Oostrom, 2009) found that a workplace intervention consisting of a stepwise communication process to identify and solve obstacles to return to work for people absent with distress found that it did not improve outcomes and had a higher cost compared to usual care. The workplace intervention for all people was unlikely to be more or less cost-effective than usual care but the workplace intervention was more likely to be cost-effective than usual care in people with an intention to return to work. The analysis was assessed as partially applicable to the review question, with potentially serious limitations.

The committee's discussion of the evidence

Cost effectiveness and resource use

The cost effectiveness review identified one study which found that a workplace intervention consisting of a stepwise communication process to identify and solve obstacles to return to work for people absent with distress did not improve outcomes and had a higher cost compared to usual care. Although the intervention for all people was unlikely to be more or less cost-effective than usual care the committee were mindful that it was more likely to be cost-effective than usual care in people with an intention to return to work. However, given the limitations of the study and the lack of evidence from effectiveness studies the committee did not consider there to be sufficient evidence to determine the value for money of these types of interventions.

Helping employees return to work and reducing long-term sickness absence (RQ 3a)

Review question

Review question 3a - What interventions, programmes, policies or strategies are cost effective in:

- helping employees on long-term sickness absence to return to work?
- reducing the recurrence of long-term sickness absence following a return to work?

Introduction

There is substantial evidence that work is beneficial for physical and mental health, whereas unemployment and long-term sickness absence often have a harmful impact (Marmot and Bell 2012). Data have shown that those who had been unemployed for more than six months had lower wellbeing than those who had been unemployed for less time (DH 2008). Reducing the extent of sickness absence in the UK, and in particular long-term sickness absence (defined as a period of four weeks or more) has therefore been a policy priority for at least the last ten years.

PICO table

Table 4: PICO inclusion criteria for interventions to help employees on long-term sickness absence return to work and prevent recurrence

Population	Adult employees (≥16 years; full- or part-time; paid or unpaid) who • are currently absent from work for 4 or more consecutive weeks due to sickness *or* • have returned to work in the past 6 months after an episode of long-term sickness absence (lasting 4 or more consecutive weeks) Organisation level All employers in the public, private and 'not-for-profit' sectors
Interventions	Any interventions, programmes, policies or strategies that aim to increase the return to work of employees who experience an episode of long-term sickness absence (≥4 consecutive weeks) and / or prevent the recurrence of long-term absence Where interventions are not delivered in a workplace or primary care setting, there should be some element of employer or primary care involvement in the design, content, implementation or funding of the intervention.
Comparator	• No work-related intervention (includes 'usual care' or usual sickness absence practice / guidance) • Any other active comparator for managing sickness absence or return to work
Outcomes	Effectiveness studies (review question 3a) *Primary outcomes*

- Return to work (full / partial). Measured as any of:
  - Proportion returning to work
  - Proportion assessed as capable of returning to work – physical or functional assessments using validated or self-report measure, clinical indicators or clinical opinion
  - Time taken to return to work
  - Hours worked per week / month
  - Proportion who take ill-health retirement

- Long-term sickness absence (following the return to work, for those on long-term sickness at baseline) - as reported by the authors, including:
  - Proportion with any long-term sickness absence (4 or more weeks duration)
  - Number of episodes of long-term sickness absence (per participant)
  - Number of days sick leave per episode
  - Total number of days sickness absence

Secondary outcomes

- Health-related quality of life - using validated patient-report measures, for example EQ-5D
- Psychological and/or social functioning - using any patient-report measure
- Adverse / unintended effects:
  - Self-reported 'presenteeism' or work performance (individual-level studies);
  - Job satisfaction (individual or organisational-level)
  - Rate of staff turnover (organisational-level studies)
  - Number of grievances (organisational-level studies)

Qualitative studies (review question 3b)

Participant views on:

- Intervention acceptability (including preferences for content, frequency, location, etc.)
- Barriers and facilitators to successful intervention delivery

Methods and process

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

Declarations of interest were recorded according to NICE's 2014 conflicts of interest policy.

Economic evidence

Included studies

8,040 records were assessed against the eligibility criteria.

7,974 records were excluded based on information in the title and abstract. One reviewer assessed all of the records and a second reviewer blind-screened 10% of the records. The level of agreement between the two reviewers was 100%.

The full-text papers of 66 documents were retrieved and assessed and 14 studies were assessed as meeting the eligibility criteria for research question 3a. One reviewer assessed

all of the full texts and a second reviewer blind-screened 10% of the records. The level of agreement between the two reviewers was 100%.

14 economic studies met the review inclusion criteria for review question 3a [2-15]. These are summarised in the health economic evidence profile in appendix I and the health economic evidence table below in Table 4 and in appendix H.

Excluded studies

52 of the 66 full text papers retrieved were excluded on full text review. The documents and the reasons for their exclusion are listed in Appendix K – Excluded studies. Documents were excluded for the following reasons: ineligible patient population (n=27), ineligible study design (n=12), ineligible intervention (n=5), ineligible outcomes (n=4), ineligible setting (n=3) and ineligible outcomes (n=1). The selection process is shown in Appendix G.

Summary of studies included in the economic evidence review

Table 4: Summary of studies included in the economic evidence review for helping employees return to work and reducing recurrent long-term sickness absence – RQ 3a

Study	Limitations	Applicability	Other comments	Costs	Effects	Incremental cost	Incremental effects	Cost-effectiveness	Uncertainty
Arends 2013 (Netherlands) Population: Workers (aged 18 to 63 years) who were diagnosed at start of sickness absence with a common mental disorder (CMD) and were now partially or fully ready to return to work. Intervention: SHARP-at work. A five steps intervention: return to work	Potentially serious limitations [c]	Partially applicable [d]	None	Mean cost per person SHARP Cost-effectiveness analysis (CEA): €4,167 Cost-benefit analysis (CBA): Between €29,337 (human capital approach (HCA) to productivity loss) and €37,215 (friction cost approach	Recurrent sickness absence over 12 months SHARP: 39% CAU: 62%	SHARP vs CAU[e] CEA: €1,764 more CBA: €4,730 (HCA) CBA: €5,530 (FCA)	Recurrent sickness absence over 12 months, SHARP vs CAU (bootstrapped estimate): 24% lower	CEA, incremental cost-effectiveness ratio (ICER), SHARP vs CAU, per 1% of recurrent sickness absence prevented: €10,605 CBA Employer occupational health costs only, SHARP was €800 greater than with CAU Productivity loss (HCA)	Sensitivity analyses CEA Excluding an outlier, which was attributed to high costs due to hospitalisation in a psychiatric ward, an ICER of -€533 was calculated for the incidence of recurrent sickness absence, indicating SHARP could be cost-effective. Reduced SHARP costs did not change the direction of the primary analyses. CBA Reduced SHARP costs did not

Study	Limitations	Applicability	Other comments	Costs	Effects	Incremental cost	Incremental effects	Cost-effectiveness	Uncertainty
(RtW) was started with the occupational physician (OP) monitoring and supporting the person through the steps. [a] Comparator: Care as usual (CAU) [b]				(FCA) to productivity loss) CAU CEA: €2,403 CBA: Between €24,607 (HCA) and €31,685 (FCA)				SHARP vs CAU: €6,046 Productivity loss (FCA) SHARP vs CAU: €3,995	change these results

Study	Limitations	Applicability	Other comments	Costs	Effects	Incremental cost	Incremental effects	Cost-effectiveness	Uncertainty
Brouwers 2007 (Netherlands) Population: People (aged 18-60 years) absent from work on sick leave for no more than 3 months due to a minor mental disorder Intervention group (IG): 5 individual sessions (50 minutes each),	Potentially serious limitations [h]	Partially applicable [i]	None	Mean cost per person IG: €14,493 (exclusive of intervention costs of €13,305 total for all people) CAU: €14,482 CAU CEA: €2,403	Mean quality-adjusted life years (QALYs) per person not reported Sick leave duration until full return to work IG: 152.7 days CAU: 156.5 days	CBA IG vs CAU (excluding costs of intervention): €11 more expensive (not statistically different) Cost-utility analysis (CUA), based on 2,000 bootstrap pairs	Mean QALYs per person IG vs CAU (Dutch EQ-5D): 0.056 higher IG vs CAU (UK EQ-5D): 0.044 higher Sick leave duration until full return to work IG vs CAU: 3.8 days sooner	CUA, ICER Probabilistic ICERs reported (ICERs are negative). IG vs CAU (Dutch EQ-5D): - €4,179 IG vs CAU (UK EQ-5D): - €5,306 IG was less expensive and more effective than CAU	Stochastic uncertainty in the data were dealt with using nonparametric bootstraps for CUA. This demonstrated an even split between the north-east and south-east quadrants of the cost-effectiveness plane indicating that any difference in costs between IG and CAU were likely small. 52% of bootstrap estimates were in the south east quadrant

Study	Limitations	Applicability	Other comments	Costs	Effects	Incremental cost	Incremental effects	Cost-effectiveness	Uncertainty
covering 3 stages, with a social worker: cause, coping and implementation. [f] Comparator: Care as usual (CAU): routine general practitioner (GP) care [g]				CBA: €24,607 (HCA) to €31,685 (FCA)	No statistically significantly difference	IG vs CAU: €234 cheaper		CBA IG vs CAU: €11 more expensive (not statistically significant but did not include intervention costs)	where IG dominates CAU.

Study	Limitations	Applicability	Other comments	Costs	Effects	Incremental cost	Incremental effects	Cost-effectiveness	Uncertainty
Bultmann 2009 (Denmark) Population: Workers on sick leave for 4 to 12 weeks due to lower back pain (LBP) or musculoskeletal disorders (MSD) Intervention: Coordinated and tailored	Potentially serious limitations [k]	Partially applicable [l]	None	Mean cost per person, over 12 months CTWR: $31,144 ($3,321 without productivity loss) CCM: $41,812 ($1,773 without	Sickness absence, per person, over 12 months CTWR: 656.6 hours CCM: 997.3 hours	Over 12 months, per person CTWR vs CCM: $10,668 ($1,548 more over 12 months without productivity loss)	Mean absence days averted CTWR vs CCM: 46.0	CEA CTWR vs CCM, per absence day avoided (without productivity loss): $33.7	One way deterministic sensitivity analysis of a doubling of intervention costs and 25% reduction in wages still resulted in cost savings under the CBA.

Study	Limitations	Applicability	Other comments	Costs	Effects	Incremental cost	Incremental effects	Cost-effectiveness	Uncertainty
work rehabilitation (CTWR), screening followed by a tailored rehabilitation plan developed by an interdisciplinary team [j] Comparator: Conventional case management (CCM) provided by the municipality. No further information given.				productivity loss)					
Finnes 2017 (Sweden) Population: Workers (at least 50% whole time equivalent (WTE)) with sickness absence due to anxiety,	Potentially serious limitations [q]	Partially applicable [r]	None	12 month costs Healthcare perspective ACT: $5,507 WDI: $6,465 ACT+WDI: $6,141	QALY gains over 12 months ACT: 0.164 WDI: 0.122 ACT+WDI: 0.168 TAU: 0.155	12 months, vs ACT Healthcare perspective WDI: $958 ACT+WDI: $634 TAU: $700	QALY gains over 12 months vs ACT WDI: -0.042 ACT+WDI: 0.046 TAU: -0.009	ICER Healthcare perspective Both TAU and WDI were dominated by ACT	Stochastic uncertainty in the data were dealt with using nonparametric bootstraps for CUA. This showed that for ACT compared to ACT+WDI from both the healthcare and societal perspectives, the

Study	Limitations	Applicability	Other comments	Costs	Effects	Incremental cost	Incremental effects	Cost-effectiveness	Uncertainty
depression, stress or exhaustion Interventions: • Acceptance and Commitment Therapy (ACT): a psychological intervention consisting of 6 X 60-minute sessions [m] • Workplace dialogue intervention (WDI): three meetings involving the participant plus work supervisor [n] • ACT + WDI: conducted by two different therapists [o] Comparator: Treatment as usual (TAU) was treatment				TAU: $6,207 Societal perspective ACT: $14,452 WDI: $15,649 ACT+WDI: $17,066 TAU: $15,593		Societal perspective WDI: $1,197 ACT+WDI: $2,614 TAU: $1,141		ACT vs baseline: $33,579 per QALY gained ACT+WDI vs ACT: $158,500 per QALY gained Societal perspective Both TAU and WDI were dominated by ACT alone. Compared to ACT, ACT+WDI had an ICER of $30,804 per QALY gained	percentage of bootstrap iterations were spread roughly equally across all four quadrants, although approximately 60% of iterations in both perspectives had ACT+WDI more costly than ACT and 50% of iterations of ACT+WDI were more effective. Scenario analysis showed that using Swedish utility weights (rather than English in the base case) resulted in ACT being the dominant strategy. A second scenario explored the impact of using costs as if the intervention was delivered in a 'regular' setting in which case ACT would no longer dominate TAU but have an ICER of $71 per QALY gained (healthcare

Study	Limitations	Applicability	Other comments	Costs	Effects	Incremental cost	Incremental effects	Cost-effectiveness	Uncertainty
as planned in a primary care centre or other care facility. [p]									perspective) and ACT+WDI had an ICER of $286,000 per QALY gained compared to ACT.
Jensen 2005 (Sweden) Population: Blue-collar and service/care workers (aged 18 to 60 years) with non-specific back pain resulting in sick leave for 1-6 months Interventions: • Behaviour-oriented physiotherapy (PT) [s] • Cognitive behavioural therapy (CBT): to improve pain management [t] • Behavioural medicine programme (BM): PT+CBT	Potentially serious limitations [u]	Partially applicable [v]	None	Mean cost per person, at 3 years: female; male BM: €107,703; €130,015 PT: €189,760; €220,268 CBT: €157,800; €199,824 TAU: €245,212; €193,239	Working days lost per year: female; male Pre intervention BM: 67; 72 PT: 76; 92 CBT:115; 109 TAU: 65; 80 Post intervention BM: 99; 123 PT: 95; 110 CBT:109; 101 TAU: 82; 86	Incremental cost per person, at 3 years, vs TAU: female; male BM: -€137,509; -€63,224 PT: -€55,452; €27,029 CBT: -€87,412; €6,585	Change in working days lost per year pre and post intervention: female; male BM: 22; 51 PT: 19; 18 CBT:-6; -8 TAU: 17; 6	For women, BM, PT and CBT were all less expensive over 3 years vs TAU with BM having the lowest cost per person vs CBT BM vs CBT: €50,097 less expensive BM vs PT: $82,057 less expensive BM vs TAU: €137,509 less expensive For men, CBT and PT were both more expensive over three years than TAU with BM being less expensive	Not undertaken

Study	Limitations	Applicability	Other comments	Costs	Effects	Incremental cost	Incremental effects	Cost-effectiveness	Uncertainty
Comparator: Treatment as usual (TAU). No additional interventions outside the normal routines in health care. This was not otherwise described.								than TAU by €63,224	
Lambeek 2010 (Netherlands) Population: Employed or self-employed workers (aged 18 to 65 years) on full or partial sick leave for 12 weeks to 2 years due to non-specific low back pain (LBP). Intervention: Integrated care (IC), a graded activity protocol at the workplace. [w]	Potentially serious limitations [x]	Partially applicable [y]	None	At 12 months IC: £13,165 (£1,479 direct costs, £11,686 indirect costs) UC: £18,475 (£1,262 direct costs, £17,213 indirect costs)	Days until sustainable return to work IC: 129 UC: 197 QALYs IC: 0.74 UC: 0.65	At 12 months IC vs UC: -£5,310 (£217 direct costs, -£5,527 indirect costs)	Days until sustainable return to work, per person IC vs UC: -68	CEA £3 extra cost for every day earlier return to work with IC. Direct costs only considered. CUA IC vs UC: dominant IC cost saving over UC, per person: £5,310 QALY gain, per person: 0.09 (direct	Stochastic uncertainty in the data were dealt with using nonparametric bootstraps for CUA and CEA. This showed that in 98% of iterations IC dominated UC, for the CUA and for the CEA that if there was a willingness to pay of £10 for one day earlier return to work there was a 95% chance that IC was cost-effective. Scenario analysis showed that if only complete cases

Study	Limitations	Applicability	Other comments	Costs	Effects	Incremental cost	Incremental effects	Cost-effectiveness	Uncertainty
Comparators: usual care (UC): referred to occupational physician and GP with a letter containing the advice to treat them according to the Dutch guidelines for patients with LBP.								and indirect costs considered) CBA IC, return on investment for every £1 spent: £26 (direct and indirect costs considered)	were considered then there was no statistical difference in costs between IC and UC. A further scenario explored the impact of the intervention only for people aged under 55 years which resulted in a doubling in the costs of IC. A final scenario analysis showed that varying productivity levels did not impact on results.
Loisel 2002 (Canada) Population: Workers absent for more than 4 weeks with occupational back pain Interventions:	Minor limitations [aa]	Partially applicable [bb]	The study had fewer than 30 people in each study arm and no statistical signifcance testing of results was performed	At 12 months OI: $9,569 CRI: $12,038 Sherbrooke model: $12,137 UC: $9,789	Mean number of days on full benefits (DFB) At 12 months OI: 116.1 CI: 114.9	Incremental costs vs UC At 12 months OI: -$220 CI $2,250 Sherbrooke model: -$2,348	Mean number of DFB, incremental difference vs UC At 12 months OI: -10.8 CI: -12	CEA (cost per DFB saved vs UC) At 12 months OI: -$20.40 (dominated UC) CI: $187.40	Sensitivity analyses were performed by varying the total healthcare costs by 60% to 190% and income per capita by 85% to 125%. Over a 6.4 year time period all interventions remained dominant vs UC over the cost ranges considered.

Study	Limitations	Applicability	Other comments	Costs	Effects	Incremental cost	Incremental effects	Cost-effectiveness	Uncertainty
• Occupational intervention (OI): visits to the study occupational medicine physician and a participatory ergonomics intervention with the study ergonomist, the injured worker, their supervisor, and management and union representatives. • Clinical rehabilitation intervention (CRI), with a back pain specialist and potentially a multidisciplinary work rehabilitation intervention at 12 weeks of absence [z]				At 6.4 years OI: $16,252 CI: $16,902 Sherbrooke model: $14,494 UC: $33,079	Sherbrooke model: 115.9 UC: 126.9 At 6.4 years OI: 228.0 CI: 178.7 Sherbrooke model: 125.6 UC: 418.3	At 6.4 years OI: -$16,827 CI: -$16,176 Sherbrooke model: -$18,585	Sherbrooke model: -11 At 6.4 years OI: -190.3 CI: -239.6 Sherbrooke model: -293.7 UC: 418.3	Sherbrooke model: $213.50 At 6.4 years OI: -$88.40 (dominated UC) CI: -$67.50 (dominated UC) Sherbrooke model: -$63.50 (dominated UC) CBA Cost differential vs UC At 12 months OI: $220 CI: -$2,250 Sherbrooke model: -$2,348 At 6.4 years OI: $16,827 CI: $16,176	

Study	Limitations	Applicability	Other comments	Costs	Effects	Incremental cost	Incremental effects	Cost-effectiveness	Uncertainty
• OI+CRI ("Sherbrooke Model") Comparator: Usual care (UC): with worker's physician receiving no advice about return to work.								Sherbrooke model: $18,585	
Meijer 2006 (Netherlands) Population: Bank and university workers on at least 50% contracts with 50% sick leave in the last 4 to 20 weeks due to non-specific upper extremity musculoskeletal disorders (MSDs) Intervention: Multidisciplinary treatment	Potentially serious limitations [dd]	Partially applicable [ee]	None	Total costs per week At 2 months MDT: €1,335 UC: €448 At 6 months MDT: €664 UC: €359 At 12 months MDT: €430 UC: €315	Percentage of regular hours worked Baseline MDT: 29% UC: 29% 6 months MDT: 82% UC: 72% 12 months MDT: 86% UC: 73%	Incremental costs of MDT vs UC per week At 2 months: €887 At 6 months: €305 At 12 months: €115	Difference in percentage of regular hours worked Baseline: 0% 6 months: 10% 12 months: 13% There was no statistical difference between MDT and UC at any time point	MDT was more expensive compared to UC and did not increase the proportion of days worked. MDT was not cost-effective.	Not undertaken

Study	Limitations	Applicability	Other comments	Costs	Effects	Incremental cost	Incremental effects	Cost-effectiveness	Uncertainty
(MDT): an outpatient training programme carried out at Dutch rehabilitation centres. [cc] Comparator: Usual care (UC): supervision by occupational health services. UC could include treatment at the workplace and in the regular health care system, initiated by a GP, or medical specialist.					There was no statistical difference between MDT and UC at any time point				
Radford 2012 (UK) Population: Patients in paid or voluntary work or in full time education, hospitalised for at least 48	Potentially serious limitations [hh]	Partially applicable [ii]	None	At 12 months Health and social care perspective TBI-VR: £2,106.94	QALYs (at 12 months) TBI-VR: 0.1938 UC: 0.1763 Return to work or	At 12 months Health and social care perspective TBI-VR vs UC: £76.24 more expensive	QALYs (at 12 months) TBI-VR vs UC: 0.0175 more QALYs Return to work or	CEA, per person returned to work, TBI-VR vs UC Health and social care perspective: £501.33	Stochastic uncertainty in the data were dealt with using nonparametric bootstraps for CUA. The boot strapped ICER was £2,567 lower than the deterministic ICER.

Study	Limitations	Applicability	Other comments	Costs	Effects	Incremental cost	Incremental effects	Cost-effectiveness	Uncertainty
hours due to traumatic brain injury (TBI) Intervention: TBI Vocational Rehabilitation (TBI-VR), provided by an occupational therapist [ff] Comparators: Usual care (UC): participants in hospitals without TBI-VR. [gg]				UC: £2,031.71 Societal perspective TBI-VR: £8,786 UC: £10,648	education (at 12 months) TBI-VR: 75% UC: 60%	 Societal perspective TBI-VR vs UC: £1,867 less expensive	education (at 12 months) TBI-VR vs UC: 15% more people returned to work	 Societal perspective: TBI-VR was more effective and saved money CBA Health and social care perspective: TBI-VR was £75.23 more costly vs UC Societal perspective: TBI-VR was £1,863 less expensive than UC. Neither difference was statistically significant CUA, TBI-VR vs UC From a health and social care	 Sensitivity analysis using imputed data for missing values more than doubled the cost per person returned to work in the CEA and increased the ICER per QALY gained in the CUA to £35,873 with TBI-VR.

Study	Limitations	Applicability	Other comments	Costs	Effects	Incremental cost	Incremental effects	Cost-effectiveness	Uncertainty
								perspective: £4,299 per QALY gained Neither the QALY gain nor cost difference was statistically significant	
Rebergen 2009 (Netherlands) Population: Police workers on sick leave due to common mental disorders (CMDs) Intervention: Guideline based care (GBC), treatment by occupational physicians (OPs) according to the Dutch guideline for	Potentially serious limitations [kk]	Partially applicable [ll]	None	At 12 months Health care perspective GBC: €2,145 UC: €2,664 Societal perspective (HCA for productivity loss) TBI-VR: €14,114 UC: €14,202 No costs were statistically significantly different	Days of sick leave GBC: 113 UC: 114 These were not statistically significantly different	At 12 months Health care perspective GBC vs UC: €520 less expensive	Days of sick leave, at 12 months GBC vs UC: 1 fewer The difference was not statistically significant	CEA GBC vs UC, ICER per sick day avoided: -€736 CBA Estimated net monitory benefit of GBC, per person: €3,582 Outcomes are similar between GBC and UC, but direct costs were lower with GBC. The authors concluded that GBC could be cost-effective.	Stochastic uncertainty in the data were dealt with using nonparametric bootstraps for CEA. The iterations showed there was never more than a 50% chance of GBC being cost-effective per day of sick leave avoided regardless of the value of the day of work lost. Different approaches to measuring productivity loss were analysed but did not affect the main findings.

Study	Limitations	Applicability	Other comments	Costs	Effects	Incremental cost	Incremental effects	Cost-effectiveness	Uncertainty
workers with mental health problems. [jj] Comparator: Usual care (UC): minimal involvement of the OP and easy access to counselling by a psychologist.				between groups					
Schene 2007 (Netherlands) Population: Workers (aged 18 years or over) with at least 50% absence over 10 weeks to 2 years due to work related major depressive disorder (WRMDD) Intervention: Treatment as usual (TAU) + occupational therapy (OT):	Potentially serious limitations [nn]	Partially applicable [oo]	None	At 12 months (cost of intervention only) TAU+OT: $3,149 TAU: $1,891	No health or employment outcomes were reported beyond earnings over 12 month period	TAU+OT vs TAU at 12 months (cost of intervention only): $1,258 more expensive (Not statistically significant)	Not applicable	Difference in total earnings minus costs of intervention at 12 months TAU+OT vs TAU: $3,952 higher (Not statistically significant)	The base case was a bootstrapped analysis to account for stochastic uncertainty. The only sensitivity analysis performed was on the value of an hour's work. As the value reduces the probability that TAU+OT is more cost-effective than TAU falls. In the base case it is 75.5% at $36.88 per hour and falls to 52.5% at $10 per hour

Study	Limitations	Applicability	Other comments	Costs	Effects	Incremental cost	Incremental effects	Cost-effectiveness	Uncertainty
TAU was as described below (comparator). OT was the addition of OT, which had diagnostic and therapeutic phases. [mm] Comparator: Treatment as usual (TAU): out-patient psychiatric treatment for depression according to American Psychiatric Association (APA) guideline and antidepressants and/or cognitive behavioural therapy (CBT) with senior psychiatric residents. Visits lasted 30 minutes every 2–3 weeks.									

Study	Limitations	Applicability	Other comments	Costs	Effects	Incremental cost	Incremental effects	Cost-effectiveness	Uncertainty
Squires 2012 (UK) Population: Workers on sick leave for 1 week to 6 months due to musculoskeletal disorders (MSDs) Interventions (synthesized evidence identified through a review): • Workplace interventions (WI): a workplace assessment and work modifications based on participative ergonomics involving all relevant stakeholders [pp]	Potentially serious limitations [ss]	Partially applicable [tt]	Costs and effects data were very poorly reported. Results were presented on a cost-effectiveness plane and not in a detailed table or text.	Not reported	Increased likelihood of return to work (i.e. relative risk) within the first 6 months of sickness absence (obtained from a literature review) WI: 1.12 PAE: 1.06 PAEW: 1.43	Not reported	Not reported	CUA (from societal perspective so includes costs to NHS and from lost wages) WI and PAEW are both cheaper than UC and more effective. PAE is more costly but more effective than UC. PAEW dominates all interventions. CEA, cost per sick day avoided PAEW is the dominant strategy	Sensitivity and scenario analyses were undertaken. PAEW was not dominant if only the employer perspective was taken and the probability of sick leave recurring was doubled. In a threshold analysis, if the intervention costs were less than an additional £3,000 and returns at least an additional 3% of people to work (32/1,000) in comparison to UC, then it is likely to result in a cost per QALY gained below £20,000.

Study	Limitations	Applicability	Other comments	Costs	Effects	Incremental cost	Incremental effects	Cost-effectiveness	Uncertainty
• Physical activity and education intervention (PAE): any form of physical activity and education around how to deal with pain and body mechanics • Physical activity, education and workplace visit (PAEW): WI+PAE plus a workplace visit by the employee and the physical therapist to inform rehabilitation. [qq] Comparator:									

Study	Limitations	Applicability	Other comments	Costs	Effects	Incremental cost	Incremental effects	Cost-effectiveness	Uncertainty
Usual care (UC) treatment of MSDs in the UK [rr]									
Steenstra 2006 (Netherlands) Population: Workers on sick leave for 2 to 6 weeks due to low back pain (LBP) The study had a 2-stage design. Between 2 to 8 weeks of sick-leave, patients received either the workplace intervention (WI) or usual care (UC). After 8 weeks, approximately half of each group also received a clinical intervention (CI).	Potentially serious limitations [xx]	Partially applicable [yy]	None	Mean total costs WI: €8,993 UC: €9,109 UC+CI: €10,537 UC+UC: €10,885 WI+CI: €12,391 WI+WI: €11,096	Actual QALY values not reported Sick leave (calendar days) WI: 108.5 UC: 135.2 UC+CI: 172.9 UC+UC: 155.9 WI+CI: 181.7 WI+WI: 115.3	Vs UC over 12 months WI: €16 UC+CI: €1,428 WI+CI: €3,282 None of the differences were statistically significant	Incremental QALY values were not reported Sick leave vs UC, calendar days WI: -26.7 days UC+UC: 20.7 days WI+CI: 46.5 days	CEA (per 1 day less of sick leave) WI vs UC: €19 WI+CI vs UC: €11 UC+CI vs UC: €29 CUA (cost per QALY) WI vs UC: -€1,483 WI+CI vs UC: €24,416 UC+CI vs UC: €5,447	The base case was a bootstrapped analysis to account for stochastic uncertainty. The cost-effective planes (and confidence intervals of point estimates) suggested that WI and UC were likely similar in cost but that WI was more effective. CI is likely less effective and more costly than both WI and UC. Scenario analyses suggested using a fixed sum per day of production lost, net rather than calendar sick days and using a HCA approach to productivity loss did not significantly influence results.

Study	Limitations	Applicability	Other comments	Costs	Effects	Incremental cost	Incremental effects	Cost-effectiveness	Uncertainty
Interventions: • WI: usual care, a workplace assessment and modification and communication between OP and GP in order to discuss how to counsel the worker to RtW [uu] • Clinical intervention (CI): a graded activity programme of 26 x 1-hour sessions, with a frequency of 2 sessions per week [vv] Comparator: Usual Care (UC): Dutch OP guidelines for LBP									

Study	Limitations	Applicability	Other comments	Costs	Effects	Incremental cost	Incremental effects	Cost-effectiveness	Uncertainty
delivered by a GP. [ww]									
Uegaki 2010 (Netherlands) Population: Workers with partial sick leave over 3 months due to distress Intervention: Minimal intervention for stress-related mental disorders with sick leave (MISS): a GP customized version of an activating approach [zz] Comparator: usual care (UC) managed by a GP. No further information given.	Potentially serious limitations [aaa]	Partially applicable [bbb]	None	At 12 months MISS: €12,538 UC: €12,722	QALYs over 12 months MISS: 0.78 UC: 0.76	MISS vs UC, incremental cost at 12 months: A saving of €184 This was not statistically significant	QALY gain, over 12 months MISS vs UC: 0.02 QALYs This was not statistically significant	ICER MISS vs UC: -€7,356 per QALY gained Neither change in costs nor change in QALYs were statistically significantly different between MISS and UC	The base case was a bootstrapped analysis to account for stochastic uncertainty. Cost-effectiveness planes showed that in the base case 77% of bootstrapped pairs would be considered cost-effective at a willingness to pay (WTP) threshold of €25,600 per QALY. Sensitivity analysis explored different approaches to costing lost productivity but did not significantly influence the results. Subgroup analysis suggested MISS may be most cost-effective for patients with stress related mental

Study	Limitations	Applicability	Other comments	Costs	Effects	Incremental cost	Incremental effects	Cost-effectiveness	Uncertainty
									disorders, which was the only analysis which had statistically significant improvement in QALYs vs UC: -€28,278

ACT: acceptance and commitment therapy; APA: American Psychiatric Association; BM: behavioural medicine; CAU: care as usual; CBA: cost-benefit analysis; CBT: cognitive behavioural therapy; CCM: conventional case management; CEA: cost-effectiveness analysis; CG: control group; CI: clinical intervention; CMD: common mental disorder; CRI: clinical rehabilitation intervention; CTWR: coordinated and tailored work rehabilitation; CUA: cost-utility analysis; DFB: days on full benefits; FCA: frictional cost approach; GBC: guideline based care; GP: general practitioner; HCA: human capital approach; IC: Integrated care; ICER: incremental cost-effectiveness ratio; IG: intervention group; LBP: lower back pain; MDT: multidisciplinary treatment; MISS: minimal Intervention for stress-related mental disorders with sick leave; MSD: musculoskeletal disorders; MSK: musculoskeletal disorders; NA: not applicable; OI: occupational intervention; OP: occupational physician; OT: occupational therapy; PAE: physical activity and education intervention; PAEW: physical activity, education and workplace visit; PSA: probabilistic sensitivity analysis; PT: physiotherapy; QALY: quality-adjusted life year; RtW: return to work; TAU: treatment as usual; TBI: traumatic brain injury; TBI-VR: traumatic brain injury vocational rehabilitation; UC: usual care; VAS: visual analogue scale; VR: vocational rehabilitation; WDI: workplace dialogue intervention; WI: workplace intervention; WRMDD: work related major depressive disorder; WTE: whole time equivalent; WTP: willingness to pay

(a) The five steps comprised: (1) making an inventory of problems and/or opportunities encountered at work after RtW; (2) brainstorming about solutions/realisations; (3) writing down solutions/ realisations and the support needed and assessing the applicability of these solutions; (4) discussing solutions/ realisations and making an action plan with the supervisor; (5) evaluating the action plan/implementation of solutions.

(b) Occupational physicians (OPs) enacted the guideline of the Netherlands Society of Occupational Medicine "The treatment of workers with mental health problems by the OP". It is primarily aimed at structuring OPs' treatment to help sick-listed workers with mental health issues to RtW. Limited focus is given to follow-up after RtW has been achieved: only one consultation, to address relapse.

(c) A 12 month time horizon was used, which is insufficient to capture whether outcomes are sustained. Impact on QALYs was not considered.

(d) It was unclear how long people in the study had been absent from work. The study was in the Netherlands where the occupational support offered is differently organised than in the UK.

(e) Calculated from the total costs reported in the paper.

(f) Treatment was over 10 weeks and entailed 3 stages: (i) understanding the cause of loss of control (ii) the development of problem-solving strategies; and (iii) their implementation.

(g) This could include medication, counselling or referral.

(h) An 18 month time horizon was used, which is insufficient to capture whether outcomes were sustained. Deterministic sensitivity analysis was not performed.

(i) People in the study could have been absent for less than four weeks. The study was in the Netherlands where the occupational support offered is differently organised than the UK. It is unclear how utility values were derived.

Study	Limitations	Applicability	Other comments	Costs	Effects	Incremental cost	Incremental effects	Cost-effectiveness	Uncertainty

(j) After 4 to 12 weeks of sick leave: (1) work disability screening was conducted: a multidisciplinary assessment of disability and functioning and identification of barriers for RtW and (2) a coordinated, tailored and action-oriented work rehabilitation plan was developed by an interdisciplinary team with continuous feedback on the plan from the sick listed worker, the interdisciplinary team, the workplace, and major stakeholders. The interdisciplinary team consisted of an occupational physician, an occupational physiotherapist, a chiropractor, a psychologist, and a social worker who had the role of case worker.

(k) A 12 month time horizon was used which is insufficient to capture whether outcomes are sustained. Impact on QALYs was not considered. Probabilistic sensitivity analysis (PSA) was not undertaken.

(l) The study was in Denmark where the organisation of the sickness benefits system is similar to the UK, but may still be different enough to limit the generalisability of findings.

(m) The first part (sessions 1 to 3) emphasized mindfulness, cognitive defusion, and acceptance. During sessions 4 to 6, the focus was on exploring and clarifying personal values and committing to pursuing valued life activities.

(n) The first step was an individual interview with the participant at the clinic followed by an interview with the participant's supervisor at the workplace. These meetings, lasting up to 60 minutes, aimed to investigate the participants' and the supervisors' views upon causes of the sickness absence, and what might facilitate RTW.

(o) There was no integration or coordination of the two interventions, and no interaction between therapists.

(p) This typically included psychotherapy, cognitive behavioural therapy and/or pharmacological treatments, physical therapy and counselling.

(q) A 12 month time horizon was used which is insufficient to capture sustainability of outcomes. Medication costs were not considered.

(r) It was unclear how much time people in the study had been absent from work and the study was in Sweden where the occupational support offered is differently organised than in the UK. Drug costs were not considered despite a societal perspective.

(s) This consisted of approximately 20 scheduled hours per week aimed at enhancing the physical functioning and facilitating lasting behaviour change. Each participant was assigned to an individually tailored training programme.

(t) This was an average of 13 to 14 scheduled hours per week aimed at improving participants' ability to manage their pain and resume a normal level of activity.

(u) A time horizon of 3 years was used which is only partly sufficient to assess whether outcomes are sustainable over the long-term. No deterministic sensitivity analysis or probabilistic sensitivity analysis was performed. Cost sources were poorly reported.

(v) The study was conducted in Sweden where the organisation of sickness benefits system is similar to the UK, but may still be different enough to limit the generalisability of the findings.

(w) The workplace intervention protocol formulated a consensus-based plan for adaptations at work to facilitate return to work. The integrated care team consisted of a medical specialist, occupational therapist, physiotherapist, and clinical occupational physician.

(x) Only a 12 month time horizon was used which is insufficient to capture whether outcomes are sustained.

(y) The study includes people on partial sick leave so may not be considered 'continuous absence'. The study was set in the Netherlands where the organisation of healthcare and sickness may be different enough from the UK to limit the generalisability of findings.

(z) Clinical examination by a back pain medical specialist, participation in a back school after eight weeks of absence from regular work and, if necessary, a multidisciplinary work rehabilitation intervention after 12 weeks of absence from work.

(aa) Impact on QALYs was not considered and no probabilistic sensitivity analysis was reported.

Study	Limitations	Applicability	Other comments	Costs	Effects	Incremental cost	Incremental effects	Cost-effectiveness	Uncertainty

(bb) The study was conducted in Canada where the organisation of the sickness benefits system is similar to the UK, but where it may still be different enough to limit the generalisability of findings. The perspective included the employment insurer.

(cc) The main part of the intervention took 13 full days, 5 return-to-work sessions and 1 feedback session, all of which took place within 2 months. Each day's schedule consisted of four (1.5 hours) sessions: two physical sessions and two psychological sessions, twice a week supplemented with a fifth session consisting of 30 minutes of relaxation exercises.

(dd) The study only had a 12 month time horizon which is insufficient to assess whether outcomes are sustained. Impact on QALYs was not considered. No deterministic or PSA was performed.

(ee) The population includes people with 50% to 100% sick leave. The study was set in the Netherlands where the occupational support offered is differently organised to the UK.

(ff) Vocational rehabilitation involved: assessing the impact of TBI on the participant, family and their roles; community reintegration training; pre-work training; liaison with employers, tutors or employment advisors.

(gg) Local differences in service provision meant that this varied widely between participants, but potentially involved support from Headway (a voluntary organization providing advice and support to TBI people and their families), community occupational therapy (OT) or physiotherapy and routine GP follow-up.

(hh) A 12 month time horizon was used which was insufficient to capture whether outcomes were sustained. QALY data were estimated using VAS. Effectiveness data were not derived from a RCT.

(ii) Although this was a UK study, the population included students and those in unpaid employment. EQ-5D VAS data were used for utilities rather than health states valued by a population.

(jj) The course focused on an early start of the intervention by OPs, in which they operated as an activating counsellor using CBT to enhance the problem-solving capacity of workers, especially in relation to their work environment. This consisted of clinical management according to the APA Guideline (2000) and antidepressants and/or CBT with senior psychiatric residents. Visits lasted 30 minutes every 2 to 3 weeks.

(kk) A 12 month time horizon was used which was insufficient to capture whether outcomes were sustained. QALYs were not considered and neither were all healthcare costs.

(ll) The length of unemployment was unclear for study participants. The study was conducted in the Netherlands where occupational support is differently organised to the UK.

(mm) TAU included antidepressants, if indicated and accepted by patients. They were treated by senior psychiatric residents with visits lasting 30 minutes every 2 to 3 weeks. OT consisted of two skilled occupational therapists providing the intervention over three manual-based phases: diagnostic phase (4 weeks) – five contacts with an occupational physician from the patient's employer and a plan for work reintegration; therapeutic phase (24 weeks) – 24 weekly group sessions (8 to 10 patients) and 12 individual sessions; follow-up phase (20 weeks) – three individual visits.

(nn) A 12 month time horizon was used which is insufficient to capture whether outcomes were sustained. QALYs were not considered. The source of costs was unclear.

(oo) The population includes people with 50% to 100% sick leave. The study was set in the Netherlands where the occupational support offered is differently organised to the UK.

(pp) Work modifications were defined as those based on participative ergonomics involving all relevant stakeholders.

Study	Limitations	Applicability	Other comments	Costs	Effects	Incremental cost	Incremental effects	Cost-effectiveness	Uncertainty

(qq) This enabled the employer to become actively involved in the rehabilitation process. The PAEW intervention did not include a workplace assessment and work modifications, as was part of the WI.

(rr) UC included 4.5 GP visits, 4.5 prescriptions, 3 packs of pain relief medication, 4 half hour sessions of physiotherapy (in 7% of cases), 2.5 sessions of osteopathy (in 5% of cases), 2.5 sessions of chiropractic treatment (in 2% of cases) and a hospital outpatient visit (in 10% of cases).

(ss) Whilst a lifetime horizon was used in the model it was based on only 12 months of effectiveness data with outcomes not influenced by the intervention after 12 months. Costs, QALYs and incremental analysis were not reported and PSA was not performed.

(tt) Although this is a UK study, it is based upon effectiveness studies that were conducted outside the UK and the authors stated that this fact may limit study generalisability. Costs and outcomes data were also not well reported.

(uu) WI started at baseline, at least 8 weeks before sick-leave. The intervention consisted of: Dutch OP guidelines for LBP; A workplace assessment and work modifications based on participative ergonomics, which involved all important stakeholders: the occupational health service's ergonomist or occupational health nurse, the worker on sick-leave, the worker's supervisor and other communication between the OP and the GP, to reach consensus on counselling the worker in RTW.

(vv) A graded activity programme based on operant behavioural therapy principles based on the findings from patient history, physical examination, functional capacity evaluation, the demands from the patients' work and the patients' expectations on time to RTW. The entire programme consisted of a maximum of 26 one-hour sessions, with a frequency of two sessions a week. The first session took half an hour more since taking the patients' history and a physical examination were part of this session. The programme ended as soon as a full RTW had been established, according to an earlier agreed upon individual schedule. During the programme the worker had an active role in RTW and the physiotherapist acted as a coach and supervisor, using a hands-off approach

*(ww)*This included resuming daily activities, working within two weeks was encouraged and a clinical intervention recommended after 12 weeks.

(xx) A 12 month time horizon was used which is insufficient to capture whether outcomes were sustained. QALYs were estimated using VAS.

(yy) This study included people with 2 to 4 weeks of sick leave. The study was in the Netherlands where the occupational support offered is differently organised than the UK. EQ-5D VAS rather than 5 level health state was used for utility values.

(zz) This was developed on the basis of three consultations over a time span of four weeks, and encompassed the following five key tasks: 1 diagnosing stress-related mental disorders; 2 providing education about the problem and importance of taking an active role in one's functional recovery; 3 advising patients on how to reflect, cope and problem-solve; 4 monitoring progress; 5 referring to specialists.

(aaa) A 12 month time horizon was used which is insufficient to capture the sustainability of outcomes.

(bbb) Participants were those with partial sick leave over six months. The study was in the Netherlands where the occupational support offered is differently organised than in the UK.

Evidence statements

- One cost-effectiveness and cost-benefit analysis (Arends 2013), in a sensitivity analysis that excluded an outlier, found that a five-step return to work programme for people with common mental disorders could be cost-effective compared to care as usual. The analysis was assessed as partially applicable to the review question, with potentially serious limitations.
- One cost-utility and cost-benefit analysis (Brouwers, 2007) found that an activating intervention by social workers with people absent from work with distress or minor mental disorders reduced sick leave duration and increased QALYs with a reduction in costs with a negative deterministic ICER indicating that the intervention dominated usual care. The analysis was assessed as partially applicable to the review question, with potentially serious limitations.
- One cost-effectiveness and cost-benefit analysis (Bultmann, 2009) found that work disability screening using a multidisciplinary assessment of disability and functioning and identification of barriers for return to work followed by a coordinated, tailored and action-oriented work rehabilitation plan developed for workers on sick leave for 4–12 weeks due to muskuloskeletal disorders had fewer sickness absence hours than controls receiving usual care. The economic evaluation showed that coordinated and tailored work rehabilitation seems to be cost saving for society. The analysis was assessed as partially applicable to the review question, with potentially serious limitations.
- One cost-utility analysis (Finnes, 2017) found that a psychological intervention either alone or in combination with a work place intervention for people on sickness absence due to mental disorders was likely to be cost-effective compared to treatment as usual. However, neither improvements in quality-adjusted life-years (QALYs) or differences in cost with the interventions were statistically significant. The analysis was assessed as partially applicable to the review question, with potentially serious limitations.
- One cost-benefit analysis (Jensen, 2005) found that a physiotherapy intervention with a CBT component had the lowest overall costs (healthcare costs, lost days of work and disability pension costs were included) compared to physiotherapy or cognitive behavioural therapy (CBT) alone or usual care for workers with neck and back pain. The analysis was assessed as partially applicable to the review question, with potentially serious limitations.
- One cost-effectiveness, cost-benefit and cost-utility analysis (Lambeek, 2010) concluded that an integrated work based CBT programme for people on sick-leave with lower back pain was cost-effective compared to usual care, saving money and generating QALYs . The analysis was assessed as partially applicable to the review question, with potentially serious limitations.
- One cost-effectiveness and cost-benefit analysis (Loisel, 2002) found evidence that an occupational intervention, clinical intervention or combination of the two (the Sherbrook Model) for people absent with back pain may be cost-effective in pairwise comparisons with usual care. The study had fewer than 30 people in each study arm and no statistical signifcance testing of results was performed. This analysis was assessed as partially applicable to the review question, with minor study limitations.
- One cost-effectiveness analysis (Meijer, 2006) found no evidence that a residential multi-disciplinary team programme for people on sick-leave with upper musculoskeletal disorders was cost-effective compared to usual care. The analysis was assessed as partially applicable to the review question, with potentially serious limitations.
- One cost-effectiveness, cost-benefit and cost-utility analysis (Radford, 2012) found that a vocational rehabilitation programme for people with traumatic brain injury returned more people to work and was potentially cost-effective. The analysis was assessed as not being applicable to the review question – because the population included students and those in unpaid employment – with potentially serious limitations.

- One cost-effectiveness and cost-benefit analysis (Rebergen, 2009) found that care following a national guideline delivered by occupational physicians for people on sick leave due to mental disorders resulted in no difference in work outcomes but lower healthcare costs than usual care and so was possibly cost-effective. The analysis was assessed as partially applicable to the review question, with potentially serious limitations.
- One cost-benefit analysis (Schene, 2007) found that an occupational therapist led CBT intervention for people absent from work with depression reduced work days lost and was likely to be cost-effective compared to treatment as usual. The analysis was assessed as partially applicable to the review question, with potentially serious limitations.
- One cost-utility analysis (Squires, 2011) using modelling based upon previously published studies found that for people on sickness absence with musculoskeletal disorders, a workplace intervention and a combination workplace intervention with physical activity and education intervention generate more QALYs compared to usual care at a lower cost and so therefore dominating usual care. The combination intervention had lower costs and generated more QALYs than a workplace intervention or physical activity intervention alone. The analysis was assessed as partially applicable to the review question, with potentially serious limitations.
- One cost-effectiveness and cost-utility analysis (Steenstra, 2006) found that for workers sick-listed due to low back pain, a work place intervention based upon ergonomics returned people to work faster than usual care at a slightly higher cost. A clinical intervention involving a graded activity programme with behavioural therapy was found to be less effective and more costly than usual care . The analysis was assessed as partially applicable to the review question, with potentially serious limitations.
- One cost-utility analysis (Uegaki, 2010) found that a general practitioner (GP) customised activation programme for people on sick leave due to stress related sick leave was not statistically superior in costs or QALYs compared to usual care managed by a GP although there was as high a likelihood of the intervention being cost-effective for people on sick leave due to stress-related mental disorders. The analysis was assessed as partially applicable to the review question, with potentially serious limitations.

The committee's discussion of the evidence

Cost effectiveness and resource use

The committee noted the lack of health economic literature directly applicable to the UK. And even though it was mixed, they were mindful that overall it suggested interventions for people on sick leave due to musculoskeletal disorders including back pain or common mental disorders to support them to return to work could be cost effective. Therefore a new health economic model was developed to determine how cost-effective an intervention will be in helping employees on sickness absence to return to work.

Because the committee were concerned that interventions and size and type of organisation vary greatly and a myriad of factors can impact sickness absence and return to work the model adopted a generalised approach. Multiple sensitivity analyses were carried out which showed the results varied greatly by key model inputs such as the cost and effectiveness of the intervention, reduction in absenteeism and baseline rate of absenteeism.

The committee noted that the results of the model reinforced the findings of the cost effectiveness review - that interventions for people on sick leave due to musculoskeletal disorders or common mental disorders could be cost effective. However, they were mindful that these results are influenced by multiple factors some of which are specific to the local conditions and that these may explain the mixed findings reported earlier.

The committed also noted that the analysis showed in general a company with high turnover costs or costs of absenteeism will likely benefit from an intervention to reduce sickness

absence, particularly if the intervention is effective and less expensive than the overall costs of absenteeism or replacing a worker. The committee were aware that the reverse is also true. For example, an organisation with low baseline turnover costs or low levels of absenteeism will find it more difficult to realise cost savings by implementing an intervention aimed at reducing sickness absence, though this does not mean that other factors could not also benefit the organisation. The committee appreciated employers may be interested in factors other than pure cost savings for example if the organisation is willing to pay for an intervention that will benefit the workers and the organisation itself.

The committee noted that the results were influenced by multiple factors that are highly dependent on factors specific to each organisation as well as external factors such as the individual's personal life, labour market and culture of the workplace. They also noted that some identified benefits could not be quantified suggesting that the overall benefits might be greater than those reported by the model. So the committee concluded that such interventions could offer good value for money dependent on local circumstances.

References

1. van Oostrom SH, Heymans MW, de Vet HCW, van Tulder MW, van Mechelen W, Anema JR. Economic evaluation of a workplace intervention for sick-listed employees with distress. Occup Environ Med. 2010;67(9):603-10.

2. Arends I, Bultmann U, van Rhenen W, H G, van der Klink JJL. Economic evaluation of a problem solving intervention to prevent recurrent sickness absence in workers with common mental disorders. PLoS ONE. 2013;8(8):e71937.

3. Brouwers E, de Bruijne M, Terluin B, Tiemens BG, Verhaak PFM. Cost-effectiveness of an activating intervention by social workers for patients with minor mental disorders on sick leave: a randomized controlled trial. Eur J Public Health. 2007;17(2):214-20.

4. Bultmann U, Sherson D, Olsen J, Hansen CL, Lund T, Kilsgaard J. Coordinated and tailored work rehabilitation: a randomized controlled trial with economic evaluation undertaken with workers on sick leave due to musculoskeletal disorders. J Occup Rehabil. 2009;19(1):81-93.

5. Finnes A, Enebrink P, Sampaio F, Sorjonen K, Dahl J, Ghaderi A*, et al.* Cost-Effectiveness of Acceptance and Commitment Therapy and a Workplace Intervention for Employees on Sickness Absence due to Mental Disorders. J Occup Environ Med. 2017;59(12):1211-20.

6. Jensen IB, Bergstrom G, Ljungquist T, Bodin L. A 3-year follow-up of a multidisciplinary rehabilitation programme for back and neck pain. Pain. 2005;115(3):273-83.

7. Lambeek LC, Bosmans JE, Van Royen BJ, Van Tulder MW, Van Mechelen W, Anema JR. Effect of integrated care for sick listed patients with chronic low back pain: economic evaluation alongside a randomised controlled trial. BMJ. 2010;341:c6414.

8. Loisel P, Lemaire J, Poitras S, Durand MJ, Champagne F, Stock S*, et al.* Cost-benefit and cost-effectiveness analysis of a disability prevention model for back pain management: a six year follow up study. Occup Environ Med. 2002;59(12):807-15.

9. Meijer EM, Sluiter JK, Heyma A, Sadiraj K, Frings-Dresen MH. Cost-effectiveness of multidisciplinary treatment in sick-listed patients with upper extremity musculoskeletal disorders: a randomized, controlled trial with one-year follow-up. Int Arch Occup Environ Health. 2006;79(8):654-64.

10. Radford K, Phillips J, Drummond A, Sach T, Walker M, Tyerman A*, et al.* Return to work after traumatic brain injury: cohort comparison and economic evaluation. Brain Inj. 2013;27(5):507-20.

11. Rebergen DS, DJ B, van Tulder MW, van der Beek AJ, van Mechelen W. Cost-effectiveness of guideline-based care for workers with mental health problems. J Occup Environ Med. 2009;51(3):313-22.

12. Schene AH, Koeter MW, Kikkert MJ, Swinkels JA, McCrone P. Adjuvant occupational therapy for work-related major depression works: randomized trial including economic evaluation. Psychol Med. 2007;37(3):351-62.

13. Squires H, Rick J, Carroll C, Hillage J. Cost-effectiveness of interventions to return employees to work following long-term sickness absence due to musculoskeletal disorders. J Public Health. 2012;34(1):115-24.

14. Steenstra IA, Anema JR, van Tulder MW, Bongers PM, de Vet HC, van Mechelen W. Economic evaluation of a multi-stage return to work program for workers on sick-leave due to low back pain. J Occup Rehabil. 2006;16(4):557-78.

15. Uegaki K, Bakker I, de Bruijne M, van der Beek A, Terluin B, van Marwijk H*, et al.* Cost-effectiveness of a minimal intervention for stress-related sick leave in general practice: results of an economic evaluation alongside a pragmatic randomised control trial. J Affect Disord. 2010;120(1-3):177-87.

Appendices

Appendix A – Review protocols

Review protocols for review questions 1, 2 and 3

Review question 1a - What interventions, programmes, policies or strategies are cost-effective in preventing or reducing recurrence of short-term sickness absence among employees?

Review question 2a - What interventions, programmes, policies or strategies are cost effective in reducing the number of employees who move from short- to long-term sickness absence?

Review question 3a - What interventions, programmes, policies or strategies are cost effective in:

- helping employees on long-term sickness absence to return to work?
- reducing the recurrence of long-term sickness absence following a return to work?

The same protocols were used for both the effectiveness and cost-effectiveness reviews. See effectiveness reviews for full details.

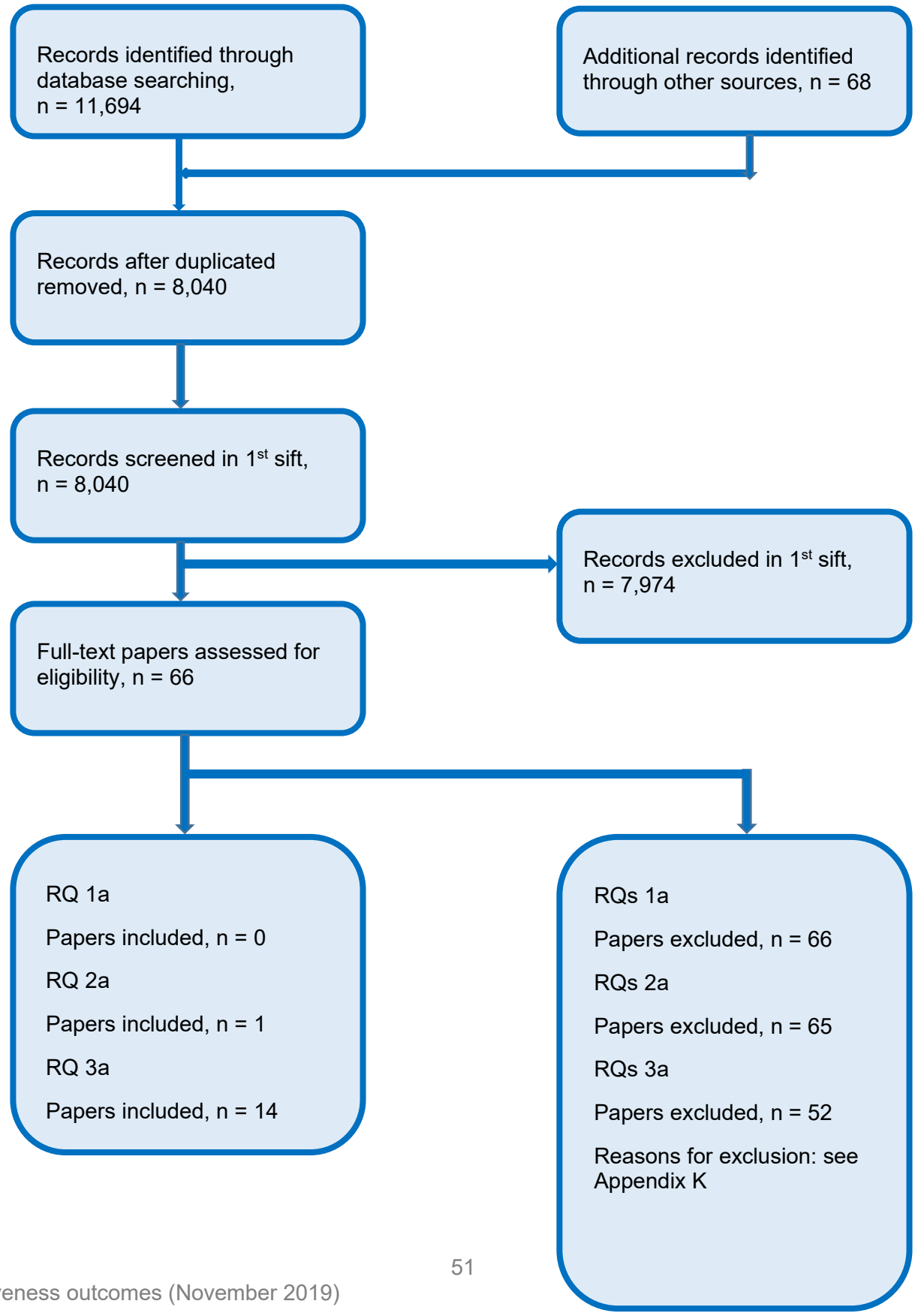
Appendix B – Literature search strategies

Guideline-wide search strategies were undertaken based on the review protocols provided for all review questions. See effectiveness reviews for full details.

Appendix G – Economic evidence study selection

The following flowchart shows the record selection process for all three review questions.

Figure 1: Flow chart of economic evidence study selection for the guideline



Appendix H – Economic evidence tables

Table 5: Summary of studies included in the economic evidence review for workplace health interventions for RQ 1a, 2a and 3a

Study	Limitations	Applicability	Other comments	Costs	Effects	Incremental cost	Incremental effects	Cost-effectiveness	Uncertainty
Arends 2013 (Netherlands) Population: Workers (aged 18 to 63 years) who were diagnosed at start of sickness absence with a common mental disorder (CMD) and were now partially or fully ready to return to work. Intervention: SHARP-at work. A five steps intervention: return to work (RtW) was started with the	Potentially serious limitations [c]	Partially applicable [d]	None	Mean cost per person SHARP Cost-effectiveness analysis (CEA): €4,167 Cost-benefit analysis (CBA): Between €29,337 (human capital approach (HCA) to productivity loss) and €37,215 (friction cost approach (FCA) to	Recurrent sickness absence over 12 months SHARP: 39% CAU: 62%	SHARP vs CAU[e] CEA: €1,764 more CBA: €4,730 (HCA) CBA: €5,530 (FCA)	Recurrent sickness absence over 12 months, SHARP vs CAU, bootstrapped estimate: 24% lower	CEA, incremental cost-effectiveness ratio (ICER), SHARP vs CAU, per 1% of recurrent sickness absence prevented: €10,605 CBA Employer occupational health costs only, SHARP was €800 greater than with CAU Productivity loss (HCA) SHARP vs CAU: €6,046	Sensitivity analyses CEA Excluding an outlier, which was attributed to high costs due to hospitalisation in a psychiatric ward, an ICER of €-533 was calculated for the incidence of recurrent sickness absence, indicating SHARP could be cost-effective. Reduced SHARP costs did not change the direction of the primary analyses. CBA Reduced SHARP costs did not change these results

Study	Limitations	Applicability	Other comments	Costs	Effects	Incremental cost	Incremental effects	Cost-effectiveness	Uncertainty
occupational physician (OP) monitoring and supporting the person through the steps. [a] Comparator: Care as usual (CAU) [b]				productivity loss) CAU CEA: €2,403 CBA: Between €24,607 (HCA) and €31,685 (FCA)				Productivity loss (FCA) SHARP vs CAU: €3,995	

Study	Limitations	Applicability	Other comments	Costs	Effects	Incremental cost	Incremental effects	Cost-effectiveness	Uncertainty
Brouwers 2007 (Netherlands) Population: People (aged 18-60 years) absent from work on sick leave for no more than 3 months due to a minor mental disorder Intervention group (IG): 5 individual sessions (50 minutes each), covering 3	Potentially serious limitations [h]	Partially applicable [i]	None	Mean cost per person IG: €14,493 (exclusive of intervention costs of €13,305 total for all people) CAU: €14,482 CAU CEA: €2,403	Mean quality-adjusted life years (QALYs) per person not reported Sick leave duration until full return to work IG: 152.7 days CAU: 156.5 days	CBA IG vs CAU (excluding costs of intervention): €11 more expensive (not statistically different) Cost-utility analysis (CUA), based on 2,000 bootstrap pairs	Mean QALYs per person IG vs CAU (Dutch EQ-5D): 0.056 higher IG vs CAU (UK EQ-5D): 0.044 higher Sick leave duration until full return to work IG vs CAU: 3.8 days sooner	CUA, ICER Probabilistic ICERs reported (ICERs are negative). IG vs CAU (Dutch EQ-5D): - €4,179 IG vs CAU (UK EQ-5D): - €5,306 IG was less expensive and more effective than CAU	Stochastic uncertainty in the data were dealt with using nonparametric bootstraps for CUA. This demonstrated an even split between the north east and south east quadrants of the cost-effectiveness plane indicating that any difference in costs between IG and CAU were likely small. 52% of bootstrap estimates were in the south east quadrant

Study	Limitations	Applicability	Other comments	Costs	Effects	Incremental cost	Incremental effects	Cost-effectiveness	Uncertainty
stages, with a social worker: cause, coping and implementation. [f] Comparator: Care as usual (CAU): routine general practitioner (GP) care [g]				CBA: €24,607 (HCA) to €31,685 (FCA)	No statistically significantly difference	IG vs CAU: €234 cheaper		CBA IG vs CAU: €11 more expensive (not statistically significant but did not include intervention costs)	where IG dominates CAU.

Study	Limitations	Applicability	Other comments	Costs	Effects	Incremental cost	Incremental effects	Cost-effectiveness	Uncertainty
Bultmann 2009 (Denmark) Population: Workers on sick leave for 4 to 12 weeks due to lower back pain (LBP) or musculoskeletal disorders (MSD) Intervention: Coordinated and tailored work	Potentially serious limitations [k]	Partially applicable [l]	None	Mean cost per person, over 12 months CTWR: $31,144 ($3,321 without productivity loss) CCM: $41,812 ($1,773 without productivity loss)	Sickness absence, per person, over 12 months CTWR: 656.6 hours CCM: 997.3 hours	Over 12 months, per person CTWR vs CCM: $10,668 ($1,548 more over 12 months without productivity loss)	Mean absence days averted CTWR vs CCM: 46.0	CEA CTWR vs CCM, per absence day avoided (without productivity loss): $33.7	One way deterministic sensitivity analysis of a doubling of intervention costs and 25% reduction in wages still resulted in cost savings under the CBA.

Study	Limitations	Applicability	Other comments	Costs	Effects	Incremental cost	Incremental effects	Cost-effectiveness	Uncertainty
rehabilitation (CTWR), screening followed by a tailored rehabilitation plan developed by an interdisciplinary team [j] Comparator: Conventional case management (CCM) provided by the municipality. No further information given.									
Finnes 2017 (Sweden) Population: Workers (at least 50% whole time equivalent (WTE)) with sickness absence due to anxiety,	Potentially serious limitations [q]	Partially applicable [r]	None	12 month costs Healthcare perspective ACT: $5,507 WDI: $6,465 ACT+WDI: $6,141	QALY gains over 12 months ACT: 0.164 WDI: 0.122 ACT+WDI: 0.168 TAU: 0.155	12 months, vs ACT Healthcare perspective WDI: $958 ACT+WDI: $634 TAU: $700 Societal perspective	QALY gains over 12 months vs ACT WDI: -0.042 ACT+WDI: 0.046 TAU: -0.009	ICER Healthcare perspective Both TAU and WDI were dominated by ACT ACT vs baseline:	Stochastic uncertainty in the data were dealt with using nonparametric bootstraps for CUA. This showed that for ACT compared to ACT+WDI from both the healthcare and societal perspectives, the percentage of

Study	Limitations	Applicability	Other comments	Costs	Effects	Incremental cost	Incremental effects	Cost-effectiveness	Uncertainty
depression, stress or exhaustion Interventions: • Acceptance and Commitment Therapy (ACT): a psychological intervention consisting of 6 X 60-minute sessions [m] • Workplace dialogue intervention (WDI): three meetings involving the participant plus work supervisor [n] • ACT + WDI: conducted by two different therapists [o] Comparator: Treatment as usual (TAU) was treatment				TAU: $6,207 Societal perspective ACT: $14,452 WDI: $15,649 ACT+WDI: $17,066 TAU: $15,593		WDI: $1,197 ACT+WDI: $2,614 TAU: $1,141		$33,579 per QALY gained ACT+WDI vs ACT: $158,500 per QALY gained Societal perspective Both TAU and WDI were dominated by ACT alone. Compared to ACT, ACT+WDI had an ICER of $30,804 per QALY gained	bootstrap iterations were spread roughly equally across all four quadrants, although approximately 60% of iterations in both perspectives had ACT+WDI more costly than ACT and 50% of iterations of ACT+WDI were more effective. Scenario analysis showed that using Swedish utility weights (rather than English in the base case) resulted in ACT being the dominant strategy. A second scenario explored the impact of using costs as if the intervention was delivered in a 'regular' setting in which case ACT would no longer dominate TAU but have an ICER of $71 per QALY gained (healthcare perspective) and

Study	Limitations	Applicability	Other comments	Costs	Effects	Incremental cost	Incremental effects	Cost-effectiveness	Uncertainty
as planned in a primary care centre or other care facility. [p]									ACT+WDI had an ICER of $286,000 per QALY gained compared to ACT.
Jensen 2005 (Sweden) Population: Blue-collar and service/care workers (aged 18 to 60 years) with non-specific back pain resulting in sick leave for 1-6 months Interventions: • Behaviour-oriented physiotherapy (PT) [s] • Cognitive behavioural therapy (CBT): to improve pain management [t] • Behavioural medicine programme (BM): PT+CBT	Potentially serious limitations [u]	Partially applicable [v]	None	Mean cost per person, at 3 years: female; male BM: €107,703; €130,015 PT: €189,760; €220,268 CBT: €157,800; €199,824 TAU: €245,212; €193,239	Working days lost per year: female; male Pre intervention BM: 67; 72 PT: 76; 92 CBT:115; 109 TAU: 65; 80 Post intervention BM: 99; 123 PT: 95; 110 CBT:109; 101 TAU: 82; 86	Incremental cost per person, at 3 years, vs TAU: female; male BM: -€137,509; -€63,224 PT: -€55,452; €27,029 CBT: -€87,412; €6,585	Change in working days lost per year pre and post intervention: female; male BM: 22; 51 PT: 19; 18 CBT:-6; -8 TAU: 17; 6	For women, BM, PT and CBT were all less expensive over 3 years vs TAU with BM having the lowest cost per person vs CBT BM vs CBT: €50,097 less expensive BM vs PT: $82,057 less expensive BM vs TAU: €137,509 less expensive For men, CBT and PT were both more expensive over three years than TAU with BM being less expensive	Not undertaken

Study	Limitations	Applicability	Other comments	Costs	Effects	Incremental cost	Incremental effects	Cost-effectiveness	Uncertainty
Comparator: Treatment as usual (TAU). No additional interventions outside the normal routines in health care. This was not otherwise described.								than TAU by €63,224	
Lambeek 2010 (Netherlands) Population: Employed or self-employed workers (aged 18 to 65 years) on full or partial sick leave for 12 weeks to 2 years due to non-specific low back pain (LBP). Intervention: Integrated care (IC), a graded activity	Potentially serious limitations [x]	Partially applicable [y]	None	At 12 months IC: £13,165 (£1,479 direct costs, £11,686 indirect costs) UC: £18,475 (£1,262 direct costs, £17,213 indirect costs)	Days until sustainable return to work IC: 129 UC: 197 QALYs IC: 0.74 UC: 0.65	At 12 months IC vs UC: -£5,310 (£217 direct costs, -£5,527 indirect costs)	Days until sustainable return to work, per person IC vs UC: -68	CEA £3 extra cost for every day earlier return to work with IC. Direct costs only considered. CUA IC vs UC: dominant IC cost saving over UC, per person: £5,310 QALY gain, per person: 0.09 (direct	Stochastic uncertainty in the data were dealt with using nonparametric bootstraps for CUA and CEA. This showed that in 98% of iterations IC dominated UC, for the CUA and for the CEA that if there was a willingness to pay of £10 for one day earlier return to work there was a 95% chance that IC was cost-effective. Scenario analysis showed that if only complete cases

Study	Limitations	Applicability	Other comments	Costs	Effects	Incremental cost	Incremental effects	Cost-effectiveness	Uncertainty
protocol at the workplace. [w] Comparators: usual care (UC): referred to occupational physician and GP with a letter containing the advice to treat them according to the Dutch guidelines for patients with LBP.								and indirect costs considered) CBA IC, return on investment for every £1 spent: £26 (direct and indirect costs considered)	were considered then there was no statistical difference in costs between IC and UC. A further scenario explored the impact of the intervention only for people aged under 55 years which resulted in a doubling in the costs of IC. A final scenario analysis showed that varying productivity levels did not impact on results.
Loisel 2002 (Canada) Population: Workers absent for more than 4 weeks with occupational back pain Interventions:	Minor limitations [aa]	Partially applicable [bb]	The study had fewer than 30 people in each study arm and no statistical signifcance testing of results was performed	At 12 months OI: $9,569 CRI: $12,038 Sherbrooke model: $12,137 UC: $9,789	Mean number of days on full benefits (DFB) At 12 months OI: 116.1 CI: 114.9	Incremental costs vs UC At 12 months OI: -$220 CI: $2,250 Sherbrooke model: -$2,348	Mean number of DFB, incremental difference vs UC At 12 months OI: -10.8 CI: -12	CEA (cost per DFB saved vs UC) At 12 months OI: -$20.40 (dominated UC) CI: $187.40	Sensitivity analyses were performed by varying the total healthcare costs by 60% to 190% and income per capita by 85% to 125%. Over a 6.4 year time period all interventions remained dominant vs UC over the cost ranges considered.

Study	Limitations	Applicability	Other comments	Costs	Effects	Incremental cost	Incremental effects	Cost-effectiveness	Uncertainty
• Occupational intervention (OI): visits to the study occupational medicine physician and a participatory ergonomics intervention with the study ergonomist, the injured worker, their supervisor, and management and union representatives. • Clinical rehabilitation intervention (CRI), with a back pain specialist and potentially a multidisciplinary work rehabilitation intervention at 12 weeks of absence [z]				At 6.4 years OI: $16,252 CI: $16,902 Sherbrooke model: $14,494 UC: $33,079	Sherbrooke model: 115.9 UC: 126.9 At 6.4 years OI: 228.0 CI: 178.7 Sherbrooke model: 125.6 UC: 418.3	At 6.4 years OI: -$16,827 CI: -$16,176 Sherbrooke model: -$18,585	Sherbrooke model: -11 At 6.4 years OI: -190.3 CI: -239.6 Sherbrooke model: -293.7 UC: 418.3	Sherbrooke model: $213.50 At 6.4 years OI: -$88.40 (dominated UC) CI: -$67.50 (dominated UC) Sherbrooke model: -$63.50 (dominated UC) CBA Cost differential vs UC At 12 months OI: $220 CI: -$2,250 Sherbrooke model: -$2,348 At 6.4 years OI: $16,827 CI: $16,176	

Study	Limitations	Applicability	Other comments	Costs	Effects	Incremental cost	Incremental effects	Cost-effectiveness	Uncertainty
• OI+CRI ("Sherbrooke Model") Comparator: Usual care (UC): with worker's physician receiving no advice about return to work.								Sherbrooke model: $18,585	
Meijer 2006 (Netherlands) Population: Bank and university workers on at least 50% contracts with 50% sick leave in the last 4 to 20 weeks due to non-specific upper extremity musculoskeletal disorders (MSDs) Intervention: Multidisciplinary treatment	Potentially serious limitations [dd]	Partially applicable [ee]	None	Total costs per week At 2 months MDT: €1,335 UC: €448 At 6 months MDT: €664 UC: €359 At 12 months MDT: €430	Percentage of regular hours worked Baseline MDT: 29% UC: 29% 6 months MDT: 82% UC: 72% 12 months MDT: 86% UC: 73%	Incremental costs of MDT vs UC per week At 2 months: €887 At 6 months: €305 At 12 months: €115	Difference in percentage of regular hours worked Baseline: 0% 6 months: 10% 12 months: 13% There was no statistical difference between MDT and UC at any time point	MDT was more expensive compared to UC and did not increase the proportion of days worked. MDT was not cost-effective.	Not undertaken

Study	Limitations	Applicability	Other comments	Costs	Effects	Incremental cost	Incremental effects	Cost-effectiveness	Uncertainty
(MDT): an outpatient training programme carried out at Dutch rehabilitation centres. [cc] Comparator: Usual care (UC): supervision by occupational health services. UC could include treatment at the workplace and in the regular health care system, initiated by a GP, or medical specialist.				UC: €315	There was no statistical difference between MDT and UC at any time point				
Radford 2012 (UK) Population: Patients in paid or voluntary work or in full time education, hospitalised for	Potentially serious limitations [hh]	Partially applicable [ii]	None	At 12 months Health and social care perspective TBI-VR: £2,106.94	QALYs (at 12 months) TBI-VR: 0.1938 UC: 0.1763 Return to work or	At 12 months Health and social care perspective TBI-VR vs UC: £76.24	QALYs (at 12 months) TBI-VR vs UC: 0.0175 more QALYs Return to work or	CEA, per person returned to work, TBI-VR vs UC Health and social care perspective: £501.33	Stochastic uncertainty in the data were dealt with using nonparametric bootstraps for CUA. The boot strapped ICER was £2,567 lower than the deterministic ICER.

Study	Limitations	Applicability	Other comments	Costs	Effects	Incremental cost	Incremental effects	Cost-effectiveness	Uncertainty
at least 48 hours due to traumatic brain injury (TBI) Intervention: TBI Vocational Rehabilitation (TBI-VR), provided by an occupational therapist [ff] Comparators: Usual care (UC): participants in hospitals without TBI-VR. [gg]				UC: £2,031.71 Societal perspective TBI-VR: £8,786 UC: £10,648	education (at 12 months) TBI-VR: 75% UC: 60%	more expensive Societal perspective TBI-VR vs UC: £1,867 less expensive	education (at 12 months) TBI-VR vs UC: 15% more people returned to work	Societal perspective: TBI-VR was more effective and saved money CBA Health and social care perspective: TBI-VR was £75.23 more costly vs UC Societal perspective: TBI-VR was £1,863 less expensive than UC. Neither difference was statistically significant CUA, TBI-VR vs UC From a health and social care	Sensitivity analysis using imputed data for missing values more than doubled the cost per person returned to work in the CEA and increased the ICER per QALY gained in the CUA to £35,873 with TBI-VR.

Study	Limitations	Applicability	Other comments	Costs	Effects	Incremental cost	Incremental effects	Cost-effectiveness	Uncertainty
								perspective: £4,299 per QALY gained Neither the QALY gain nor cost difference was statistically significant	
Rebergen 2009 (Netherlands) Population: Police workers on sick leave due to common mental disorders (CMDs) Intervention: Guideline based care (GBC), treatment by occupational physicians (OPs) according to the Dutch guideline for	Potentially serious limitations [kk]	Partially applicable [ll]	None	At 12 months Health care perspective GBC: €2,145 UC: €2,664 Societal perspective (HCA for productivity loss) TBI-VR: €14,114 UC: €14,202 No costs were statistically significantly	Days of sick leave GBC: 113 UC: 114 These were not statistically significantly different	At 12 months Health care perspective GBC vs UC: €520 less expensive	Days of sick leave, at 12 months GBC vs UC: 1 fewer The difference was not statistically significant	CEA GBC vs UC, ICER per sick day avoided: -€736 CBA Estimated net monitory benefit of GBC, per person: €3,582 Outcomes are similar between GBC and UC, but direct costs were lower with GBC. The authors concluded that GBC could be cost-effective.	Stochastic uncertainty in the data were dealt with using nonparametric bootstraps for CEA. The iterations showed there was never more than a 50% chance of GBC being cost-effective per day of sick leave avoided regardless of the value of the day of work lost. Different approaches to measuring productivity loss were analysed but did not affect the main findings.

Study	Limitations	Applicability	Other comments	Costs	Effects	Incremental cost	Incremental effects	Cost-effectiveness	Uncertainty
workers with mental health problems. [jj] Comparator: Usual care (UC): minimal involvement of the OP and easy access to counselling by a psychologist.				different between groups					
Schene 2007 (Netherlands) Population: Workers (aged 18 years or over) with at least 50% absence over 10 weeks to 2 years due to work related major depressive disorder (WRMDD) Intervention: Treatment as usual (TAU) + occupational therapy (OT):	Potentially serious limitations [nn]	Partially applicable [oo]	None	At 12 months (cost of intervention only) TAU+OT: $3,149 TAU: $1,891	No health or employment outcomes were reported beyond earnings over 12 month period	TAU+OT vs TAU at 12 months (cost of intervention only): $1,258 more expensive (Not statistically significant)	Not applicable	Difference in total earnings minus costs of intervention at 12 months TAU+OT vs TAU: $3,952 higher (Not statistically significant)	The base case was a bootstrapped analysis to account for stochastic uncertainty. The only sensitivity analysis performed was on the value of an hour's work. As the value reduces the probability that TAU+OT is more cost-effective than TAU falls. In the base case it is 75.5% at $36.88 per hour and falls to 52.5% at $10 per hour

Study	Limitations	Applicability	Other comments	Costs	Effects	Incremental cost	Incremental effects	Cost-effectiveness	Uncertainty
TAU was as described below (comparator). OT was the addition of OT, which had diagnostic and therapeutic phases. [mm] Comparator: Treatment as usual (TAU): out-patient psychiatric treatment for depression according to American Psychiatric Association (APA) guideline and antidepressants and/or cognitive behavioural therapy (CBT) with senior psychiatric residents. Visits lasted 30 minutes every 2–3 weeks.									

Study	Limitations	Applicability	Other comments	Costs	Effects	Incremental cost	Incremental effects	Cost-effectiveness	Uncertainty
Squires 2012 (UK) Population: Workers on sick leave for 1 week to 6 months due to musculoskeletal disorders (MSDs) Interventions (synthesized evidence identified through a review): • Workplace interventions (WI): a workplace assessment and work modifications based on participative ergonomics involving all relevant stakeholders [pp]	Potentially serious limitations [ss]	Partially applicable [tt]	Costs and effects data were very poorly reported. Results were presented on a cost-effectiveness plane and not in a detailed table or text.	Not reported	Increased likelihood of return to work (i.e. relative risk) within the first 6 months of sickness absence (obtained from a literature review) WI: 1.12 PAE: 1.06 PAEW: 1.43	Not reported	Not reported	CUA (from societal perspective so includes costs to NHS and from lost wages) WI and PAEW are both cheaper than UC and more effective. PAE is more costly but more effective than UC. PAEW dominates all interventions. CEA, cost per sick day avoided PAEW is the dominant strategy	Sensitivity and scenario analyses were undertaken. PAEW was not dominant if only the employer perspective was taken and the probability of sick leave recurring was doubled. In a threshold analysis, if the intervention costs were less than an additional £3,000 and returns at least an additional 3% of people to work (32/1,000) in comparison to UC, then it is likely to result in a cost per QALY gained below £20,000.

Study	Limitations	Applicability	Other comments	Costs	Effects	Incremental cost	Incremental effects	Cost-effectiveness	Uncertainty
• Physical activity and education intervention (PAE): any form of physical activity and education around how to deal with pain and body mechanics • Physical activity, education and workplace visit (PAEW): WI+PAE plus a workplace visit by the employee and the physical therapist to inform rehabilitation. [qq] Comparator:									

Study	Limitations	Applicability	Other comments	Costs	Effects	Incremental cost	Incremental effects	Cost-effectiveness	Uncertainty
Usual care (UC) treatment of MSDs in the UK [rr]									
Steenstra 2006 (Netherlands) Population: Workers on sick leave for 2 to 6 weeks due to low back pain (LBP) The study had a 2-stage design. Between 2 to 8 weeks of sick-leave, patients received either the workplace intervention (WI) or usual care (UC). After 8 weeks, approximately half of each group also received a clinical intervention (CI).	Potentially serious limitations [xx]	Partially applicable [yy]	None	Mean total costs WI: €8,993 UC: €9,109 UC+CI: €10,537 UC+UC: €10,885 WI+CI: €12,391 WI+WI: €11,096	Actual QALY values not reported Sick leave (calendar days) WI: 108.5 UC: 135.2 UC+CI: 172.9 UC+UC: 155.9 WI+CI: 181.7 WI+WI: 115.3	Vs UC over 12 months WI: €16 UC+CI: €1,428 WI+CI: €3,282 None of the differences were statistically significant	Incremental QALY values were not reported Sick leave vs UC, calendar days WI: -26.7 days UC+UC: 20.7 days WI+CI: 46.5 days	CEA (per 1 day less of sick leave) WI vs UC: €19 WI+CI vs UC: €11 UC+CI vs UC: €29 CUA (cost per QALY) WI vs UC: -€1,483 WI+CI vs UC: €24,416 UC+CI vs UC: €5,447	The base case was a bootstrapped analysis to account for stochastic uncertainty. The cost-effective planes (and confidence intervals of point estimates) suggested that WI and UC were likely similar in cost but that WI was more effective. CI is likely less effective and more costly than both WI and UC. Scenario analyses suggested using a fixed sum per day of production lost, net rather than calendar sick days and using a HCA approach to productivity loss did not significantly influence results.

Study	Limitations	Applicability	Other comments	Costs	Effects	Incremental cost	Incremental effects	Cost-effectiveness	Uncertainty
Interventions: • WI: usual care, a workplace assessment and modification and communication between OP and GP in order to discuss how to counsel the worker to RtW [uu] • Clinical intervention (CI): a graded activity programme of 26 x 1-hour sessions, with a frequency of 2 sessions per week [vv] Comparator: Usual Care (UC): Dutch OP guidelines for LBP									

Study	Limitations	Applicability	Other comments	Costs	Effects	Incremental cost	Incremental effects	Cost-effectiveness	Uncertainty
delivered by a GP. [ww]									
Uegaki 2010 (Netherlands) Population: Workers with partial sick leave over 3 months due to distress Intervention: Minimal intervention for stress-related mental disorders with sick leave (MISS): a GP customized version of an activating approach [zz] Comparator: usual care (UC) managed by a GP. No further information given.	Potentially serious limitations [aaa]	Partially applicable [bbb]	None	At 12 months MISS: €12,538 UC: €12,722	QALYs over 12 months MISS: 0.78 UC: 0.76	MISS vs UC, incremental cost at 12 months: A saving of €184 This was not statistically significant	QALY gain, over 12 months MISS vs UC: 0.02 QALYs This was not statistically significant	ICER MISS vs UC: -€7,356 per QALY gained Neither change in costs nor change in QALYs were statistically significantly different between MISS and UC	The base case was a bootstrapped analysis to account for stochastic uncertainty. Cost-effectiveness planes showed that in the base case 77% of bootstrapped pairs would be considered cost-effective at a willingness to pay (WTP) threshold of €25,600 per QALY. Sensitivity analysis explored different approaches to costing lost productivity but did not significantly influence the results. Subgroup analysis suggested MISS may be most cost-effective for patients with stress

Study	Limitations	Applicability	Other comments	Costs	Effects	Incremental cost	Incremental effects	Cost-effectiveness	Uncertainty
									related mental disorders, which was the only analysis which had statistically significant improvement in QALYs vs UC: -€28,278
van Oostrom 2009 (Netherlands) Population: Workers on sick leave for 2 to 8 weeks due to distress Interventions: Workplace intervention (WI): a stepwise communication process to identify and solve obstacles to return to work (RTW).[ccc] Comparators: Usual care (UC):	Potentially serious limitations [eee]	Partially applicable [fff]	None	Mean total costs, over 12 months Societal perspective WI: €3,201 UC: €2,758 Employer perspective WI: €1,386 UC: €802	Mean duration of sick leave, over 12 months Cost Effectiveness Analysis (CEA) WI: 133 days UC: 134 days Cost utility analysis (CUA) WI: 0.77 UC: 0.78	Mean cost difference, over 12 months Societal perspective WI vs UC: €443 more costly (not statistically significant) Employer perspective WI vs UC: €583 more costly (not statistically significant)	Mean duration of sick leave, over 12 months WI vs UC: 1 day fewer (not statistically significant) QALYs WI vs UC: 0.01 less (not statistically significant)	CEA WI vs UC ICER: €627 per sick day avoided Neither change in costs or change in sick days were statistically different between WI and UC CBA Net monetary benefit with WI was -€1,987 with human capital approach (HCA) and -€1,700 with	The base case was a bootstrapped analysis to account for stochastic uncertainty. Cost effectiveness planes showed substantial uncertainty in results which reflects the statistical uncertainty in the point estimates of cost differences and effectiveness measures between WI and UC. Subgroup analysis suggested WI may be most cost-effective for patients with an intention to return to work but findings

Study	Limitations	Applicability	Other comments	Costs	Effects	Incremental cost	Incremental effects	Cost-effectiveness	Uncertainty
treatment by an occupational physician, according to the Dutch Guidelines. [ddd]								friction cost approach (FCA) WI was statistically significantly more costly than UC and changes in costs of productivity loss favoured UC but were not statistically significant regardless of productivity measure. CUA WI vs UC, incremental cost-utility ratio (ICUR) (HCA): -€184,562 per QALY gained (HCA) WI vs UC, ICER (FCA): -€155,850 WI dominates UC. Neither cost differences	were still limited in statistical significance.

Study	Limitations	Applicability	Other comments	Costs	Effects	Incremental cost	Incremental effects	Cost-effectiveness	Uncertainty
								with WI or QALY gains were statistically significant	

ACT: acceptance and commitment therapy; APA: American Psychiatric Association; BM: behavioural medicine; CAU: care as usual; CBA: cost-benefit analysis; CBT: cognitive behavioural therapy; CCM: conventional case management; CEA: cost-effectiveness analysis; CG: control group; CI: clinical intervention; CMD: common mental disorder; CRI: clinical rehabilitation intervention; CTWR: coordinated and tailored work rehabilitation; CUA: cost-utility analysis; DFB: days on full benefits; FCA: frictional cost approach; GBC: guideline based care; GP: general practitioner; HCA: human capital approach; IC: Integrated care; ICER: incremental cost-effectiveness ratio; ICUR: incremental cost-utility ratio; IG: intervention group; LBP: lower back pain; MDT: multidisciplinary treatment; MSD: musculoskeletal disorders; MISS: minimal Intervention for stress-related mental disorders with sick leave; MSK: musculoskeletal disorders; NA: not applicable; OI: occupational intervention; OP: occupational physician; OT: occupational therapy; PAE: physical activity and education intervention; PAEW: physical activity, education and workplace visit; PSA: probabilistic sensitivity analysis; PT: physiotherapy; QALY: quality-adjusted life year; RtW: return to work; TAU: treatment as usual; TBI: traumatic brain injury; TBI-VR: traumatic brain injury vocational rehabilitation; UC: usual care; VAS: visual analogue scale; VR: vocational rehabilitation; WDI: workplace dialogue intervention; WI: workplace intervention; WRMDD: work related major depressive disorder; WTE: whole time equivalent; WTP: willingness to pay

(a) The five steps comprised: (1) making an inventory of problems and/or opportunities encountered at work after RtW; (2) brainstorming about solutions/realisations; (3) writing down solutions/ realisations and the support needed and assessing the applicability of these solutions; (4) discussing solutions/ realisations and making an action plan with the supervisor; (5) evaluating the action plan/implementation of solutions.

(b) Occupational physicians (OPs) enacted the guideline of the Netherlands Society of Occupational Medicine "The treatment of workers with mental health problems by the OP". It is primarily aimed at structuring OPs' treatment to help sick-listed workers with mental health issues to RtW. Limited focus is given to follow-up after RtW has been achieved: only one consultation, to address relapse.

(c) A 12 month time horizon was used, which is insufficient to capture whether outcomes are sustained. Impact on QALYs was not considered.

(d) It was unclear how long people in the study had been absent from work. The study was in the Netherlands where the occupational support offered is differently organised than in the UK.

(e) Calculated from the total costs reported in the paper.

(f) Treatment was over 10 weeks and entailed 3 stages: (i) understanding the cause of loss of control (ii) the development of problem-solving strategies; and (iii) their implementation.

(g) This could include medication, counselling or referral.

(h) An 18 month time horizon was used, which is insufficient to capture whether outcomes were sustained. Deterministic sensitivity analysis was not performed.

(i) People in the study could have been absent for less than four weeks. The study was in the Netherlands where the occupational support offered is differently organised than the UK. It is unclear how utility values were derived.

(j) After 4 to 12 weeks of sick leave: (1) work disability screening was conducted: a multidisciplinary assessment of disability and functioning and identification of barriers for RtW and (2) a coordinated, tailored and action-oriented work rehabilitation plan was developed by an interdisciplinary team with continuous

Study	Limitations	Applicability	Other comments	Costs	Effects	Incremental cost	Incremental effects	Cost-effectiveness	Uncertainty

feedback on the plan from the sick listed worker, the interdisciplinary team, the workplace, and major stakeholders. The interdisciplinary team consisted of an occupational physician, an occupational physiotherapist, a chiropractor, a psychologist, and a social worker who had the role of case worker.

(k) A 12 month time horizon was used which is insufficient to capture whether outcomes are sustained. Impact on QALYs was not considered. Probabilistic sensitivity analysis (PSA) was not undertaken.

(l) The study was in Denmark where the organisation of the sickness benefits system is similar to the UK, but may still be different enough to limit the generalisability of findings.

(m) The first part (sessions 1 to 3) emphasized mindfulness, cognitive defusion, and acceptance. During sessions 4 to 6, the focus was on exploring and clarifying personal values and committing to pursuing valued life activities.

(n) The first step was an individual interview with the participant at the clinic followed by an interview with the participant's supervisor at the workplace. These meetings, lasting up to 60 minutes, aimed to investigate the participants' and the supervisors' views upon causes of the sickness absence, and what might facilitate RTW.

(o) There was no integration or coordination of the two interventions, and no interaction between therapists.

(p) This typically included psychotherapy, cognitive behavioural therapy and/or pharmacological treatments, physical therapy and counselling.

(q) A 12 month time horizon was used which is insufficient to capture sustainability of outcomes. Medication costs were not considered.

(r) It was unclear how much time people in the study had been absent from work and the study was in Sweden where the occupational support offered is differently organised than in the UK. Drug costs were not considered despite a societal perspective.

(s) This consisted of approximately 20 scheduled hours per week aimed at enhancing the physical functioning and facilitating lasting behaviour change. Each participant was assigned to an individually tailored training programme.

(t) This was an average of 13 to 14 scheduled hours per week aimed at improving participants' ability to manage their pain and resume a normal level of activity.

(u) A time horizon of 3 years was used which is only partly sufficient to assess whether outcomes are sustainable over the long-term. No deterministic sensitivity analysis or probabilistic sensitivity analysis was performed. Cost sources were poorly reported.

(v) The study was conducted in Sweden where the organisation of sickness benefits system is similar to the UK, but may still be different enough to limit the generalisability of the findings.

(w) The workplace intervention protocol formulated a consensus-based plan for adaptations at work to facilitate return to work. The integrated care team consisted of a medical specialist, occupational therapist, physiotherapist, and clinical occupational physician.

(x) Only a 12 month time horizon was used which is insufficient to capture whether outcomes are sustained.

(y) The study includes people on partial sick leave so may not be considered 'continuous absence'. The study was set in the Netherlands where the organisation of healthcare and sickness may be different enough from the UK to limit the generalisability of findings.

(z) Clinical examination by a back pain medical specialist, participation in a back school after eight weeks of absence from regular work and, if necessary, a multidisciplinary work rehabilitation intervention after 12 weeks of absence from work.

(aa) Impact on QALYs was not considered and no probabilistic sensitivity analysis was reported.

(bb) The study was conducted in Canada where the organisation of the sickness benefits system is similar to the UK, but where it may still be different enough to limit the generalisability of findings. The perspective included the employment insurer.

Study	Limitations	Applicability	Other comments	Costs	Effects	Incremental cost	Incremental effects	Cost-effectiveness	Uncertainty

(cc) The main part of the intervention took 13 full days, 5 return-to-work sessions and 1 feedback session, all of which took place within 2 months. Each day's schedule consisted of four (1.5 hours) sessions: two physical sessions and two psychological sessions, twice a week supplemented with a fifth session consisting of 30 minutes of relaxation exercises.

(dd) The study only had a 12 month time horizon which is insufficient to assess whether outcomes are sustained. Impact on QALYs was not considered. No deterministic or PSA was performed.

(ee) The population includes people with 50% to 100% sick leave. The study was set in the Netherlands where the occupational support offered is differently organised to the UK.

(ff) Vocational rehabilitation involved: assessing the impact of TBI on the participant, family and their roles; community reintegration training; pre-work training; liaison with employers, tutors or employment advisors.

(gg) Local differences in service provision meant that this varied widely between participants, but potentially involved support from Headway (a voluntary organization providing advice and support to TBI people and their families), community occupational therapy (OT) or physiotherapy and routine GP follow-up.

(hh) A 12 month time horizon was used which was insufficient to capture whether outcomes were sustained. QALY data were estimated using VAS. Effectiveness data were not derived from a RCT.

(ii) Although this was a UK study, the population included students and those in unpaid employment. EQ-5D VAS data were used for utilities rather than health states valued by a population.

(jj) The course focused on an early start of the intervention by OPs, in which they operated as an activating counsellor using CBT to enhance the problem-solving capacity of workers, especially in relation to their work environment. This consisted of clinical management according to the APA Guideline (2000) and antidepressants and/or CBT with senior psychiatric residents. Visits lasted 30 minutes every 2 to 3 weeks.

(kk) A 12 month time horizon was used which was insufficient to capture whether outcomes were sustained. QALYs were not considered and neither were all healthcare costs.

(ll) The length of unemployment was unclear for study participants. The study was conducted in the Netherlands where occupational support is differently organised to the UK.

(mm) TAU included antidepressants, if indicated and accepted by patients. They were treated by senior psychiatric residents with visits lasting 30 minutes every 2 to 3 weeks. OT consisted of two skilled occupational therapists providing the intervention over three manual-based phases: diagnostic phase (4 weeks) – five contacts with an occupational physician from the patient's employer and a plan for work reintegration; therapeutic phase (24 weeks) – 24 weekly group sessions (8 to 10 patients) and 12 individual sessions; follow-up phase (20 weeks) – three individual visits.

(nn) A 12 month time horizon was used which is insufficient to capture whether outcomes were sustained. QALYs were not considered. The source of costs was unclear.

(oo) The population includes people with 50% to 100% sick leave. The study was set in the Netherlands where the occupational support offered is differently organised to the UK.

(pp) Work modifications were defined as those based on participative ergonomics involving all relevant stakeholders.

(qq) This enabled the employer to become actively involved in the rehabilitation process. The PAEW intervention did not include a workplace assessment and work modifications, as was part of the WI.

Study	Limitations	Applicability	Other comments	Costs	Effects	Incremental cost	Incremental effects	Cost-effectiveness	Uncertainty

(rr) UC included 4.5 GP visits, 4.5 prescriptions, 3 packs of pain relief medication, 4 half hour sessions of physiotherapy (in 7% of cases), 2.5 sessions of osteopathy (in 5% of cases), 2.5 sessions of chiropractic treatment (in 2% of cases) and a hospital outpatient visit (in 10% of cases).

(ss) Whilst a lifetime horizon was used in the model it was based on only 12 months of effectiveness data with outcomes not influenced by the intervention after 12 months. Costs, QALYs and incremental analysis were not reported and PSA was not performed.

(tt) Although this is a UK study, it is based upon effectiveness studies that were conducted outside the UK and the authors stated that this fact may limit study generalisability. Costs and outcomes data were also not well reported.

(uu) WI started at baseline, at least 8 weeks before sick-leave. The intervention consisted of: Dutch OP guidelines for LBP; A workplace assessment and work modifications based on participative ergonomics, which involved all important stakeholders: the occupational health service's ergonomist or occupational health nurse, the worker on sick-leave, the worker's supervisor and other communication between the OP and the GP, to reach consensus on counselling the worker in RTW.

(vv) A graded activity programme based on operant behavioural therapy principles based on the findings from patient history, physical examination, functional capacity evaluation, the demands from the patients' work and the patients' expectations on time to RTW. The entire programme consisted of a maximum of 26 one-hour sessions, with a frequency of two sessions a week. The first session took half an hour more since taking the patients' history and a physical examination were part of this session. The programme ended as soon as a full RTW had been established, according to an earlier agreed upon individual schedule. During the programme the worker had an active role in RTW and the physiotherapist acted as a coach and supervisor, using a hands-off approach

*(ww)*This included resuming daily activities, working within two weeks was encouraged and a clinical intervention recommended after 12 weeks.

(xx) A 12 month time horizon was used which is insufficient to capture whether outcomes were sustained. QALYs were estimated using VAS.

(yy) This study included people with 2 to 4 weeks of sick leave. The study was in the Netherlands where the occupational support offered is differently organised than the UK. EQ-5D VAS rather than 5 level health state was used for utility values.

(zz) This was developed on the basis of three consultations over a time span of four weeks, and encompassed the following five key tasks: 1 diagnosing stress-related mental disorders; 2 providing education about the problem and importance of taking an active role in one's functional recovery; 3 advising patients on how to reflect, cope and problem-solve; 4 monitoring progress; 5 referring to specialists.

(aaa) A 12 month time horizon was used which is insufficient to capture the sustainability of outcomes.

(bbb) Participants were those with partial sick leave over six months. The study was in the Netherlands where the occupational support offered is differently organised than in the UK.

(ccc) Three meetings were planned to take place within 2 weeks. The purpose of the first meeting between the sick-listed employee and the RTW coordinator was to identify obstacles for RTW from the perspective of the employee. The second meeting was between the supervisor and the RTW coordinator, where obstacles to the employee's RTW were identified from the supervisor's perspective. In the third meeting, which was generally the longest, the employee, supervisor and RTW coordinator discussed solutions and formulated a consensus-based plan for their implementation.

(ddd) According to the evidence-based guideline of the Dutch Association of Occupational Physicians (NVAB) published in 2000 and updated in 2007. This guideline aims to facilitate the optimal functioning of employees with mental health problems and to prevent long-term sick leave and frequent recurrences. An early start to the treatment by occupational physicians is recommended. Occupational physicians act as motivating counsellors using cognitive behavioural elements to enhance the problem-solving capacity of employees. In addition, the Improved Gatekeeper Act requires that both the employer and employee take responsibility for a RTW plan.

Study	Limitations	Applicability	Other comments	Costs	Effects	Incremental cost	Incremental effects	Cost-effectiveness	Uncertainty

(eee) Only a 12 month time horizon, so insufficient to capture sustainability of outcomes.

(fff) This study included people with 2 to 4 weeks of sick leave. The study was in the Netherlands where the occupational support offered is differently organised to the UK. EQ-5D VAS, rather than 5 level health state instrument, was used for utility values.

Appendix I – Health economic evidence profiles

Table 6: Health economic evidence profiles of studies included in the economic evidence review for workplace health interventions for RQ 1a, 2a and 3a

Study	Arends 2013			
Study details	**Population & interventions**	**Costs**	**Health outcomes**	**Cost-effectiveness**
Arends 2013 (Netherlands) **Economic analysis:** Cost-benefit analysis (CBA) and cost-effectiveness analysis (CEA) **Study design:** An economic evaluation using data directly from a trial. No economic model was constructed. **Approach to analysis:** An economic evaluation was conducted alongside a cluster-randomised controlled trial (RCT). Different costs and outcomes were used to undertake CEA (with prevention of an episode of recurrent sickness as the effectiveness measure) and CBA. **Perspective:** CEA: societal CBA: employer **Time horizon:** 12 months	**Population:** Workers (aged 18 to 63 years) who were diagnosed at start of sickness absence with a common mental disorder (CMD) and were now partially or fully ready to return to work. **Cohort settings:** Not applicable (NA) **Intervention 1:** SHARP-at work (n=80, mean age 41.3 years, 66.2% female). A five steps intervention return to work (RtW) was started with the occupational physician (OP) monitoring and supporting the person through the steps. [a] **Intervention 2:** Care as usual (CAU) (n=78, Mean age 42.3, 51.3% female): OP followed an evidence	**Mean cost per person:** SHARP CEA: €4,167 CBA: Between €29,337 (human capital approach (HCA) to productivity loss) and €37,215 (friction cost approach (FCA) to productivity loss) CAU CEA: €2,403 CBA: Between €24,607 (HCA) and €31,685 (FCA) **Currency & cost year:** Cost year not stated, Euros (€) **Cost components incorporated:** CEA: Health care costs for society and individual (e.g. GP, specialist, prescriptions and over the counter medications). CBA: Occupational health services for employer and productivity loss (sickness days adjusted by	**Recurrent sickness absence over 12 months** SHARP: 39% CAU: 62%	**Full incremental analysis** CEA, incremental cost-effectiveness ratio (ICER), SHARP vs CAU, per 1% of recurrent sickness absence prevented: €10,605 CBA Employer occupational health costs only, SHARP was €800 greater than with CAU Productivity loss (HCA) SHARP vs CAU: €6,046 Productivity loss (FCA) SHARP vs CAU: €3,995 **Analysis of uncertainty** Stochastic uncertainty in the data were dealt with using nonparametric bootstraps for CEA. This showed that if the ICER is €20,000 per 1% reduction in recurrence of sickness absence there is an 84% chance that CAU would be cost-effective. Deterministic sensitivity analysis looked at plausibly cheaper costs of SHARP but found this made no significant difference to results. **Sensitivity analyses** CEA – Excluding an outlier, which was attributed to high costs due to hospitalisation in a psychiatric ward, an ICER of €-533 was calculated for the incidence of recurrent sickness absence, indicating SHARP could be cost-effective. Reduced SHARP costs did not

Study	Arends 2013			
Study details	**Population & interventions**	**Costs**	**Health outcomes**	**Cost-effectiveness**
Treatment effect duration: Not relevant **Discounting:** Not conducted	based national guideline on helping people on sick leave with mental health problems return to work. [b]	productivity loss from hours of absence measured using HCA and FCA).		change the direction of the primary analyses. CBA – Reduced SHARP costs did not change these results.
Data sources				
Health outcomes: Within trial analysis using retrospective questionnaires. **Quality-of-life weights:** Not applicable. **Cost sources:** Underlying trial for resource use and published sources for costs.				
Comments				
Source of funding: A grant from Stichting Instituut GAK, a Dutch funding agency. **Limitations:** Author-recognised limitations: the data that was collected was self-reported and the accuracy could not be checked, 38% of patients not having completed cost data meaning the CEA and CBA could be underpowered. There was evidence that some people could not understand the productivity question. **Other:** None				
Overall applicability: Partially applicable **Overall quality:** Potentially serious limitations				
Abbreviations: CAU: care as usual; CBA: cost-benefit analysis; CEA: cost-effectiveness analysis; CMD: common mental disorder; FCA: friction cost approach; HCA: human capital approach; ICER: incremental cost-effectiveness ratio; OP: occupational physician; RCT: randomised controlled trial; RTW: return to work				
(a) The five steps comprised: (1) making an inventory of problems and/or opportunities encountered at work after RtW; (2) brainstorming about solutions/realisations; (3) writing down solutions/ realisations and the support needed and assessing the applicability of these solutions; (4) discussing solutions/ realisations and making an action plan with the supervisor; (5) evaluating the action plan/implementation of solutions. *(b)* OPs enacted the guideline of the Netherlands Society of Occupational Medicine "The treatment of workers with mental health problems by the OP". It is primarily aimed at structuring OPs' treatment to help sick-listed workers with mental health issues to RtW. Limited focus is given to follow-up after RtW has been achieved: only one consultation, to address relapse.				

Study	Brouwers 2007			
Study details	**Population & interventions**	**Costs**	**Health outcomes**	**Cost-effectiveness**
Brouwers 2007 (Netherlands)	**Population:** People (aged 18 to 60 years) absent from	**Mean cost per person:**	Mean quality-adjusted life-years (QALYs) per person	**Full incremental analysis** CUA (based on 2,000 bootstrapped pairs)

Study	Brouwers 2007			
Study details	**Population & interventions**	**Costs**	**Health outcomes**	**Cost-effectiveness**
Economic analysis: Cost-utility analysis (CUA) and cost-benefit analysis (CBA) **Study design:** An economic evaluation using data directly from a trial. No economic model was constructed. **Approach to analysis:** An economic evaluation was conducted alongside a randomised controlled trial (RCT) where healthcare and sick leave costs and utility values data were captured. Different costs and outcomes were used to undertake CUA and CBA. **Perspective:** CUA: societal CBA: public health insurer **Time horizon:** 18 months **Treatment effect duration:** Not relevant **Discounting:** Not conducted	work on sick leave for no more than 3 months due to a minor mental disorder. **Cohort settings:** Total trial cohort Mean age: 40; female: 60% **Intervention 1:** Intervention group (IG) (n=95): 5 individual sessions (50 minutes each), covering 3 stages, with a social worker: cause, coping and implementation. [a] **Intervention 2:** Care As Usual (CAU)) (n=90): routine general practitioner (GP) care, which could include medication or counselling or referral.	IG: €14,493 (exclusive of intervention costs of €13,305 total for all people) CG: €14,482 CAU CEA: €2,403 CBA: €24,607 human capital approach (HCA) to €31,685 frictional cost analysis (FCA) **Currency & cost year:** Cost year not stated, Euros (€) **Cost components incorporated:** Health care costs for society (e.g. GP, specialist, prescriptions), productivity loss (sickness days adjusted by productivity loss from hours of absence measured using HCA and FCA. Intervention costs.	IG vs CAU (Dutch EQ-5D): 0.056 higher IG vs CAU (UK EQ-5D): 0.044 higher **Sick leave duration until full return to work** IG: 152.7 days CAU: 156.5 days These were not statistically significantly different	Probabilistic ICERs reported (ICERs are negative). IG vs CAU: €234 less expensive ICER, IG vs CAU (Dutch EQ-5D): -€,4179 ICER, IG vs CAU (UK EQ-5D): -€5,306 IG was less expensive and more effective than CAU CBA IG vs CAU: €11 more expensive (not statistically significant but did not include intervention costs) **Analysis of uncertainty** Stochastic uncertainty in the data were dealt with using nonparametric bootstraps for CUA. This demonstrated an even split between the north-east and south-east quadrants of the cost-effectiveness plane indicating that any difference in costs between IG and CAU were likely small. 52% of bootstrap estimates were in the south east quadrant where IG dominates CAU.

Study	Brouwers 2007			
Study details	Population & interventions	Costs	Health outcomes	Cost-effectiveness
Data sources				
Health outcomes: The underlying trial. **Quality-of-life weights:** Health states derived using SF-36. Sources of utility values for SF-36 health states were not provided. **Cost sources:** The underlying trial for resource use and published sources for costs.				
Comments				
Source of funding: The Netherlands Organisation for Health Research and Development. **Limitations:** Author recognised limitations. Only sick leave duration was considered and not sick leave episodes after return to work. Indirect costs were not considered. Cost data were skewed by a few high cost individuals. All participants came from one part of Amsterdam. GPs in the CG may have heard of the intervention through their patients resulting in contamination of CG. **Other:** None				
Overall applicability: Partially applicable **Overall quality:** Potentially serious limitations				
Abbreviations: CAU: care as usual; CBA: cost-benefit analysis; CEA: cost-effectiveness analysis; CUA: cost-utility analysis; FCA: frictional cost approach; GP: general practitioner; HCA: human capital approach; ICER: incremental cost-effectiveness ratio; IG: intervention group; QALY: quality-adjusted life year; RCT: randomised controlled trial				
(a) Treatment was over 10 weeks and entailed 3 stages: (i) understanding the cause of loss of control (ii) the development of problem-solving strategies; and (iii) their implementation.				

Study	Bultmann 2009			
Study details	Population & interventions	Costs	Health outcomes	Cost-effectiveness
Bultmann 2009 (Denmark) **Economic analysis:** Cost-benefit analysis (CBA) and cost-effectiveness analysis (CEA) **Study design:** An economic evaluation using data directly from	**Population:** Workers on sick leave for 4-12 weeks due to lower back pain (LBP) or musculoskeletal disorders (MSK). **Cohort settings:** Not applicable (NA) **Intervention 1:**	**Mean cost:** CTWR (per person): $31,144 over 12 months ($3,321 without productivity loss) CCM (per person): $41,812 over 12 months ($1,773 without productivity loss) **Currency & cost year:** 2007 US$	**Sickness absence hours, per person, over 12 months** CTWR: 656.6 hours CCM: 997.3 hours	**Full incremental analysis** CTWR vs CCM, over 12 months, per person: $10,668 ($1,548 more over 12 months without productivity loss) CEA CTWR vs CCM, per absence day avoided (without productivity loss): $33.7 **Analysis of uncertainty**

Study	Bultmann 2009			
Study details	**Population & interventions**	**Costs**	**Health outcomes**	**Cost-effectiveness**
a trial. No economic model was constructed. **Approach to analysis:** An economic evaluation was conducted alongside a randomised controlled trial (RCT) where healthcare costs and lost days of work were captured. CEA used averted absence days as the effectiveness measure. **Perspective:** Societal **Time horizon:** 12 months **Treatment effect duration:** Not relevant **Discounting:** Not conducted	Coordinated and tailored work rehabilitation (CTWR) (n=60, mean age 44.2, 48.5% female) screening followed by a tailored rehabilitation plan developed by an interdisciplinary team. [a] **Intervention 2:** Conventional case management (CCM) (n=47, mean age 42.9, 63.8% female): Conventional case management provided by the municipality. No further information given.	**Cost components incorporated:** CBA: Primary care and specialist treatment costs, productivity loss (sickness days adjusted by productivity loss from hours of absence measured using human capital approach (HCA)). Intervention costs. CEA: As for CBA but without productivity loss.		CBA: One way deterministic sensitivity analysis of a doubling of intervention costs and 25% reduction in wages still resulted in cost savings
Data sources				
Health outcomes: Within trial analysis using retrospective questionnaires. **Quality-of-life weights:** NA. **Cost sources:** Resource and cost data collected from the national Danish registries.				
Comments				
Source of funding: Danish National Labour Market Authority, Vejle County, and the Danish Chiropractic Research Fund. **Limitations:** Authors recognised limitations: the required sample size was not obtained; gender, education levels and prevalence of neck pain differed between intervention and control groups which may have influenced findings. There was significant loss to follow up (45% at 12 months in the control group). The trial was not blinded. **Other:** None				
Overall applicability: Partially applicable	**Overall quality:** Potentially serious limitations			
Abbreviations: CAU: care as usual; CBA: cost-benefit analysis; CCM: conventional case management; CEA: cost-effectiveness analysis; CG: control group; CTWR: coordinated and tailored work rehabilitation; FCA: frictional cost approach;; HCA: human capital approach; ICER: incremental cost-effectiveness ratio; IG: intervention group; LBP: low back pain; MSK: musculoskeletal disorder; NA: not applicable; RCT: randomised controlled trial; RtW: return to work				

Study	Bultmann 2009			
Study details	**Population & interventions**	**Costs**	**Health outcomes**	**Cost-effectiveness**
(a) After 4 to 12 weeks of sick leave: (1) work disability screening was conducted: a multidisciplinary assessment of disability and functioning and identification of barriers for RtW and (2) a coordinated, tailored and action-oriented work rehabilitation plan was developed by an interdisciplinary team with continuous feedback on the plan from the sick listed worker, the interdisciplinary team, the workplace, and major stakeholders. The interdisciplinary team consisted of an occupational physician, an occupational physiotherapist, a chiropractor, a psychologist, and a social worker who had the role of case worker.				

Study	Finnes 2017			
Study details	**Population & interventions**	**Costs**	**Health outcomes**	**Cost-effectiveness**
Finnes 2017 (Sweden) **Economic analysis:** Cost-utilisation analysis (CUA) **Study design:** An economic evaluation using data directly from a trial. No economic model was constructed. **Approach to analysis:** An economic evaluation conducted alongside a randomised controlled trial (RCT) where healthcare costs, lost days of work and utility values were captured.	**Population:** Workers (at least 50% whole time equivalent (WTE)) with sickness absence due to anxiety, depression, stress or exhaustion **Cohort settings:** Age and gender split of trial not provided **Intervention 1:** Acceptance and Commitment Therapy (ACT) (n=89): a psychological intervention consisting of 6 x 60-minute sessions. [a] **Intervention 2:**	**Total costs:** Healthcare perspective (12 months) ACT: $5,507 WDI: $6,465 ACT+WDI: $6,141 TAU: $6,207 Societal perspective (12 months) ACT: $14,452 WDI: $15,649 ACT+WDI: $17,066 TAU: $15,593 **Currency & cost year:** 2015 US$ **Cost components incorporated:**	**Quality-adjusted life years (QALY) gains over 12 months** ACT: 0.164 WDI: 0.122 ACT+WDI: 0.168 TAU: 0.155	**Full incremental analysis** Healthcare perspective, incremental cost-effectiveness ratio (ICER) Both TAU and WDI were dominated by ACT ACT vs baseline: $33,579 per QALY gained ACT+WDI vs ACT: $158,500 per QALY gained Societal perspective Both TAU and WDI were dominated by ACT alone. Compared to ACT, ACT+WDI had an ICER of $30804 per QALY gained **Analysis of uncertainty** Stochastic uncertainty in the data were dealt with using nonparametric bootstraps for CUA. This showed that for ACT compared to ACT+WDI from both the healthcare and societal perspectives, the percentage of bootstrap iterations were spread roughly equally across all four quadrants, although approximately 60% of iterations in both perspectives had ACT+WDI

Study	Finnes 2017			
Study details	**Population & interventions**	**Costs**	**Health outcomes**	**Cost-effectiveness**
Perspective: Healthcare and separate societal analysis including sickness benefit costs **Time horizon:** 12 months **Treatment effect duration:** Not relevant **Discounting:** Not conducted	Workplace dialogue intervention (WDI) (n=87): three meetings involving the participant plus work supervisor. [b] **Intervention 3:** ACT+WDI (n=88): conducted by two different therapists. [c] **Intervention 4:** Treatment as usual (TAU (n=88)): treatment as it was planned in a primary care centre or other care facility. [d]	For healthcare perspective, intervention and costs of visits to health professionals (drug costs were excluded). For societal perspective, sickness benefit payments were added.		more costly than ACT and 50% of iterations of ACT+WDI were more effective. Scenario analysis showed that using Swedish utility weights (rather than English in the base case) resulted in ACT being the dominant strategy. A second scenario explored the impact of using costs as if the intervention was delivered in a 'regular' setting in which case ACT would no longer dominate TAU but have an ICER of $71 per QALY gained (healthcare perspective) and ACT+WDI had an ICER of $286,000 per QALY gained compared to ACT.
Data sources				
Health outcomes: Within trial analysis using retrospective questionnaires. **Quality-of-life weights:** Health states were derived using EQ-5D and valued using UK valuation set (Swedish in the scenario analysis). **Cost sources:** The volumes of each cost category were obtained from study records, and unit costs were obtained from national public databases and websites.				
Comments				
Source of funding: REHSAM research fund (2011/12) and from the County Council in Stockholm, Sweden. **Limitations:** Author recognised limitations: it excluded the unemployed and self-employed people; data on healthcare resource use was retrospective and self-completed and so may have recall bias; the societal perspective did not include impacts on employers and drug costs were not included in either perspective; cost data were skewed towards a few individuals which has an impact where loss to follow up was not insignificant (although actual follow up rates were not reported). **Other:** None				
Overall applicability: Partially applicable **Overall quality:** Potentially serious limitations				
Abbreviations: ACT: acceptance and commitment therapy; CAU: care as usual; CBA: cost-benefit analysis; CBT: cognitive behavioural therapy; CEA: cost-effectiveness analysis; CUA: cost-utilisation analysis; DALY: disability-adjusted life-year; ICER: incremental cost-effectiveness ratio; RCT: randomised				

Study	Finnes 2017			
Study details	Population & interventions	Costs	Health outcomes	Cost-effectiveness

controlled trial; RTW: return to work; TAU: treatment as usual; WDI: workplace dialogue intervention; WTE: whole time equivalent; QALY: quality-adjusted life year

(a) The first part (sessions 1 to 3) emphasized mindfulness, cognitive defusion, and acceptance. During sessions 4 to 6, the focus was on exploring and clarifying personal values and committing to pursuing valued life activities.

(b) The first step was an individual interview with the participant at the clinic followed by an interview with the participant's supervisor at the workplace. These meetings, lasting up to 60 minutes, aimed to investigate the participants' and the supervisors' views upon causes of the sickness absence, and what might facilitate RTW.

(c) There was no integration or coordination of the two interventions, and no interaction between therapists.

(d) This typically included psychotherapy, CBT and/or pharmacological treatments, physical therapy and counselling.

Study	Jensen 2005			
Study details	Population & interventions	Costs	Health outcomes	Cost-effectiveness
Jensen 2005 (Sweden) **Economic analysis:** Cost-benefit analysis (CBA) **Study design:** An economic evaluation using data directly from a trial. No economic model was constructed. **Approach to analysis:** An economic evaluation was conducted alongside a randomised controlled trial (RCT) where healthcare costs,	**Population:** Blue-collar and service/care workers (aged 18 to 60 years) with non-specific back pain resulting in sick leave for 1-6 months. **Cohort settings:** Not applicable (NA) **Intervention 1:** Behaviour-oriented physiotherapy (PT) (n=54, mean age: 43, 68% female) [a]	**Total costs:** At 3 years (mean cost per person): female; male BM: €107,703; €130,015 PT: €189,760; €220,268 CBT:€157,800; €199,824 TAU: €245,212; €193,239 **Currency & cost year:** Euros (€), price year not stated **Cost components incorporated:** Health care costs for society (e.g. general practitioner (GP), specialist,	**Working days lost** per year, pre-intervention: male; female BM: 67; 72 PT: 76; 92 CBT:115; 109 TAU: 65; 80 **Working days lost** per year, post-intervention BM: 99; 123 PT: 95; 110 CBT:109; 101 TAU: 82; 86	**Full incremental analysis** For women, BM, PT and CBT were all less expensive over 3 years vs TAU with BM having the lowest cost per person vs CBT BM vs CBT: €50,097 less expensive BM vs PT: $82,057 less expensive BM vs TAU: €137,509 less expensive For men, CBT and PT were both more expensive over 3 years than TAU with BM being less expensive than TAU by €63,224 **Analysis of uncertainty** Not undertaken

Study	Jensen 2005			
Study details	**Population & interventions**	**Costs**	**Health outcomes**	**Cost-effectiveness**
lost days of work and disability pension costs were captured. **Perspective:** Societal **Time horizon:** 3 years **Treatment effect duration:** Not relevant **Discounting:** Not conducted	**Intervention 2:** Cognitive behavioural therapy (CBT) (n=49, mean age: 44, 45% female) to improve pain management. [b] **Intervention 3:** Behavioural medicine (BM) (PT+CBT) (n=63, mean age: 43, 48% female) **Intervention 4:** Treatment-as-usual (TAU) (n=48, mean age: 44, 58% female): No additional interventions outside the normal routines in health care. This was not otherwise described.	emergency medicine), productivity loss (sickness days adjusted by productivity loss from hours of absence measured using human capital approach), disability pensions. Intervention costs.		
Data sources				
Health outcomes: Within trial analysis using retrospective questionnaires. Absence from work from National Social Insurance Board. **Quality-of-life weights:** SF-36 data were collected but not reported. **Cost sources:** Costs were from published sources but not clearly reported.				
Comments				
Source of funding: AFA Insurance and Alecta Insurance. **Limitations:** Author recognised limitations: there was a small sample size with low power and wide confidence intervals; the intention to treat results were not statistically significant. **Other:** None				
Overall applicability: Partially applicable **Overall quality:** Potentially serious limitations				

Study	Jensen 2005			
Study details	Population & interventions	Costs	Health outcomes	Cost-effectiveness
Abbreviations: BM: behavioural medicine; CBA: cost-benefit analysis; CBT: cognitive behavioural therapy; GP: general practitioner;; NA: not applicable; PT: physiotherapy; RCT: randomised controlled trial				
(a) This consisted of approximately 20 scheduled hours per week aimed at enhancing the physical functioning and facilitating lasting behaviour change. Each participant was assigned to an individually tailored training program. *(b)* This was an average of 13 to 14 scheduled hours per week aimed at improving the participants' ability to manage their pain and resume a normal level of activity.				

Study	Lambeek 2010			
Study details	Population & interventions	Costs	Health outcomes	Cost-effectiveness
Lambeek 2010 (Netherlands) **Economic analysis:** Cost-benefit analysis (CBA), cost-effectiveness analysis (CEA) and cost-utilisation analysis(CUA) **Study design:** An economic evaluation using data directly from a trial. No economic model was constructed. **Approach to analysis:** An economic evaluation conducted alongside a randomised controlled trial where primary and	**Population:** Workers (aged 18 to 65 years) on full or partial sick leave for 12 weeks to two years due to non-specific lower back pain (LBP) **Cohort settings:** Integrated Care (IC) (Intervention): mean age 45.5, 44% female Usual care (UC): mean age 46.8, 40% female **Intervention 1:** IC (n=66, mean age 45.5, 44% female), a graded activity	**Total costs:** At 12 months IC: £13,165 (£1,479 direct costs, £11,686 indirect costs) UC: £18,475 (£1,262 direct costs, £17,213 indirect costs) **Currency & cost year:** 2007 UK£ **Cost components incorporated:** Health care costs (primary and secondary care physicians and specialists, hospital stays and diagnostic tests, drug costs). Intervention costs.	**Days until sustainable return to work** IC: 129 UC: 197 **QALYs** IC: 0.74 UC: 0.65	**Full incremental analysis** CEA £3 extra cost for every day earlier return to work with IC. Only direct costs were considered. CUA IC vs UC: dominant IC cost saving over UC, per person: £5,310 QALY gain, per person: 0.09 (direct and indirect costs considered) CBA IC, return on investment for every £1 spent: £26 (direct and indirect costs considered) **Analysis of uncertainty** Stochastic uncertainty in the data were dealt with using nonparametric bootstraps for CUA and CEA. This showed that in 98% of iterations IC dominated UC. For the CUA and for the CEA

Study	Lambeek 2010			
Study details	**Population & interventions**	**Costs**	**Health outcomes**	**Cost-effectiveness**
secondary healthcare costs, lost days of work and utility values were captured. CEA had sustainable return to work as effectiveness measure. **Perspective:** Societal **Time horizon:** 12 months **Treatment effect duration:** Not relevant **Discounting:** Not conducted	protocol at the workplace. [a] **Intervention 2:** UC (n=68, mean age 46.8, 40% female): referred to occupational physician and GP with a letter containing the advice to treat them according to the Dutch guidelines for patients with LBP.	Productivity loss from absenteeism.		that if there was a willingness to pay of £10 for one day earlier return to work there was a 95% chance that IC was cost effective. Scenario analysis showed that if only complete cases were considered then there was no statistical difference in costs between IC and UC. A further scenario explored the impact of the intervention only for people aged under 55 years which resulted in a doubling in the costs of IC. A final scenario analysis showed that varying productivity levels did not impact on results.
Data sources				
Health outcomes: Within trial analysis was used, using retrospective questionnaires. Absence from work data were from the National Social Insurance Board. **Quality-of-life weights:** SF-36 data were collected but not reported beyond a statement that there was no difference between groups. **Cost sources:** Costs were from published sources but not clearly reported.				
Comments				
Source of funding: AFA Insurance and Alecta Insurance. **Limitations:** Author recognised limitations: small sample size with low power and wide confidence intervals; intention to treat results were not statistically significant. **Other:** None				
Overall applicability: Partially applicable **Overall quality:** Potentially serious limitations				
Abbreviations: CBA: cost-benefit analysis; CEA: cost-effectiveness analysis; CUA: cost-utility analysis; IC: ; LBP: low back pain; UC: usual care; QALY: quality-adjusted life year				

Study	Lambeek 2010			
Study details	**Population & interventions**	**Costs**	**Health outcomes**	**Cost-effectiveness**
(a) Workers were referred to a clinical occupational physician who was responsible for the coordination of the care and for communication with the other healthcare professionals in the team. The workplace intervention protocol formulated a consensus based plan for adaptations at work to facilitate return to work. The integrated care team consisted of a medical specialist, occupational therapist, physiotherapist, and clinical occupational physician.				

Study	Loisel 2002			
Study details	**Population & interventions**	**Costs**	**Health outcomes**	**Cost-effectiveness**
Loisel 2002 (Canada) **Economic analysis:** Cost-benefit analysis (CBA) and cost-effectiveness analysis (CEA) **Study design:** Economic evaluation using data directly from a trial. No economic model was constructed. **Approach to analysis:** Economic evaluation conducted alongside a randomised controlled trial where healthcare and sick pay costs were captured. CEA had days on full benefits (DFB) as effectiveness measure.	**Population:** Workers absent for more than 4 weeks with occupational back pain **Cohort settings:** Mean age ranged from 37.4 for "Sherbrooke Model" to 44.5 with occupational intervention (OI). Gender split ranged from 60% female with "Sherbrooke model" to 19% with usual care (UC). The study had fewer than 30 people in each study arm and no statistical signifcance testing of results was performed **Intervention 1:**	**Total costs:** At 12 months CI: $12,038 OI: $9,569 Sherbrooke: $12,137 UC: $9,789 At 6.4 years CI: $16,902 OI: $16,252 Sherbrooke: $14,494 UC: $33,079 **Currency & cost year:** 1998 Canadian$ **Cost components incorporated:** Health care costs, intervention costs and income replacement costs	**Mean number of DFB** At 12 months CI: 114.9 OI: 116.1 Sherbrooke: 115.9 UC: 126.9 At 6.4 years CI: 178.7 OI: 228.0 Sherbrooke: 125.6 UC: 418.3	**Full incremental analysis** CEA (cost per DFB saved compared to UC) At 12 months CI: $187.40 OI: -$20.40 (dominated UC) Sherbrooke: $213.50 At 6.4 years CI: -$67.50 (dominated UC) OI: -$88.40 (dominated UC) Sherbrooke: -$63.50 (dominated UC) CBA, cost differential compared to UC At 12 months CI: -$2,250 OI: $220 Sherbrooke: -$2,348 At 6.4 years

Study	Loisel 2002			
Study details	**Population & interventions**	**Costs**	**Health outcomes**	**Cost-effectiveness**
Perspective: Health and employment insurer **Time horizon:** 6.4 years **Treatment effect duration:** Not relevant **Discounting:** Not conducted	OI (n=22, mean age: 44.5, 41% female): visits to the study occupational medicine physician and a participatory ergonomics intervention with the study ergonomist, the injured worker, there supervisor, and management and union representatives. [a] **Intervention 2:** Clinical rehabilitation intervention (CRI) (n=31, mean age: 40.2, 42% female)): with a back pain specialist and potentially a multidisciplinary work rehabilitation intervention at 12 weeks of absence. [b] **Intervention 3:** OI+CRI ("Sherbrooke Model") (n=10, mean age: 37.4, 60% female))			CI: $16,176 OI: $16,827 Sherbrooke: $18,585 **Analysis of uncertainty** Sensitivity analyses were performed but varying the total healthcare costs by 60% to 190% and income per capita by 85% to 125%. Over a 6.4 year time period all interventions remained dominant compared to UC over the cost ranges considered.

Study	Loisel 2002			
Study details	**Population & interventions**	**Costs**	**Health outcomes**	**Cost-effectiveness**
	Intervention 4: Usual care (UC) (n=26, mean age: 41.6, 19% female): with worker's physician receiving no advice about return to work.			
Data sources				
Health outcomes: Quebec Workers Compensation Database. **Quality-of-life weights:** NA. **Cost sources:** Quebec Workers Compensation Database.				
Comments				
Source of funding: Institut de Recherche en Santé et Sécurité au Travail du Québec (IRSST). **Limitations:** Author recognised limitations Salaries in control arm were higher than intervention arms. Costs of job modifications were not recorded. Workers may have had subsequent back problems not considered to be work related. **Other:** None				
Overall applicability: Partially applicable **Overall quality:** Minor limitations				
Abbreviations: CBA: cost-benefit analysis; CEA: cost-effectiveness analysis; CI: clinical intervention; CRI: clinical rehabilitation intervention; DFB: days on full benefits; OI: occupational intervention; UC: usual care				
(a) This participatory ergonomics intervention was limited in scope and duration with job modifications recommended to the employer who was at liberty to implement them or not. *(b)* Clinical examination by a back pain medical specialist, participation in a back school after eight weeks of absence from regular work and, if necessary, a multidisciplinary work rehabilitation intervention after 12 weeks of absence from work.				

Study	Meijer 2006			
Study details	**Population & interventions**	**Costs**	**Health outcomes**	**Cost-effectiveness**
Meijer 2006 (Netherlands) **Economic analysis:**	**Population:** Bank and university workers on at least 50% contracts with	**Total costs per week** 2 months MDT: €1,335	**Percentage of regular hours worked** Baseline	MDT was more expensive compared to UC and did not increase the proportion of days worked. MDT was not cost-effective.

Study	Meijer 2006			
Study details	**Population & interventions**	**Costs**	**Health outcomes**	**Cost-effectiveness**
Cost-effectiveness analysis (CEA) **Study design:** An economic evaluation using data directly from a trial. No economic model was constructed. **Approach to analysis:** An economic evaluation was conducted alongside a randomised controlled trial (RCT) where healthcare costs, productivity losses (days of work lost and time at work lost from extra breaks) and free time lost were captured. CEA used half days returned to work as the effectiveness measure. **Perspective:** Societal **Time horizon:** 12 months **Treatment effect duration:** Not relevant	50% sick leave in last 4 to 20 weeks due to non-specific upper extremity musculoskeletal disorders (MSDs) **Cohort settings:** Not applicable (NA) **Intervention 1:** Multidisciplinary treatment (MDT) (n=20, mean age: 38.3, 70% female): an outpatient training programme carried out at Dutch rehabilitation centres. [a] **Intervention 2:** Usual care (UC) (n=14, mean age: 37.9, 64% female): supervision by occupational health services. UC could include treatment at the workplace and in the regular health care system, initiated by a general practitioner, or medical specialist.	UC: €448 6 months MDT: €664 UC: €359 12 months MDT: €430 UC: €315 **Currency & cost year:** Euro (€) 2004 **Cost components incorporated:** Health care costs (medical services and medications), productivity loss (sickness days adjusted by productivity loss from hours of absence measured using human capital approach (HCA)), free time costs. Intervention costs.	MDT: 29% UC: 29% 6 months MDT: 82% UC: 72% 12 months MDT: 86% UC: 73% There was no statistical difference between MDT and UC at any time point.	**Analysis of uncertainty** Not undertaken

Study	Meijer 2006			
Study details	**Population & interventions**	**Costs**	**Health outcomes**	**Cost-effectiveness**
Discounting: Not conducted				
Data sources				
Health outcomes: Within trial analysis using retrospective questionnaires. **Quality-of-life weights:** NA. **Cost sources:** Dutch board on medical tariffs, Dutch medicines compensation system, self-reported costs in questionnaire.				
Comments				
Source of funding: The Netherlands Organization for Health Research and Development (ZONMw) and a supplementary grant from the UWV. **Limitations:** Author recognised limitations: the study was not adequately powered failing to recruit the targeted number of participants. **Other:** None				
Overall applicability: Partially applicable **Overall quality:** Potentially serious limitations				
Abbreviations: CEA: cost-effectiveness analysis; HCA: human capital approach; MDT: multidisciplinary treatment; MSD: musculoskeletal disorders; NA: not available; RCT: randomised controlled trial; UC: usual care				
(a) The main part of the intervention took 13 full days, 5 return-to-work sessions and 1 feedback session, all of which took place within 2 months. Each day's schedule consisted of four (1.5 hours) sessions: two physical sessions and two psychological sessions, twice a week supplemented with a fifth session consisting of 30 minutes of relaxation exercises.				

Study	Radford 2012			
Study details	**Population & interventions**	**Costs**	**Health outcomes**	**Cost-effectiveness**
Radford 2012 (UK) **Economic analysis:** Cost-benefit analysis (CBA), cost-effectiveness analysis (CEA) and cost-utilisation analysis (CUA) **Study design:** An economic evaluation	**Population:** Patients in paid or voluntary work or in full time education hospitalised for at least 48 hours due to traumatic brain injury (TBI) **Cohort settings:**	At 12 months (health and social care perspective) TBI-VR: £2,106.94 UC: £2,031.71 At 12 months (societal perspective) TBI-VR: £8,786 UC: £10,648	**Quality-adjusted life years (QALYs)** at 12 months TBI-VR: 0.1938 UC: 0.1763 **Return to work or education** at 12 months TBI-VR: 75% UC: 60%	**CEA** Per person returned to work, TBI-VR vs UC (health and social care perspective): £501.33 Societal perspective: TBI-VR was more effective and saved money **CBA** From health and social care perspective, TBI-VR vs UC was £75.23 more costly. From societal perspective TBI-VR vs UC was £1,863 less expensive.

Study	Radford 2012			
Study details	**Population & interventions**	**Costs**	**Health outcomes**	**Cost-effectiveness**
using data directly from a cohort study. No economic model was constructed. **Approach to analysis:** Economic evaluation conducted alongside a trial where healthcare, return to work or study outcomes and utility values were captured. The intervention was compared to usual care by looking at costs and outcomes in patients in surrounding areas. CEA had return to paid or voluntary work or study as outcome. **Perspective:** CBA: health and social care CEA and CUA: societal **Time horizon:** 12 months **Treatment effect duration:** Not relevant **Discounting:** Not conducted	Total cohort: male (80%), mean age 34.3 **Intervention 1:** TBI Vocational Rehabilitation (TBI-VR), provided by an occupational therapist. [a] **Intervention 2:** Usual care (UC) (n=54): participants in hospitals without TBI-VR. [b]	**Currency & cost year:** 2007 UK£ **Cost components incorporated:** Health and social care perspective: Social worker and rehabilitation therapy costs, primary care costs. Societal perspective added included lost wages for participant and carer and benefits advisor costs.		Neither difference was statistically significant **CUA** TBI-VR vs UC, health and social care perspective: £4,299 per QALY gained. Neither the QALY gain nor cost difference were statistically significant **Analysis of uncertainty** Stochastic uncertainty in the data were dealt with using nonparametric bootstraps for CUA. The boot strapped incremental cost-effectiveness ratio (ICER) was £2,567 lower than the deterministic ICER. Sensitivity analysis using imputed data for missing values more than doubled the cost per person returned to work in the CEA and increased the ICER per QALY gained in the CUA to £35,873 with TBI-VR.

Study	Radford 2012			
Study details	Population & interventions	Costs	Health outcomes	Cost-effectiveness
Data sources				
Health outcomes: Within trial analysis using retrospective questionnaires. **Quality-of-life weights:** EQ-5D visual analogue scale (VAS). **Cost sources:** NHS reference costs, PSSRU and Jobcentre plus.				
Comments				
Source of funding: College of Occupational Therapists. **Limitations:** Author recognised limitations: Incomplete follow up data; not an RCT; not properly powered resulting in wide confidence intervals. **Other:** There were no statistically significant results. It was difficult to isolate the effect of the intervention from the wider effects of the MDT that operates within Nottingham. It included people who worked, were students and were unemployed.				
Overall applicability: Not applicable **Overall quality:** Potentially serious limitations				
Abbreviations: CBA: cost-benefit analysis; CEA: cost-effectiveness analysis; CMD: ; CUA: cost-utilisation analysis; GP: general practitioner; ICER: incremental cost-effectiveness ratio; MDT: multidisciplinary treatment; NHS: national health service; OT: occupational therapy; PSSRU: Personal Social Services Research Unit; QALY: quality-adjusted life year; RCT: randomised controlled trial; TBI: traumatic brain injury; UC: usual care; VAS: visual analogue scale; VR: vocational rehabilitation;				
(a) Vocational rehabilitation involved: assessing the impact of TBI on the participant, family and their roles; community reintegration training; pre-work training; liaison with employers, tutors or employment advisors. (b) Local differences in service provision meant that this varied widely between participants, but potentially involved support from Headway (a voluntary organization providing advice and support to TBI people and their families), community occupational therapy (OT) or physiotherapy and routine GP follow-up.				

Study	Rebergen 2009			
Study details	Population & interventions	Costs	Health outcomes	Cost-effectiveness
Rebergen 2009 (Netherlands) **Economic analysis:** Cost-benefit analysis (CBA) and cost-effectiveness analysis (CEA)	**Population:** Police workers on sick leave due to common mental disorders (CMDs) **Cohort settings:** Not applicable (NA)	At 12 months (health care perspective) GBC: €2,145 UC: €2,664 At 12 months (societal perspective using HCA for productivity loss)	**Days of sick leave** GBC: 113 UC: 114 These were not statistically significantly different	**CEA** GBC vs UC, incremental cost-effectiveness ratio (ICER) per sick day avoided: -€736 **CBA** Estimated net monitory benefit of GBC, per person: €3,582

Study	Rebergen 2009			
Study details	**Population & interventions**	**Costs**	**Health outcomes**	**Cost-effectiveness**
Study design: Economic evaluation using data directly from a trial. No economic model was constructed. **Approach to analysis:** Economic evaluation conducted alongside a randomised controlled trial where healthcare costs, days of sick leave and productivity loss were captured. CEA had days of sick leave as outcome. **Perspective:** CEA: societal CBA: employer **Time horizon:** 12 months **Treatment effect duration:** Not relevant **Discounting:** Not conducted	**Intervention 1:** Guideline based care (GBC) (n=125, mean age: 38.8, 48.8% female), treatment by OPs according to the Dutch guideline for workers with mental health problems. [a] **Intervention 2:** Usual care (UC) (n=115, 40.0, 39.5% female): minimal involvement of the OP and easy access to counselling by a psychologist.	Traumatic brain injury - vocational rehabilitation (TBI-VR): €14,114 UC: €14,202 No costs were statistically significantly different **Currency & cost year:** 2003 Euros (€) **Cost components incorporated:** Healthcare perspective: Primary care (general practitioner (GP) visits, tests and medications), occupational healthcare, hospital care and psychological treatment. Societal perspective added in productivity loss using human capital approach (HCA) approach. Frictional cost method (FCM) approach was also used but only partially reported.		Outcomes are similar between GBC and UC, but direct costs were lower with GBC. The authors concluded that GBC could be cost-effective. **Analysis of uncertainty** Stochastic uncertainty in the data were dealt with using nonparametric bootstraps for CEA. The iterations showed there was never more than a 50% chance of GBC being cost effective per day of sick leave avoided regardless of the value of the day of work lost Different approaches to measuring productivity loss were analysed but did not affect the main findings.
Data sources				
Health outcomes: Within trial analysis using retrospective questionnaires. **Quality-of-life weights:** EQ-5D visual analogue scale (VAS). **Cost sources:** NHS reference costs, PSSRU and Jobcentre plus.				

Study	Rebergen 2009			
Study details	**Population & interventions**	**Costs**	**Health outcomes**	**Cost-effectiveness**
Comments				
Source of funding: College of Occupational Therapists. **Limitations:** Author recognised limitations: Incomplete follow up data, not an RCT and not properly powered resulting in wide confidence intervals. **Other:** No statistically significant results. Difficult to isolate effect of the intervention from the wider effects of the MDT that operates within Nottingham. Included people who worked, were students and were unemployed.				
Overall applicability: Partially applicable **Overall quality:** Potentially serious limitations				
Abbreviations: CBA: cost-benefit analysis; CEA: cost-effectiveness analysis; CMD: common mental disorder; GBC: guideline based care; GP: general practitioner; FCM: friction cost method; HCA: human capital approach; ICER: incremental cost-effectiveness ratio; NA: not available; OP: occupational physician; TBI: traumatic brain injury; UC: usual care; VR: vocational rehabilitation				
(a) The course focused on an early start of the intervention by OPs, in which they operated as an activating counsellor using CBT to enhance the problem-solving capacity of workers, especially in relation to their work environment. This consisted of clinical management according to the APA Guideline (2000) and antidepressants and/or CBT with senior psychiatric residents. Visits lasted 30 minutes every 2 to 3 weeks.				

Study	Schene 2007			
Study details	**Population & interventions**	**Costs**	**Health outcomes**	**Cost-effectiveness**
Schene 2007 (Netherlands) **Economic analysis:** Cost-benefit analysis (CBA) **Study design:** An economic evaluation using data directly from a trial. No economic model was constructed. **Approach to analysis:** An economic evaluation	**Population:** Workers (aged 18 years or over) with at least 50% absence over 10 weeks to 2 years due to work related major depressive disorder (WRMDD) **Cohort settings:** Not applicable (NA) **Intervention 1:**	At 12 months (cost of intervention only) OT: $3,149 TAU: $1,891 **Currency & cost year:** US$, cost year not reported **Cost components incorporated:** Outpatient treatments, OT, medications, GP visits, hospitalisations, travelling and parking and earnings	No health or employment outcomes reported beyond earnings over 12 month period	**Difference in total earnings minus costs of intervention (cost of intervention only)** OT vs TAU: $3,952 higher (not statistically significant) **Analysis of uncertainty** The base case was a bootstrapped analysis to account for stochastic uncertainty. The only sensitivity analysis performed was on the value of an hours work. As the value reduces the probability of that OT is more cost effective than TAU falls. In the base case it is 75.5% at $36.88 per hour and falls to 52.5% at $10 per hour.

Study	Schene 2007			
Study details	**Population & interventions**	**Costs**	**Health outcomes**	**Cost-effectiveness**
conducted alongside a randomised controlled trial (RCT) where healthcare costs (outpatient, GP and medication) and hours of work were captured. For the CBA, hours of work were multiplied by Dutch average hourly wage. **Perspective:** Societal **Time horizon:** 12 months for economic evaluation **Treatment effect duration:** Not relevant **Discounting:** Not conducted	Treatment as usual (TAU) (n=30, mean age: 45.2, 53% female): out-patient treatment for depression. This consisted of clinical management according to the American Psychiatric Association Guideline (2000) and antidepressants and/or cognitive behavioural therapy (CBT) with senior psychiatric residents. Visits lasted 30 minutes every 2–3 weeks. **Intervention 2:** TAU + occupational therapy (OT) (n=32, mean age: 46.6, 50% female), the addition of OT, which had diagnostic and therapeutic phases. [a]			
Data sources				
Health outcomes: Within trial analysis were used, using retrospective questionnaires. **Quality-of-life weights:** NA. **Cost sources:** Not reported.				
Comments				
Source of funding: Landelijk Instituut Sociale Verzekering (LISV). **Limitations:** Author recognised limitations: small sample size and limited follow up data. **Other:** None				

Study	Schene 2007			
Study details	Population & interventions	Costs	Health outcomes	Cost-effectiveness
Overall applicability: Partially applicable		**Overall quality:** Potentially serious limitations		
Abbreviations: CBA: cost-benefit analysis; CBT: cognitive behavioural therapy; GP: general practitioner; NA: not applicable; OT: occupational therapy; RCT: randomised controlled trial; TAU: treatment as usual; WRMDD: work related major depressive disorder;				
(a) TAU included antidepressants, if indicated and accepted by patients. They were treated by senior psychiatric residents with visits lasting 30 minutes every 2 to 3 weeks. OT consisted of two skilled occupational therapists providing the intervention over three manual-based phases: diagnostic phase (4 weeks) – five contacts with an occupational physician from the patient's employer and a plan for work reintegration; therapeutic phase (24 weeks) – 24 weekly group sessions (8 to 10 patients) and 12 individual sessions; follow-up phase (20 weeks) – three individual visits.				

Study	Squires 2011			
Study details	Population & interventions	Costs	Health outcomes	Cost-effectiveness
Squires 2011 (UK) **Economic analysis:** Cost-utilisation analysis (CUA) **Study design:** An economic evaluation using a Markov model using data from published studies on three interventions **Approach to analysis:** Economic evaluation using effectiveness data from previously published studies, utilities from the British Household Panel Survey	**Population:** Workers on sick leave for 1 week to 6 months due to musculoskeletal disorders (MSDs) **Cohort settings:** Mean age: 41; gender not reported **Intervention 1:** Workplace intervention (WI): a workplace assessment and work modifications based on participative ergonomics involving all relevant stakeholders.	Not reported **Currency & cost year:** 2007 UK£ **Cost components incorporated:** Costs to NHS of MSD: general practitioner (GP) visits, prescriptions, allied health professionals, hospital outpatients, Cost of interventions, salaries.	Not reported	**CUA (from societal perspective so includes costs to NHS and from lost wages)** WI and PAEW are both cheaper than UC and more effective PAI is more costly but more effective than UC PAEW dominates all interventions. CEA, cost per sick day avoided PAEW is the dominant strategy Results were presented on the cost-effectiveness plane and not in a detailed table or text. **Analysis of uncertainty** Sensitivity and scenario analyses were undertaken. PAEW was not dominant if only the

Study	Squires 2011			
Study details	**Population & interventions**	**Costs**	**Health outcomes**	**Cost-effectiveness**
and costs from published sources. **Perspective:** NHS and person shaped support (PSS), societal and employer. **Time horizon:** Lifetime **Treatment effect duration:** If an individual did not return to work in 6 months, the probability of return to work was assumed to be same for both interventions and usual care. **Discounting:** Not conducted	**Intervention 2:** Physical activity and education intervention (PAE): any form of physical activity and education around how to deal with pain and body mechanics. **Intervention 3:** Physical activity, education and workplace visit (PAEW): WI+PAE plus a workplace visit by the employee and the physical therapist to inform rehabilitation. [a] **Intervention 4:** Usual care (UC): treatment of MSDs in the UK [b]			employer perspective was taken and the probability of sick leave recurring was doubled. In a threshold analysis, if the intervention costs were less than an additional £3,000 and returns at least an additional 3% of people to work (32/1,000) in comparison to UC, then it is likely to result in a cost per QALY gained below £20,000.
Data sources				
Health outcomes: From published studies. **Quality-of-life weights:** SF-36 data from British Household Panel Survey. **Cost sources:** DWP, PSSRU and published sources.				
Comments				
Source of funding: National Institute for Health and Care Excellence. **Limitations:** Author recognised limitations: Evidence on effectiveness of interventions was poor and not necessarily generalizable to the UK. No long term (post 12 month) follow up was available. No probabilistic sensitivity analysis was possible. Large amount of structural uncertainty. Relationships between variables was simplified. **Other:** None				

Study	Squires 2011			
Study details	Population & interventions	Costs	Health outcomes	Cost-effectiveness
Overall applicability: Partially applicable		**Overall quality:** Potentially serious limitations		
Abbreviations: CEA: cost-effectiveness analysis; CUA: cost-utilisation analysis; GP: general practitioner; MSD: musculoskeletal disorders; NHS: national health service; PAEW: physical activity, education and workplace visit; PAE: physical activity and education intervention; PSS: person shaped support; QALY: quality-adjusted life year; UC: usual care; WI: workplace intervention;				
(a) This enabled the employer to become actively involved in the rehabilitation process. The PAEW intervention did not include a workplace assessment and work modifications, as was part of the WI. *(b)* UC included 4.5 GP visits, 4.5 prescriptions, 3 packs of pain relief medication, 4 half hour sessions of physiotherapy (in 7% of cases), 2.5 sessions of osteopathy (in 5% of cases), 2.5 sessions of chiropractic treatment (in 2% of cases) and a hospital outpatient visit (in 10% of cases).				

Study	Steenstra 2006			
Study details	Population & interventions	Costs	Health outcomes	Cost-effectiveness
Steenstra 2006 (Netherlands) **Economic analysis:** Cost-effectiveness analysis (CEA) and cost-utilisation analysis (CUA) **Study design:** An economic evaluation using data directly from a trial. No economic model was constructed. **Approach to analysis:** An economic evaluation was conducted alongside a randomised	**Population:** Workers on sick leave for 2 to 6 weeks due to lower back pain (LBP) **Cohort settings:** Not applicable (NA) **Intervention 1:** Clinical intervention (CI) (n=28, mean age: 39.2, 79% female): a graded activity programme of 26 x 1-hour sessions, with a frequency of 2 sessions per week. [a]	**Mean total costs** WI: €8,993 CI: €10,537 WI+CI: €12,391 UC: €9,109 **Currency & cost year:** Euro (€), cost year not stated **Cost components incorporated:** Direct healthcare costs (occupational physician, allied health professionals, hospitalisations), interventions, absenteeism	Actual quality-adjusted life years (QALY) values not reported **Sick leave (calendar days)** WI: 108.5 CI: 155.9 WI+CI: 181.7 UC: 135.2	**CEA** (per one day less of sick leave) WI vs UC: €19 WI+CI vs WI: €11 CI vs UC: €29 **CUA** (cost per QALY) WI vs UC: -€1483 WI+CI vs WI: €24416 CI vs UC: €5447 **Analysis of uncertainty** The base case was a bootstrapped analysis to account for stochastic uncertainty.

Study	Steenstra 2006			
Study details	**Population & interventions**	**Costs**	**Health outcomes**	**Cost-effectiveness**
controlled trial (RCT) where healthcare costs, productivity losses and utility values were captured. CEA had days sick leave as outcome. **Perspective:** Societal **Time horizon:** 52 weeks **Treatment effect duration:** Not relevant **Discounting:** Not conducted	**Intervention 2:** Workplace intervention (WI) (n=96, mean age: 44, 47% female): UC, a workplace assessment and modification and communication between OP and GP in order to discuss how to counsel the worker to RtW. [b] **Intervention 3:** Usual care (UC) (n=100, mean age: 41.2, 67% female): Dutch OP guidelines for LBP delivered by a GP. Resuming daily activities and work within two weeks is encouraged and a clinical intervention recommended after 12 weeks. **Intervention 4:** WI + CI (n=27, mean age: 43.6, 47% female) where workers had WI in the first 8 weeks.			The cost-effective planes (and confidence intervals of point estimates) suggested that WI and UC were likely similar in cost but that WI was more effective. CI is likely less effective and more costly than both WI and UC. Scenario analyses suggested using a fixed sum per day of production lost, net rather than calendar sick days and using a HCA approach to productivity loss did not significantly influence results.

Study	Steenstra 2006			
Study details	Population & interventions	Costs	Health outcomes	Cost-effectiveness
Data sources				
Health outcomes: Within trial analysis was used using retrospective questionnaires and computerised medical records. **Quality-of-life weights:** EQ-5D VAS. **Cost sources:** Dutch costing guidelines, health care charges and professional organisations.				
Comments				
Source of funding: The Netherlands Organisation for Health Research and Development (ZonMw), Dutch Ministries of Health, Welfare and Sports and of Social Affairs. **Limitations:** None discussed. **Other:** None				
Overall applicability: Partially applicable **Overall quality:** Potentially serious limitations				
Abbreviations: CEA: cost-effectiveness analysis; CI: clinical intervention; CUA: cost-utilisation analysis; GP: general practitioner; LBP: lower back pain; LP: lumbar puncture; NA: not applicable; OP: occupational therapy; PT: physiotherapy; RCT: randomised controlled trial; RTW: return to work; UC: usual care; WI: work intervention				
(a) A graded activity programme based on operant behavioural therapy principles based on the findings from patient history, physical examination, functional capacity evaluation, the demands from the patients' work and the patients' expectations on time to RTW. The entire programme consisted of a maximum of 26 one-hour sessions, with a frequency of two sessions a week. The first session took half an hour more since taking the patients' history and a physical examination were part of this session. The programme ended as soon as a full RTW had been established, according to an earlier agreed upon individual schedule. During the programme the worker had an active role in RTW and the physiotherapist acted as a coach and supervisor, using a hands-off approach. *(b)* The WI started at baseline, at least before 8 weeks of sick-leave. The intervention consisted of: Dutch OP guidelines for LBP; A workplace assessment and work modifications based on participative ergonomics, which involved all important stakeholders: the occupational health service's ergonomist or occupational health nurse, the worker on sick-leave, the workers supervisor and other communication between the OP and the GP, to reach consensus on counselling the worker in RTW.				

Study	Uegaki 2010			
Study details	Population & interventions	Costs	Health outcomes	Cost-effectiveness
Uegaki 2010 (Netherlands) **Economic analysis:** Cost-utilisation analysis (CUA)	**Population:** Workers with partial sick leave over 3 months due to distress **Cohort settings:**	At 12 months MISS: €12,538 UC: €12,722 **Currency & cost year:** Euro (€) 2004	**Quality-adjusted life years (QALYs)** over 12 months MISS: 0.78 UC: 0.76	**Incremental cost-effectiveness ratio (ICER)** MISS vs UC: -€7,356 per QALY gained Neither change in costs nor change in QALYs were statistically significantly different between MISS and UC.

Study	Uegaki 2010			
Study details	**Population & interventions**	**Costs**	**Health outcomes**	**Cost-effectiveness**
Study design: An economic evaluation using data directly from a trial. No economic model was constructed. **Approach to analysis:** An economic evaluation was conducted alongside a randomised controlled trial (RCT) where healthcare costs, productivity losses and utility values were captured. **Perspective:** Societal **Time horizon:** 12 months **Treatment effect duration:** Not relevant **Discounting:** Not conducted	Not applicable (NA) **Intervention 1:** Minimal intervention for stress-related mental disorders with sick leave (MISS) (n=109, mean age: 42.0, 67% female): a GP customized version of an activating approach [a] **Intervention 2:** Usual care (UC) (n=83, mean age: 39.6, 65% female): comparable to usual care in real life managed by a general practitioner (GP). No further information given.	**Cost components incorporated:** Primary care costs (general practitioner (GP), diagnostic tests, psychologist). Secondary care costs (mental health care, medical specialists, home help). Occupational physician (OP). Productivity losses (sick leave per hour assessed using frictional cost method (FCM) approach to productivity loss). Intervention costs (training for MISS).		**Analysis of uncertainty** The base case was a bootstrapped analysis to account for stochastic uncertainty. Cost-effectiveness planes showed that in the base case 77% of bootstrapped pairs would be considered cost-effective at a willingness to pay (WTP) threshold of €25,600 per QALY. Sensitivity analysis explored different approaches to costing lost productivity but did not significantly influence the results. Subgroup analysis suggested MISS may be most cost-effective for patients with stress related mental disorders, which was the only analysis which had statistically significant improvement in QALYs vs UC: -€28,278
Data sources				
Health outcomes: Within trial analysis using retrospective questionnaires and computerised medical records. **Quality-of-life weights:** EQ-5D using Dutch tariff. **Cost sources:** Dutch costing guidelines, health care charges and professional organisations.				
Comments				

Study	Uegaki 2010			
Study details	**Population & interventions**	**Costs**	**Health outcomes**	**Cost-effectiveness**
Source of funding: Health Research and Development Council (ZonMw) in The Netherlands. **Limitations:** Author recognised limitations Usual care may not have mirrored the real world, lack of statistical power from small sample size, retrospective nature of data collection, QALYs may not be an appropriate estimate of benefit for patients with mental health problems. Presenteeism was not measured. **Other:** None				
Overall applicability: Partially applicable **Overall quality:** Potentially serious limitations				
Abbreviations: CUA: cost-utilisation analysis; FCM: friction cost method; GP: general practitioner; ICER: incremental cost-effectiveness ratio; MISS: minimal Intervention for stress-related mental disorders with sick leave; NA: not applicable; OP: occupational physician; QALY: quality-adjusted life year; RCT: randomised controlled trial; UC: usual care; WTP: willingness to pay				
(a) This was developed on the basis of three consultations over a time span of four weeks, and encompassed the following five key tasks: 1 diagnosing stress-related mental disorders; 2 providing education about the problem and importance of taking an active role in one's functional recovery; 3 advising patients on how to reflect, cope and problem-solve; 4 monitoring progress; 5 referring to specialists.				

Study	van Oostrom 2009			
Study details	**Population & interventions**	**Costs**	**Health outcomes**	**Cost-effectiveness**
van Oostrom 2009 (Netherlands) **Economic analysis:** Cost-benefit analysis (CBA), cost-effectiveness analysis (CEA) and cost-utilisation analysis (CUA) **Study design:** An economic evaluation was used, using data directly from a trial. No economic model was constructed.	**Population:** Workers on sick leave for 2 to 8 weeks due to distress. **Cohort settings:** Not applicable (NA) **Intervention 1:** Workplace intervention (WI) (n=73, mean age 48.6, 23.3% female): consisted of a stepwise communication process to identify and	Societal perspective (12 months) WI: €3,201 UC: €2,758 Employer perspective (12 months) WI: €1,386 UC: €802 **Currency & cost year:** Euro (€) 2008 **Cost components incorporated:**	**Mean duration of sick leave, over 12 months** CEA WI: 133 days UC: 134 days **Mean quality-adjusted life year (QALY)** CUA WI: 0.77 UC: 0.78	**CEA** WI vs UC: £627 per sick day avoided Change in costs or change in sick days was not statistically different between WI and UC **CBA** Net Monetary Benefit WI (HCA): -€1,987 WI (FCA): -€1,700 WI was statistically significantly more costly than UC and changes in costs of productivity loss whilst favouring UC were not statistically significant regardless of productivity measure. **CUA**

Study	van Oostrom 2009			
Study details	**Population & interventions**	**Costs**	**Health outcomes**	**Cost-effectiveness**
Approach to analysis: An economic evaluation was conducted alongside a randomised controlled trial (RCT) where healthcare, occupational health services, productivity loss and utility values were captured. Reduction in day's sick leave was outcome for CEA. **Perspective:** CEA and CUA: societal CBA: employer **Time horizon:** 12 months **Treatment effect duration:** Not relevant **Discounting:** Not conducted	solve obstacles to return to work (RTW). [a] **Intervention 2:** Usual care (UC) (n=72, mean age 49.2, 19.4% female): treatment by the OP according to the Dutch Guidelines. [b]	Societal perspective: healthcare costs (primary care, occupational physician, home healthcare, medication, allied health professionals). Productivity loss (Human capital approach (HCA) and friction cost analysis (FCA) approaches). Employer perspective: occupational health services provided by employer, productivity loss as per societal perspective.		WI vs UC, incremental cost-effectiveness ratio (ICER) (HCA): -€18,4562 per QALY gained WI vs UC, ICER (FCA): -€155,850 WI dominates UC. Neither cost differences with WI or QALY gains were statistically significant. **Analysis of uncertainty** The base case was a bootstrapped analysis to account for stochastic uncertainty. Cost effectiveness planes showed substantial uncertainty in results which reflects the statistical uncertainty in the point estimates of cost differences and effectiveness measures between WI and UC. Subgroup analysis suggested WI may be most cost-effective for patients with an intention to return to work but findings were still limited in statistical significance.
Data sources				
Health outcomes: Within trial analysis using retrospective questionnaires and computerised medical records. **Quality-of-life weights:** EQ-5D using Dutch tariff. **Cost sources:** Dutch costing guidelines, health care charges and professional organisations.				
Comments				

Study	van Oostrom 2009			
Study details	Population & interventions	Costs	Health outcomes	Cost-effectiveness
Source of funding: Dutch Ministry of Social Affairs and Employment and the participating occupational health services. **Limitations:** Author recognised limitations: costs of workplace adaptations were not registered. Presenteeism was not considered. Small sample size with effects skewed to a small number of costly participants. 20 out of 73 participants did not receive the WI. **Other:** None				
Overall applicability: Partially applicable **Overall quality:** Potentially serious limitations				
Abbreviations: CBA: cost-benefit analysis; CEA: cost-effectiveness analysis; CUA: cost-utilisation analysis; FCA: frictional cost approach; HCA: human capital approach; ICER: incremental cost-effectiveness ratio; NA: not applicable; OP: occupational physician; QALY: quality-adjusted life year; RCT: randomised controlled trial; RTW: return to work; UC: usual care; WI: work intervention				

(a) Three meetings were planned to take place within 2 weeks. The purpose of the first meeting between the sick-listed employee and the RTW coordinator was to identify obstacles for RTW from the perspective of the employee. The second meeting was between the supervisor and the RTW coordinator, where obstacles to the employee's RTW were identified from the perspective of the supervisor. In the third meeting, which was generally the longest, the employee, supervisor and RTW coordinator discussed solutions and formulated a consensus-based plan for their implementation.

(b) According to the evidence-based guideline of the Dutch Association of Occupational Physicians (NVAB) published in 2000 and updated in 2007. This guideline aims to facilitate the optimal functioning of employees with mental health problems and to prevent long-term sick leave and frequent recurrences. An early start to the treatment by occupational physicians is recommended. Occupational physicians act as motivating counsellors using cognitive behavioural elements to enhance the problem-solving capacity of employees. In addition, the Improved Gatekeeper Act requires that both the employer and employee take responsibility for a RTW plan.

Appendix J – Health economic analysis

See separate economic modelling report.

Appendix K – Excluded studies

Economic studies

Table 6: Summary of studies excluded from the economic evidence review for the workplace health interventions

Reference	Reason for exclusion	RQs
Aas RW, Holte KA, Tuntland H, Roe C, Labriola M, Lund T, et al. Workplace interventions for neck pain in workers. Cochrane Database Syst Rev. 2011; (4): CD008160. Available from: https://www.cochranelibrary.com/cdsr/doi/10.1002/14651858.CD008160/full	Ineligible study design	1a, 2a, 3a
Arends I, Bultmann U, van Rhenen W, H G, van der Klink JJL. Economic evaluation of a problem solving intervention to prevent recurrent sickness absence in workers with common mental disorders. PLoS ONE. 2013;8(8):e71937.	Ineligible outcomes	1a, 2a
Bedell W, Kaszkin-Bettag M. Coherence and health care cost--RCA actuarial study: a cost-effectiveness cohort study. Altern Ther Health Med. 2010;16(4):26-31.	Ineligible study design	1a, 2a, 3a
Bergstrom G, Bergstrom C, Hagberg J, Bodin L, Jensen I. A 7-year follow-up of multidisciplinary rehabilitation among chronic neck and back pain patients. Is sick leave outcome dependent on psychologically derived patient groups? Eur J Pain. 2010;14(4):426-33.	Ineligible intervention	1a, 2a, 3a
Bernaards CM, Bosmans JE, Hildebrandt VH, van Tulder MW, Heymans MW. The cost-effectiveness of a lifestyle physical activity intervention in addition to a work style intervention on recovery from neck and upper limb symptoms and pain reduction in computer workers. Occup Environ Med. 2011;68(4):265-72.	Ineligible patient population	1a, 2a, 3a
Braun T, Bambra C, Booth M, Adetayo K, Milne E. Better health at work? An evaluation of the effects and cost-benefits of a structured workplace health improvement programme in reducing sickness absence. J Public Health. 2015;37(1):138-42.	Ineligible patient population	1a, 2a, 3a
Brown KC, Sirles AT, Hilyer JC, Thomas MJ. Cost-effectiveness of a back school intervention for municipal employees. Spine. 1992;17(10):1224-8.	Ineligible patient population	1a, 2a, 3a
Brouwers E, de Bruijne M, Terluin B, Tiemens BG, Verhaak PFM. Cost-effectiveness of an activating intervention by social workers for patients with minor mental disorders on sick leave: a randomized controlled trial. Eur J Public Health. 2007;17(2):214-20.	Ineligible outcomes	1a, 2a

Reference	Reason for exclusion	RQs
Bultmann U, Sherson D, Olsen J, Hansen CL, Lund T, Kilsgaard J. Coordinated and tailored work rehabilitation: a randomized controlled trial with economic evaluation undertaken with workers on sick leave due to musculoskeletal disorders. J Occup Rehabil. 2009;19(1):81-93.	Ineligible outcomes	1a, 2a
de Jong PHP, Hazes JM, Buisman LR, Barendregt PJ, van Zeben D, van der Lubbe PA, et al. Best cost-effectiveness and worker productivity with initial triple DMARD therapy compared with methotrexate monotherapy in early rheumatoid arthritis: cost-utility analysis of the tREACH trial. Rheumatol. 2016;55(12):2138-47.	Ineligible patient population	1a, 2a, 3a
Dewa CS, Hoch JS. Estimating the net benefit of a specialized return-to-work program for workers on short-term disability related to a mental disorder: an example exploring investment in collaborative care. J Occup Environ Med. 2014;56(6):628-31.	Ineligible patient population	1a, 2a, 3a
Dewa CS, Hoch JS, Carmen G, Guscott R, Anderson C. Cost, effectiveness, and cost-effectiveness of a collaborative mental health care program for people receiving short-term disability benefits for psychiatric disorders. Can J Psychiatry. 2009;54(6):379-88.	Ineligible patient population	1a, 2a, 3a
Driessen M, Bosmans J, Proper K, Anema J, Bongers P, van der Beek A. The economic evaluation of a participatory ergonomics programme to prevent low back and neck pain. Work. 2012;41(Suppl 1):2315-20.	Ineligible patient population	1a, 2a, 3a
Finnes A, Enebrink P, Sampaio F, Sorjonen K, Dahl J, Ghaderi A, et al. Cost-Effectiveness of Acceptance and Commitment Therapy and a Workplace Intervention for Employees on Sickness Absence due to Mental Disorders. J Occup Environ Med. 2017;59(12):1211-20.	Ineligible outcomes	1a, 2a
Flanagan H, Barwell F, Mazelan P, Spurgeon P. A Better Model of Managing Sickness Absence. In: Spurgeon P, Burke RJ, Cooper CL, editors. The Innovation Imperative in Health Care Organisations. Cheltenham: Edward Elgar Publishing; 2012. p. 113-34.	Ineligible study design	1a, 2a, 3a
Geraedts AS, Van Dongen JM, Kleiboer AM, Wiezer NM, Van Mechelen W, Cuijpers P, et al. Economic evaluation of a web-based guided self-help intervention for employees with depressive symptoms: Results of a randomized controlled trial. J Occup Environ Med. 2015;57(6):666-75.	Ineligible patient population	1a, 2a, 3a
Globe D, Mazonson P, Santas C, Murphy R, Cheng A, Huang X, et al. Impact of etanercept treatment on absenteeism and productivity: The work loss and productivity survey. Am Health Drug Benefits. 2010;3(4):191-200.	Ineligible patient population	1a, 2a, 3a

Reference	Reason for exclusion	RQs
Haldorsen EM, Kronholm K, Skouen JS, Ursin H. Predictors for outcome of a multi-modal cognitive behavioural treatment program for low back pain patients-a 12-month follow-up study. Eur J Pain. 1998;2(4):293-307.	Ineligible study design	1a, 2a, 3a
Hartfiel N, Clarke G, Havenhand J, Phillips C, Edwards RT. Cost-effectiveness of yoga for managing musculoskeletal conditions in the workplace. Occup Med. 2017;67(9):687-95.	Ineligible patient population	1a, 2a, 3a
Hlobil H, Staal JB, Twisk J, Koke A, Ariens G, Smid T, et al. The effects of a graded activity intervention for low back pain in occupational health on sick leave, functional status and pain: 12-month results of a randomized controlled trial. J Occup Rehabil. 2005;15(4):569-80.	Ineligible study design	1a, 2a, 3a
Iijima S, Yokoyama K, Kitamura F, Fukuda T, Inaba R. Cost-benefit analysis of comprehensive mental health prevention programs in Japanese workplaces: a pilot study. Ind Health. 2013;51(6):627-33.	Ineligible intervention	1a, 2a, 3a
Jensen IB, Bergstrom G, Ljungquist T, Bodin L. A 3-year follow-up of a multidisciplinary rehabilitation programme for back and neck pain. Pain. 2005;115(3):273-83.	Ineligible outcomes	1a, 2a
Jensen C, Nielsen CV, Jensen OK, Petersen KD. Cost-effectiveness and cost-benefit analyses of a multidisciplinary intervention compared with a brief intervention to facilitate return to work in sick-listed patients with low back pain. Spine. 2013;38(13):1059-67.	Ineligible setting	1a, 2a, 3a
Kim P, Hayden JA, Mior SA. The cost-effectiveness of a back education program for firefighters: a case study. J Can Chiropr Assoc. 2004;48(1):13-9.	Ineligible patient population	1a, 2a, 3a
Lambeek LC, Bosmans JE, Van Royen BJ, Van Tulder MW, Van Mechelen W, Anema JR. Effect of integrated care for sick listed patients with chronic low back pain: economic evaluation alongside a randomised controlled trial. BMJ. 2010;341:c6414.	Ineligible outcomes	1a, 2a
Lammerts L, van Dongen JM, Schaafsma FG, van Mechelen W, Anema JR. A participatory supportive return to work program for workers without an employment contract, sick-listed due to a common mental disorder: an economic evaluation alongside a randomized controlled trial. BMC Public Health. 2017;17(1):162.	Ineligible patient population	1a, 2a, 3a
Loisel P, Abenhaim L, Durand P, Esdaile JM, Suissa S, Gosselin L, et al. A population-based, randomized clinical trial on back pain management. Spine. 1997;22(24):2911-8.	Ineligible study design	1a, 2a, 3a
Loisel P, Lemaire J, Poitras S, Durand MJ, Champagne F, Stock S, et al. Cost-benefit and cost-effectiveness analysis of a disability prevention model for back pain management: a six year follow up study. Occup Environ Med. 2002;59(12):807-15.	Ineligible outcomes	1a, 2a

Reference	Reason for exclusion	RQs
McLaren CF, Reville RT, Seabury SA. How Effective Are Employer Return to Work Programs? International Review of Law and Economics. 2017;52(C):58-73.	Ineligible patient population	1a, 2a, 3a
Meijer EM, Sluiter JK, Heyma A, Sadiraj K, Frings-Dresen MH. Cost-effectiveness of multidisciplinary treatment in sick-listed patients with upper extremity musculoskeletal disorders: a randomized, controlled trial with one-year follow-up. Int Arch Occup Environ Health. 2006;79(8):654-64.	Ineligible outcomes	1a, 2a
Mewes JC, Steuten LMG, Groeneveld IF, de Boer AGEM, Frings-Dresen MHW, Ijzerman MJ, et al. Return-to-work intervention for cancer survivors: budget impact and allocation of costs and returns in the Netherlands and six major EU-countries. BMC Cancer. 2015; 15: 899. Available from: https://bmccancer.biomedcentral.com/articles/10.1186/s12885-015-1912-7	Ineligible patient population	1a, 2a, 3a
Michaels CN, Greene AM. Worksite wellness: increasing adoption of workplace health promotion programs. Health Promot Pract. 2013;14(4):473-9.	Ineligible study design	1a, 2a, 3a
Molde Hagen E, Grasdal A, Eriksen H R. Does early intervention with a light mobilisation program reduce longterm sick leave for low back pain: a 3- year follow-up study. Spine. 2003;28(20):2309-16.	Ineligible setting	1a, 2a, 3a
Moyneur E, Bookhart BK, Mody SH, Fournier A-A, Mallett D, Duh MS. The economic impact of pre-dialysis epoetin alpha on health care and work loss costs in chronic kidney disease: an employer's perspective. Disease Management. 2008;11(1):49-58.	Ineligible patient population	1a, 2a, 3a
Niemisto L, Rissanen P, Sarna S, Lahtinen-Suopanki T, Lindgren KA, Hurri H. Cost-effectiveness of combined manipulation, stabilizing exercises, and physician consultation compared to physician consultation alone for chronic low back pain: a prospective randomized trial with 2-year follow-up. Spine. 2005;30(10):1109-15.	Ineligible patient population	1a, 2a, 3a
Noben C, Evers S, Genabeek Jv, Nijhuis F, de Rijk A. Improving a web-based employability intervention for work-disabled employees: results of a pilot economic evaluation. Disability and rehabilitation. Assistive technology. 2017;12(3):280-89.	Ineligible outcomes	1a, 2a, 3a
Noben C, Hoefsmit N, Evers S, de Rijk A, Houkes I, Nijhuis F. Economic Evaluation of a New Organizational RTW Intervention to Improve Cooperation Between Sick-Listed Employees and Their Supervisors: A Field Study. J Occup Environ Med. 2015;57(11):1170-7.	Ineligible outcomes	1a, 2a, 3a
Noben C, Smit F, Nieuwenhuijsen K, Ketelaar S, Gartner F, Boon B, et al. Comparative cost-effectiveness of two interventions to promote work functioning by targeting mental health complaints among nurses: pragmatic cluster randomised trial. Int J Nurs Stud. 2014;51(10):1321-31.	Ineligible patient population	1a, 2a, 3a

Reference	Reason for exclusion	RQs
Olofsson S, Wickstrom A, Hager Glenngard A, Persson U, Svenningsson A. Effect of treatment with natalizumab on ability to work in people with multiple sclerosis: Productivity gain based on direct measurement of work capacity before and after 1 year of treatment. BioDrugs. 2011;25(5):299-306.	Ineligible study design	1a, 2a, 3a
Oude Hengel KM, Bosmans JE, Van Dongen JM, Bongers PM, Van der Beek AJ, Blatter BM. Prevention program at construction worksites aimed at improving health and work ability is cost-saving to the employer: results from an RCT. Am J Ind Med. 2014;57(1):56-68.	Ineligible patient population	1a, 2a, 3a
Radford K, Phillips J, Drummond A, Sach T, Walker M, Tyerman A, et al. Return to work after traumatic brain injury: cohort comparison and economic evaluation. Brain Inj. 2013;27(5):507-20.	Ineligible outcomes	1a, 2a
Rantonen J, Karppinen J, Vehtari A, Luoto S, Viikari-Juntura E, Hupli M, et al. Cost-effectiveness of providing patients with information on managing mild low-back symptoms in an occupational health setting. BMC Public Health. 2016; 16: 316. Available from: https://bmcpublichealth.biomedcentral.com/articles/10.1186/s12889-016-2974-4	Ineligible patient population	1a, 2a, 3a
Rebergen DS, DJ B, van Tulder MW, van der Beek AJ, van Mechelen W. Cost-effectiveness of guideline-based care for workers with mental health problems. J Occup Environ Med. 2009;51(3):313-22.	Ineligible outcomes	1a, 2a
Rittle C. Can increasing adult vaccination rates reduce lost time and increase productivity? Workplace Health Saf. 2014;62(12):508-16.	Ineligible patient population	1a, 2a, 3a
Roelofs PDDM, Bierma-Zeinstra SMA, van Poppel MNM, van Mechelen W, Koes BW, van Tulder MW. Cost-effectiveness of lumbar supports for home care workers with recurrent low back pain: an economic evaluation alongside a randomized-controlled trial. Spine. 2010;35(26):E1619-26.	Ineligible patient population	1a, 2a, 3a
Schene AH, Koeter MW, Kikkert MJ, Swinkels JA, McCrone P. Adjuvant occupational therapy for work-related major depression works: randomized trial including economic evaluation. Psychol Med. 2007;37(3):351-62.	Ineligible outcomes	1a, 2a
Schneider U, Linder R, Verheyen F. Long-term sick leave and the impact of a graded return-to-work program: evidence from Germany. Eur J Health Econ. 2016;17(5):629-43.	Ineligible study design	1a, 2a, 3a
Shephard RJ. Do work-site exercise and health programs work? Phys Sportsmed. 1999;27(2):48-72.	Ineligible study design	1a, 2a, 3a
Spekle EM, Heinrich J, Hoozemans MJM, Blatter BM, van der Beek AJ, van Dieen JH, et al. The cost-effectiveness of the RSI QuickScan intervention programme for computer workers: Results of an economic evaluation alongside a randomised controlled trial. BMC Musculoskelet Disord. 2010; 11:	Ineligible intervention	1a, 2a, 3a

Reference	Reason for exclusion	RQs
259. Available from: https://bmcmusculoskeletdisord.biomedcentral.com/articles/10.1186/1471-2474-11-259		
Squires H, Rick J, Carroll C, Hillage J. Cost-effectiveness of interventions to return employees to work following long-term sickness absence due to musculoskeletal disorders. J Public Health. 2012;34(1):115-24.	Ineligible outcomes	1a, 2a
Steenstra IA, Anema JR, van Tulder MW, Bongers PM, de Vet HC, van Mechelen W. Economic evaluation of a multi-stage return to work program for workers on sick-leave due to low back pain. J Occup Rehabil. 2006;16(4):557-78.	Ineligible outcomes	1a, 2a
Suoyrjo H, Oksanen T, Hinkka K, Kivimaki M, Klaukka T, Pentti J, et al. The effectiveness of vocationally oriented multidisciplinary intervention on sickness absence and early retirement among employees at risk: an observational study. Occup Environ Med. 2009;66(4):235-42.	Ineligible patient population	1a, 2a, 3a
Suryahadi A, Sambodho P. An Assessment of Policies to Improve Teacher Quality and Reduce Teacher Absenteeism. In: Suryadarma D, Jones GW, editors. Education in Indonesia. Singapore Institute of Southeast Asian Studies; 2013. p. 139-59.	Ineligible patient population	1a, 2a, 3a
Taimela S, Justen S, Aronen P, Sintonen H, Laara E, Malmivaara A, et al. An occupational health intervention programme for workers at high risk for sickness absence. Cost effectiveness analysis based on a randomised controlled trial. Occup Environ Med. 2008;65(4):242-8.	Ineligible patient population	1a, 2a, 3a
Targett P, Wehman P. Return to Work after Traumatic Brain Injury: A Supported Employment Approach. In: Schultz IZ, Rogers S, editors. Work Accommodation and Retention in Mental Health. New York: Springer; 2011. p. 277-94.	Ineligible outcomes	1a, 2a, 3a
Theodore BR, Mayer TG, Gatchel RJ. Cost-effectiveness of early versus delayed functional restoration for chronic disabling occupational musculoskeletal disorders. J Occup Rehabil. 2015;25(2):303-15.	Ineligible patient population	1a, 2a, 3a
Torstensen TA, Ljunggren AE, Meen HD, Odland E, Mowinckel P, Geijerstam S. Efficiency and costs of medical exercise therapy, conventional physiotherapy, and self-exercise in patients with chronic low back pain. A pragmatic, randomized, single-blinded, controlled trial with 1-year follow-up. Spine. 1998;23(23):2616-24.	Ineligible setting	1a, 2a, 3a
Uegaki K, Bakker I, de Bruijne M, van der Beek A, Terluin B, van Marwijk H, et al. Cost-effectiveness of a minimal intervention for stress-related sick leave in general practice: results of an economic evaluation alongside a pragmatic randomised control trial. J Affect Disord. 2010;120(1-3):177-87.	Ineligible outcomes	1a, 2a

Reference	Reason for exclusion	RQs
Van Der Beek AJ. Primary preventive effects of a multifaceted workplace intervention on low back pain. Pain. 2015;156(9):1583-84.	Ineligible study design	1a, 2a, 3a
van Duijn M, Eijkemans MJ, Koes BW, Koopmanschap MA, Burton KA, Burdorf A. The effects of timing on the cost-effectiveness of interventions for workers on sick leave due to low back pain. Occup Environ Med. 2010;67(11):744-50.	Ineligible intervention	1a, 2a, 3a
van Oostrom SH, Heymans MW, de Vet HCW, van Tulder MW, van Mechelen W, Anema JR. Economic evaluation of a workplace intervention for sick-listed employees with distress. Occup Environ Med. 2010;67(9):603-10.	Ineligible outcomes	1a, 3a
Vogt J, Leonhardt J, Koper B, Pennig S. Economic evaluation of CISM--a pilot study. Int J Emerg Ment Health. 2004;6(4):185-96.	Ineligible intervention	1a, 2a, 3a
Welch LS. Improving work ability in construction workers - Let's get to work. Scand J Work Environ Health. 2009;35(5):321-24.	Ineligible study design	1a, 2a, 3a
Wynne-Jones G, Artus M, Bishop A, Lawton SA, Lewis M, Jowett S, et al. Effectiveness and costs of a vocational advice service to improve work outcomes in patients with musculoskeletal pain in primary care: A cluster randomised trial (SWAP trial ISRCTN 52269669). Pain. 2018;159(1):128-38.	Ineligible outcomes	1a, 2a, 3a
Yassi A, Kettner J, Hammond G, Cheang M, McGill M. Effectiveness and cost-benefit of an influenza vaccination program for health care workers. Can J Infect Dis. 1991;2(3):101-8.	Ineligible patient population	1a, 2a, 3a
Yermakov S, Davis M, Calnan M, Fay M, Cox-Buckley B, Sarda S, et al. Impact of increasing adherence to disease-modifying therapies on healthcare resource utilization and direct medical and indirect work loss costs for patients with multiple sclerosis. J Med Econ. 2015;18(9):711-20.	Ineligible patient population	1a, 2a, 3a

Appendix M – Health economic quality assessment

Study identification **Arends I, Bultmann U, van Rhenen W, Groen H, van der Klink JJL. Economic evaluation of a problem solving intervention to prevent recurrent sickness absence in workers with common mental disorders. PLoS ONE. 2013;8(8):e71937.**		
Guidance topic: Indoor Air Quality At Home		**Question no: 3.1 & 3.3**
Section 1: Applicability (relevance to specific review questions and the NICE reference case)	**Yes/partly/no/unclear/NA**	**Comments**
1.1 Is the study population appropriate for the review question?	Unclear	Not clear about the length of time people have been off of work
1.2 Are the interventions appropriate for the review question?	Yes	Intervention targeted at return to work
1.3 Is the system in which the study was conducted sufficiently similar to the current UK context?	Partly	The study was in the Netherlands where the occupational support offered is differently organised to the UK - for example there are occupational physicians
1.4 Are the perspectives clearly stated and are they appropriate for the review question?	Yes	Societal for CEA and employer for CBA
1.5 Are all direct effects on individuals included, and are all other effects included where they are material?	Yes	Effects included were appropriate for the analysis chosen
1.6 Are all future costs and outcomes discounted appropriately?	NA	Not conducted but a short time horizon was used
1.7 Is QALY used as an outcome, and was it derived using NICE's preferred methods? If not, describe rationale and outcomes used in line with analytical perspectives taken (item 1.4 above).	NA	QALYs were not used, but the effectiveness measures chosen were reasonable for the CEA performed
1.8 Are costs and outcomes from other sectors fully and appropriately measured and valued?	Yes	Costs to all relevant sectors were considered
1.9 Overall judgement: Partially applicable		
Section 2: Study limitations (the level of methodological quality)		

2.1 Does the model structure adequately reflect the nature of the topic under evaluation?	NA	No decision model was used
2.2 Is the time horizon sufficiently long to reflect all important differences in costs and outcomes?	No	The time horizon was only 12 months so it is unclear whether return to work was sustained
2.3 Are all important and relevant outcomes included?	Partly	Impact on QALYs was not considered
2.4 Are the estimates of baseline outcomes from the best available source?	Yes	Drawn from trial participants
2.5 Are the estimates of relative intervention effects from the best available source?	Yes	Taken from a RCT
2.6 Are all important and relevant costs included?	Yes	All relevant costs were considered
2.7 Are the estimates of resource use from the best available source?	Yes	The underlying trial was used for resource use data and published sources were used for costs data
2.8 Are the unit costs of resources from the best available source?	Yes	The underlying trial was used for resource use data and published sources were used for costs data
2.9 Is an appropriate incremental analysis presented or can it be calculated from the data?	Yes	Incremental results were given
2.10 Are all important parameters whose values are uncertain subjected to appropriate sensitivity analysis?	Yes	Stochastic uncertainty in the data were dealt with using nonparametric bootstraps. Deterministic SA performed on key parameters
2.11 Is there any potential conflict of interest?	No	There were no notable conflicts of interest
2.12 Overall assessment: Potentially serious limitations		
Other comments: None		
CBA: cost-benefit analysis; CEA: cost-effectiveness analysis ; QALY: quality-adjusted life-year; RCT: randomised controlled trial; SA: sensitivity analysis		

Study identification **Brouwers EPM, de Bruijne MC, Terluin B, Tiemens BG, Verhaak PFM. Cost-effectiveness of an activating intervention by social workers for patients with minor mental disorders on sick leave: a randomized controlled trial. Eur J Public Health. 2007;17(2):214-20.**		
Guidance topic: Indoor Air Quality At Home		**Question no: 3.1 & 3.3**
Section 1: Applicability (relevance to specific review questions and the NICE reference case)	**Yes/partly/no/unclear/NA**	**Comments**

1.1 Is the study population appropriate for the review question?	Partly	Patients were on sick leave for less than 3 months
1.2 Are the interventions appropriate for the review question?	Yes	Intervention was targeted at return to work
1.3 Is the system in which the study was conducted sufficiently similar to the current UK context?	Partly	The study was conducted in the Netherlands where the occupational support offered is differently organised to that in the UK - for example there are occupational physicians
1.4 Are the perspectives clearly stated and are they appropriate for the review question?	Yes	Societal for CEA, public health insurer for CBA
1.5 Are all direct effects on individuals included, and are all other effects included where they are material?	Yes	Effects included were appropriate for the analysis chosen
1.6 Are all future costs and outcomes discounted appropriately?	NA	Not conducted but a short time horizon was used
1.7 Is QALY used as an outcome, and was it derived using NICE's preferred methods? If not, describe rationale and outcomes used in line with analytical perspectives taken (item 1.4 above).	Partly	Health states were derived using SF36. The sources of utility values for SF36 health states were not provided.
1.8 Are costs and outcomes from other sectors fully and appropriately measured and valued?	Partly	Indirect costs were not considered
1.9 Overall judgement: Partially applicable		
Section 2: Study limitations (the level of methodological quality)		
2.1 Does the model structure adequately reflect the nature of the topic under evaluation?	NA	No decision model was used
2.2 Is the time horizon sufficiently long to reflect all important differences in costs and outcomes?	No	The time horizon was only 18 months so it is unclear whether return to work was sustained
2.3 Are all important and relevant outcomes included?	Yes	QALYs were reported
2.4 Are the estimates of baseline outcomes from the best available source?	Yes	Drawn from trial participants
2.5 Are the estimates of relative intervention effects from the best available source?	Yes	Taken from a RCT
2.6 Are all important and relevant costs included?	Yes	All relevant costs were considered

2.7 Are the estimates of resource use from the best available source?	Yes	Underlying trial for resource use and published sources for costs
2.8 Are the unit costs of resources from the best available source?	Yes	The underlying trial was used for resource use data and published sources were used for costs data
2.9 Is an appropriate incremental analysis presented or can it be calculated from the data?	Yes	Incremental results were given
2.10 Are all important parameters whose values are uncertain subjected to appropriate sensitivity analysis?	Partly	Stochastic uncertainty in the data were dealt with using nonparametric bootstraps. No deterministic sensitivity analysis (SA) was performed on key parameters
2.11 Is there any potential conflict of interest?	No	There were no notable conflicts of interest
2.12 Overall assessment: Potentially serious limitations		
Other comments: None		
CBA: cost-benefit analysis; CUA: cost-utility analysis; QALY: quality-adjusted life-year; RCT: randomised controlled trial; SA: sensitivity analysis; SF36: short-form 36		

Study identification **Bultmann U, Sherson D, Olsen J, Hansen CL, Lund T, Kilsgaard J. Coordinated and tailored work rehabilitation: a randomized controlled trial with economic evaluation undertaken with workers on sick leave due to musculoskeletal disorders. J Occup Rehabil. 2009;19(1):81-93.**		
Guidance topic: Indoor Air Quality At Home		**Question no: 3.1 & 3.3**
Section 1: Applicability (relevance to specific review questions and the NICE reference case)	**Yes/partly/no/unclear/NA**	**Comments**
1.1 Is the study population appropriate for the review question?	Yes	Workers were on sick leave for 4-12 weeks
1.2 Are the interventions appropriate for the review question?	Yes	Intervention was targeted at return to work
1.3 Is the system in which the study was conducted sufficiently similar to the current UK context?	Partly	The study was in Denmark where the organisation of sickness benefits system is similar to the UK, but may still be different enough to limit the generalisability of findings
1.4 Are the perspectives clearly stated and are they appropriate for the review question?	Yes	Societal

1.5 Are all direct effects on individuals included, and are all other effects included where they are material?	Yes	The effects included were appropriate for the analysis chosen
1.6 Are all future costs and outcomes discounted appropriately?	NA	Not conducted but a short time horizon was used
1.7 Is QALY used as an outcome, and was it derived using NICE's preferred methods? If not, describe rationale and outcomes used in line with analytical perspectives taken (item 1.4 above).	NA	QALYs were not used but the effectiveness measures chosen were reasonable
1.8 Are costs and outcomes from other sectors fully and appropriately measured and valued?	Yes	Costs to all relevant sectors were considered
1.9 Overall judgement: Partially applicable		
Section 2: Study limitations (the level of methodological quality)		
2.1 Does the model structure adequately reflect the nature of the topic under evaluation?	NA	No decision model was used
2.2 Is the time horizon sufficiently long to reflect all important differences in costs and outcomes?	No	The time horizon was only 12 months so it's unclear whether return to work was sustained
2.3 Are all important and relevant outcomes included?	Partly	Impact on QALYs was not considered
2.4 Are the estimates of baseline outcomes from the best available source?	Yes	Drawn from trial participants
2.5 Are the estimates of relative intervention effects from the best available source?	Yes	Taken from a RCT
2.6 Are all important and relevant costs included?	Yes	All relevant costs were considered
2.7 Are the estimates of resource use from the best available source?	Yes	Resource use and cost data were collected from national Danish registries
2.8 Are the unit costs of resources from the best available source?	Yes	Resource and cost data collected from national Danish registries for trial participants
2.9 Is an appropriate incremental analysis presented or can it be calculated from the data?	Yes	Incremental results were given
2.10 Are all important parameters whose values are uncertain subjected to appropriate sensitivity analysis?	Partly	One way deterministic sensitivity analysis. No PSA was undertaken.
2.11 Is there any potential conflict of interest?	No	There were no notable conflicts of interest
2.12 Overall assessment: Potentially serious limitations		

Other comments: None
PSA: probabilistic sensitivity analysis; QALY: quality-adjusted life-year; RCT: randomised controlled trial

Study identification **Finnes A, Enebrink P, Sampaio F, Sorjonen K, Dahl J, Ghaderi A, et al. Cost-Effectiveness of Acceptance and Commitment Therapy and a Workplace Intervention for Employees on Sickness Absence due to Mental Disorders. J Occup Environ Med. 2017;59(12):1211-20.**		
Guidance topic: Indoor Air Quality At Home		**Question no: 3.1 & 3.3**
Section 1: Applicability (relevance to specific review questions and the NICE reference case)	**Yes/partly/no/unclear/NA**	**Comments**
1.1 Is the study population appropriate for the review question?	Unclear	Workers on sickness absence due to anxiety
1.2 Are the interventions appropriate for the review question?	Yes	Intervention targeted at return to work
1.3 Is the system in which the study was conducted sufficiently similar to the current UK context?	Partly	The study was in Sweden where the organisation of sickness benefits system is similar to the UK but may still be different enough to limit the generalisability of findings
1.4 Are the perspectives clearly stated and are they appropriate for the review question?	Yes	Healthcare and separate societal analysis including sickness benefit costs
1.5 Are all direct effects on individuals included, and are all other effects included where they are material?	Yes	The effects included were appropriate for the analysis chosen
1.6 Are all future costs and outcomes discounted appropriately?	NA	Not conducted but a short time horizon was used
1.7 Is QALY used as an outcome, and was it derived using NICE's preferred methods? If not, describe rationale and outcomes used in line with analytical perspectives taken (item 1.4 above).	Yes	Health states were derived using EQ-5D utility data valued using the English valuation set (Swedish in scenario analysis)
1.8 Are costs and outcomes from other sectors fully and appropriately measured and valued?	No	The societal perspective did not include impacts on employers and drug costs were not included in either perspective.
1.9 Overall judgement: Partially applicable		
Section 2: Study limitations (the level of methodological quality)		

2.1 Does the model structure adequately reflect the nature of the topic under evaluation?	NA	No decision model was used
2.2 Is the time horizon sufficiently long to reflect all important differences in costs and outcomes?	No	The time horizon was 12 months so it is unclear whether return to work was sustained
2.3 Are all important and relevant outcomes included?	Yes	Health states were derived using EQ-5D data valued using the UK valuation set (Swedish in scenario analysis)
2.4 Are the estimates of baseline outcomes from the best available source?	Yes	Drawn from trial participants
2.5 Are the estimates of relative intervention effects from the best available source?	Yes	Taken from a RCT
2.6 Are all important and relevant costs included?	Partly	Medication costs were not included
2.7 Are the estimates of resource use from the best available source?	Yes	The volumes of each cost category were obtained from study records, and unit costs were obtained from national public databases and websites
2.8 Are the unit costs of resources from the best available source?	Yes	The volumes of each cost category were obtained from study records, and unit costs were obtained from national public databases and websites
2.9 Is an appropriate incremental analysis presented or can it be calculated from the data?	Yes	Incremental results were given
2.10 Are all important parameters whose values are uncertain subjected to appropriate sensitivity analysis?	Yes	Stochastic uncertainty in the data were dealt with using nonparametric bootstrapping. Scenario analysis for key model assumptions
2.11 Is there any potential conflict of interest?	No	There were no notable conflicts of interest
2.12 Overall assessment: Potentially serious limitations		
Other comments: None		
EQ5D:euroqol 5 dimensions ; DALY: disability-adjusted life-year; QALY: quality-adjusted life-year; RCT: randomised controlled trial		

Study identification

Jensen IB, Bergstrom G, Ljungquist T, Bodin L. A 3-year follow-up of a multidisciplinary rehabilitation programme for back and neck pain. Pain. 2005;115(3):273-83.		
Guidance topic: Indoor Air Quality At Home		**Question no: 3.1 & 3.3**
Section 1: Applicability (relevance to specific review questions and the NICE reference case)	**Yes/partly/no/unclear/NA**	**Comments**
1.1 Is the study population appropriate for the review question?	Yes	On sick leave for 1 to 6 months
1.2 Are the interventions appropriate for the review question?	Yes	Intervention targeted at return to work
1.3 Is the system in which the study was conducted sufficiently similar to the current UK context?	Partly	The study was in Sweden where the organisation of sickness benefits system is similar to the UK, but may still be different enough to limit the generalisability of findings
1.4 Are the perspectives clearly stated and are they appropriate for the review question?	Yes	Societal
1.5 Are all direct effects on individuals included, and are all other effects included where they are material?	Yes	The effects included were appropriate for the analysis chosen
1.6 Are all future costs and outcomes discounted appropriately?	NA	Not conducted, but a short time horizon was used
1.7 Is QALY used as an outcome, and was it derived using NICE's preferred methods? If not, describe rationale and outcomes used in line with analytical perspectives taken (item 1.4 above).	NA	SF-36 data were collected, but not reported beyond a statement that there was no difference between groups
1.8 Are costs and outcomes from other sectors fully and appropriately measured and valued?	Yes	Appropriate costs and outcomes were considered, for the perspective taken
1.9 Overall judgement: Partially applicable		
Section 2: Study limitations (the level of methodological quality)		
2.1 Does the model structure adequately reflect the nature of the topic under evaluation?	NA	No decision model was used
2.2 Is the time horizon sufficiently long to reflect all important differences in costs and outcomes?	Partly	The time horizon was 3 years so some estimate of long-term costs and effectiveness could be made

2.3 Are all important and relevant outcomes included?	Partly	SF-36 data were collected, but not reported beyond a statement that there was no difference between groups
2.4 Are the estimates of baseline outcomes from the best available source?	Yes	Drawn from trial participants
2.5 Are the estimates of relative intervention effects from the best available source?	Yes	Taken from a RCT
2.6 Are all important and relevant costs included?	Yes	All relevant costs were considered
2.7 Are the estimates of resource use from the best available source?	Yes	Resource use from a trial
2.8 Are the unit costs of resources from the best available source?	Partly	Costs were from published sources
2.9 Is an appropriate incremental analysis presented or can it be calculated from the data?	NA	Not relevant (CBA)
2.10 Are all important parameters whose values are uncertain subjected to appropriate sensitivity analysis?	No	Not undertaken
2.11 Is there any potential conflict of interest?	No	There were no notable conflicts of interest
2.12 Overall assessment: Potentially serious limitations		
Other comments: None		
CBA: cost-benefit analysis; PSA: probabilistic sensitivity analysis; QALY: quality-adjusted life-year; RCT: randomised controlled trial; SA: sensitivity analysis; SF36: short form 36		

Study identification **Lambeek LC, Bosmans JE, Van Royen BJ, Van Tulder MW, Van Mechelen W, Anema JR. Effect of integrated care for sick listed patients with chronic low back pain: economic evaluation alongside a randomised controlled trial. BMJ (Clinical research ed.). 2010;341:c6414.**		
Guidance topic: Indoor Air Quality At Home		**Question no: 3.1 & 3.3**
Section 1: Applicability (relevance to specific review questions and the NICE reference case)	**Yes/partly/no/unclear/NA**	**Comments**
1.1 Is the study population appropriate for the review question?	Partly	Includes people on partial sick leave so it may not be continuous leave
1.2 Are the interventions appropriate for the review question?	Yes	Intervention was targeted at return to work
1.3 Is the system in which the study was conducted sufficiently similar to the current UK context?	Partly	The study was conducted in the Netherlands where the occupational support offered is

		differently organised to the UK, for example there are occupational physicians
1.4 Are the perspectives clearly stated and are they appropriate for the review question?	Yes	Societal
1.5 Are all direct effects on individuals included, and are all other effects included where they are material?	Yes	The effects included were appropriate for analysis chosen
1.6 Are all future costs and outcomes discounted appropriately?	NA	Not conducted, but a short time horizon was used
1.7 Is QALY used as an outcome, and was it derived using NICE's preferred methods? If not, describe rationale and outcomes used in line with analytical perspectives taken (item 1.4 above).	Yes	Health states were derived using EQ-5D data valued using the Dutch tariff
1.8 Are costs and outcomes from other sectors fully and appropriately measured and valued?	Partly	Cost of work modifications were not included
1.9 Overall judgement: Partially applicable		
Section 2: Study limitations (the level of methodological quality)		
2.1 Does the model structure adequately reflect the nature of the topic under evaluation?	NA	No decision model was used
2.2 Is the time horizon sufficiently long to reflect all important differences in costs and outcomes?	No	The time horizon was 12 months so it is unclear whether return to work was sustained
2.3 Are all important and relevant outcomes included?	Yes	QALYs were reported
2.4 Are the estimates of baseline outcomes from the best available source?	Yes	Drawn from trial participants
2.5 Are the estimates of relative intervention effects from the best available source?	Yes	Taken from a RCT
2.6 Are all important and relevant costs included?	Yes	All relevant costs were considered
2.7 Are the estimates of resource use from the best available source?	Yes	From a retrospective questionnaire and Dutch manual for costing economic evaluations
2.8 Are the unit costs of resources from the best available source?	Yes	From a retrospective questionnaire and Dutch manual for costing economic evaluations
2.9 Is an appropriate incremental analysis presented or can it be calculated from the data?	Yes	Incremental results were given

2.10 Are all important parameters whose values are uncertain subjected to appropriate sensitivity analysis?	Yes	Stochastic uncertainty in the data were dealt with using nonparametric bootstrapping. Scenario analysis was undertaken for key model assumptions.
2.11 Is there any potential conflict of interest?	No	There were no notable conflicts of interest
2.12 Overall assessment: Potentially serious limitations		
Other comments: None		
EQ5D: euroqol 5 dimensions; QALY: quality-adjusted life-year; RCT: randomised controlled trial		

Study identification **Loisel P, Lemaire J, Poitras S, Durand MJ, Champagne F, Stock S, et al. Cost-benefit and cost-effectiveness analysis of a disability prevention model for back pain management: a six year follow up study. Occup Environ Med. 2002;59(12):807-15.**		
Guidance topic: Indoor Air Quality At Home		**Question no: 3.1 & 3.3**
Section 1: Applicability (relevance to specific review questions and the NICE reference case)	**Yes/partly/no/unclear/NA**	**Comments**
1.1 Is the study population appropriate for the review question?	Yes	Workers were absent for 4 or more weeks
1.2 Are the interventions appropriate for the review question?	Yes	Intervention was targeted at return to work
1.3 Is the system in which the study was conducted sufficiently similar to the current UK context?	Partly	The study was in Canada where the organisation of sickness benefits system is similar to the UK, but may still be different enough to limit the generalisability of findings
1.4 Are the perspectives clearly stated and are they appropriate for the review question?	Partly	Health and employment insurer
1.5 Are all direct effects on individuals included, and are all other effects included where they are material?	Yes	The effects included were appropriate for the analysis chosen
1.6 Are all future costs and outcomes discounted appropriately?	NA	Not conducted but a short time horizon was used
1.7 Is QALY used as an outcome, and was it derived using NICE's preferred methods? If not, describe rationale and outcomes used in line with analytical perspectives taken (item 1.4 above).	NA	QALYs were not used, but the effectiveness measures chosen were reasonable

1.8 Are costs and outcomes from other sectors fully and appropriately measured and valued?	Partly	Costs of job modifications were not recorded.
1.9 Overall judgement: Partially applicable		
Section 2: Study limitations (the level of methodological quality)		
2.1 Does the model structure adequately reflect the nature of the topic under evaluation?	NA	No decision model was used
2.2 Is the time horizon sufficiently long to reflect all important differences in costs and outcomes?	Yes	The time horizon of 6.4 years showed significant changes in costs and outcomes over time
2.3 Are all important and relevant outcomes included?	Partly	The impact on QALYs was not considered
2.4 Are the estimates of baseline outcomes from the best available source?	Yes	Drawn from trial participants
2.5 Are the estimates of relative intervention effects from the best available source?	Yes	Taken from a RCT
2.6 Are all important and relevant costs included?	Yes	All relevant costs were considered
2.7 Are the estimates of resource use from the best available source?	Yes	Quebec Workers Compensation Database
2.8 Are the unit costs of resources from the best available source?	Yes	Quebec Workers Compensation Database
2.9 Is an appropriate incremental analysis presented or can it be calculated from the data?	Yes	Incremental results were given
2.10 Are all important parameters whose values are uncertain subjected to appropriate sensitivity analysis?	Partly	Deterministic SA was performed. No probabilistic sensitivity analysis (PSA) was performed.
2.11 Is there any potential conflict of interest?	No	There were no notable conflicts of interest
2.12 Overall assessment: Minor limitations		
Other comments: None		
PSA: probabilistic sensitivity analysis; QALY: quality-adjusted life-year; RCT: randomised controlled trial; SA: sensitivity analysis		

Study identification **Meijer EM, Sluiter JK, Heyma A, Sadiraj K, Frings-Dresen MH. Cost-effectiveness of multidisciplinary treatment in sick-listed patients with upper extremity musculoskeletal disorders: a randomized, controlled trial with one-year follow-up. Int Arch Occup Environ Health. 2006;79(8):654-64.**	
Guidance topic: Indoor Air Quality At Home	**Question no: 3.1 & 3.3**

Section 1: Applicability (relevance to specific review questions and the NICE reference case)	Yes/partly/no/unclear/NA	Comments
1.1 Is the study population appropriate for the review question?	Partly	At least 50% sick leave over past 4 to 20 weeks
1.2 Are the interventions appropriate for the review question?	Yes	Intervention was targeted at return to work
1.3 Is the system in which the study was conducted sufficiently similar to the current UK context?	Partly	The study was in the Netherlands where the occupational support offered is differently organised to the UK, for example there are occupational physicians
1.4 Are the perspectives clearly stated and are they appropriate for the review question?	Yes	Societal
1.5 Are all direct effects on individuals included, and are all other effects included where they are material?	Yes	The effects included were appropriate for the analysis chosen
1.6 Are all future costs and outcomes discounted appropriately?	NA	Not conducted but a short time horizon was used
1.7 Is QALY used as an outcome, and was it derived using NICE's preferred methods? If not, describe rationale and outcomes used in line with analytical perspectives taken (item 1.4 above).	NA	QALYs were not used but the effectiveness measures chosen were reasonable
1.8 Are costs and outcomes from other sectors fully and appropriately measured and valued?	Yes	Appropriate costs and outcomes for the perspective were considered
1.9 Overall judgement: Partially applicable		
Section 2: Study limitations (the level of methodological quality)		
2.1 Does the model structure adequately reflect the nature of the topic under evaluation?	NA	No decision model was used
2.2 Is the time horizon sufficiently long to reflect all important differences in costs and outcomes?	No	The time horizon was 12 months so it is unclear whether return to work was sustained
2.3 Are all important and relevant outcomes included?	Partly	The impact on QALYs was not considered
2.4 Are the estimates of baseline outcomes from the best available source?	Yes	Drawn from trial participants
2.5 Are the estimates of relative intervention effects from the best available source?	Yes	Taken from a RCT
2.6 Are all important and relevant costs included?	Yes	All relevant costs were considered

2.7 Are the estimates of resource use from the best available source?	Yes	Dutch board on medical tariffs, Dutch medicines compensation system, self-reported costs in questionnaire
2.8 Are the unit costs of resources from the best available source?	Yes	Dutch board on medical tariffs, Dutch medicines compensation system, self-reported costs in questionnaire
2.9 Is an appropriate incremental analysis presented or can it be calculated from the data?	Yes	Incremental results were given
2.10 Are all important parameters whose values are uncertain subjected to appropriate sensitivity analysis?	No	Not undertaken
2.11 Is there any potential conflict of interest?	No	There were no notable conflicts of interest
2.12 Overall assessment: Potentially serious limitations		
Other comments: None		
PSA: probabilistic sensitivity analysis; QALY: quality-adjusted life-year; RCT: randomised controlled trial		

Study identification **Radford K, Phillips J, Drummond A, Sach T, Walker M, Tyerman A, et al. Return to work after traumatic brain injury: cohort comparison and economic evaluation. Brain Inj. 2013;27(5):507-20.**		
Guidance topic: Indoor Air Quality At Home		**Question no: 3.1 & 3.3**
Section 1: Applicability (relevance to specific review questions and the NICE reference case)	**Yes/partly/no/unclear/NA**	**Comments**
1.1 Is the study population appropriate for the review question?	No	Includes unpaid workers and students. It is not clear how long injury had caused the workers to be out of work nor is it clear if they are able to return to work.
1.2 Are the interventions appropriate for the review question?	Yes	Intervention targeted at return to work
1.3 Is the system in which the study was conducted sufficiently similar to the current UK context?	Yes	UK study within past 6 years
1.4 Are the perspectives clearly stated and are they appropriate for the review question?	Yes	Health and social care for CBA, societal for CEA and CUA

1.5 Are all direct effects on individuals included, and are all other effects included where they are material?	Yes	The effects included were appropriate for the analysis chosen
1.6 Are all future costs and outcomes discounted appropriately?	NA	Not conducted but a short time horizon was used
1.7 Is QALY used as an outcome, and was it derived using NICE's preferred methods? If not, describe rationale and outcomes used in line with analytical perspectives taken (item 1.4 above).	No	EQ-5D VAS was used
1.8 Are costs and outcomes from other sectors fully and appropriately measured and valued?	Yes	Appropriate costs and outcomes for the perspective were considered
1.9 Overall judgement: Not applicable		
Section 2: Study limitations (the level of methodological quality)		
2.1 Does the model structure adequately reflect the nature of the topic under evaluation?	NA	No decision model was used
2.2 Is the time horizon sufficiently long to reflect all important differences in costs and outcomes?	No	The time horizon was 12 months so it is unclear whether return to work was sustained
2.3 Are all important and relevant outcomes included?	Partly	Impact on QALYs was reported using VAS
2.4 Are the estimates of baseline outcomes from the best available source?	Yes	Drawn from trial participants
2.5 Are the estimates of relative intervention effects from the best available source?	Partly	The estimates were taken from a clinical trial but it was only an observational study
2.6 Are all important and relevant costs included?	Yes	All relevant costs were considered
2.7 Are the estimates of resource use from the best available source?	Yes	Resource use from a trial. NHS reference costs, PSSRU and Jobcentre plus.
2.8 Are the unit costs of resources from the best available source?	Yes	NHS reference costs, PSSRU and Jobcentre plus
2.9 Is an appropriate incremental analysis presented or can it be calculated from the data?	Yes	Incremental results were given
2.10 Are all important parameters whose values are uncertain subjected to appropriate sensitivity analysis?	Yes	Stochastic uncertainty in the data were dealt with using nonparametric bootstrapping. Scenario analysis was used for key model assumptions

2.11 Is there any potential conflict of interest?	No	There were no notable conflicts of interest
2.12 Overall assessment: Potentially serious limitations		
Other comments:		
CBA: cost-benefit analysis; CEA: cost-effectiveness analysis; cost-utility analysis; EQ5D: euroqol 5 dimensions; NHS: National Health Service; PSSRU: Personal Social Services Research Unit; QALY: quality-adjusted life-year; RCT: randomised controlled trial; VAS - visual analogue scale		

Study identification **Rebergen DS, Bruinvels DJ, van Tulder MW, van der Beek AJ, van Mechelen W. Cost-effectiveness of guideline-based care for workers with mental health problems. J Occup Environ Med. 2009;51(3):313-22.**		
Guidance topic: Indoor Air Quality At Home		**Question no: 3.1 & 3.3**
Section 1: Applicability (relevance to specific review questions and the NICE reference case)	**Yes/partly/no/unclear/NA**	**Comments**
1.1 Is the study population appropriate for the review question?	Unclear	The length of time people have been off work is unclear.
1.2 Are the interventions appropriate for the review question?	Yes	Intervention was targeted at return to work
1.3 Is the system in which the study was conducted sufficiently similar to the current UK context?	Partly	The study was conducted in the Netherlands where the occupational support offered is differently organised to the UK, for example there are occupational physicians
1.4 Are the perspectives clearly stated and are they appropriate for the review question?	Yes	Societal for CEA, employer for CBA
1.5 Are all direct effects on individuals included, and are all other effects included where they are material?	Yes	The effects included were appropriate for the analysis chosen
1.6 Are all future costs and outcomes discounted appropriately?	NA	Not conducted, but a short time horizon was used
1.7 Is QALY used as an outcome, and was it derived using NICE's preferred methods? If not, describe rationale and outcomes used in line with analytical perspectives taken (item 1.4 above).	NA	QALYs were not used, but the effectiveness measures chosen were reasonable
1.8 Are costs and outcomes from other sectors fully and appropriately measured and valued?	Partly	Patient and family health care costs outside of occupational healthcare costs were not included

1.9 Overall judgement: Partially applicable		
Section 2: Study limitations (the level of methodological quality)		
2.1 Does the model structure adequately reflect the nature of the topic under evaluation?	NA	No decision model was used
2.2 Is the time horizon sufficiently long to reflect all important differences in costs and outcomes?	No	The time horizon was 12 months, so it is unclear whether return to work was sustained
2.3 Are all important and relevant outcomes included?	Partly	Impact on QALYs was not considered
2.4 Are the estimates of baseline outcomes from the best available source?	Yes	Drawn from trial participants
2.5 Are the estimates of relative intervention effects from the best available source?	Yes	Taken from a RCT
2.6 Are all important and relevant costs included?	Partly	Patient and family health care costs outside of occupational healthcare costs were not included
2.7 Are the estimates of resource use from the best available source?	Yes	Insurance company records of Dutch police force on trial participants
2.8 Are the unit costs of resources from the best available source?	Yes	Insurance company records of Dutch police force on trial participants
2.9 Is an appropriate incremental analysis presented or can it be calculated from the data?	Yes	Incremental results were given
2.10 Are all important parameters whose values are uncertain subjected to appropriate sensitivity analysis?	Yes	Stochastic uncertainty in the data were dealt with using nonparametric bootstrapping. Scenario analysis was used for key model assumptions
2.11 Is there any potential conflict of interest?	No	There were no notable conflicts of interest
2.12 Overall assessment: Potentially serious limitations		
Other comments: None		
CBA: cost-benefit analysis; CEA: cost-effectiveness analysis; QALY: quality-adjusted life-year; RCT: randomised controlled trial		

Study identification

Schene AH, Koeter MW, Kikkert MJ, Swinkels JA, McCrone P. Adjuvant occupational therapy for work-related major depression works: randomized trial including economic evaluation. Psychol Med. 2007;37(3):351-62.		
Guidance topic: Indoor Air Quality At Home		**Question no: 3.1 & 3.3**
Section 1: Applicability (relevance to specific review questions and the NICE reference case)	**Yes/partly/no/unclear/NA**	**Comments**
1.1 Is the study population appropriate for the review question?	Partly	Workers with at least 50% absence over last 10 weeks to 2 years
1.2 Are the interventions appropriate for the review question?	Yes	Intervention was targeted at return to work
1.3 Is the system in which the study was conducted sufficiently similar to the current UK context?	Partly	The study was in the Netherlands where the occupational support offered is differently organised to the UK, for example there are occupational physicians
1.4 Are the perspectives clearly stated and are they appropriate for the review question?	Yes	Societal
1.5 Are all direct effects on individuals included, and are all other effects included where they are material?	No	No health or employment outcomes were reported beyond earnings over a 12-month period
1.6 Are all future costs and outcomes discounted appropriately?	NA	Not conducted, but a short time horizon was used
1.7 Is QALY used as an outcome, and was it derived using NICE's preferred methods? If not, describe rationale and outcomes used in line with analytical perspectives taken (item 1.4 above).	Partly	QALYs were not used, but the effectiveness measures chosen were reasonable
1.8 Are costs and outcomes from other sectors fully and appropriately measured and valued?	Yes	Appropriate costs and outcomes for the perspective were considered
1.9 Overall judgement: Partially applicable		
Section 2: Study limitations (the level of methodological quality)		
2.1 Does the model structure adequately reflect the nature of the topic under evaluation?	NA	No decision model was used
2.2 Is the time horizon sufficiently long to reflect all important differences in costs and outcomes?	No	The time horizon was only 12 months so it is unclear whether return to work was sustained

2.3 Are all important and relevant outcomes included?	Partly	Impact on QALYs was not considered
2.4 Are the estimates of baseline outcomes from the best available source?	Yes	Drawn from trial participants
2.5 Are the estimates of relative intervention effects from the best available source?	Yes	Taken from a RCT
2.6 Are all important and relevant costs included?	Yes	All relevant costs were considered
2.7 Are the estimates of resource use from the best available source?	Yes	From trial
2.8 Are the unit costs of resources from the best available source?	No	Not reported
2.9 Is an appropriate incremental analysis presented or can it be calculated from the data?	NA	Was a CBA
2.10 Are all important parameters whose values are uncertain subjected to appropriate sensitivity analysis?	Yes	Stochastic uncertainty in the data were dealt with using nonparametric bootstrapping. Scenario analysis was used for key model assumptions.
2.11 Is there any potential conflict of interest?	No	There were no notable conflicts of interest
2.12 Overall assessment: Potentially serious limitations		
Other comments: None		
CBA: cost-benefit analysis; QALY: quality-adjusted life-year; RCT: randomised controlled trial		

Study identification **Squires H, Rick J, Carroll C, Hillage J. Cost-effectiveness of interventions to return employees to work following long-term sickness absence due to musculoskeletal disorders. Journal of public health (Oxford, England). 2012;34(1):115-24.**		
Guidance topic: Indoor Air Quality At Home		**Question no: 3.1 & 3.3**
Section 1: Applicability (relevance to specific review questions and the NICE reference case)	**Yes/partly/no/unclear/NA**	**Comments**
1.1 Is the study population appropriate for the review question?	Partly	Sick leave was 1 week to 6 months
1.2 Are the interventions appropriate for the review question?	Yes	Intervention was targeted at return to work
1.3 Is the system in which the study was conducted sufficiently similar to the current UK context?	Partly	Although this is a UK study, it is based upon effectiveness studies that were conducted outside of the UK and the authors stated that this may limit the generalisability of the results

1.4 Are the perspectives clearly stated and are they appropriate for the review question?	Yes	NHS and PSS, societal and employer.
1.5 Are all direct effects on individuals included, and are all other effects included where they are material?	Partly	Whilst QALYs and increased likelihood of return to work are included, they are not well-reported
1.6 Are all future costs and outcomes discounted appropriately?	NA	Not conducted, but a short time horizon was used
1.7 Is QALY used as an outcome, and was it derived using NICE's preferred methods? If not, describe rationale and outcomes used in line with analytical perspectives taken (item 1.4 above).	Partly	SF-36 data from British Household Panel Survey
1.8 Are costs and outcomes from other sectors fully and appropriately measured and valued?	Yes	Appropriate costs and outcomes for the perspective were considered
1.9 Overall judgement: Partially applicable		
Section 2: Study limitations (the level of methodological quality)		
2.1 Does the model structure adequately reflect the nature of the topic under evaluation?	Yes	The Markov model that was developed was adequate to answer the current topic
2.2 Is the time horizon sufficiently long to reflect all important differences in costs and outcomes?	Partly	Although a lifetime time horizon was used, the model was populated with effectiveness evidence over 12 months
2.3 Are all important and relevant outcomes included?	Yes	QALYs were reported
2.4 Are the estimates of baseline outcomes from the best available source?	NA	Hypothetical cohort in the model
2.5 Are the estimates of relative intervention effects from the best available source?	Yes	Taken from RCTs
2.6 Are all important and relevant costs included?	Yes	All relevant costs were considered
2.7 Are the estimates of resource use from the best available source?	Yes	DWP, PSSRU and published sources
2.8 Are the unit costs of resources from the best available source?	Yes	DWP, PSSRU and published sources
2.9 Is an appropriate incremental analysis presented or can it be calculated from the data?	Partly	The cost-effectiveness plane was given, but full incremental results were not provided and could not be calculated

2.10 Are all important parameters whose values are uncertain subjected to appropriate sensitivity analysis?	Partly	Deterministic SA was performed. No PSA was undertaken.
2.11 Is there any potential conflict of interest?	No	There were no notable conflicts of interest
2.12 Overall assessment: Potentially serious limitations		
Other comments: None		
DWP: Department of Work and Pensions; NHS: National Health Service; PSA: probabilistic sensitivity analysis; PSS: person shaped support ; PSSRU: Personal Social Services Research Unit; QALY: quality-adjusted life-year; RCT: randomised controlled trial; SA: sensitivity analysis; SF36: short form 36		

Study identification **Steenstra IA, Anema JR, van Tulder MW, Bongers PM, de Vet HC, van Mechelen W. Economic evaluation of a multi-stage return to work program for workers on sick-leave due to low back pain. J Occup Rehabil. 2006;16(4):557-78.**		
Guidance topic: Indoor Air Quality At Home		**Question no: 3.1 & 3.3**
Section 1: Applicability (relevance to specific review questions and the NICE reference case)	**Yes/partly/no/unclear/NA**	**Comments**
1.1 Is the study population appropriate for the review question?	Partly	Sick leave was 2 to 6 weeks
1.2 Are the interventions appropriate for the review question?	Yes	The intervention was targeted at return to work
1.3 Is the system in which the study was conducted sufficiently similar to the current UK context?	Partly	The study was in the Netherlands where the occupational support offered is differently organised to the UK, for example there are occupational physicians
1.4 Are the perspectives clearly stated and are they appropriate for the review question?	Yes	Societal
1.5 Are all direct effects on individuals included, and are all other effects included where they are material?	Yes	The effects included were appropriate for the analysis chosen
1.6 Are all future costs and outcomes discounted appropriately?	NA	Not conducted, but a short time horizon was used
1.7 Is QALY used as an outcome, and was it derived using NICE's preferred methods? If not, describe rationale and outcomes used in line with analytical perspectives taken (item 1.4 above).	No	EQ-5D VAS data were used
1.8 Are costs and outcomes from other sectors fully and appropriately measured and valued?	Yes	A full range of costs and outcomes were considered for the perspective chosen

1.9 Overall judgement: Partially applicable		
Section 2: Study limitations (the level of methodological quality)		
2.1 Does the model structure adequately reflect the nature of the topic under evaluation?	NA	No decision model was used
2.2 Is the time horizon sufficiently long to reflect all important differences in costs and outcomes?	No	The time horizon was 12 months so it is unclear whether return to work was sustained
2.3 Are all important and relevant outcomes included?	Partly	Impact on QALYs was reported using VAS
2.4 Are the estimates of baseline outcomes from the best available source?	Yes	Drawn from trial participants
2.5 Are the estimates of relative intervention effects from the best available source?	Yes	Taken from a RCT
2.6 Are all important and relevant costs included?	Yes	All relevant costs were considered
2.7 Are the estimates of resource use from the best available source?	Yes	Dutch costing guidelines, health care charges and professional organisations for trial participants
2.8 Are the unit costs of resources from the best available source?	Yes	Dutch costing guidelines, health care charges and professional organisations for trial participants
2.9 Is an appropriate incremental analysis presented or can it be calculated from the data?	Yes	Incremental results were given
2.10 Are all important parameters whose values are uncertain subjected to appropriate sensitivity analysis?	Yes	Stochastic uncertainty in the data were dealt with using nonparametric bootstrapping. Scenario analysis was used for key model assumptions.
2.11 Is there any potential conflict of interest?	No	There were no notable conflicts of interest
2.12 Overall assessment: Potentially serious limitations		
Other comments: None		
EQ5D: euroqol 5 dimensions; QALY: quality-adjusted life-year; RCT: randomised controlled trial; VAS: visual analogue scale		

Study identification

Uegaki K, Bakker I, de Bruijne M, van der Beek A, Terluin B, van Marwijk H, et al. Cost-effectiveness of a minimal intervention for stress-related sick leave in general practice: results of an economic evaluation alongside a pragmatic randomised control trial. J Affect Disord. 2010;120(1-3):177-87.		
Guidance topic: Indoor Air Quality At Home		**Question no: 3.1 & 3.3**
Section 1: Applicability (relevance to specific review questions and the NICE reference case)	**Yes/partly/no/unclear/NA**	**Comments**
1.1 Is the study population appropriate for the review question?	Partly	Partial sick leave was over 3 months
1.2 Are the interventions appropriate for the review question?	Yes	The intervention was targeted at return to work
1.3 Is the system in which the study was conducted sufficiently similar to the current UK context?	Partly	The study was in the Netherlands where the occupational support offered is differently organised to the UK, for example there are occupational physicians
1.4 Are the perspectives clearly stated and are they appropriate for the review question?	Yes	Societal
1.5 Are all direct effects on individuals included, and are all other effects included where they are material?	Yes	The effects included were appropriate for the analysis chosen
1.6 Are all future costs and outcomes discounted appropriately?	NA	Not conducted, but a short time horizon was used
1.7 Is QALY used as an outcome, and was it derived using NICE's preferred methods? If not, describe rationale and outcomes used in line with analytical perspectives taken (item 1.4 above).	Yes	EQ-5D data using the Dutch tariff
1.8 Are costs and outcomes from other sectors fully and appropriately measured and valued?	Yes	A full range of costs and outcomes were considered for the perspective chosen
1.9 Overall judgement: Partially applicable		
Section 2: Study limitations (the level of methodological quality)		
2.1 Does the model structure adequately reflect the nature of the topic under evaluation?	NA	No decision model was used
2.2 Is the time horizon sufficiently long to reflect all important differences in costs and outcomes?	No	The time horizon was 12 months so it is unclear whether return to work was sustained
2.3 Are all important and relevant outcomes included?	Yes	QALYs were reported
2.4 Are the estimates of baseline outcomes from the best available source?	Yes	Drawn from trial participants

2.5 Are the estimates of relative intervention effects from the best available source?	Yes	Taken from a RCT
2.6 Are all important and relevant costs included?	Yes	All relevant costs were considered
2.7 Are the estimates of resource use from the best available source?	Yes	Dutch costing guidelines, health care charges and professional organisations for trial participants
2.8 Are the unit costs of resources from the best available source?	Yes	Dutch costing guidelines, health care charges and professional organisations
2.9 Is an appropriate incremental analysis presented or can it be calculated from the data?	Yes	Incremental results were given
2.10 Are all important parameters whose values are uncertain subjected to appropriate sensitivity analysis?	Yes	Stochastic uncertainty in the data were dealt with using nonparametric bootstrapping. Scenario analysis was used for key model assumptions
2.11 Is there any potential conflict of interest?	No	There were no notable conflicts of interest
2.12 Overall assessment: Potentially serious limitations		
Other comments: None		
EQ5D: euroqol 5 dimensions; QALY: quality-adjusted life-year; RCT: randomised controlled trial		

Study identification **van Oostrom SH, Heymans MW, de Vet HCW, van Tulder MW, van Mechelen W, Anema JR. Economic evaluation of a workplace intervention for sick-listed employees with distress. Occup Environ Med. 2010;67(9):603-10.**		
Guidance topic: Indoor Air Quality At Home		**Question no: 3.1 & 3.3**
Section 1: Applicability (relevance to specific review questions and the NICE reference case)	**Yes/partly/no/unclear/NA**	**Comments**
1.1 Is the study population appropriate for the review question?	Partly	Workers had sick leave for 2 to 8 weeks
1.2 Are the interventions appropriate for the review question?	Yes	The intervention targeted return to work
1.3 Is the system in which the study was conducted sufficiently similar to the current UK context?	Partly	The study was in the Netherlands where the occupational support offered is differently organised to the UK, for example there are occupational physicians

1.4 Are the perspectives clearly stated and are they appropriate for the review question?	Yes	Societal for CEA and CUA, employer perspective for CBA
1.5 Are all direct effects on individuals included, and are all other effects included where they are material?	Yes	The effects included were appropriate for the analysis chosen
1.6 Are all future costs and outcomes discounted appropriately?	NA	Not conducted, but a short time horizon was used
1.7 Is QALY used as an outcome, and was it derived using NICE's preferred methods? If not, describe rationale and outcomes used in line with analytical perspectives taken (item 1.4 above).	Yes	EQ-5D data using the Dutch tariff
1.8 Are costs and outcomes from other sectors fully and appropriately measured and valued?	Partly	The costs of workplace adaptations were not considered
1.9 Overall judgement: Partially applicable		
Section 2: Study limitations (the level of methodological quality)		
2.1 Does the model structure adequately reflect the nature of the topic under evaluation?	NA	No decision model was used
2.2 Is the time horizon sufficiently long to reflect all important differences in costs and outcomes?	No	The time horizon was 12 months so it is unclear whether return to work was sustained
2.3 Are all important and relevant outcomes included?	Yes	QALYs were reported
2.4 Are the estimates of baseline outcomes from the best available source?	Yes	Drawn from trial participants
2.5 Are the estimates of relative intervention effects from the best available source?	Yes	Taken from a RCT
2.6 Are all important and relevant costs included?	Yes	All relevant costs were considered
2.7 Are the estimates of resource use from the best available source?	Yes	Dutch costing guidelines, health care charges and professional organisations for trial participants
2.8 Are the unit costs of resources from the best available source?	Yes	Dutch costing guidelines, health care charges and professional organisations
2.9 Is an appropriate incremental analysis presented or can it be calculated from the data?	Yes	Incremental results were given

2.10 Are all important parameters whose values are uncertain subjected to appropriate sensitivity analysis?	Yes	Stochastic uncertainty in the data were dealt with using nonparametric bootstrapping. Scenario analysis was undertaken for key model assumptions
2.11 Is there any potential conflict of interest?	No	There were no notable conflicts of interest
2.12 Overall assessment: Potentially serious limitations		
Other comments: None		
CBA: cost-benefit analysis; CEA: cost-effectiveness analysis; CUA: cost-utility analysis; EQ5D: euroqol 5 dimensions; QALY: quality-adjusted life-year; RCT: randomised controlled trial; VAS: visual analogue scale		