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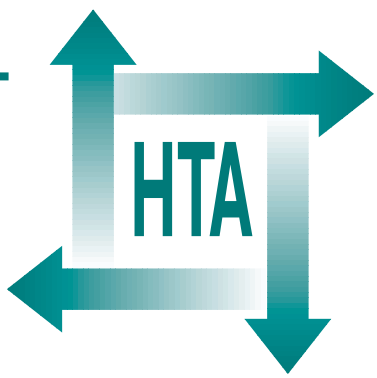

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Contents

List of abbreviations and glossary

Technical terms and abbreviations are used throughout this report. The meaning is usually clear from the context, but a glossary is provided for the non-specialist reader. In some cases, usage differs in the literature, but the term has a constant meaning throughout this review.

List of abbreviations

ASQ	Attributional Style Questionnaire
ATQ	Automatic Thoughts Questionnaire
BAI	Beck Anxiety Inventory
BDI	Beck Depression Inventory
BSI	Brief Symptom Inventory
BSI-GSI	BSI – General Severity Index
BSI-PST	BSI – Positive Symptom Total
BTB	Beating the Blues
CBT	cognitive behaviour therapy
CCBT	computerised cognitive behaviour therapy
CGI	Clinical Global Impression of Severity Scale
CMA	cost-minimisation analysis
DSM	Diagnostic and Statistical Manual of Mental Disorders
ES	effect size
FF	FearFighter
FQ	Fear Questionnaire
GAD	generalised anxiety disorder
GP	general practitioner
HADS	Hospital Anxiety and Depression Scale
HAD-A	HADS – Anxiety
HAD-D	HADS – Depression
HAM-D or HRSD	Hamilton Rating Scale for Depression
ICD	International Classification of Diseases
IT	information technology
ITT	intention-to-treat
IVR	interactive voice response
NDC	non-directive counselling
NS	not significant
NSF	National Service Framework
OCD	obsessive-compulsive disorder
OPCS	Office of Population Censuses and Surveys
PGI	Patient Global Impression
Prime MD	Primary Care Evaluation of Mental Disorders
PROQSY	Programmable Questionnaire System
QALY	quality-adjusted life-year
RCT	randomised controlled trial
SCL	Symptom Check List
SD	standard deviation
SPQ or SQ	Spider Questionnaire
SSRI	selective serotonin re-uptake inhibitor
STAI	State–Trait Anxiety Inventory

continued

List of abbreviations *contd*

TAU	treatment as usual	WLC	waiting list control
TCA	tricyclic antidepressant	WSA	Work and Social Adjustment Scale
TCBT	therapist-led cognitive behaviour therapy	WTE	whole time equivalent

All abbreviations that have been used in this report are listed here unless the abbreviation is well known (e.g. NHS), or it has been used only once, or it is a non-standard abbreviation used only in figures/tables/appendices in which case the abbreviation is defined in the figure legend or at the end of the table."

Glossary

Bibliotherapy CBT provided in a printed format, such as a book.

Cognitive behaviour therapy (CBT) CBT refers to the pragmatic combination of concepts and techniques from cognitive and behaviour therapies common in clinical practice.

Computerised cognitive behaviour therapy (CCBT) Defined as CBT delivered via a computer interface or over the telephone with a computer-led response. The computer program is interactive making appropriate responses to patient input.

On costs Essential associated costs, for example an employer's national insurance contributions on salaries.

Homework Tasks set for patients to complete in their own time. The tasks may be set either by the CCBT package or by patients themselves.

Whole time equivalent A measure of manpower on a scale of 0 to 1, where 1 equals a full-time worker.

Executive summary

Background

Most patients suffering from depression, anxiety and phobias are treated within the primary care setting, although many patients do not seek help or their condition is not recognised by healthcare professionals. Medication is usually the first treatment offered but this is often associated with side-effects. There is substantial evidence to support the use of cognitive behaviour therapy (CBT) in the treatment of these disorders. However, access is limited due to too few therapists, expense, waiting lists, and patients' reluctance to enter therapy. Computerised cognitive behaviour therapy (CCBT) is a self-help option that offers patients the potential benefits of CBT with less therapist involvement.

Objective

The overall aim of the review was to assess the clinical effectiveness of CCBT for treating anxiety, depression and phobias and to compare the cost-effectiveness of CCBT with CBT by conventional methods and with treatment as usual (TAU).

Methods

A systematic review of the literature was performed to identify all studies describing trials of CCBT either delivered alone or as part of a package and either via a computer interface or over the telephone with a computer-led response. Databases were searched from 1966 to September 2001.

The cost-effectiveness review was divided into two parts: the economic evidence on CCBT was reviewed, and a modelling exercise was undertaken with the aim of estimating the cost per year of providing CCBT and the number of patients that could be treated. An attempt was also made to estimate the effect of CCBT in terms of quality-adjusted life-years (QALYs).

Results

Number and quality of studies

Sixteen studies met the inclusion criteria. Of these, 11 were randomised controlled trials (RCTs) and five were pilot studies or cohort studies. The quality of the studies ranged from poor to moderate. An additional three studies were identified that dealt with the use of CCBT as a treatment adjunct for therapist-led CBT (TCBT).

Thirteen papers were identified for the cost-effectiveness review although none dealt specifically with CCBT. Four sponsor submissions were used in the cost-effectiveness analysis including Ultrasis (Beating the Blues), Leeds Innovations (Calipso), University of Glasgow (Stresspac) and ST Solutions (FearFighter and Cope).

Clinical effectiveness

The results can be summarised as follows.

- There is some evidence of poor-to-moderate quality that CCBT is as effective as TCBT in clinically depressed, anxious or phobic outpatient and primary care populations.
- There is limited evidence of poor-to-moderate quality that CCBT is more effective than TAU in clinically depressed, anxious or phobic outpatient and primary care populations.
- CCBT may be as effective or less effective than bibliotherapy. There is no evidence that CCBT is more effective than bibliotherapy.
- In studies reporting accurate estimates of therapist time, CCBT appears to reduce therapist time compared with TCBT and is therefore of use where access to TCBT is limited.
- CCBT may form a useful component of a stepped-care programme, being one of the options offered to patients as a first-line treatment approach.
- There is evidence to support the effectiveness of Beating the Blues and FearFighter.

Cost-effectiveness

No studies performed an economic analysis of CCBT. Therefore the only available economic evidence was provided by the four sponsor

submissions. These were critically reviewed and data from them used in a modelling exercise.

- CCBT using Stresspac was found to cost more, but was no better in terms of patient outcomes than TAU.
- The cost per patient of Cope was less than the corresponding costs for CBT and drug therapy.
- CCBT using FearFighter was stated to be less costly than CBT and drug therapy.
- There was insufficient data in the Calipso submission to make any judgement regarding the efficiency of Calipso relative to alternative treatment options.
- The results of the economic analysis of CCBT using Beating the Blues indicated that compared with TAU, Beating the Blues is a cost-effective strategy for treating patients with anxiety and depression. The economic analysis presented in this submission is the most rigorous of all the submissions.

Modelling

Under baseline assumptions, the cost in the first year of implementing Beating the Blues with an assistant psychologist is £21,691. If a practice nurse is used, the cost is £25,192. The corresponding costs for Stresspac and FearFighter are £19,902 and £22,574, respectively.

Under baseline assumptions, Beating the Blues with an assistant psychologist was estimated to cost £275 million in England and £13 million in Wales. If a practice nurse is used, the corresponding costs were £237 million in England and £11 million in Wales. The costs for Stresspac were estimated to be £206 million in England and £10 million in Wales.

In view of the data deficiencies and the large number of assumptions made, all the model estimates should be treated with caution.

Cost per QALY

Based on a number of assumptions, one set of data suggest that the incremental cost per QALY gained of Beating the Blues over TAU lies between £1209.68 and £7692.30. If the data from another data set are used, the corresponding range lies between £3000 and £6667 per QALY gained. It should be stated once again, however, that these estimates are crude and should be treated with caution.

Conclusions

There is limited evidence of poor-to-moderate quality that CCBT may be effective in the treatment of depression, anxiety and phobias. The evidence for CCBT is uncertain as the studies varied widely in setting, patient populations, comparators and outcome measures. Further research is needed in order to answer the many questions surrounding the design and implementation of CCBT programmes.

Recommendations for further research

- Studies are needed to determine the level of therapist involvement needed to produce optimal outcomes for patients using CCBT programmes.
- Studies need to be undertaken within the general practice setting.
- Efforts should be made to include patients with co-morbidities routinely treated within general practictioner care.
- The position of CCBT within a stepped-care programme needs to be identified as well as its relationship to other efforts to increase access to CBT and psychological therapies.
- Appropriate comparison groups must be included in studies, such as bibliotherapy and other self-help approaches to treatment that reduce therapist time.

Other important research issues include the inclusion of patients from a variety of socio-economic and ethnic backgrounds, different age groups and both males and females. Co-morbidity and medication need to be taken into account in trial design. Also further research is needed to ensure patients who cannot currently access services because they are housebound may benefit from CCBT.

Study design issues include the need for independent researchers, the need for good quality RCTs of adequate power using appropriate comparison groups and well-validated outcome measures.

Components of CCBT packages that warrant further research are the type and amount of CBT material to incorporate, length and frequency of sessions, amount of homework and the appropriate software and computer interface necessary for most effective usage. Readability and legibility of CCBT materials must also be taken into account.

Chapter 1

Aims and background

Aims of the review

The overall aim of the review was to assess the clinical effectiveness of computer-based cognitive behaviour therapy (CCBT) for treating anxiety and depression and to compare the cost-effectiveness of CCBT with two options:

- delivering cognitive behaviour therapy (CBT) by conventional methods
- treatment as usual (TAU).

More specifically the aims of the review were to:

- evaluate clinical effectiveness in terms of improvement in psychological symptoms
- evaluate effectiveness in terms of interpersonal and social functioning
- evaluate effectiveness in terms of quality of life
- evaluate the effectiveness in terms of preference, satisfaction and acceptability of treatment
- evaluate cost-effectiveness in comparison with current standard treatments
- estimate the possible overall cost in England and Wales.

Background

Description of underlying health problem

At any one time approximately one in six people of working age has a mental health problem, most often anxiety or depression.[1] Most people with mental health problems who seek help are cared for by their general practitioner (GP) together with the primary care team. For every 100 individuals who consult their GP with a mental health problem, nine will be referred to specialist services for assessment and advice or for treatment.[1]

The Office of Population Censuses and Surveys (OPCS) *Surveys of Psychiatric Morbidity* (1995)[2] found the following prevalence rates (per 1000 population):

- mixed anxiety and depression: 77 in England and 70 in Wales
- generalised anxiety disorder (GAD): 31 in England and 40 in Wales
- depressive episode: 21 in England and 24 in Wales
- panic disorders: nine in England and no data for Wales.

Estimates in Britain for community prevalence of anxiety disorders are 5%, with over 2 million sufferers. However, only a small minority actually receive treatment.[3]

Depression

Depression is associated with long suffering, suicide, occupational impairment and impairment in interpersonal and family relationships.[4] It has been estimated that up to 50% of attendees at primary care level present with some symptoms of depression although depression is often undiagnosed.[5] Patients may not seek treatment for depression for several reasons including failure to recognise symptoms, underestimation of the severity, limited access to services or reluctance to see a mental healthcare specialist due to stigma. Patients may be unwilling to comply with taking medication or to comply with psychological therapies and for these reasons may also not seek treatment.

A multi-national study of depression found that the symptoms most commonly reported from seven countries were insomnia, loss of energy and thoughts of suicide for major depression.[6] There are two main depressive syndromes, major and minor.[7] *Box 1* shows the criteria for a major depressive episode. A minor depressive episode is diagnosed when a patient has only three or four of the symptoms described in *Box 1.*

Women consistently have higher rates of depression than men, although this changes over the age of 55.[8] The mean onset of major depression is in the late 20s. Deprivation is associated with higher prevalence rates of depressive symptoms in a community, with variations in prevalence related to indices of deprivation.[5]

Depression is also associated with physical illness and some studies have shown that healthcare costs for depressed patients are substantially more than for non-depressed patients.[5]

BOX 1 Diagnostic criteria for a major depressive episode[7]

1 Depressed mood or

2 Loss of pleasure or interest

3 At least four (or three if both 1 and 2 are present) additional symptoms:
- Increase or loss of appetite or significant weight gain or loss when not trying to lose weight
- Insomnia or hypersomnia
- Psychomotor retardation or agitation (observable by others)
- Fatigue or loss of energy
- Feelings of worthlessness or excessive/ inappropriate guilt
- Diminished ability to think, concentrate or make simple decisions
- Recurrent thoughts of death, passive or active suicidal ideas

4 Duration of at least 2 weeks with the above symptoms being present most of the time, nearly every day

5 Symptoms are distressing and/or interfere with functioning

Anxiety

Anxiety disorders are recognised as one of the most prevalent diagnostic mental disorder groups.[9] Anxiety syndromes are frequent in primary care and are associated with a clinically significant degree of severity and substantial psychosocial disability.[10] The OPCS *Surveys of Psychiatric Morbidity*[11] defines generalised anxiety disorder (GAD) by four criteria including:

- duration longer than 6 months
- presence of free-floating anxiety
- autonomic overactivity, and
- an overall anxiety score of two or more (including heart racing, hands sweating, feeling dizzy and difficulty getting breath among other symptoms).

Panic is diagnosed when criteria for phobic disorders are not met and the patient has had recent panic attacks, is anxiety-free between attacks and has an overall panic score of two or more (frequency, duration and severity of symptoms are used in scoring).[11]

Symptoms of depression and anxiety more often than not co-exist.[5] Studies of the prevalence of depression and anxiety disorders have shown that there is a high prevalence of co-morbidity of these two disorders.[6] One study of over 20,000 individuals in the USA[9] found 47.2% of those meeting lifetime criteria for major depression to also have met criteria for a co-morbid anxiety disorder; 25.6% had a lifetime prevalence of simple phobia; 20.4% had agoraphobia; 13.6% had social phobia; 13.0% had panic disorder; and 14.4% had obsessive-compulsive disorder (OCD).[9]

Recognition of anxiety disorders by GPs is often poor, and the proportion of patients who actually receive treatment is low. There are several well-defined anxiety disorders the most frequent being agoraphobia, panic disorder and GAD.[10] Women are more likely than men to develop anxiety disorders.[12] Epidemiological studies suggest that women have a 2–3-fold increase in the occurrence of panic disorder and GAD.[12]

One UK study[13] found a lifetime prevalence of panic to be 8.6% and well over half of this sample of 1000 patients had single or multiple additional psychiatric diagnoses. The amount of perceived disability suffered by individuals with panic is considerable.

OCD is also considered to be an anxiety disorder but is not included within the remit of this review.

Phobias

Phobias are separated by the OPCS *Survey of Psychiatric Morbidity*[11] into four categories:

- agoraphobia without panic disorder
- agoraphobia with panic disorder
- social phobias, and
- specific (isolated phobias).

All four categories are diagnosed if social impairment is present, if avoidant behaviour is a prominent feature and if there is an overall phobia score of two or more (scoring includes feeling nervous and anxious with the symptoms such as heart racing, hands sweating, feeling dizzy, difficulty getting breath among others and avoidance behaviour). There is often overlap between panic and phobias with many people suffering from both. There is also considerable co-morbidity between disorders such as agoraphobia and panic disorder with depression.[5] Panic and agoraphobia alone form a considerable mental health burden, being the fifth most common problem seen in primary care settings.[14] Phobias frequently have their onset early in life and are considered to be risk factors for later development of major depression and alcoholism.[15] One study of phobias found that simple phobias often involve multiple fears.[15] The most prevalent specific fears identified in this study were of animals for women and of heights for men.

Many people avoid the panic associated with their phobias through avoidance behaviours, which can have a considerable impact on their quality of life. One study of social phobia found that persons with social phobia reported low functioning on the Quality of Well-Being scale and dissatisfaction with many aspects of life.[16] Social phobia contributes to early behavioural difficulties and decreased academic performance, potentially leading to lower educational attainment and income.[17] Rates of reported lifetime prevalence of social phobia range from 0.5% to 16.0%.[17]

Changes in the diagnostic criteria have resulted in increased estimates in more recent years. Variations in prevalence rates may also be due to the use of different survey instruments and methods used to identify cases.

Current service provision

As stated previously, the majority of people identified with depression are treated in the primary care setting. Drugs prescribed in primary care are usually either tricyclic antidepressants (TCAs) or selective serotonin re-uptake inhibitors (SSRIs). However, antidepressants are often associated with side-effects such as dry mouth, drowsiness, blurred vision, constipation, urinary retention and sweating for TCAs, and gastrointestinal effects, anorexia and hypersensitivity reactions among others for SSRIs.[18] This can result in poor compliance. As there is a stigma attached to the use of antidepressants some patients may be hesitant to use them. Also benefits are not immediately apparent and can take several weeks to occur. Patients are also often not aware of the necessity for continued treatment over several months.

Some psychological therapies have been found to be as effective as antidepressants in treating mild-to-moderate depression. These include CBT, problem solving therapy, psychodynamic-interpersonal therapy and interpersonal therapy, all of them found to be equally effective.[5]

Treatments recommended for anxiety include CBT, antidepressant drugs, relaxation and other coping strategies and behavioural psychotherapy.[19] Panic disorders also benefit from CBT. Recommended treatments for phobias include combinations of cognitive treatments and exposure treatments.[19] SSRIs are considered by many to be the drug of choice in social phobia.[20]

In the OPCS *Survey of Psychiatric Morbidity*,[11] one in eight people with a neurotic disorder was receiving treatment. Among this group, two-thirds were taking medication and half were having either therapy or counselling. Patients classified as having two or more neurotic disorders were three times more likely to have received some form of treatment than those with one disorder (30% compared with 10%). In the OPCS Survey the groups most likely to be receiving treatment were those classified as having a phobia (28%) or a depressive episode (25%). Those least likely to be receiving treatment were those with mixed anxiety and depressive disorder (9%). For patients with one or more neurotic disorders **receiving treatment**, 39% received psychotherapy or psychoanalysis, 2% received sex, marital or family therapy, 2% received art, music or drama therapy, 5% received social skills training, 51% received counselling and 2% received behaviour or cognitive therapy. Therefore, 0.24% of all patients with a neurotic disorder receive either behaviour or cognitive therapy.

Although many patients with depression would prefer psychological therapy to drug treatment,[5] the huge demand for these services means that they are not available to the majority of patients. Not all GPs possess the skills for mental health work so services must often be obtained elsewhere. Finally, GPs may not be enthusiastic about the appropriateness of mental health services for patients and may therefore not refer patients who might benefit from these services. GPs interviewed for the Clinical Standards Advisory Group study, concerned with the treatment of depression in the primary care setting in the UK, reported that NHS psychological therapy services had waiting lists of as long as 18 months for some therapies. Waiting times for appointments with mental health specialists providing sessions in primary care were generally shorter, ranging from 2–3 weeks to 3 months.[5] The very long waiting lists may mean that this treatment is simply not available to the majority of patients. There is also often a lack of clear referral criteria and referral pathways from primary care to specialist mental health workers.[5]

The National Service Framework (NSF) for Mental Health[1] was developed to determine models of treatment and care for working age adults up to the age of 65 living in England. The NSF for Mental Health defines national standards for mental health, what they aim to achieve, how they should be developed and delivered and how performance should be measured. Standard two of the NSF for Mental Health states that any service user who contacts their primary healthcare team

with a common mental health problem should have their mental health needs identified and assessed and be offered effective treatments, including referral to specialist services for further assessment, treatment and care if they require it. Standard three states that any individual with a common mental health problem should be able to make contact round the clock with the local services necessary to meet their needs and receive adequate care and be able to use NHS Direct, as it develops, for first-level advice and referral on to specialist help lines or to local services.

The House of Commons Select Committee on Health[21] investigated the delivery of general mental health services and the implementation of the NSF. The Report states that there is clear evidence that there are considerable shortages in key mental health professions, and that the NSF is unlikely to become a reality unless these shortages are addressed. One of the service gaps highlighted as currently inadequate was talking treatments such as psychotherapy and cognitive therapy on the NHS. Although the Report identified a shortage of psychologically based treatments in the NHS, there was little evidence to determine if this was due to the shortage of professionals, lack of awareness among those responsible for purchasing mental health services as to their benefits, or due to cost. More research in this area is recommended.

CBT

CBT is a psychotherapy commonly practised in the NHS. CBT refers to the pragmatic combination of concepts and techniques from cognitive and behaviour therapies common in clinical practice.[22] The behaviour component of CBT is structured to solve problems and relieve symptoms by changing behaviour and the environmental factors that control behaviour. Graded exposure to feared situations is one of the commonest behavioural treatment methods and is used in a range of anxiety disorders. Self-exposure therapy is exposure therapy that is administered by the patient who exposes him/herself to situations of increasing difficulty. It is often used in the treatment of phobias.

The cognitive therapy component of CBT is also a structured approach. Techniques such as challenging negative automatic thoughts and behavioural techniques, such as activity scheduling and behavioural experiments, are used with the main aim of relieving symptoms by changing maladaptive thoughts and beliefs.[22] Relaxation training and social skills training are also used in CBT.[23]

The NSF for Mental Health states that CBT and interpersonal therapy have been found to be efficacious in the treatment of depression.[22] CBT has been identified as a major component of primary and secondary mental healthcare services. The NSF for Mental Health proposes national standards guided by ten principles including service user involvement and evidence-based interventions.[24] There is strong evidence that CBT is effective in specialist settings but the results from general practice have been equivocal.[25] A randomised controlled trial (RCT) compared treatment with non-directive counselling (NDC), CBT and usual GP care for patients with depression.[25] The study found counselling and CBT to be equally effective and superior to usual GP treatment for both depression and mixed anxiety/depression at 4 months. By 1 year the usual GP care group improved to be equivalent to other two groups. Patients at 1 year expressed higher levels of satisfaction with the NDC treatment.

In another RCT, CBT was compared with imipramine, their combination or placebo for the treatment of panic disorder.[26] Combining imipramine and CBT appeared to confer limited advantage over imipramine alone in the acute phase but more advantage by the end of maintenance phase. Each treatment worked well immediately following treatment and during maintenance. CBT improvements remained durable in the follow-up phase.

A meta-analysis of treatment outcome for panic disorder[27] examined the effectiveness of pharmacological, cognitive behaviour and combined pharmacological and cognitive behaviour treatments in 43 controlled studies that included 76 treatment interventions. Cognitive behaviour treatments yielded the highest mean effect size (ES = 0.68) relative to the other treatments. Drop-out rates were also found to be lower for CBT: 5.6% versus 19.8% in pharmacological treatments and 22% in combined treatments. Studies were selected on the basis that the patients had panic disorder with or without agoraphobia, employed a control group and had random assignment to treatment. Studies that compared multiple or combination treatments were included as long as they included a control.

CBT is also effective in treating anxiety disorders with marked symptomatic anxiety (panic disorder, phobias and GAD).[22] Patients meeting the criteria for GAD were randomised to CBT, analytic psychotherapy or anxiety management training in another RCT.[28] In this trial, CBT

was found to be significantly more effective than analytic psychotherapy ($p < 0.05$ for some outcome measures). Anxiety management was also significantly more effective ($p < 0.01$) although at follow-up CBT improvement was superior.

The Evidence-Based Clinical Practice Guideline, *Treatment choice in psychological therapies and counselling* states that common therapy length for CBT in the NHS is from eight to 20 sessions.[22] Therapy length of fewer than eight sessions is unlikely to be optimally effective for most moderate-to-severe mental health problems.[22] Often 16 sessions or more are required for symptomatic relief. Recommendations from the guideline are that patient preference should inform treatment choice, particularly where the research evidence does not indicate a clear choice of therapy. The skill and experience of the therapist should also be taken into account. More complex problems and those where patients are poorly motivated require the more skilful therapist.[22]

Two recent papers[29,30] have challenged the traditional length of time needed to obtain benefit from CBT. The RCT reported in these papers compared three groups: standard therapist contact of 6 hours with minimal therapist contact of 3 hours and bibliotherapy in 104 patients. The standard therapy group showed the greatest treatment efficacy even though therapy was of notably shorter duration that the usual recommended length of therapy. The standard treatment group had significantly greater improvement compared with the bibliotherapy group on all endpoint measures and on some endpoint measures for the reduced therapy group.

In common with all psychological therapies, there are problems in the delivery of CBT including too few therapists, expense, waiting lists, and patients' reluctance to enter therapy. As stated previously, only 0.24% of patients with a neurotic disorder receive either behaviour or cognitive therapy.[11] There have been calls for therapists to rethink the traditional emphasis on 9-to-5 working hours, face-to-face sessions, hourly appointments and appointment systems run through outpatient waiting lists[24] as this approach does not currently meet patient needs.

Description of new intervention

CCBT is one of several self-help therapies that aim to offer CBT to patients while reducing the amount of therapists' time needed. Stepped care is one approach in which a variety of self-help options are offered to appropriately screened patients.

Self-help therapies

There are currently problems with access to good mental healthcare due to staff shortages, patchy services, poor coordination between services and long waiting lists. Recent developments in psychological treatments have included problem solving, psycho-education and self-help. These provide an alternative to the traditional therapist-led treatments.

Problem solving is a simple treatment that can be implemented by primary care staff usually involving six sessions of treatment. Training is delivered to nurses in as little as four half-day sessions. Techniques include problem definition, choice of achievable goals, finding solutions and evaluation. There is evidence that problem solving can be of benefit in major depression.[31,32]

Psycho-education involves eight weekly 2-hour sessions. The techniques include information, changing thoughts, activities and relaxation. Training includes a 2-day course, practice group, video assessment, follow-up meetings and ongoing quality control. Psycho-education may be as effective as problem solving.[31,32]

Self-help is used to describe the use of materials to deliver treatment in a medium-based format such as via books, audio or video tapes or computers and used by an individual for self-treatment.[33] Self-help usually forms an adjunct to therapy or may be a stand-alone treatment.

A recent systematic review of self-help treatments for anxiety and depression found that the available evidence is limited in both quantity and quality.[34] The review concludes that these treatments may have the potential to improve the overall cost-effectiveness of mental health service provision. Bibliotherapy is one form of self-help involving minimal contact with a therapist. It usually takes the form of cognitive behaviour methods in a written format. Four meta-analyses of self-help[35–38] have found that they are as effective as therapist-led CBT (TCBT). Self-help treatments appear to be most effective for skills-deficit training and the treatment of anxiety, depression and sexual dysfunction. In the meta-analysis of bibliotherapy for unipolar depression, it was found to be an effective treatment modality, and no less effective than either individual or group therapy.[37] With regard to additional therapist input, there appears to be little effect on patient outcome over self-help

alone.[35,36,38] However, anxiety treatments do appear to be more effective when there is additional therapist contact.[36] Self-help approaches are not suitable for patients not interested in using self-help, those with severe or major depression and patients with visual, hearing or reading difficulties.[33] The evidence on self-help therapies is limited and at present there is little evidence to suggest that one approach may be more effective than another. Two trials are currently underway to assess the use of self-help therapies in primary care. The first, Psychological Health Assessing Self-Help Education in Primary Care (PHASE) is a multicentre study exploring the use of a practice nurse to supervise self-help interventions. The second trial, the Self-Help in Anxiety and Depression (SHADE) trial involves the use of facilitated self-help using a manual with additional support from assistant psychologists in primary care settings.

A survey of CBT therapists' attitudes towards structured self-help materials[39] found self-help materials were used by 88.7% of therapists who responded to the survey. The self-help materials were usually used as a supplement to individual therapy and were delivered in paper-based formats.

Stepped care

Stepped care involves individualised treatment so that the patient steps up to more complex treatment as and when necessary. Stepped-care approaches have tremendous potential as patients have improved access to treatments. Many patients will benefit from the use of first-stage treatments and need no further access to services. Those patients who must move further up the stepped-care system would have improved access to these facilities.

Stepped-care programmes need to include careful monitoring of patients in order to prevent at-risk patients being put into treatment steps that are ineffective and potentially dangerous.

Computers in mental healthcare

Computers are used for a variety of purposes in mental healthcare. They can be used as a diagnostic assessment tool, for assessment measures and to administer *in vivo* exposure, as well as to provide treatment.[40] Computers can also be used for monitoring patients' progress and to provide education to patients.[41] A variety of treatment options is possible and treatment may be via the Internet, interactive telephones or virtual reality systems.[42] Even patients who are illiterate can have access to computers via interactive voice response (IVR) telephone systems.

Computerised therapy has distinct possible advantages.[43] It allows the dissemination of standardised yet personalised treatments. The programmes can be customised for each patient while still maintaining protocols in the correct sequence. Finally, the costs associated with computer-based treatments are potentially less than those associated with clinician-based treatments. Other advantages are that they can be used 24 hours a day, 7 days a week, depending on access, without affecting efficiency, and they do not suffer some of the deficiencies of human therapists such as memory problems and fatigue.[44] Computer-based therapies can potentially improve access to treatment, promote self-monitoring, give systematic feedback to the user and help with coping skills as well as provide built-in outcome measures.[45] Privacy and consistency of care and ease of data collection are other advantages.[42]

Computer-based therapies can be used at home, making them particularly useful for people who are currently unable to access care because of their mental health problems. Other setting options for computer-based therapies include GP surgeries, psychiatric clinics, drop-in clinics, libraries and supermarkets, among others.

Fundamental requirements of computer programs in a public health system are that they are easy to use, of demonstrated effectiveness and that they protect confidentiality of patient data.[45] Client safety issues should be given careful consideration so that clinician negligence does not result in harm to the patient.[42] There is the danger that patients are left to use the computer with little supervision. Recent recommendations from the Department of Health[46] emphasise the need for clear understanding of informed consent, express consent, public interest, anonymisation and pseudonymisation of patient information. These issues affect the use of computers in mental healthcare as patient information must remain confidential but be accessible by professionals involved in the care of the patient.

Clinician resistance may be a barrier to the use of computers, as clinicians may feel supplanted. This approach may not be useful for patients who are not computer literate, although most programs are user friendly, requiring minimal computer skills. Some programs also use activation via the telephone as opposed to keyboard. Not all patients will be open to the idea of using a computer.

Another drawback to the widespread use of computer treatment programs is that some packages may be very expensive.

CCBT

As stated above, CBT is an effective treatment for many psychological disorders. Due to problems such as lengthy waiting lists there is a real need to find new ways to make CBT accessible to patients. Along with the self-help approaches, such as bibliotherapy, CCBT is a potentially useful treatment option for depression, anxiety and phobias and involves minimal therapist contact.

Equipment required to use CCBT will include a computer or telephone. The type of equipment needed depends to a large extent on the program. At one end of the spectrum are programs that are available on compact discs, which can be purchased by individuals for use on home computers. At the other end are programs that require designated specialised computers.

Some CCBT programs are for use in GP surgeries or libraries and some are used over the Internet. Patients may use other programs at home or in clinic or hospital settings. The personnel required to implement CCBT can vary from psychiatrist to practice nurse. Therapist time needed for the program will also vary depending on the program. Some are designed to need very little input, apart from a brief introduction and monitoring from someone with minimal training. Other programs are used as a treatment adjunct so that patients receive the same amount of CBT with a therapist and the computer treatment provides an additional technique.

CCBT programs are most often developed for specific patient groups, patients with depression or patients with phobias, for example. Some, however, may be used for more than one patient group. Programs are interactive in that the computer makes appropriate responses to the input received from the patient. On the basis of the responses, homework is usually generated from the computer sessions. Examples of available CCBT packages include:

- Overcoming Depression
- Cognitive Therapy: a Multimedia Learning Programme
- Beating the Blues
- FearFighter
- Stresspac, and
- Cope.

Currently CCBT is used experimentally within the NHS.

Chapter 2

Effectiveness

Methods for reviewing effectiveness

Search strategy

The search aimed to identify all literature relating to CCBT for anxiety and depression. The searches were conducted in September and October 2001.

Seventeen electronic bibliographic databases were searched from 1966 to September 2001 and covered biomedical, science, social science, health economic and grey literature (including current research). A list of databases is provided in appendix 1.

In addition, the reference lists of relevant articles and sponsor submissions were handsearched and various health services research-related resources were consulted via the Internet. These included health economics and health technology assessment organisations, guideline-producing agencies, generic research and trials registers, and specialist sites. A list of these additional sources is given in appendix 1. Citation searches were conducted on key papers and authors using the Science and Social Science Citation Index facilities.

A combination of free-text and thesaurus terms was used. 'Population' search terms (e.g. depression, anxiety, panic, agoraphobia, phobia) were combined with 'intervention' terms (e.g. cognitive therapy, behavio(u)r therapy, psychotherapy, AND computer, medical informatics computing, computer-assisted instruction, multimedia). This was supplemented by more specific searches on named packages, such as Overcoming Depression, Stresspac, and a general search on CBT economic evaluations (MEDLINE, EMBASE, NHS EED and HEED). Copies of the search strategies used in the major databases are included in appendix 2.

No date, language or study/publication type restrictions were applied to the searches. An economic evaluations filter was used for the CBT-economics search (appendix 2).

Inclusion and exclusion criteria

The following inclusion criteria were used.

- **Subjects:** adults with depression or anxiety with or without depression as defined by individual studies. Included in this remit were generalised anxiety, panic disorders, agoraphobia, social phobia and specific phobias
- **Intervention:** CCBT delivered alone or as part of a package of care either via a computer interface or over the telephone with a computer-led response (IVR). Studies that used CCBT as a treatment **adjunct**, as opposed to a therapist comparator, are reported separately in the review
- **Comparator:** current standard treatments including TCBT, NDC, routine management (including drug treatment) and alternative methods of CBT delivery
- **Outcomes:** improvement in psychological symptoms, interpersonal and social functioning, quality of life, preference, satisfaction, acceptability of treatment, therapist time and cost
- **Study type:** RCTs; for outcomes where RCTs were not available, non-randomised studies were included.

Papers describing a computer package but not reporting the results of a study were not included in the review.

The following disorders did not fall within the remit of this review:

- post-traumatic stress disorder
- OCD
- post-natal depression
- bilpolar disorder (manic depression)
- depression with psychotic symptoms
- Tourette's syndrome
- schizophrenia
- psychosis
- serious suicidal thoughts or unstable medical conditions in the past 6 months
- alcohol or substance abuse.

Studies on patients receiving psychosurgery or electroconvulsive therapy were also excluded from the review.

Figure 1 shows a summary of study selection and exclusion.

Quality assessment strategy

The quality of the RCTs was assessed by the Jadad criteria.[47] The non-randomised trials,

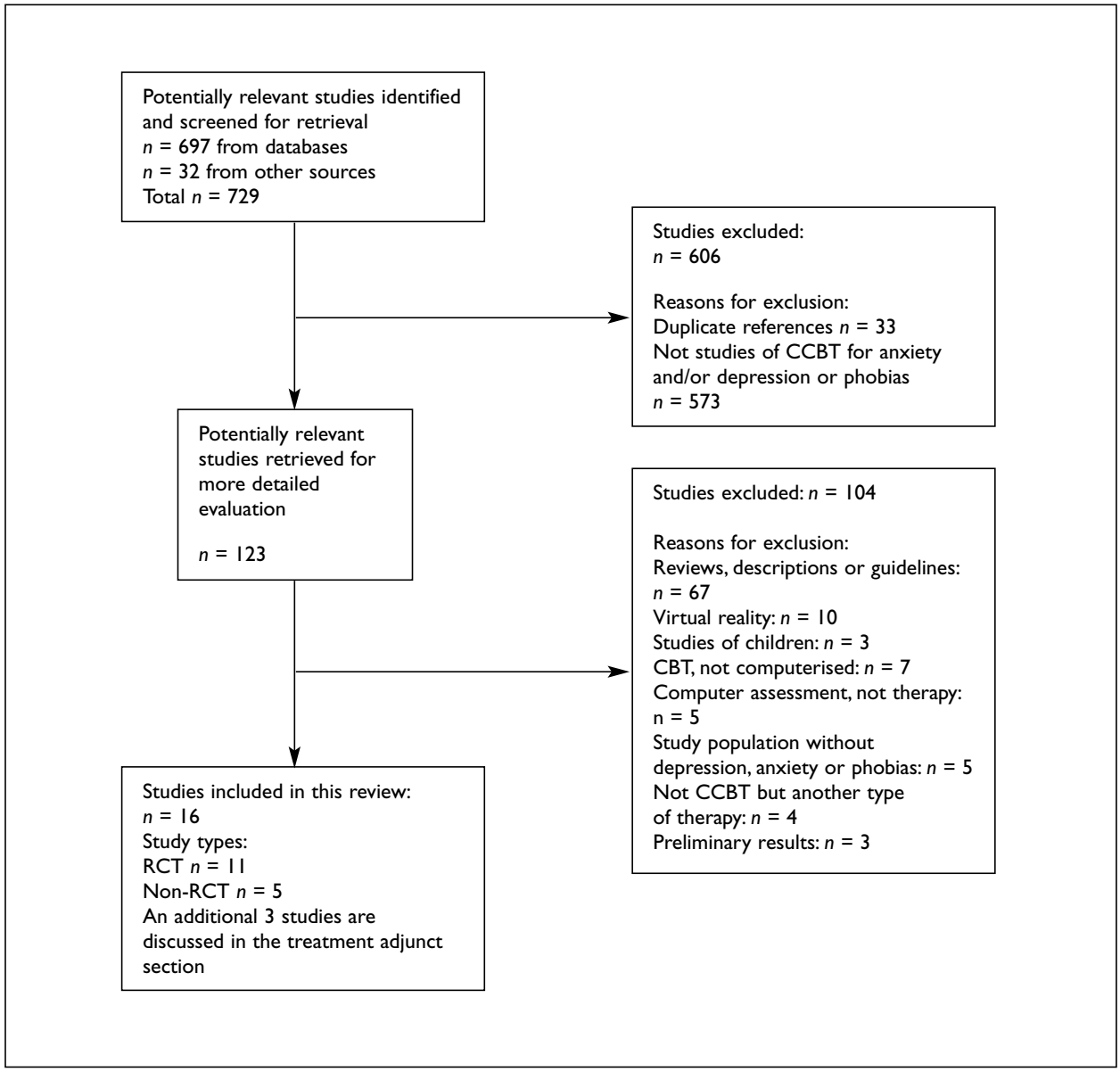

FIGURE 1 *Summary of flow of study selection and exclusion*

which included cohort studies, and pilot studies were assessed using criteria modified from the Users' Guides to Evidence-Based Medicine.[48] These criteria included the use of a comparator and description of drop-outs. Other aspects of quality assessment, such as length of follow-up, choice of outcome measures and intention-to-treat analysis were assessed in the evidence tables. Blinding of the quality assessors to author, institution or journal was not undertaken.

Data extraction strategy

Data were extracted by one researcher and checked by another using customised data extraction forms. Any disagreements were resolved by discussion.

Data synthesis in the form of meta-analysis was considered to be inappropriate due to the variety of both the CCBT packages and the comparators used in the trials. Trial data are reported in tabular form with qualitative discussion of the results.

Results

Quantity and quality of research available

Sixteen studies were identified to be included in this review.[49–64] Of these, 11 were RCTs and five were non-RCTs, including two cohort studies, two pilot studies and one comparative study. The studies included in this review are summarised in *Table 1*. Three additional studies describing

TABLE 1 *Studies included in the review*

Study	Funding	CCBT components (package)	Study type	Patient population
Bowers *et al.*, 1993[49]	Not reported	CBT, (Overcoming Depression)	RCT	Inpatients with major depression
Carr *et al.*, 1988[50]	MRC	Self-exposure	Comparative study	Phobias (85% agoraphobia, 10% social phobias, 5% specific phobias – animals)
Ghosh *et al.*, 1988[51]	MRC	Self-exposure	RCT	Phobias
Grime (dissertation), 2001[52]	No funding	CBT (BTB)	RCT	Work-related anxiety, depression and stress
Jones *et al.*, (unpublished)[53]	HSRC	Self-help CBT anxiety management package based on Stresspac (printed)	RCT	GAD
Klein & Richards, 2001[54]	Not reported	Internet-based cognitive therapy programme	RCT	Panic disorder
Marks *et al.*, (unpublished)[55]	Not reported	Self-exposure therapy (FF)	RCT	Panic disorder with agoraphobia or agoraphobia without panic, social phobia or specific phobia
Newman *et al.*, 1997[56]	National Health & Medical Research Council, Australia	CBT with palmtop computer	RCT	Panic disorder
Osgood-Hynes *et al.*, 1998[57]	Pfizer Pharmaceuticals, Inc.	Psychotherapy using treatment booklets and telephone calls to a computer-aided IVR system (Cope)	Open cohort trial	Mild-to-moderate depression, major depression and/or dysthymia
Proudfoot *et al.*, (unpublished)[58]	Not reported	CBT (BTB)	Pilot study (beta-test)	Anxiety/depression
Proudfoot *et al.*, (in press)[59]	NHS Executive, Research & Development Responsive Funding Programme	CBT (BTB)	RCT	Anxiety, depression or phobias
Selmi *et al.*, 1990[60]	NIMH, USA	CBT	RCT	Major and minor depression
Shaw *et al.*, 1999[61]	Not reported	Self-exposure and relaxation (FF) (two pilot tests)	Cohort studies	Agoraphobia, claustrophobia and panic
Smith *et al.*, 1997[62]	Not reported	Self-exposure therapy using interactive animations	RCT	Spider phobia
White *et al.*, 2000[63]	Not reported	CBT (based on Stresspac printed materials)	Pilot study	Anxiety disorder
Wright *et al.*, (poster) 2001[64]	NIMH, USA and Norton Community Trust Foundation for Cognitive Therapy & Research	CBT (Cognitive Therapy: a Multimedia Learning Program)	RCT	Major depression

BTB, Beating the Blues; FF, FearFighter; MRC, Medical Research Council; HSRC, Health Service Research Committee; NIMH, National Institutes for Mental Health
All other abbreviations are expanded in the List of Abbreviations

the use of CCBT as a treatment adjunct were also identified.[65–67] These three studies are discussed in the section on therapist time below.

Of the 16 studies, 12 covered CCBT and five covered self-exposure behaviour therapy, a technique that is part of CBT and which is used to treat phobias. One computer system was via a palmtop computer,[56] one was an Internet-based program[54] and one an IVR program.[57] The remainder were via desktop computer programs.

Table 2 summarises the patient populations covered by the 16 studies. Some studies included patients from more than one type of disorder,[55,61,58,59] including work-related anxiety, depression and stress.[52] This overlap is to be expected due to the co-morbidity experienced in these study populations.

Study characteristics

Study characteristics are described in appendix 3 both for the 11 RCTs and the five non-RCTs.

Description of CCBT: The studies report varying amounts of detail with regard to the description of the CCBT packages used. All of the packages were interactive in that patients entered information to which the computer made an appropriate response. All computer programs generated homework apart from that used in the Bowers study.[49]

Study quality: The Jadad criteria[47] were used to assess the quality of the 11 RCTs. The Jadad criteria consist of three categories: randomisation (including method to generate the sequence of randomisation and whether or not the method was appropriate), double-blinding and description of withdrawals and drop-outs. The maximum number of possible points is 5. Scores for the 11 RCTs ranged from 1 to 3, with three studies achieving 3.[52,55,59] No studies were double-blinded, which resulted in loss of points on the Jadad score. However, blinding is virtually impossible in trials of psychological therapies as patients and therapists are aware that therapy is taking place. Four of the total 16 studies[49–51,55] did use a blinded assessor to assess outcome and this is noted in appendix 3 (see *Table 22*). Even the use of a blinded assessor is difficult in studies of psychological therapies because self-assessment scales are often used. Three of the total 16 studies gave no description of drop-outs from the trials.[51,56,64]

The Wright and co-workers study[64] is presented as a poster with little detail regarding study design. It is possible that this study was of higher quality but the information is not presented. This study has also not been peer-reviewed. The studies by Jones and co-workers,[53] and Marks and co-workers[55] are unpublished studies awaiting peer-review.

With regard to the quality of the five non-RCTs, one[50] did use a comparator, exposure therapy

TABLE 2 *Summary of patient populations*

Depression studies	Anxiety/panic studies	Phobia studies
Bowers *et al.*, 1993[49] (major depression)	Jones *et al.*, (unpublished)[53] (GAD)	Carr *et al.*, 1988[50] (agoraphobia, social phobias and specific phobias)
Osgood-Hynes *et al.*, 1998[57] (mild-to-moderate depression, major depression and/or dysthymia)	Klein & Richards, 2001[54] (panic disorder)	Ghosh *et al.*, 1988[51] (phobias)
Selmi *et al.*, 1990[60] (major and minor depression)	Newman *et al.*, 1997[56] (panic disorder)	Marks *et al.*, unpublished[55] (panic disorder with agoraphobia or agoraphobia without panic, social phobia or specific phobia)
Wright *et al.*, 2001[64] (poster) (major depression)	White *et al.*, 2000[63] (anxiety disorder)	Shaw *et al.*, 1999[61] (agoraphobia, claustrophobia and panic)
		Smith *et al.*, 1997[62] (spider phobia)
Proudfoot *et al.*, unpublished[58] (anxiety and depression)		
Grime (dissertation), 2001[52] (work-related anxiety, depression and stress)		
Proudfoot *et al.*, (in press)[59] (anxiety, depression or phobias)		

with therapist. Another (unpublished) study,[58] is awaiting peer-review. Drop-outs were described in all five non-RCTs.

An intention-to-treat analysis, where all patients who enter the study are included in the analysis, gives a more realistic estimation of clinical effectiveness.[68] Of the studies included in this review only four reported the use of an intention-to-treat analysis.[52,55,57,59]

Co-therapy or medication: If co-therapy or the use of medication was described in the study, this was reported. It is possible that patients in some studies were receiving medication or therapy and this was not reported in the trial results. One study was unique[59] in that a separate analysis was undertaken for the group randomised to receive drugs in order to determine if there were any differences between this group and the group not receiving drugs.

Comparators: Four of the 16 studies had no comparator group.[57,58,61,63] Six studies had waiting list controls or TAU groups as comparators,[49,52,53,59,64] thus giving an indication of the number of patients who improved without CCBT or TCBT. *Table 3* shows the comparators used in the studies. Some studies had more than one comparator. One study[62] compared three variations of the same computerised exposure therapy.

Sample sizes: Sample sizes were generally small. Five studies included fewer than 30 patients.[49,54,56,58,61] Seven studies had between 30 and 80 patients,[50,52,57,60,62–64] and four studies had more than 80 patients.[51,53,55,59]

Four authors mentioned the use of power calculations being used to determine sample size[52,53,55,59] but only two studies were adequately powered.[55,59]

Therapy details

Appendix 3 describes the details of therapy for the 11 RCTs and the five non-RCTs (*Tables 24* and *25*).

Recruitment: Recruitment varied from self-referral through newspaper advertisements and other sources to GP referral and referral from inpatient and outpatient centres. It is not clear in any of the

TABLE 3 *Comparators used in CCBT trials*

Study	TCBT	TAU	Other	None
Bowers *et al.*, 1993[49]	✔	✔		
Carr *et al.*, 1988[50]	✔			
Ghosh *et al.*, 1988[51]	✔		✔ (book)	
Grime, 2001[52]		✔ (conventional care)		
Jones *et al.* (unpublished)[53]		✔	✔ (book)	
Klein & Richards, 2001[54]		✔ (self-monitoring)		
Marks *et al.* (unpublished)[55]	✔		✔ (relaxation programme)	
Newman *et al.*, 1997[56]	✔			
Osgood-Hynes *et al.*, 1998[57]				✔
Proudfoot *et al.* (unpublished)[58]				✔
Proudfoot *et al.* (in press)[59]		✔		
Selmi *et al.*, 1990[60]	✔	✔ (WLC)		
Shaw *et al.*, 1999[61]				✔
Smith *et al.*, 1997[62]			✔ Three variations of same computer exposure therapy	
White *et al.*, 2000[63]				✔
Wright *et al.*, 2001[64]	✔	✔ (WLC)		

WLC, waiting list control

studies whether or not the method chosen for recruiting patients ensured that they were representative of the specific patient population.

Number and length of sessions: The number of sessions of CCBT ranged from four[53] to a maximum of 12 sessions.[61] The number and length of sessions was not always reported making it difficult to assess the implications of implementing these programmes with regard to amount of time needed for each computer program.

Therapist contact and professional background of therapist: Similarly, the amount of contact patients had with therapists was not consistently reported. Six studies did not give any information regarding therapist time.[49,52,58,60,62,63] Four studies stated that therapists were used only for initial assessment or for technical support.[53,54,57,61] For the remaining seven studies a range of therapist time was reported: 40–45 minutes;[50] maximum of 90 minutes;[59] 2 hours;[55] 4.2 hours;[64] 4.7 hours;[51] maximum of 6 hours.[56] *Table 4* provides more detail regarding therapist time reported in the studies.

Therapists varied in their professional background, although again this was not always reported. Five studies did not report the background of the therapist.[52,54,57,62,64] The remaining 11 studies used psychiatrists,[50,51] psychologists,[49] a clinician[55] research assistants,[58,63] a nurse,[59] or therapists from a variety of backgrounds.[53,56,60,61]

Study site, follow-up and inclusion/ exclusion criteria

Appendix 3 describes the study site, follow-up and inclusion/exclusion criteria of the 11 RCTs and the five non-RCTs (*Tables 26* and *27*).

Study site and setting: Three studies took place in Australia,[54,56,62] nine in the UK,[50–53,55,58,59,61,63] and three in the USA.[49,60,64] One study was a multicentre trial with centres in the UK and the USA.[57] With regard to setting, one study was conducted entirely in GP surgeries.[59] One took place over the Internet with the service based at a University.[54] Eight studies took place in outpatient psychiatric units, either hospital- or university-based.[50–52,55,56,58,62,63] One study was based entirely

TABLE 4 *Therapist time*

Study	CCBT group	Comparator
Bowers *et al.*, 1993[49]	Not reported	Not reported
Carr *et al.*, 1988[50]	40 minutes	11.5 hours for therapist group
Ghosh *et al.*, 1988[51]	4.7 hours	4.6 hours for therapist group and 1.5 hours for book group
Grime, 2001[52]	Not reported	Not reported
Jones *et al.* (unpublished)[53]	One initial interview	Three short appointments at weekly intervals to check progress for book group; in current care group patients continued with GP visits as usual
Klein & Richards, 2001[54]	Initial interview treatment phase and monitoring of usage	Initial interview treatment phase and monitoring of usage
Marks *et al.* (unpublished)[55]	Up to 20 minutes/session (max 120 minutes); mean 76 ± 43 minutes	Therapist led was 283 ± 118 minutes and the relaxation group was 76 ± 22 minutes
Newman *et al.*, 1997[56]	6 hours	12 hours for therapist group
Osgood-Hynes *et al.*, 1998[57]	Assessment only	No comparator
Proudfoot *et al.* (unpublished)[58]	Not reported	No comparator
Proudfoot *et al.* (in press)[59]	5 minutes at the beginning and end of each session (max 90 minutes)	Not reported
Selmi *et al.*, 1990[60]	Not reported "minimal contact"	Therapist group had six sessions of therapy
Shaw *et al.*, 1999[61]	Technical support only, assessment at end	No comparator
Smith *et al.*, 1997[62]	Not reported	Not reported
White *et al.*, 2000[63]	Not reported	No comparator
Wright *et al.*, 2001[64]	4.2 hours	7.5 hours

in an inpatient psychiatric unit.[49] One study was based in both libraries and health centres,[53] and one was based in a hospital outpatient psychiatric unit and a GP surgery.[61] Three studies reported no information on study setting.[57,60,64]

Follow-up: Two studies did not report length of follow-up,[49,58] and follow-up for the other studies ranged from 3 weeks[54] to up to 12 months.[62] All studies reported the number of patients lost to follow-up although five studies gave no information as to the reasons for loss to follow-up.[51–53,56,64] The most common reason for loss to follow-up was that patients did not attend sessions or had moved from the area. However, in two studies,[49,59] at least some patients were unhappy with treatment allocation, and in one study[58] one patient felt that the computer program was not appropriate for his problems. Drop-out rates ranged from 0%[60] to 45%.[58]

Inclusion and exclusion criteria: Inclusion and exclusion criteria were usually clearly stated, although one study[53] did not report inclusion criteria, and four[53,54,58,62] did not report exclusion criteria. Standardised criteria or scales for depression, anxiety or phobias were used as inclusion criteria in all but three studies[51,58,64] Many exclusion criteria included co-morbidities often associated with depression, anxiety and phobias and this has implications for the reproducibility of the results from these studies.

Patient characteristics

Patient characteristics are described in appendix 3 (*Tables 28* and *29*).

Diagnosis of disorder: Only two studies[52,58] did not report the methods used to diagnose the disorder, although the Grime study[52] dealt with stress, depression and anxiety in the workplace so the study population was not necessarily clinically ill. The methods used to diagnose depression, anxiety and phobias included criteria from:

- the Diagnostic and Statistical Manual of Mental Disorders (DSM)-III-R
- DSM-IV
- International Classification of Diseases (ICD)-9
- ICD-10, and
- Symptom Check List (SCL)-90-R criteria.

Scales for diagnoses included:

- Hospital Anxiety and Depression Scale (HADS)
- State–Trait Anxiety Inventory (STAI)
- Brief Symptom Inventory (BSI)
- Primary Care Evaluation of Mental Disorders (Prime MD)
- Hamilton Rating Scale for Depression (HAM-D), and
- Clinical Interview Schedule of the Programmable Questionnaire System (PROQSY).

Age, sex, ethnicity, background and patient history: All studies had considerably more women than men and most had patients aged between 30 and 40 years, although mean ages were not always reported. Only two studies reported the ethnicity of patients,[59,60] and only one reported the inclusion of patients from ethnic minorities.[59] At least some information on education and socio-economic background was reported in all but four studies,[49,56,62,64] although most provided little detail. Information reported in the studies included employment and marital status, length of education and previous use of computers, although no studies reported all of these. Jones [53] reported information on deprivation.

With regard to patient history, 13 of the 16 studies gave at least some information on previous experience of therapy and duration of condition although four[49,52,59,64] provide no information at all. Eleven studies reported that at least some patients had had previous therapy or medication for their condition.[50,51,53,55–58,60–63] Duration of illness was reported in nine studies.[51,54–58,60–62]

Baseline comparability: Information on baseline comparability (no significant difference for important variables before treatment) is only relevant for the 11 RCTs included in the study. Four of these reported no information at all on baseline comparability.[52,54,55,64] The other seven studies reported varying amounts of detail. Bowers[49] reported baseline comparability for age, marital status, level of education, duration of present episode of depression, number of previous episodes, number of previous hospitalisations, and severity of depression, while Jones[53] and Newman[56] only reported comparability between pre-treatment depression scores.

Outcomes and results

Outcomes to be reported in this review included:

- clinical effectiveness in terms of improvement in psychological symptoms,
- effectiveness in terms of interpersonal and social functioning,
- effectiveness in terms of preference, satisfaction and acceptability of treatment,

- effectiveness in terms of quality of life,
- cost.

In addition, therapist time was also reported as an outcome measure.

Improvement in psychological symptoms and interpersonal and social functioning

The psychological symptoms and interpersonal and social functioning outcomes reported in the studies are presented in appendix 3 (*Table 30*), together with the instruments or scales used to measure these outcomes. All studies reported outcomes related to psychological symptoms. Seven studies[51,55,57,58,59,61,62] reported outcomes related to interpersonal and social functioning. Measurement periods are also presented in *Table 30* as well as intention-to-treat analyses (see *Study quality* above). *Table 31* presents this information for the non-RCTs.

Instruments: Outcomes on the whole related to improvement in depression and anxiety symptoms or improvement in phobias. In order to measure these outcomes a variety of instruments were utilised by the investigators. The full range of these instruments is presented in *Table 5*. Of these instruments, the Beck Depression Inventory (BDI), Beck Anxiety Inventory (BAI), Hamilton Rating Scale for Depression (HRSD) and HADS are well-recognised and frequently used scales to measure depression and/or anxiety. Of the

TABLE 5 *Scales used as outcome measures in included studies*

Scale	Abbreviation	Studies
Beck Depression Inventory Beck Anxiety Inventory	BDI BAI	Bowers *et al.*, 1993[49] Proudfoot *et al.* (unpublished)[58], Proudfoot *et al.* (in press)[59], Selmi *et al.*, 1990[60], White *et al.*, 2000[63], Wright *et al.*, 2001[64]
Hamilton Rating Scale for Depression	HRSD or HAM-D	Bowers *et al.*, 1993[49], Osgood-Hynes *et al.*, 1998[57], Selmi *et al.*, 1990[60], Wright *et al.*, 2001[64]
Phobic problems		Ghosh *et al.*, 1988[51]
Phobic targets	PT	Ghosh *et al.*, 1988[51], Smith *et al.*, 1997[62]
Hospital Anxiety and Depression Scale	HADS	Grime, 2001[52], Jones *et al.* (unpublished)[53], White *et al.*, 2000[63]
Attributional Style Questionnaire	ASQ	Grime, 2001[52], Proudfoot *et al.* (unpublished)[58]
State–Trait Anxiety Inventory	STAI	Jones *et al.* (unpublished)[53]
Brief Symptom Inventory	BSI	Jones *et al.* (unpublished)[53], White *et al.*, 2000[63]
Primary Care Evaluation of Mental Disorders	Prime MD	Klein & Richards, 2001[54]
Main Problems & Goals		Marks *et al.* (unpublished)[55]
Work and Social Adjustment scale	WSA	Ghosh *et al.*, 1988[51], Marks *et al.* (unpublished)[55], Osgood-Hynes *et al.*, 1998[57], Proudfoot *et al.* (unpublished)[58], Proudfoot *et al.* (in press)[59], Shaw *et al.*, 1999[61], Smith *et al.*, 1997[62]
Fear Questionnaire	FQ	Carr *et al.*, 1988[50], Ghosh *et al.*, 1988[51], Marks *et al.* (unpublished)[55], Newman *et al.*, 1997[56], Shaw *et al.*, 1999[61]
Mobility Inventory for Agoraphobia		Newman *et al.*, 1997[56]
Agoraphobia Cognitions Questionnaire		Newman *et al.*, 1997[56]
Body Vigilance Scale		Klein & Richards, 2001[54]
Symptom Check List – depression and global symptoms scales	SCL-90-R	Selmi *et al.*, 1990[60]
Anxiety Sensitivity Index		Klein & Richards, 2001[54]
Self-Efficacy Questionnaire		Klein & Richards, 2001[54]
Body Sensations Questionnaire		Newman *et al.*, 1997[56]
Automatic Thoughts Questionnaire	ATQ	Selmi *et al.*, 1990[60]
Spider Questionnaire	SPQ or SQ	Smith *et al.*, 1997[62]

others, little information was found to recommend one over another with regard to validity and reproducibility.

The **BDI** is a 21-item self-report scale used to determine depression severity. Items are scored on a 0–3 scale giving a total range of 0–63. Total scores within the 1–13 range indicate minimal depression, 14–19 mild depression, 20–28 moderate and 29–63 severe depression.

The **BAI** is also a 21-item self-report scale. Patients rate symptoms 0–3 according to severity. A score of 0–9 reflects normal levels of anxiety, 10–18 indicates mild-to-moderate anxiety, 19–29 moderate-to-severe anxiety and 30–63 severe anxiety.

The **HAM-D** (or HRSD) is designed to be used on patients already diagnosed as suffering from an affective disorder of depressive type. There are 17 variables measured on either a five-point or a three-point rating scale.

HADS is a self-assessment instrument for measuring depression and anxiety independently. It was developed for use with physically ill patients. It is limited to 14 items and scored on a four-point scale from 0–3.

The **Work and Social Adjustment Scale** (WSA) is a self-report scale of five single-item sub-scales: ability to work, home management, social life, private leisure and relationships. A sixth scale measures the degree to which the problems impair their overall ability to lead a normal life. Each of the indices is measured by a single-item Likert scale ranging from 0 to 8, with 8 indicating severe impairment. Total score range is 0–40.

Results for psychological symptoms and interpersonal and social functioning outcomes

Results of improvement in psychological symptoms and interpersonal and social functioning are presented in appendix 3 (*Tables 32* and *33*).

Of the 16 included studies, 11 were RCTs. Only one other study[50] included a comparator group (TCBT). In this study both treatment groups improved significantly on all six measures ($p < 0.001$). No numerical data were reported for this study. The results for the 11 RCTs are described below by comparator (TCBT, TAU and bibliotherapy). Some studies are reported more than once due to multiple comparators. Smith[62] compared three variations of the same exposure therapy computer program (changing only the type of exposure and feedback).

CCBT versus TCBT: Of the 11 RCTs, five studies showed CCBT to be as good as TCBT.[51,55,56,60,64] One study[51] found both groups to improve significantly on all measures from baseline ($p < 0.001$); however, no numerical data were reported in this study.

The Marks and co-workers study,[55] which was one of the larger studies with 90 patients, reported effect sizes from pre- to post-treatment for TCBT and CCBT of 3.6 and 3.9 respectively (Main Problem), 3.3 and 3.9 (Goals), 2.8 and 1.7 (Fear Questionnaire Global Phobia self), 1.9 and 2.1 (Fear Questionnaire Global Phobia blind assessor) and 1.2 and 0. 9 (WSA Total blind assessor). There were no significant differences between TCBT and CCBT at 1-month follow-up and both groups improved significantly from baseline.

Newman and co-workers,[56] a small study with only 18 patients, showed TCBT to be more effective post-treatment but not at follow-up when there were no significant differences between the two groups.

Selmi and co-workers[60] reported effect sizes for four outcomes (BDI, HRS, SCL-90-R Depression and SCL-90 Global). Effect sizes were for follow-up outcomes and based on control group means (*Table 6*). There were no statistically significant differences between TCBT and CCBT.

TABLE 6 *Effect sizes for follow-up outcomes for studies comparing CCBT with TCBT*

	ES	
	CCBT	**TCBT**
BDI	−1.47	−1.2
HRS	−1.42	−1.47
SCL-90-R Depression	−1.21	−1.05
SCL-90 Global	−1.11	−1.02

Wright and co-workers[64] found no significant differences between TCBT and CCBT on all measures.

One study found TCBT to be more effective than CCBT.[49] Both the BDI ($p < 0.049$) and HRSD ($p < 0.005$) showed greater improvement in the TCBT group than in the CCBT group.

CCBT versus TAU: Four studies found CCBT to be more effective than TAU,[54,59,60,64] although TAU was not defined as the same thing in all four studies. Klein[54] compares CCBT with 'self-

monitoring', Proudfoot and co-workers[59] uses 'usual GP care' and Selmi and co-workers[60] and Wright and co-workers[64] use 'waiting list control'.

The Klein and Richards study[54] reported effect sizes for condition by time interactions for four outcomes (panic frequency, anticipatory fear of panic, general anxiety and general depression). Effect sizes were 0.40, 0.39, 0.32, 0.16, respectively. There was significant condition effect for self-efficacy (ES = 0.42) and time effect for this variable (ES = 0.50). There was also condition effect for body vigilance (ES = 0.21) and time effect for this variable (ES = 0.42). All measured outcomes showed statistically greater improvement in the CCBT group than the TAU group, apart from general depression.

In the Proudfoot and co-workers study,[59] a main effects model was used to show significantly greater reduction in the BDI, BAI and WSA for the CCBT group compared with the TAU group.

Selmi and co-workers [60] as reported above in the CCBT versus TCBT section, found both of these two groups to be significantly more effective than the waiting list control group ($p < 0.05$).

Wright and co-workers[64] found CCBT to be significantly more effective than TAU ($p = 0.02$).

Bowers and co-workers [49] found no significant differences between the CCBT and the TAU group. Grime[52] found scores for HADS depression and negative attributional style scores to be significantly lower in the CCBT group compared with the TAU group at treatment and 1 month post-treatment only. HADS anxiety scores in this study were signifi-cantly lower at 1 month only in the CCBT group. The CCBT group in the Grime study also had a higher composite attributional style score at the end of treatment only. There were no statistically significant differences for any scores at 3 and 6 months between the CCBT and the TAU groups. The primary outcome variable for this study, however, was absenteeism from work. Again, the Bowers study was undertaken in an inpatient setting. The Grime study took place in the workplace with a study population that was not necessarily clinically depressed.

CCBT versus bibliotherapy: Two studies compared CCBT with bibliotherapy (Ghosh[51] and Jones[53]), with conflicting results. Ghosh and co-workers reported no numerical data in this study of exposure therapy and found equal improvement in the three groups (therapist, computer and book). Jones and co-workers[53] found bibliotherapy to be more effective than CCBT for two outcomes, HADS anxiety ($p = 0.06$) and HADS depression ($p = 0.02$). No other outcomes (STAI state score, STAI trait score, BSI General Symptom Index and BSI Positive Symptom Total) were significant. In this study, however, GPs were unwilling to deliver bibliotherapy, due to the work associated with it. They were willing to deliver CCBT.

Patient preference, satisfaction and acceptability

The outcomes of patient preference, satisfaction and acceptability of treatment for RCTs and non-RCTs are presented in appendix 3 (*Tables 34* and *35*).

Four studies[54,59,62,64] reported no information regarding patient preference, satisfaction and acceptability of treatment. In those 12 studies recording at least some information on patients' views, in general the computer programs were viewed in a positive light although this varied and the amount of detail collected varied tremendously between studies.

In those studies reporting minimal information, Carr and co-workers[50] stated that no patients expressed regret at receiving computer treatment. Newman and co-workers[56] reported no differences identified between the computer and the therapy groups with regard to treatment satisfaction.

More information was given by Marks and co-workers[55] who reported that there were no differences in ratings of treatment helpfulness between the computer group, therapy group and relaxation tape group, although those in the relaxation tape group were less satisfied and more people in the computer group did not complete the treatment sessions than in the therapy group. Osgood-Hynes and co-workers[57] reported that patients found the system easy to use and helpful. Proudfoot and co-workers[58] reported that patients liked the computer program and felt that it worked as well if not better than previous treatments they had received. Selmi and co-workers[60] reported several variables where patients in the therapy group responded more positively than in the computer group including therapist understanding and learning methods for dealing with people. Shaw and co-workers,[61] in a very small study, reported patients found the computer to be satisfactory and easy to use. White and co-workers[63] also reported positive patient responses to the computer.

Bowers and co-workers[49] reported that three patients dropped out of treatment after being assigned to the computer group. Ghosh and co-workers[51] reported that the psychiatrist was seen as significantly more tolerant, understanding and reliable than the computer or book ($p < 0.01$). Grime[52] reported that there was a low participation rate in the study and that the computer program was much less popular than counselling. Jones and co-workers[53] reported that two people in the computer group felt that the computer "made things worse".

Therapist time

Table 4 presents the results for the outcome of therapist time for the 16 studies included in this review. Exact times are reported if they were available from the studies. In the absence of exact times, as much information as given in the studies is reported below. Five studies give no information at all with regard to therapist time.[49,52,58,62,63] Five studies report only the use of an interview, assessment or technical support.[53,54,57,60,61] Four studies report actual times and a marked reduction in therapist time for the computer group.[50,55,56,64] One study,[51] reported **more** therapist time for the CCBT group than for the TCBT group. Finally, one study[59] reported a total of 45 minutes time for the computer group but no information on therapist time for the TAU group (which did include counselling and psychotherapy for some patients).

Studies using CCBT as a treatment adjunct

Three studies reported the use of CCBT as a treatment adjunct.[65–67] The two Newman studies[65,66] report very small non-RCT studies ($n = 4$ and $n = 1$, respectively). The Wright and co-workers study[67] was a cohort study of 96 patients. In all three studies patients were receiving CBT via a therapist with no comparator group. The use of CCBT formed an **additional** component of therapy and did not replace therapist time.

In one of the Newman studies,[65] the patient used a hand-held computer for the treatment of panic disorder. The patient was reported to have a significant reduction in panic and anxiety and this was maintained at 3-month follow-up.

For the other Newman study,[66] four patients with GAD used a hand-held computer. One patient dropped out of this study but 6-month follow-up data reflected maintenance or continued improvement in psychological functioning outcomes in the other three patients.

In the Wright and co-workers study,[67] patients used the program *Cognitive Therapy: A Multimedia Learning Program*. Patient satisfaction with the computer program was high and there were significant improvements in the BDI, BAI and Attributional/Automatic Thoughts Questionnaire (ATQ) from baseline.

Quality of life

No information for quality of life outcomes were reported in the 16 studies reviewed. As no CCBT study was wholly excluded from this review, there does not appear to be quality of life data for CCBT.

Cost

Cost-effectiveness in comparison with current standards of treatment and overall cost in England and Wales is reported below in the *Economic analysis* chapter.

Assessment of effectiveness

Table 7 presents a brief summary of the clinical effectiveness results. Sixteen studies were included in the review using TCBT, TAU, bibliotherapy and in one instance a computerised relaxation program, as comparators. Several studies[49,51,53,55,60,64] used more than one comparator.

The study by Smith and co-workers[62] is not included in *Table 7* as the comparisons in this study are three variations of the same CCBT program. In this study, no comparisons are made with other treatments. One additional study,[50] was not an RCT but did have a comparison group (TCBT). TCBT and CCBT were found to be equally effective in this study.

The results of the studies can be briefly summarised as follows. With regard to studies comparing CCBT with TCBT, five studies showed CCBT to be as effective as TCBT.[51,55,56,60,64] One study[49] found TCBT to be significantly more effective than CCBT, although this study took place among patients hospitalised for depression.

Four studies found CCBT to be more effective than TAU.[54,59,60,64] One study found CCBT to be no more effective than TAU,[49] and one study found CCBT to be no more effective than TAU at 3 and 6 months post-treatment.[52]

Two studies compared CCBT with bibliotherapy. One found CCBT to be as effective as bibliotherapy,[51] and the other found bibliotherapy to be more effective than CCBT.[53]

TABLE 7 *Summary of clinical effectiveness*

Study	Jadad score (out of possible 5)	Study size	Comparators	Evidence for CCBT
Bowers *et al.*, 1993[49]	2	22	TCBT/TAU	TCBT improvement only; CCBT same as TAU
Ghosh *et al.*, 1988[51]	1	84	TCBT/book	Improvement in all three groups
Grime, 2001[52]	3	48	TAU	CCBT improvement on some scores but NS at 3 and 6 months
Jones *et al.* (unpublished)[53]	2	170	TAU/book	Book more effective than CCBT or TAU
Klein & Richards, 2001[54]	2	23	TAU	CCBT more effective than TAU
Marks *et al.* (unpublished)[55]	3	90	TCBT/relaxation programme	CCBT and TCBT group equally effective and more effective than relaxation
Newman *et al.*, 1997[56]	1	18	TCBT	TCBT more effective but not at follow-up when no differences
Proudfoot *et al.* (in press)[59]	3	167	TAU	CCBT more effective than TAU
Selmi *et al.*, 1990[60]	2	36	TCBT/TAU	Both TCBT and CCBT more effective than TAU
Wright *et al.*, 2001[64]	1	96	TCBT/TAU	Both TCBT and CCBT equally effective and more effective than TAU

NS, not significant

Patient populations

There was some overlap between studies with regard to patient population, in that some studies included more than one patient population. With regard to the 11 RCTs included in the review, five were of patients with depression.[49,52,59,60,64]

Depression: One study [49] showed TCBT to be more effective than CCBT, although this was in an inpatient population. One study[52] found CCBT to be no more effective than TAU at 3 and 6 months post-treatment, although this population was not clinically depressed and the primary outcome measure was absenteeism from work.

Two RCTs[60,64] of patients with depression found CCBT to be as effective as TCBT. One RCT[59] found CCBT to be more effective than TAU.

Anxiety/panic: Five RCTs included patients with anxiety or panic.[52–54,56,59] One study[52] found no difference between CCBT and TAU, although again in this study the population was not clinically depressed. One study[63] found bibliotherapy to be more effective than CCBT or TAU. Two studies[54,59] found CCBT to be more effective than TAU, and one study[56] found no difference between TCBT and CCBT at follow-up.

Phobias: Two RCTs[51,55] included patients with phobias. Both of these studies found CCBT to be as effective as TCBT and one of them [51] also found bibliotherapy to be effective.

Therapy details

The amount of information provided with regard to therapy reported in the studies varied widely. The number of sessions of CCBT ranged from four[53] to 12.[61] The length of sessions was also not always reported. The professional background of the therapist was also not always reported. Five studies gave no information.[52,54,57,62,64] Psychiatrists were used in two studies,[50,51] a psychologist in one[49] and a clinician (unspecified) in one.[55] Research assistants were used in two studies,[58,63] a nurse in one[59] and therapists from a variety of backgrounds in four.[53,56,60,61]

Setting

The sixteen studies took place in a variety of settings, although the majority were in psychiatric clinics. Only one study was conducted entirely in GP surgeries.[59] One took place over the Internet

with the service based at a University.[54] Eight studies took place in outpatient psychiatric units, either hospital- or university-based.[50,51,52,55,56,58,62,63] One study was based entirely in an inpatient psychiatric unit.[49] One study was based in both libraries and health centres,[53] one was based in a hospital outpatient psychiatric unit and a GP surgery.[61] Three studies reported no information at all on study setting.[57,60,64]

Comparators

The results of the RCTs can be briefly summarised as follows. With regard to studies comparing CCBT with TCBT, five studies showed CCBT to be as effective as TCBT.[51,55,56,60,64] One study[49] found TCBT to be significantly more effective than CCBT, although this study took place among patients hospitalised for depression. Four studies found CCBT to be more effective than TAU.[54,59,60,64] One study found CCBT to be no more effective than TAU[49] and one study found CCBT to be no more effective than TAU at 3 and 6 months post-treatment.[52] Two studies compared CCBT with bibliotherapy. One study[51] found CCBT to be as effective as bibliotherapy and one[53] found bibliotherapy to be more effective than CCBT. One RCT[62] compared three variations of the same exposure therapy computer program (changing only the type of exposure and feedback).

Patient preference

With regard to patient preference, there is some evidence to suggest that patients respond favourably to CCBT programs although four of the 16 studies reported no information regarding patient preference, satisfaction and acceptability of treatment.[54,59,62,64] In the six studies reporting detailed information on patient preference,[55,57,58,60,61,63] the computer programs were generally held in a positive light.

Four studies[49,51,52,60] did report that patients in the therapist group were more satisfied.

Therapist time

Five studies[49,52,58,62,63] gave no information at all with regard to therapist time. Five studies[53,54,57,60,61] reported only the use of an interview, assessment or technical support. Four studies[50,55,56,64] reported actual times and a marked reduction in therapist time for the computer group. One study,[51] reported **more** therapist time for the CCBT group than for the TCBT group. Finally, one study[59] reported a total of 45 minutes for the computer group but no information on therapist time for the TAU group (which did include counselling and psychotherapy for some patients).

Sponsor submissions

Four of the 16 studies described above also form part of the sponsor submissions.[53,55,58,59] *Table 8* provides a brief summary of the four submissions included in this review.

Cost data for the four submissions are reported below (see *Review of sponsor submissions*).

TABLE 8 *Summary of sponsor submissions*

Submission	Part of clinical evidence	Therapist background	Therapist time for CCBT	Access
Ultrasis BTB[70]	Proudfoot *et al.* (unpublished)[58], Proudfoot *et al.* (in press)[59]	Nurse	5 minutes at each of nine sessions	GP surgery
Leeds Innovations Calipso[71]	No (no trial data)	Not reported	Not reported	Not reported
University of Glasgow Stresspac[72]	Jones *et al.* (unpublished)[53]	GP, practice nurse, research assistant	Not reported	Ten public libraries and one health centre
ST Solutions FF[73]	Marks *et al.* (unpublished)[55]	Clinician	76 ± 43 minutes	Psychotherapy unit/hospital
Cope[74]	Osgood-Hynes *et al.*, 1998[57]	Not reported	Clinic visits not reported, calls 8–23 minutes each	Not reported

Chapter 3

Economic analysis

This section is divided into two parts. In the first part, the economic evidence on CCBT is reviewed. A distinction is drawn between the published literature and the sponsor submissions. In the second part, a modelling exercise is undertaken with the aims of estimating the cost per year of providing CCBT and the number of patients that could be treated. The data for the model are largely taken from the sponsor submissions. As well as modelling the cost implications of CCBT, attempt is also made to estimate the effect of CCBT in terms of quality-adjusted life-years (QALYs). To do this, data on health state utilities for different depression states were obtained from the literature and combined with data from the Beating the Blues submission[70] in an attempt to estimate the incremental cost per QALY of CCBT.

Search strategy

Searches were undertaken to identify any economic studies relating to CCBT. No papers were identified in the economics search. Any studies identified in the other searches that contained sections on costing or the economics of CCBT were reviewed for their economic evidence. In addition, studies traced through references from other papers were also obtained if suitable and reviewed. Thirteen papers were identified and all of these were reviewed. Generally, the papers were focussed on CBT and not CCBT and were therefore of limited use in providing any economic evidence for CCBT. The setting was also often in the USA, making the usefulness of any data very limited.

Of the 13 papers, there were two review papers, four general discussion papers, two studies, one of which reported a study design, one cost paper, one meta-analysis and the remaining two were published in conjunction with each other and reported on their RCT, one being an effectiveness paper, the other reporting the cost-effectiveness. A summary of the papers and comments on their usefulness, in terms of potential to inform the model, is given below.

Summary of evidence

Wells, 1999[75] This paper describes a study design to look at the cost-effectiveness of treatments and of quality improvement for depression in primary care, managed care practices. These treatments are medication and CBT. CCBT is not considered and no study results are reported, only characteristics of the study sites and patients. Costs that are mentioned are extremely vague and unlikely to be of any use.

Smith *et al.*, 1997[76] This paper reports a 1992 cost-of-illness figure for anxiety disorders. It also quotes an average per patient cost for a Health Maintenance Organisation for patients with either anxiety or depression for a 6-month period and compare this with the cost without the disorders. There is no supporting reference for the costs given and it is likely that they are based on charges and so will be of little use. There are also cost data on medication for anxiety, panic/phobias, and OCD. Again, there is no indication as to where these data have come from or how the costs have been calculated.

Marks, 1995[77] This paper is mainly a discussion paper of CBT and does not present any data. There are claims made about the cost of CBT compared with drug treatment, in that although there is no difference in cost in the first year, drug treatment costs are higher in subsequent years. These claims are not substantiated by any evidence.

Klerman and Weissman, 1992[78] This paper is mainly a review of eight studies on depression. There is no mention of any economic issues in any of the studies, apart from a section on cost–benefit analyses, which just states that economic studies are needed. The author also seems to misunderstand what cost–benefit analysis is used for.

Otto *et al.*, 2000[79] This study compared CBT with pharmacotherapy for the treatment of panic disorder. The study was small ($n = 80$) and non-randomised. Patients were divided into two groups, pharmacotherapy ($n = 40$) and CBT ($n = 40$). Of the CBT patients, 20 had group therapy and 20 had individual therapy. Outcomes were measured using the Clinical Global Impression of Severity Scale (CGI). Analysis of these scores revealed that

regardless of previous medication status, treatment with CBT provides patients with short-term benefits that are at least equal, and maybe superior to those treated with short-term pharmacotherapy.

Costs were calculated, but no detail of method is given. It appears that they were calculated by multiplying the billing charge for a session by the number of sessions. Total treatment costs over 1 year are calculated and divided by the 4-month efficacy assessment (the implication is that this is the change in CGI rating since the start of therapy) to give an average cost per one-point change in the CGI. The conclusion was that group CBT was particularly cost-effective.

Costs were largely charges, there is a lack of detail and the study is US-based, and so the cost data are of little use.

Marks, 1999[80] This article was a discussion and review of computer aids to mental healthcare and no data were included that would be useful; however, the paper was useful as background information.

Ghosh and Greist, 1988[44]
This is a think piece for computer treatment arguing for the use of computers in psychiatry. No new data are introduced and figures are used only as demonstrations and unsupported rough estimates.

Newman *et al.*, 1999[50] This paper was a test of methodology and was not aiming for any empirical validation. Only three people were involved in the study and there was no control group. Different baselines for costs and effects were used in order to calculate cost-effectiveness ratios, which means that any cost-effectiveness ratios derived are inconsistent. The sample size is tiny and the methodology inconsistent; the study is therefore of little use.

Ward *et al.*, [81] This paper is published in conjunction with Bower *et al.*[82] (see below). They appear consecutively in the *BMJ*. This paper attempts to measure the effectiveness of three different treatments (GP care, CBT, and NDC). The study is an RCT and allocates patients among the three treatments. The main results were that there was no overall group difference ($p = 0.25$) but that self-assessed status differed by time ($p < 0.001$) and in the interaction between group and time ($p = 0.004$). It was also argued that the CBT and NDC achieved better results initially, with self-assessed recovery on the BDI quicker than for GP care. Those treated by GP's "caught up" within 12 months though. There was no follow-up beyond 12 months.

Bower *et al.*, 2000[82] This second part considers the cost differences between the treatments. All direct non-treatment costs were ignored except travel to primary care/therapy sessions, even though a "substantial number" of people had secondary visits in their records. Indirect costs were calculated as the cost of wages for time lost. The main finding argued that there were no significant differences between the three groups at 4 or 12 months in terms of societal costs. Neither indirect nor direct treatment costs were statistically significant.

It was also argued that there is a significant difference at 4 months between the costs of GP and CBT treatments in direct costs excluding the cost of the therapy itself. Also argued was that the costs of providing CBT were recouped through reduced use of other services in the short term. Going by the mean costs, NDC appears to be more expensive than GP care at both 4 and 12 months, with the difference increasing over the second period.

Jones and Cockrum, 2000[83] This is a critical review of published economic modelling studies in depression. Ten different studies are reviewed. There are no modelling studies of CCBT and the review mainly concentrates on assessing the quality of the modelling and devising recommendations for modelling in depression. Primarily, the modelling studies were assessed on grounds of whether the assumptions used in each model were explicit and whether sensitivity analysis had been undertaken.

Marks, 1994[84] This is a short discussion on the problems of justifying the use of psychotherapies when the knowledge base on their effectiveness and cost is low. There are no data in this article and it is not useful even for background material.

Gould and Otto, 1995[27] This paper is a meta-analysis of treatment outcome for panic disorder. It examines the effectiveness of pharmacological, cognitive behaviour and combined pharmacological and cognitive behaviour treatments in a meta-analysis of 43 controlled studies that included 76 treatment interventions. Cognitive behaviour treatments yielded the highest mean effect size (ES = 0.68) relative to the other treatments. Drop-out rates were also found to be lower for CBT: 5.6% versus 19.8% in pharmacological treatments and versus 22% in combined treatments. Studies

were selected on the basis that the patients had panic disorder with or without agoraphobia, employed a control group and had random assignment to treatment. Studies that compared multiple or combination treatments were included as long as they had a control. Although this meta analysis is useful background material, there are no useful data on CCBT.

Overview of economic literature review

The literature reviewed was often of poor quality or was not relevant, in that the focus was on CBT or other forms of treatment for depression/anxiety such as medication or counselling and any costing data were largely US charge data. There are therefore no data in the published literature that are useful for any modelling purposes or for establishing the cost-effectiveness of CCBT.

Review of sponsor submissions

Computerised Stresspac[72] (University of Glasgow)

The CCBT intervention considered in this submission was a touch screen multimedia computer system based on a CBT self-help anxiety management printed package known as 'Stresspac'. The evaluation of CCBT had two aims: to investigate how computer-based treatment for anxiety could be routinely delivered in general practice, and to investigate the effectiveness and cost of CCBT compared with the printed Stresspac and current care. The viewpoint adopted in the analysis was the NHS.

Randomised trial

A randomised trial was conducted in which GPs were invited to refer patients with GAD with or without depression, for whom alcohol or drug abuse was not their main problem. This trial is already included in the clinical effectiveness review (Jones and co-workers[53]).

From a total of 316 GPs who were invited to participate, 121 agreed to take part. Of these, 60 GPs referred patients for possible randomisation. Of the 239 patients who were referred, 178 were recruited.

All participants initially completed a computer interview which required them to complete HADS, STAI and BSI. In addition, patients were asked to answer questions about information sources.

The trial had three arms:

- CCBT: following the initial contact, patients were invited to return at their own convenience three more times for unsupervised computer use. They were given a relaxation tape, and printed materials equivalent to Stresspac were 'made available'. It is not specified how many patients took the printed Stresspac.
- Printed Stresspac: patients were invited to use printed Stresspac and have three short appointments at weekly intervals to check progress. They were also given a relaxation tape.
- Current care: patients were told to continue with whatever treatment had been agreed with their GP (what forms this treatment took were not specified).

Following the initial interview, eight patients had a low HADS score and were not randomised. The remaining 170 patients were randomised as follows: 121 patients to CCBT; 24 patients to printed Stresspac; and 25 patients to current care. It was initially hoped to recruit 900 patients. However, due to a lack of referrals in the early stages of the trial, the protocol was changed, which led to a loss of funding. Hence, the small patient numbers, particularly in the printed Stresspac and current care arms.

Computers for use with the CCBT were sited at ten public libraries and one health centre. The original aim was to have five computers in libraries and five in health centres. However, only one health centre had a 'suitable site' (i.e. enough space for this purpose).

At 6 months, patients were sent a postal questionnaire in which they were asked to complete HADS, STAI and BSI. In addition, they were asked about their experience with treatment, use of health services, use of medications and sources of information. Case notes were also examined for the 6 months before and after recruitment, and data extracted on number of GP consultations, anxiety-related prescriptions and referrals to other agencies.

Of the 119 patients who responded to 6-month follow-up, 21 (18%) were normal on HADS (14 CCBT patients, six printed Stresspac patients and one current care patient). Among these 119 patients, printed Stresspac patients showed a significant improvement over controls in terms of HADS for both anxiety and depression ($p = 0.04$ and $p = 0.01$, respectively). With respect to CCBT, there was no significant improvement over current

care in terms of HADS, STAI or BSI. However, if consideration is given only to the 84 patients recruited after the protocol change, CCBT showed significant improvement over current care in terms of HADS depression scores ($p = 0.02$). However, there were only seven patients in the current care arm.

With respect to attendance following the initial contact, all printed Stresspac patients attended at least one session (it is not specified how many patients attended all three sessions). In the CCBT group, 26 patients (21%) did not use the computer at all after recruitment. No indication is given as to why this was the case. A possible explanation might be that some patients in the CCBT group may have chosen to use the printed Stresspac that was made available to them rather than continue using the computer. In both printed Stresspac and CCBT, there was no association between the number of sessions attended by patients and improvement in scores.

All three groups showed clinically significant improvements as defined by HADS anxiety divided by standard deviation of HADS anxiety at the start. Stresspac patients showed more improvement than the other two groups.

A total of 157 patients had their case notes reviewed. There was no difference between the groups in terms of GP consultations and stress-related prescriptions.

Cost-effectiveness

Additional NHS costs per patient from CCBT were estimated to be between £26 and £40 (depending on volume of referrals and the proportion of computer costs attributed to this use). The implication is that these costs are additional to the costs of current care, although it is not explicitly stated. These costs are based on the assumption that at the first appointment patients meet a psychology assistant.

Costs per patient for printed Stresspacs were estimated to be between £89 and £97 if treatment was carried out by a research assistant, and £24 if treatment was carried out by a practice nurse. Again, it is not stated in the text whether these are additional costs compared with current care, although the implication is that they are.

Two further (untried in the study) options involving the computer were costed. The first involved the first session being with a practice nurse (rather than a psychology assistant) followed by computer, which was estimated to cost £10 per patient. The second was CCBT as used in the trial but with telephone follow-up by a psychology assistant. The cost of this was estimated to be in the range £37 to £52. It should be noted that the effectiveness of these two additional options is not known.

The authors note in their discussion that almost 100% of the printed Stresspac additional costs and 70% of the CCBT additional costs were due to the psychology assistant.

Ranges presented for the CCBT costs are indicative of some sensitivity analysis being carried out around volume of referrals and proportion of computer time allocated to CCBT vis-à-vis other uses of the computer. Ranges are also given for printed Stresspacs and one of the additional options, but no details of how these were arrived at are given in the text.

In conclusion, the finding that the printed Stresspac group had significantly better anxiety and depression scores than the current care group, whereas the CCBT group did not, is suggestive of the printed Stresspac being more effective than CCBT in this patient group. However, this result must be tempered somewhat by the problems encountered in the trial, in particular the relatively small patient numbers in the printed Stresspac and current care groups.

Cope[74] (ST Solutions)

Cope is a computer-based CBT self-help system for non-suicidal depression. The Cope computer system incorporates IVR technology, allowing it to be accessed by patients via a telephone call. The 12-week programme involves seven booklets for patients to read before and during their calls and 11 free telephone calls to the computer. The system is driven by the patient pressing keys on their telephone keypad in response to the computer's questions (the system contains over 700 pre-recorded voice files). Cope reacts to patients' responses by giving customised feedback regarding their progress and also makes treatment suggestions.

The stated aims of the study are: to establish whether Cope is less costly than standard alternatives (these being CBT without computer aids and drug treatment – specifically, paroxetine); and to examine its broader impact on health services should it be adopted. The viewpoint for the analysis is an NHS purchaser.

The data used for the economic analysis are from two non-randomised studies – an open trial and a pragmatic evaluation.

The open trial

The open trial took the form of a 12-week study of 41 patients with depression and/or dysthymia in the UK (n = 14) and the USA (n = 27). This study is reported in the clinical effectiveness review (Osgood-Hynes and co-workers[57]). Outcome was measured using a modified version of the HAM-D. At the end of the study, 28 patients had completed the 12-week Cope programme (32% drop-out rate). Of these 28, 18 (64%) had at least a 50% reduction in HAM-D scores.

The authors compare the response rate to Cope therapy with response rates to drug treatment and psychotherapy. These latter rates are from a meta-analysis and relate to 'adult outpatients'. (No information on how representative Cope patients are of adult outpatients is given). The rates are: Cope 49%, drugs 54%, and psychotherapy 50%.

The pragmatic evaluation

In this UK study, 19 patients with depression who self-referred to an NHS Stress Self-Help Clinic chose to use Cope. The main outcome measure was the BDI. At 12 weeks, three patients had dropped out, and six patients had improved meaningfully by 50% on the BDI. Three of the 16 patients who completed the Cope programme had serious suicide thoughts, but were included in the analysis (thereby influencing the effectiveness results). This is curious given that Cope is not designed to be used by these patients.

Cost-effectiveness

The chosen form of economic analysis was cost-minimisation analysis (CMA). In order to apply CMA, the authors have 'adjusted' benefits to be equal for a completed treatment episode or an annual throughput of a given number of patients treated by (i) CBT without computer aids and (ii) Cope plus brief clinician back-up support.

With respect to the costing, estimates are made of the costs of the three interventions (CCBT, CBT and drugs). Costs are calculated on the basis of cost per completed treatment episode.

Two different methods of costing CBT are reported. The first (Method A) uses the annual salary of a therapist (including on-costs) and assumes that the therapist will deal with 50 new patients a year. The cost per completed treatment episode is estimated to be the salary divided by 50. This is estimated to be £700. A crucial assumption of this method is that all the therapist's time is devoted to treating the 50 patients. If the therapist has other responsibilities, then only the proportion of his/her time spent with the 50 patients should be costed. To do this, an hourly rate (including on-costs) should be calculated and used in conjunction with an estimate of the total number of hours spent with the 50 patients. The authors' chosen method of costing also discounts the possibility that a proportion of the 50 patients will drop out of treatment.

The second method (Method B) uses an hourly rate for a therapist's time. This rate is multiplied by the mean number of sessions a therapist would need to yield a 50% improvement in a patient. This is estimated to be £606 per patient.

With respect to the cost calculations of CBT and CCBT, it is not clear why the authors assume that screening, back-up and follow-up takes 2 hours for CBT when the same tasks were found to take 1.25 hours in CCBT.

With respect to drug treatment, equal effectiveness with CBT and CCBT has been assumed. Separate costs have been calculated depending upon whether the patient saw a GP (£459 per patient) or a psychiatrist (£482 per patient).

The authors also attempt to estimate the increase in patient throughput that could be achieved using Cope. A potential problem here is the adoption of the Method A of costing used for the CBT option above (i.e. dividing annual salary by number of patients). If the therapist does more than deal with 50 new patients a year, the method is problematic.

Some sensitivity analysis was performed around therapist time and drug dosages to examine the effect on the cost per completed treatment episode/annual drug cost.

In conclusion, based on the figures presented, CCBT using Cope appears to be the most cost-effective option. However, it should be noted that the effectiveness data were based on two relatively small randomised studies and there were problems with the costing. The authors acknowledge the problems with the effectiveness studies by stating that a large trial with long-term follow-up is needed.

FearFighter[73] (ST Solutions)

FearFighter is a computerised CBT system that offers self-help through exposure therapy for

adults with panic disorder or any kind of phobia (agoraphobia, specific phobia and social phobia). FearFighter comprises nine steps and is designed to guide the user through treatment in much the same way as a therapist. When first developed, FearFighter could only be accessed when installed on a personal computer, using a keyboard and mouse. More recently, an Internet version has been developed and is currently being piloted.

The stated aims of the study are: to establish whether FearFighter is less costly than standard alternatives (these being entirely clinician-guided CBT and drug treatment – specifically, paroxetine); and to examine its broader impact on health services should it be adopted. The viewpoint for the analysis is an NHS purchaser.

Two separate studies on effectiveness are reported: a randomised trial and a pragmatic evaluation.

Randomised trial

This UK study compared FearFighter and clinician-based CBT (CBT) with each other and with a placebo – relaxation therapy using a computer (Relax) group. This trial is included in the clinical effectiveness review (Marks and co-workers[55]). A total of 90 patients with panic disorder/agoraphobia, social or specific phobia were randomised to one of the three arms: FearFighter (n = 35), CBT (n = 38) and Relax (n = 17). Of these patients, 25 dropped out before completion of treatment (15 from FearFighter, nine from CBT and one from Relax). The difference in drop-out rates between FearFighter and CBT was not significant.

The main outcome measures were Main Problem and Goals, the Global Phobia item of the Fear Questionnaire and the WSA scale.

At the end of treatment, FearFighter and CBT patients showed significantly better improvements on all three scales than Relax patients. There were no significant differences in outcome between FearFighter and CBT.

At 1-month follow-up, patient gains were maintained or enhanced for the 60 patients who were available (19 in FearFighter, 27 in CBT and 14 in Relax).

Of the 52 patients who had no other treatment after 1-month follow-up, 3-month follow-up ratings were received from only 34 (11 in FearFighter, 19 in CBT and four in Relax). FearFighter and CBT patients had significant and similar improvement from pre-treatment to follow-up on all three scales. Comparisons could not be made with Relax as at 1-month follow-up many of the Relax patients who showed no improvement went on to have computer-guided self-exposure.

In an intention-to-treat analysis, no significant differences between FearFighter and CBT patient were found.

With respect to time spent with therapists, at the end of treatment, CBT patients had significantly more time with therapists than FearFighter and Relax patients (3.7 times more). During 1-month follow-up, CBT patients had significantly more time with clinicians than FearFighter and Relax patients.

Pragmatic evaluation

This evaluation is currently taking place in an NHS Stress Self-help Clinic in London. The Clinic offers self-referring patients with anxiety or depressive disorders free access to appropriate CCBT. Of 44 patients offered FearFighter, 39 took up the offer. At the time of the report, 20 were still using it, 14 had completed it and four had dropped out (one patient was refused funding by a PCT).

In an intention-to-treat analysis with 16 patients, ten improved by at least 50% on Total Phobia (Fear Questionnaire). In addition, mean scores on the BDI and Total Phobia (Fear Questionnaire) showed significant improvement from pre- to post-treatment.

Cost-effectiveness

The economic analysis compares FearFighter with CBT and drug treatment. The chosen form of economic analysis was the CMA. The use of CMA requires that the three therapies are equally effective. On the basis of the trial results, this seems reasonable for FearFighter and CBT. The authors assume equal short-term efficacy for the sake of calculations but note the high relapse rate on discontinuing drugs and other drawbacks from medication that are not incurred by CBT or CCBT.

Estimates are made of the per patient costs of the three interventions, with costs being calculated for each new patient completing treatment over 1 year.

With respect to CCBT, a price of £149 per patient is quoted for FearFighter. This is based on 'large patient volumes'. Costs of hardware, property rental and overheads are not included on the basis that these do not constitute extra expenditure for an established mental health service. This is

problematic. While the existence of hardware may mean that purchase costs are avoided, there may still be an opportunity cost to take into account. For example, if a computer is being used by a patient for CCBT, it cannot be used by anyone else. This opportunity cost needs to be estimated.

From the trial, the mean duration of clinician contact was estimated to be 76 minutes from the trial. However, the authors chose to use a lower time estimate from the pragmatic study (based on only 39 patients). At the very least, sensitivity analysis should have been carried out with the 76-minute figure. If the time is 76 minutes, the per patient cost of FearFighter is £226 (which is more than the upper range estimate in the authors' sensitivity analysis).

With respect to CBT, in calculating the cost per patient (estimated to be £549), the authors choose to disregard the mean time patients spend with therapists estimated from the trial (283 minutes – 4 hours 43 minutes) in favour of a figure of 9 hours from the British Association of Behavioural and Cognitive Psychotherapy. It is not clear why this is the case. Again, the authors should at least use the trial data in a sensitivity analysis. If 283 minutes is used, the cost per patient is £288.

With respect to drug treatment, separate costs have been calculated depending upon whether the patient sees a GP or a psychiatrist. These were estimated to be £459 for a GP and £482 for a psychiatrist.

The authors attempt to estimate the increase in throughput that can be achieved using FearFighter compared with CBT. They also attempt to estimate a unit cost per referral. As with Cope, the method adopted uses the annual salary of a therapist (including on-costs), and assumes that the therapist will deal with 50 new patients a year. The cost per completed treatment episode is estimated to be the salary divided by 50. If the therapist has other responsibilities, then only the proportion of his/her time spent with the 50 patients should be costed. To do this, an hourly rate (including on costs) should be calculated and used in conjunction with an estimate of the total number of hours spent with the 50 patients. The authors' chosen method of costing also discounts the possibility that a proportion of the 50 patients will drop out of treatment.

Some sensitivity analysis has been performed around therapist time and drug dosages to examine the effect on the cost per completed treatment episode/annual drug cost.

In conclusion, the authors' calculations suggest that FearFighter is more cost-effective than CBT and drug therapy. However, it should be noted that there were some problems with the economic analysis, particularly the costing, which can significantly affect the cost-effectiveness estimates.

Calipso[71] (Leeds Innovations)

Calipso takes the form of a CD-ROM package and was originally developed to provide training to postgraduate healthcare workers in the field of mental health. It has subsequently been developed to be used as a form of CCBT for patients with depression.

The submission does not present any evidence on the effectiveness of Calipso. The authors make reference to an ongoing clinical trial, but state that they are not in a position to comment on this aspect in the submission.

With respect to cost data, the only information presented is the annual licence fee for Calipso of £350, with additional CD-ROMs being made available at a cost of £50 each. Mention is made of offsetting costs due to saving made through lower antidepressant prescribing. However, no evidence to support this claim is presented.

In conclusion, insufficient evidence is provided to allow any judgement to be made regarding the efficiency of Calipso relative to alternative treatment options.

Beating the Blues[70] (Ultrasis)

Beating the Blues is a computerised package designed to deliver CBT for anxiety and depression in primary care and other healthcare settings. The program uses interactive multimedia techniques and comprises nine sessions: a 15-minute introductory video followed by eight 1-hour therapy sessions integrating both cognitive and behavioural techniques, which are designed to promote more helpful thinking styles and behavioural repertoires.

The stated aim of the economic analysis is to determine the cost-effectiveness of CCBT using Beating the Blues compared with TAU among primary care patients with anxiety and/or depression. The data for the economic analysis are from an RCT. The viewpoint for the economic analysis is that of the NHS (although indirect costs are also calculated).

The CCBT intervention involved the Beating the Blues package, with patients also being allowed to receive other forms of treatment as per usual from the GP with the exception of face-to-face

counselling or other psychological input. The TAU intervention comprised a variety of interventions including discussions with a GP, referral to a counsellor, practice nurse or mental health professional, and treatment of physical conditions. As patients in both arms could be prescribed psychotropic medication, the sample in both arms was stratified according to whether or not such medication was prescribed and results compared to check for any differences.

The trial recruited 167 patients with anxiety and/or depression from seven general practices in the South East of England and randomised them to receive either CCBT (n = 89) or TAU (n = 78). This trial is included in the clinical effectiveness review above (Proudfoot and co-workers[59]). Patient outcomes were measured using three illness-specific measures: BDI, BAI and WSA scale. Patients completed these scales pre- and post-treatment and at 1-month, 3-month and 6-month follow-up.

The results indicated that CCBT led to greater improvement than TAU on all three measures. This improvement was statistically and clinically significant and was sustained at 6-month follow-up. No interactions of CCBT with concomitant pharmacotherapy or duration of illness were found, although the authors acknowledge that the sample size is too small to rule this out.

Cost-effectiveness

The chosen form of economic analysis was cost-effectiveness in which the data on reported clinical outcomes were combined with cost data to generate cost-effectiveness ratios. Data on resource use were collected prospectively alongside the trial and costed using appropriate unit costs. A wide range of resource usage was considered. Estimates were also made of the indirect costs of lost production.

Resource use data were collected for the period 6 months prior to study entry to 8 months after. Complete data were available for 161 patients (84 in CCBT and 77 in TAU).

Comparisons were made between the mean costs of CCBT and TAU using a bootstrapping technique to generate 95% confidence intervals. Costs were reported separately with and without indirect costs.

An intention-to-treat analysis revealed that the mean service cost for CCBT was £473. If indirect costs were included, this cost rose to £515. Controlling for baseline costs, CCBT completers had a mean service cost that was £150 greater than that for TAU (the product accounted for most of this difference). This cost difference was not statistically significant. In view of the fact that CCBT led to a greater improvement than TAU on all three measures of outcome (BDI, BAI and WSA), it can be concluded that CCBT is more cost-effective than TAU.

However, given that the statistical power of the analysis may be quite low, the authors decided to calculate incremental cost-effectiveness ratios for CCBT compared with TAU to allow for the possibility that with a larger sample the cost difference might be statistically significant. In calculating these ratios, the authors focus on the BDI and WSA scores, claiming that the BAI was relevant to far fewer patients. The ratios were £29 for a one-point increase on the BDI scale, and £47 for a one-point increase in the WSA scale. However, as highlighted by the authors, neither the BDI nor the WSA have been shown to have interval properties, so these ratios should be treated with caution.

A sensitivity analysis was carried out around the unit cost of Beating the Blues. A lower and upper value of £50 and £150, respectively, were considered, although it was not necessary to use the lower figure as this could not result in a statistically significant difference. When the higher figure was used, the cost difference remained statistically insignificant. Justification for the range used in the sensitivity analysis was that this was the range of costs that could be expected from the manufacturer. No sensitivity analysis was carried out on the other costs (e.g. staff costs).

The authors attempted to estimate the impact of Beating the Blues on the NHS budget, but this is difficult to estimate with any confidence because Beating the Blues is a new technology and few comparators are currently in use. The authors assume an adoption to steady state in 5 years' time of 40 Beating the Blues systems per health authority. The cost per machine is £10,000, which may vary depending on delivery setting, throughput or other factors. This would make available approximately 20 courses of effective CBT per year per GP. A typical GP to patient ratio of 1:2600 is assumed. This would mean one course of therapy per year per 130 patients. This would not provide sufficient coverage, as 330 patients per GP list are reported by the authors to be anxious and/or depressed. The estimated total running costs of a single Beating the Blues system was estimated to be

£18,000, or £100 per patient plus £16 capital overheads per patient.

In conclusion, the evidence suggests that compared with TAU, CCBT using Beating the Blues is a cost-effective strategy for treating patients with anxiety and depression.

Overview of the economic evidence

The review of the published literature revealed no studies in which an economic analysis of CCBT was performed. This meant that the only available economic evidence was provided by the sponsor submissions.

CCBT using Stresspac was found to cost more, but was no better in terms of patient outcomes than current care. The additional cost per patient for CCBT compared with current care was estimated to be between £26 and £40. While the study carried out detailed costing and was based on a randomised trial, the results must be tempered somewhat by the problems encountered with the trial, in particular the relatively small patient numbers in two of the three arms.

The results of the economic analysis of CCBT using Cope state that the cost per patient of Cope is less than the corresponding costs for CBT and drug therapy. However, it should be noted that the effectiveness data were based on two relatively small randomised studies and there were problems with the costing.

The results of the economic analysis of CCBT using FearFighter state that the cost per patient of FearFighter is less than the corresponding costs for CBT and drug therapy. However, it should be noted that there were problems with the economic analysis, particularly the costing, which can significantly affect the cost-effectiveness estimates.

The submission on using Calipso for CCBT did not present any data on effectiveness. The only cost information regarded the licence fee for the package. Thus, due to insufficient evidence being presented, it was not possible to make any judgement regarding the efficiency of Calipso relative to alternative treatment options.

The results of the economic analysis of CCBT using Beating the Blues indicate that compared with TAU Beating the Blues is a cost-effective strategy for treating patients with anxiety and depression. The economic analysis presented in this submission is the most rigorous of all the submissions. The effectiveness data are based on a randomised trial, resource use was collected alongside the trial and a wide range of resources were considered, actual drug use by patients was monitored and recorded, and tests of statistical significance were performed. For this reason, the data in this submission are used as the basis for modelling presented below.

Modelling the cost of implementing CCBT

In this section we describe a modelling exercise in which we have attempted to estimate the costs of implementing CCBT. Due to the lack of useful data on CCBT in the published literature, the model uses the data from the sponsor submissions. In particular, we draw heavily on the Beating the Blues submission[70] because this provides the best data for modelling purposes. However, attempt is also made to model the costs of Stresspac[72] and FearFighter.[73]

For each of the three submissions (Beating the Blues, Stresspac and FearFighter), estimates of the cost per year, the maximum patient numbers, and the cost per patient are presented. In addition, a sensitivity analysis is performed.

It is not easy to model the likely impact of CCBT as it is a relatively new method of CBT delivery and there are currently few comparable technologies in use. Following discussions with clinical experts in the area and a GP, and after consulting the Clinical Standards Advisory Group report on depression,[5] it became clear that in practice, access to treatment varies heavily and waiting lists for CBT are very long. It is therefore likely that CCBT, rather than being seen as a replacement for CBT, would be introduced alongside CBT. The introduction of CCBT is likely to improve access to treatment as it will offer another option to GPs when faced with a patient presenting with mild-to-moderate depression. It may also reduce the number of people being added to the waiting list for CBT. However, as mentioned earlier, waiting lists are very long for CBT and so it is unlikely that introducing CCBT will have much impact in the short term. There is also not enough evidence to justify this.

The cost of implementing CCBT has been modelled as an additional cost as in practice this is how it is likely to work. No cost savings are assumed here, as the evidence from the Beating

the Blues submission found no significant cost difference between the two treatment options of CCBT and TAU. Without sufficient data, it is difficult to know what the implications are in terms of any resource savings and so the modelling has been kept relatively simple and concentrates on the additional cost of implementing CCBT. For each package, the following costs are considered:

- computer purchase cost
- overheads
- staff
- GP monitoring
- information technology (IT) support
- training.

In view of the limited availability of data and evidence, this model should be viewed with caution.

The cost modelled is the cost to the health authority per year of implementing CCBT using one computer. For Beating the Blues and Stresspac, the setting is primary care, while for FearFighter the setting is a specialist clinic.

Beating the Blues

Cost per year

Computer purchase cost: This is stated in the submission to be £10,000.

Licence fee: This is included in the computer purchase cost.

Overheads: These are taken from Netten and Curtis (2000)[85] and are £2496 per year.

Staff: An assistant psychologist has been costed using the scale for a community auxiliary nurse as this was the closest profession for which a salary could be found. This is the same scale used in the submission. The salary is £11,197 per annum plus £1052 on-costs. Assuming that a 0.4 whole time equivalent (WTE) is required gives a cost of £4900 per annum. This is based on the assistant psychologist spending 2 hours per day providing support and help. This is reasonable given the description that is provided in the submission of how much time is needed by staff for each session.

The practice nurse cost has been calculated in the same way. This salary is £18,931 per annum plus £2073 on-costs. This is based on the mid-point of an F grade nurse. At 0.4 WTE, this gives a cost of £8401.60.

The two different staff types were calculated to show the cost implications of deploying different members of staff for the role. The cost of using a practice nurse was not included in the Beating the Blues submission.

GP monitoring: The amount of GP monitoring time was estimated to be 10 minutes for each patient who receives a full course of treatment. This does not include the initial referral. Using costs from Netten and Curtis,[85] the cost of 1 minute of GP time in a surgery is £1.96. If we assume a maximum of 187 patients are treated (see *Maximum patient numbers* below), this gives a total cost of 187 × 10 × £1.96 = £3665.20.

IT support: This is included in the computer purchase cost.

Training: Training costs of £630 have been taken from the submission and are based upon six staff members undertaking two half-days training each.

Based on these data, the cost per year of implementing Beating the Blues can be estimated and are shown in *Table 9*.

TABLE 9 *Estimated cost per year of implementing Beating the Blues*

Item	Cost per year (£)
Computer purchase cost	10,000
Licence fee	0 (included in purchase cost)
Overheads (space, heat, lighting, etc.)	2496
Staff:	
Practice nurse	8401.6
Assistant psychologist	4900
GP monitoring	3665.2
IT support	0 (included in purchase cost)
Training	630
Total cost (practice nurse)	**25,192.8**
Total cost (assistant psychologist)	**21,691.2**

As the useful life of the computer is not known, its annual equivalent cost cannot be calculated. It is worth noting this, as assuming the computer can be used for more than 1 year means the costs will be less in year 2. There is no information provided in the submission on how this £10,000 breaks down into the costs of the computer, licence and IT support, and so it is not possible

to calculate the true annual cost. It would therefore be more meaningful to think of the £10,000 as being fixed when the machine is purchased, with an operating cost each year of £11,691.20 if an assistant psychologist is used and £15,192.80 if a practice nurse is used. This assumes that training costs are incurred each year (perhaps as the computer package develops or to allow new staff to train).

Maximum patient numbers

A reasonable assumption is that two 3-hour sessions per day can be run. This gives 6 hours per day.

$6 \times 5 = 30$ hours per week
(assuming weekends are not used)
$30 \times 50 = 1500$ hours per year
(assuming 50 weeks a year the surgery is open)

This would give 1500 sessions/hours per year.

Each patient needs eight sessions plus a 15-minute introduction for a full course of Beating the Blues. 1500 / 8 = 187.5 courses available per year, plus 15 minutes introduction needed for each patient.

Therefore, approximately 187 patients could have a course of CCBT (Beating the Blues) each year based on one computer being available and with the staff employed as outlined above.

Cost per patient

The following calculations assume maximum patient capacity.

Taking the total cost figures:
cost per patient if practice nurse employed = £25,192.80 / 187 = £134.72
cost per patient if assistant psychologist employed = £21,691.20 / 187 = £116

Taking the operating cost figures:
cost per patient if practice nurse employed = £15,192.80 / 187 = £81.24
cost per patient if assistant psychologist employed = £11,691.20 / 187 = £62.52

Sensitivity analysis

The above calculations have assumed that maximum patient numbers use CCBT each year. This is unlikely to be the case in practice. The Beating the Blues submission assumes that there will be an 80% usage, which would mean that approximately 150 patients would receive treatment. The effect of this reduced capacity on cost per patient in relation to total cost and operating cost would be £139.77 and £73.11, respectively, if a assistant psychologist is employed and £163.12 and £96.45, respectively, if a practice nurse is employed.

If usage was as low as 60% (112 patients), cost per patient in relation to total cost and operating cost would be £180.55 and £91.26, respectively, if an assistant psychologist is employed and £211.81 and £122.53, respectively, if a practice nurse is employed.

In estimating the effects on cost of reduced patient numbers, it has been assumed that staff costs remain the same (i.e. at 0.4 WTE). Therefore, the estimated costs per patient represent upper estimates (other things being equal).

Stresspac

Cost per year

Computer purchase cost: This is stated in the submission to be £1550.

Licence fee: This is estimated to be £1000.

Overheads: These are assumed to be the same as overheads in the Beating the Blues submission (i.e. £2496 per annum).

Staff: A practice nurse is required. We estimate that 0.2 WTE is required to provide the service at full capacity. This is based on the assumption that 750 patients can use the service each year (see *Maximum patient numbers* below). Each patient sees the practice nurse for 30 minutes, which means 375 hours of practice nurse time (0.2 WTE) are required each year. The cost of this time is £4200.80 (using the same salary scale as in Beating the Blues).

GP monitoring: As fewer sessions are required compared with Beating the Blues, we assumed that each patient requires 6 minutes of GP time. Assuming 750 patients per year, and using the same cost of GP time as in Beating the Blues, the total annual cost of GP time is £8820.

IT support: The annual maintenance costs of software and hardware are £110 and £95, respectively.

Training: It is assumed that some training will be required. In the absence of data specific to Stresspac, we have assumed a cost of £630 (from Beating the Blues).

Based on these data, the costs per year of implementing Stresspac can be estimated and are shown in *Table 10*.

TABLE 10 *Estimated cost per year of implementing Stresspac*

Item	Cost per year (£)
Computer purchase cost	1550
Licence fee	1000
Overheads (space, heat, lighting, etc.)	2496
Staff:	
Practice nurse	4200.8
GP monitoring	8820.0
IT support	205
Training	630
Total cost	**18,901.8**

The computer for Stresspac is given a useful life of 4 years. As the useful life of Beating the Blues is not known, no comparison can be made. As with Beating the Blues, the computer cost can be regarded as a set-up cost, with an operating cost of £17,351.80 each year.

Maximum patient numbers

As with Beating the Blues, we assume 1500 hours of session time per year. As each patient requires 2 hours per session, a maximum of 750 patients can receive treatment each year.

Cost per patient

The following calculations assume maximum patient capacity.

Taking the total cost figure:
cost per patient = £18,901.80 / 750 = £25.20

Taking the operating cost:
cost per patient = £17,351.80 / 750 = £23.14.

Sensitivity analysis

As with Beating the Blues, the above calculations have assumed that maximum patient numbers use CCBT each year. This is again unlikely with Stresspac, where approximately 20% of patients in the trial did not use the computer after recruitment. If usage is 80% (600 patients), cost per patient in relation to total cost and operating cost would be £28.56 and £25.98, respectively.

If usage was as low as 60% (450 patients), cost per patient in relation to total cost and operating cost would be £34.16 and £30.72, respectively.

As with Beating the Blues, in estimating the effects on cost of reduced patient numbers, it has been assumed that staff costs remain the same (i.e. at 0.2 WTE). Therefore, the estimated costs per patient represent upper estimates (other things being equal).

FearFighter

FearFighter was the only submission to include any information on delivering CCBT in a clinic setting, and thus the cost model has been amended to reflect that. The paucity of data means this model should be viewed with caution.

Cost per year

Computer purchase cost: This was stated to be £10,000 per annum.

Overheads: These are assumed to be the same as overheads in the Beating the Blues submission (i.e. £2496 per annum).

Staff: A clinical psychologist is required. We estimate that 0.26 WTE is required to provide the service at full capacity. This is based on the assumption that 187 patients can use the service each year (see *Maximum patient numbers* below), and assuming only one computer is used. Using the salary figure from the submission, the cost of this time is estimated to be £8710.

A receptionist/administrator is also required. Assuming 30 minutes contact per patient, the total time per year is 93.5 hours. This is equivalent to 0.05 WTE. Using the salary figure from the submission, the cost of this time is estimated to be £900.

IT support: This is stated to be £200 per annum.

Training: According to the submission, the clinical psychologist requires three training days. The cost of this is estimated to be £268.

Based on these data, the costs per year of implementing FearFighter can be estimated and are shown in *Table 11*.

TABLE 11 *Estimated cost per year of implementing FearFighter*

Item	Cost per year (£)
Computer purchase cost	10,000
Overheads (space, heat, lighting, etc.)	2496
Staff:	
Clinical psychologist	8710.8
Receptionist/administrator	900
IT support	200
Training	268
Total cost	**22,574**

As the useful life of the computer is not stated, the computer cost can be regarded as a set-up cost, with an operating cost of £12,574 each year.

Maximum patient numbers

As with Beating the Blues, we assume 1500 hours of session time per year. As each patient requires eight sessions at 1 hour per session, a maximum of 187 patients could receive treatment each year.

Cost per patient

The following calculations assume maximum patient capacity.

Taking the total cost figure:
cost per patient = £22,574 / 187 = £120.70.

Taking the operating cost:
cost per patient = £12,524 / 187 = £66.97

Sensitivity analysis

As with Beating the Blues and Stresspac, the above calculations have assumed that maximum patient numbers use CCBT each year. If we assume 80% uptake (150 patients), cost per patient in relation to total cost and operating cost would be £150.50 and £83.50, respectively.

If usage was as low as 60% (112 patients), cost per patient in relation to total cost and operating cost would be £201.55 and £111.82, respectively.

As with Beating the Blues and Stresspac, in estimating the effects on cost of reduced patient numbers, it has been assumed that staff costs remain the same. Therefore, the estimated costs per patient represent upper estimates (other things being equal).

Modelling the global cost of implementing CCBT

The cost model focussed on the cost to a health authority of providing CCBT in a specific setting, assuming that one computer was entirely dedicated to CCBT. In this section we attempt to estimate a global cost of implementing CCBT in England and Wales by combining the cost model with estimates of the number of health authorities and GP surgeries in England and Wales. As before, a number of assumptions have been made in estimating the costs, and consequently the estimates should be regarded as 'rough' and treated with caution.

Costs were calculated separately for the following:

- an average sized health authority in England
- an average sized health authority in Wales
- the whole of England
- the whole of Wales.

The costs were estimated for Beating the Blues and Stresspac. It is not possible to do a similar analysis for FearFighter as it has been modelled in a clinic setting. We do not know how many clinics could potentially be in each health authority, nor do we know how many computers may be housed in each clinic. From the information provided in the FearFighter submission, it appears that one of the potential advantages of a clinic setting is that more than one computer can be housed there. This is supported by the suggestion that patients do not mind if they are not in a dedicated room and so this would increase the feasibility of having more than one computer in the setting. There may be potential cost savings if more than one computer could be accommodated in a clinic (e.g. only needing to train staff once and reduction in overheads).

In line with the cost modelling, costs are presented separately for year 1 (including the computer purchase cost) and year 2 (excluding the computer cost, i.e. operating costs).

As Beating the Blues had two alternative staffing strategies, one using a practice nurse (abbreviated to BTB1) and one using an assistant psychologist (abbreviated to BTB2), costs have been calculated for both.

The Department of Health website[86–88] has been used to estimate the following:

- the number of GP practices in England and Wales
- the number of health authorities in England and Wales
- the average list sizes of a GP.

The average number of practices per health authority has been calculated by dividing the total number of practices by the number of health authorities.

Estimates of the maximum number of patients that could be treated have been taken from the earlier modelling exercise. These are combined with information on the number of practices in England and Wales in order to calculate an estimate of the total number of patients that could be treated. In line with previous assumptions, a patient uptake rate of 80% is assumed.

Patient numbers

The numbers of patients who would be able to receive a full course of CCBT per annum in England and Wales (assuming an 80% patient uptake) are shown in *Table 12*. First and second year costs are shown in *Table 13*.

TABLE 12 *Patient numbers for England and Wales*

	Patient numbers	
	England	**Wales**
BTB per practice	149	149
Stresspac per practice	600	600
FF per clinic	149	149
BTB per HA	17,204	15,558
Stresspac per HA	69,000	62,400
BTB for all HAs	1,634,380	77,792
Stresspac for all HAs	6,555,000	312,000

HA, health authority

Threshold analysis

Beating the Blues was the only submission in which incremental cost-effectiveness ratios were calculated. These were calculated in terms of the amount of money needed to achieve one-point improvements in the BDI and WSA scales. Compared with TAU, a one-point improvement on the BDI and WSA from Beating the Blues costs £29 and £47, respectively.

Assuming a threshold value of £30,000 per QALY, above which the programme will not be funded, a one-point improvement on the BDI and WSA must be equal to at least 0.00097 QALYs (£29/£30,000 = 0.00097) and 0.00157 QALYs (£47/£30,000 = 0.00157), respectively. These calculations assume the BDI and WSA have interval properties, which has not been established.

The above calculations have been repeated for different threshold cost per QALY ratios, the results of which are summarised in *Table 14*.

TABLE 14 *Threshold analysis for Beating the Blues*

Threshold	QALY gain required (BDI)	QALY gain required (WSA)
40,000	0.000725	0.001175
30,000	0.00097	0.00157
20,000	0.00145	0.00235
10,000	0.0029	0.0047

Estimating an incremental cost per QALY

We have attempted to estimate an incremental cost per QALY gained for Beating the Blues over TAU. It should be emphasised at the outset that a number of strong assumptions have been made and that the estimated figures are crude and

TABLE 13 *First and second year costs in England and Wales*

	England		Wales	
Number of HAs	95		5	
Average list size	1853		1695	
Average number of GP practices per HA	115		104	
	Year 1	**Year 2**	**Year 1**	**Year 2**
Cost of BTB1*	£25,193	£15,193	£25,193	£15,193
Cost of BTB2†	£21,691	£11,691	£21,691	£11,691
Cost of Stresspac	£18,902	£17,352	£18,902	£17,352
Cost of FF	£22,574	£12,574	£22,574	£12,574
Average cost to HA of BTB1*	£2,897,172	£1,747,172	£2,620,051	£1,580,051
Average cost to HA of BTB2†	£2,494,488	£1,344,488	£2,255,885	£1,215,884
Average cost to HA of Stresspac	£2,173,707	£1,995,457	£1,965,787	£1,804,588
Total cost for all HAs of BTB1*	£275,231,340	£165,981,340	£13,100,256	£7,900,256
Total cost for all HAs of BTB2†	£236,976,360	£127,726,360	£11,279,424	£6,079,424
Total cost for all HAs of Stresspac	£206,502,165	£189,568,415	£9,828,936	£9,022,936

HA, health authority

* *Practice nurse employed*

† *Assistant psychologist employed*

should be treated with caution. In particular, it should be noted that the analysis is for depression only (no corresponding data were available for anxiety), and the estimated cost per QALY figures relate to a 6-month period following treatment.

In order to estimate QALYs, information is needed on the utility values that can be assigned to different health states (the utility values are defined along a 0–1 scale in which 0 represents death and 1 represents perfect health/best possible health state). Our sources for this information are two independent studies in which utility values for severe depression, moderate depression, mild depression and depression remission were estimated.[89,90]

In order to map these utility values into the data provided in the Beating the Blues submission, BDI scores are used. The range of scores on the BDI are:

- 1–13 minimal depression
- 14–19 mild depression
- 20–28 moderate depression
- 29–63 severe depression.

From the randomised trial of Beating the Blues, the mean BDI scores at pre-treatment and at 6-month follow-up for TAU and Beating the Blues are shown in *Table 15*.

TABLE 15 *Mean BDI scores for TAU and Beating the Blues*

Treatment	Pre-treatment	6-month follow-up
TAU	24.08	16.07
BTB	25.38	9.61

According to the classification of the BDI, at pre-treatment the TAU and Beating the Blues BDI scores represent moderate depression. At 6-month follow-up, the BDI score for TAU represents mild depression, whereas the BDI score for Beating the Blues represents minimal depression. The estimated utility values from Bennett and co-workers[89] and Revicki and Wood[90] can thus be assigned to these broad classifications to calculate QALY gains from treatment (it is assumed for both studies that minimal depression in the BDI is equivalent to depression remission).

Bennett and co-workers (2000)[89]

Utility values were elicited using the McSad health state classification system. Values were obtained from 105 patients who had experienced at least one episode of major, unipolar depression in the previous 2 years but who were currently in remission. The health state descriptions referred to untreated depression. The mean utility values for the health states are shown in *Table 16*.

TABLE 16 *Mean utility values for health states*

Depression state	Mean utility value
Severe	0.09
Moderate	0.32
Mild	0.59
Remission	0.79

These utility values can be mapped into the BDI scores (*Table 17*).

To convert the utility gains to QALYs, the utility values need to be multiplied by 0.5 (6 months is half of 1 year). The QALY gains are therefore:

- TAU = 0.135
- Beating the Blues = 0.235.

The incremental QALY gain of Beating the Blues over TAU is equal to 0.1. The mean service cost of Beating the Blues was estimated to be £150 higher than that for TAU. The incremental cost per QALY of Beating the Blues over TAU is therefore £150 / 0.1 = £1500.

If the mean service cost difference between Beating the Blues and TAU is £200 (the upper figure in the submission's sensitivity analysis), then the incremental cost per QALY gained is £200 / 0.1 = £2000.

As there is uncertainty around the effectiveness data, we have used the 95% confidence intervals from the main effects model fitted to scores on the BDI in the Beating the Blues submission, to calculate upper and lower limits for the incremental cost per QALY ratios. This was the only source of uncertainty data that was available for the treatment effect.

Assuming linear mapping between the BDI scale and the utility values given as previous, this would imply an upper limit of 0.1244 (treatment gain for 6 months) and a lower limit of 0.026332 (treatment gain over 6 months).

TABLE 17 *Mapping to the BDI scores*

Treatment	Pre-treatment		6-month follow-up		Utility gain
	BDI 'group'	Utility	BDI 'group'	Utility	
TAU	Moderate	0.32	Mild	0.59	0.27
BTB	Moderate	0.32	Minimal	0.79	0.47

Using the upper cost of £200 and the lower QALY gain of 0.026 would give an incremental cost-effectiveness ratio of 200 / 0.026 = **£7692.30**.

Using the lower cost of £150 and the upper QALY gain of 0.124 would give an incremental cost-effectiveness ratio of 150 / 0.124 = **£1209.68**.

Revicki and Wood (1998)[90]

Values were elicited through the administration of standard gamble questions to 70 patients with major depressive disorder or dysthymia. Unlike the Bennett and co-workers study,[89] the health state descriptions that were evaluated included descriptions of the side-effects of drug treatment. Three different drugs were considered: nefazodone, fluoxetine and imipramine. The mean utility values for the various depression states are shown in *Table 18*.

TABLE 18 *Mean utility values*

Treatment	Mean utility value
Severe depression untreated	0.30
Moderate depression	
Nefazodone	0.63
Fluoxetine	0.63
Imipramine	0.55
Mild depression	
Nefazodone	0.73
Fluoxetine	0.70
Imipramine	0.64
Depression remission	
Nefazodone	0.83
Fluoxetine	0.80
Imipramine	0.72

As Revicki and Wood[90] consider three different drugs, separate calculations need to be performed for each drug (*Tables 19–21*).

Nefazodone

As before, to convert the utility gains to QALYs, the utility values need to be multiplied by 0.5. The QALY gains are:

- TAU = 0.05
- Beating the Blues = 0.10
- the incremental QALY gain of Beating the Blues over TAU is equal to 0.05
- the mean service cost of Beating the Blues was estimated to be £150 higher than that for TAU. The incremental cost per QALY of Beating the Blues over TAU is therefore £150 / 0.05 = £3000
- if the mean service cost difference between Beating the Blues and TAU is £200, then the incremental cost per QALY gained is £200 / 0.05 = £4000.

Fluoxetine

Converting the utility gains to QALYs by multiplying by 0.5 gives the following QALY gains:

- TAU = 0.035
- Beating the Blues = 0.085
- the incremental QALY gain of Beating the Blues over TAU is equal to 0.05
- using the incremental cost of Beating the Blues of £150, the incremental cost per QALY of Beating the Blues over TAU = £150 / 0.05 = £3000
- if the mean service cost difference between Beating the Blues and TAU is £200, then the incremental cost per QALY gained is £200 / 0.05 = £4000.

Imipramine

Converting the utility gains to QALYs by multiplying by 0.5 gives the following QALY gains:

- TAU = 0.055
- Beating the Blues = 0.085
- the incremental QALY gain of Beating the Blues over TAU is equal to 0.03
- using the incremental cost of Beating the Blues of £150, the incremental cost per QALY of Beating the Blues over TAU = £150 / 0.03 = £5000
- if the mean service cost difference between Beating the Blues and TAU is £200, then the incremental cost per QALY gained is £200 / 0.03 = £6667.

TABLE 19 *Mapping to the BDI scores from nefazodone mean utilities*

Treatment	Pre-treatment		6-month follow-up		Utility gain
	BDI 'group'	Utility	BDI 'group'	Utility	
TAU	Moderate	0.63	Mild	0.73	0.10
BTB	Moderate	0.63	Minimal	0.83	0.20

TABLE 20 *Mapping to the BDI scores from fluoxetine mean utilities*

Treatment	Pre-treatment		6-month follow-up		Utility gain
	BDI 'group'	Utility	BDI 'group'	Utility	
TAU	Moderate	0.63	Mild	0.70	0.07
BTB	Moderate	0.63	Minimal	0.80	0.17

TABLE 21 *Mapping to the BDI scores from imipramine mean utilities*

Treatment	Pre-treatment		6-month follow-up		Utility gain
	BDI 'group'	Utility	BDI 'group'	Utility	
TAU	Moderate	0.55	Mild	0.64	0.11
BTB	Moderate	0.55	Minimal	0.72	0.17

Conclusion

Based on a number of assumptions, the data from Bennett and co-workers[89] suggest that the incremental cost per QALY gained of Beating the Blues over TAU lies between £1209.68 and £7692.30. If the data from Revicki and Wood[89] are used, the corresponding range lies between £3000 and £6667 per QALY gained. It should be stated once again, however, that these estimates are crude and should be treated with caution. Additional notes on the economic analysis can be found in appendix 4.

Chapter 4

Discussion and conclusions

Factors relevant to the NHS

The NSF[1] states that patients who contact their primary healthcare team with a common mental health problem should have their mental health needs identified and assessed and be offered effective treatment. CBT has been identified by the NSF as being effective in the treatment of depression. Currently the NHS is unable to deliver CBT to all patients who may benefit from it. Long waiting lists, too few therapists, expense and patients' reluctance to enter therapy are some of the barriers preventing many patients with depression, anxiety and phobias from having access to CBT.

Although evidence regarding CCBT is limited, the evidence which is available suggests that CCBT holds promise as a treatment for anxiety, depression and phobias. If a CCBT package were implemented within the NHS, computers would need to be made available and quite possibly designated for CCBT use only. Time would need to be set aside by the GP, practice nurse or therapist. Training needs for implementation would also need to be met. Money would also be needed for the licence fee, which would include training and maintenance.

Computer use would not be acceptable to all patients and equivalent alternatives would need to be offered to those not comfortable using CCBT. Access to computers could potentially be in primary care settings, clinics or public places such as libraries. Some computer programs can even be used at home, thus allowing CCBT to be utilised by those patients at present unable to access services because they cannot leave their home due to their mental health problems.

The use of CCBT could potentially allow CBT to be accessible to more patients than at present. The placing of CCBT within the NHS needs careful consideration and appropriate monitoring of at risk patients. Such implementation of CCBT packages would allow more efficient use of current therapy resources (i.e. patients most likely to need therapist directed CBT would be able to have it).

Assuming an 80% patient uptake of CCBT, the number of patients able to receive a full course of CCBT per annum in England would range from 1,634,380 to 6,555,000. The wide variation is due to CCBT packages having different lengths of treatment. Resulting costs for England for the first year would range from £206,502,165 to £275,231,340, depending on the type of package implemented and the professional background of the therapist. For the second year costs in England would be reduced to between £127,726,360 and £189,568,415. In Wales, the number of patients able to receive a full course of CCBT per annum, assuming an 80% uptake of CCBT would range from 77,792 to 312,000. Resulting costs for Wales in the first year would range from £9,828,936 to £13,100,256. For the second year, costs would be reduced to between £6,079,424 and £9,022,936.

Discussion

Main results

Sixteen studies were identified in the clinical effectiveness review. Of these, 11 were RCTs of moderate-to-poor quality. The results from these 16 studies show that although there is some evidence that CCBT may be as effective as TCBT and better than TAU the evidence is by no means conclusive. There is also some evidence that the use of CCBT results in the reduction of therapist time in comparison with TCBT. As not all studies used the same patient groups, computer programmes or outcome measures it is difficult to draw comparisons between them.

No studies in which an economic analysis of CCBT was performed were identified in the published literature. The only available economic evidence came from the four sponsor submissions.

The economic evidence on CCBT provided in the submissions was of variable quality. This meant that a number of assumptions had to be made in the modelling. Costs for implementing Stresspac, FearFighter and Beating the Blues were estimated. The global cost of implementing Beating the Blues and Stresspac in England and Wales were also calculated.

In view of the data deficiencies and the large number of assumptions made, all the model estimates should be treated with caution.

Cost per QALY were estimated, based on a number of assumptions. It should be stated once again, however, that these estimates are crude and should be treated with caution.

Assumptions, limitations and uncertainties

Although there is some evidence that CCBT programs may be as effective as TCBT or more effective than TAU one cannot conclude that all CCBT programs are effective. Not all patients will benefit from CCBT and little information was identified in this review as to the optimal setting through which it should be delivered.

Formal assessment of patients needs to be undertaken before CCBT treatment in order to ensure that patients are not at risk and that the CCBT is an appropriate treatment for them.

Although there is some evidence to suggest that patients responded favourably to CCBT programs, there is little information available regarding patient preference. It is by no means certain that CCBT and TCBT would be interchangeable treatments in the eyes of patients.

In evaluating these studies is it assumed that the investigators have been objective in assessing the programs. However, investigator allegiance can introduce strong bias in studies of psychological treatments. Therefore it is essential that any evaluations of new CCBT packages are made by objective parties who do not have a vested interest in seeing them implemented.[91] Many of the results presented in this report are from unpublished trials and in one instance a poster. They have therefore not been peer-reviewed.

The appropriate method for implementing CCBT programs also remains uncertain. There is a variety of settings in which CCBT could be placed. It does not replace TCBT in the NHS as this treatment is currently unavailable to the majority of patients. CCBT could be offered as a stand-alone treatment, an addition to therapist treatment, a first step within a stepped-care system, part of a package of care or used while patients are on TCBT waiting lists or as a relapse prevention strategy. More research is needed to determine the appropriate place to implement CCBT and whether or not this implementation needs to be undertaken in primary or secondary care. Other unanswered questions include the necessary degree of therapist involvement.

The studies in this review use a range of therapist involvement and in many cases therapist involvement and time is not clearly reported. It is therefore unclear to what extent therapist involvement is necessary in order to obtain optimum outcomes for patients. It is also unclear what level of training is needed in order to supervise CCBT use. Some studies report the use of a psychiatrist while others the use of a practice nurse. This has important cost and training implications.

It was not possible to calculate any incremental cost-effectiveness ratios for any of the packages. The main reason for this was that there were no data on patient preferences, hence no QALY calculations could be made. This meant it was not possible to compare different packages in terms of their cost per QALY. Other problems with the effectiveness data were that not all the submissions carried out randomised trials. Of those that did, patient numbers were relatively small.

The different CCBT packages were also evaluated in different settings with different conditions (e.g. the amount of staff time varied, computers were housed in different locations such as GP surgeries, libraries, clinics). This made it difficult to do any comparative work.

Finally, the costing methodologies used in the submissions varied in terms of what they costed and how they costed, this again presented problems for comparative work.

Need for further research

Several key research needs were identified in this review.

- Research is needed to determine the level of therapist involvement needed when using CCBT programs in order to produce optimal outcomes.
- Studies need to be undertaken within the GP setting as this is where most patients with anxiety, depression and phobias are treated.
- Efforts should be made to include patients with co-morbidities routinely treated within primary care.
- The position of CCBT within a stepped-care programme needs to be identified as well as its relationship to other efforts to increase access to CBT and psychological therapies.
- Research is needed to compare CCBT with other therapies that reduce therapist time, in particular bibliotherapy.

Other important issues requiring further research include the following.

- The type of patient most likely to benefit from CCBT, particularly with regard to condition and severity of condition should be considered.
- Patients from a variety of ethnic and socio-economic backgrounds must be included in studies and attention should be paid to age and sex.
- Co-morbidity and medication must be taken into account.
- Other variables such as chronicity, previous treatment, social adjustment, interpersonal difficulties and social circumstances also need to be considered.
- Further research is needed to ensure how patients with agoraphobia and social phobia, who do not currently access services because they are housebound, may benefit from CCBT.
- Further research is also needed to explore the use of CCBT via the Internet.

Study design issues include the following.

- Research needs to be carried out by independent researchers. Research should be carried out by those who are not associated with commercial or product gains.
- Study design should minimise researcher allegiance effects.
- Studies of CCBT should be RCTs and need to include an intention-to-treat analysis in order to take into account patients who drop out of trials. The reasons for withdrawal from trials need to be identified as this relates directly to patient preference.
- If possible, patients who drop out of trials should be asked to complete outcome measures, and reasons for withdrawal from trials should be clearly stated.
- Studies must be designed with adequate statistical power taking into account the sample sizes needed to determine equivalent and superior effectiveness.
- Studies should use appropriate, well-validated outcome measures.
- Studies comparing CCBT with TAU need to be designed so that TAU is genuine and not minimal intervention in order to maximise the benefits associated with CCBT.
- Patient preference should be addressed in trial design. Two possibilities are the inclusion of qualitative research methods or the use of patient preference trials.

Components of CCBT warranting further research include:

- incorporation of CBT material
- readability and legibility of material
- length and frequency of sessions
- amount of homework
- the most appropriate software and computer interface
- comparison of individual CCBT packages to determine if one may be more effective than others; CCBT packages need to be fully described and categorised in order to facilitate comparison
- amount of therapist time required for CCBT packages to be effective
- use of individual rooms for each patient compared with multiple user rooms.

Research recommendations for cost-effectiveness include:

- larger trials in a variety of settings; it is recommended that the trials have sufficient numbers to provide enough power for testing differences in both cost and effectiveness
- primary data should be collected on patient preferences for various health states associated with anxiety and depression to facilitate the calculation of QALYs and thus incremental cost-effectiveness ratios.

Conclusions

There is limited evidence of moderate-to-poor quality that CCBT may be effective in the treatment of depression, anxiety and phobias. The evidence for CCBT is equivocal as the studies varied widely in setting, patient populations, comparators and outcome measures. Therefore further research as described above is needed in order to answer the many questions surrounding the design and implementation of CCBT programs.

The conclusions can be summarised as follows.

- There is some evidence of moderate-to-poor quality that CCBT is as effective as TCBT in clinically depressed, anxious or phobic outpatient and primary care populations.
- There is limited evidence of moderate-to-poor quality that CCBT is more effective than TAU in clinically depressed, anxious or phobic outpatient and primary care populations.

- CCBT may be as effective or less effective than bibliotherapy. There is no evidence that CCBT is more effective than bibliotherapy.
- In studies reporting accurate estimates of therapist time, CCBT appears to reduce therapist time compared with TCBT and is therefore of use where access to TCBT is limited.
- CCBT may form a useful component of a stepped-care programme, being one of the options offered to patients as a first-line treatment approach.
- With regard to the sponsor submissions, there is evidence to support the implementation of Beating the Blues and FearFighter.

Cost-effectiveness review of the evidence

The literature reviewed was often of poor quality or was not relevant, in that the focus was on CBT or other forms of treatment for depression/anxiety, such as medication or counselling, and any costing data were largely US charge data. There are no data in the published literature therefore that are useful for any modelling purposes.

Review of submissions

The economic evidence on CCBT provided in the submissions was of variable quality. This meant that a number of assumptions had to be made in the modelling.

Modelling

Under baseline assumptions, the cost in the first year of implementing Beating the Blues, Stresspac and FearFighter in a single setting were estimated. For Beating the Blues with an assistant psychologist, this cost is £21,691. If a practice nurse is used, the cost is £25,193. The corresponding costs for Stresspac and FearFighter are £18,902 and £22,574, respectively.

Under Baseline assumptions, Beating the Blues with an assistant psychologist was estimated to cost £237 million in England and £11 million in Wales. If a practice nurse is used, the corresponding costs were £275 million in England and £13 million in Wales. The costs for Stresspac were estimated to be £206,500,000 in England and £10 million in Wales.

In view of the data deficiencies and the large number of assumptions made, all the model estimates should be treated with caution.

Cost per QALY

Based on a number of assumptions, the data from Bennett and co-workers[89] suggest that the incremental cost per QALY gained of Beating the Blues over TAU lies between £1210 and £7692. If the data from Revicki and Wood[90] are used, the corresponding range lies between £3000 and £6667 per QALY gained. It should be stated once again, however, that these estimates are crude and should be treated with caution.

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Contributions of authors

Eva Kaltenthaler (Research Fellow) carried out the review of clinical effectiveness.
Phil Shackley (Lecturer) and Katherine Stevens (Research Assistant) carried out the economic analysis.

Catherine Beverley (Systematic Reviews Information Officer) undertook the electronic literature searches.
Glenys Parry (Professor Associate in Healthcare Psychology) provided specialist advice.
Jim Chilcott (Senior Operational Research Analyst) assisted with the economic modelling.

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* At the time of going to print these studies were unpublished. For further information please contact the authors of this report.

Appendix 1

Sources of literature

Electronic bibliographic databases searched

1. Biological Abstracts
2. CCTR (Cochrane Controlled Trials Register)
3. CDSR (Cochrane Database of Systematic Reviews)
4. CINAHL
5. EBM Reviews
6. EconLit
7. EMBASE
8. HEED
9. HMIC (Health Management Information Consortium – comprising DH-Data, the King's Fund Database, and Helmis)
10. MEDLINE
11. NHS DARE
12. NHS EED
13. NHS HTA
14. PreMEDLINE
15. PsycINFO
16. Science Citation Index
17. Social Sciences Citation Index

Other sources searched

1. ABPI (Association of the British Pharmaceutical Industry)
2. AHRQ (Agency for Healthcare Research and Quality)
3. Alberta Clinical Guidelines Programme
4. AltaVista
5. ARIF (Aggressive Research Intelligence Facility)
6. BABCP (British Association for Behavioural and Cognitive Psychotherapies)
7. *Bandolier*
8. BPS (British Psychological Society)
9. CCOHTA (Canadian Co-ordinating Centre for Health Technology Assessment)
10. CCT (Current Controlled Trials)
11. CenterWatch Trials Register
12. Centre for Clinical Effectiveness, Monash University
13. Centre for Health Economics, University of York
14. ClinicalTrials.gov, NIH (National Institutes of Health) Clinical Trials Database
15. COIN/POINT, Department of Health
16. Computers in Mental Health (www.ex.ac/cimh/software.htm)
17. Copernic
18. CRiB (Current Research in Britain)
19. eGuidelines
20. Health Evidence Bulletins, Wales
21. HSTAT (Health Services/Technology Assessment Text, US National Library of Medicine)
22. INAHTA (International Network of Agencies for Health Technology Assessment) Clearinghouse
23. Index to Theses
24. MRC (Medical Research Council) Funded Projects Database
25. National Guideline Clearinghouse
26. NRR (National Research Register)
27. NCCHTA (National Co-ordinating Centre for Health Technology Assessment)
28. NHS CRD (Centre for Reviews and Dissemination), University of York
29. NHS R&D Programmes
30. NIH Consensus Development Programme
31. North of England Guidelines, University of Newcastle
32. OMNI (Organising Medical Networked Information)
33. ReFeR (Research Findings Register)
34. RCP (Royal College of Psychiatry)
35. SBU (Swedish Council for Health Technology Assessment)
36. ScHARR (School of Health and Related Research) Library Catalogue
37. SIGN (Scottish Intercollegiate Guidelines Network)
38. SumSearch
39. Trent Working Group on Acute Purchasing
40. TRIP (Turning Research into Practice) Database
41. UK Central Council for Nursing, Midwifery, and Health Visiting
42. Wessex DEC (Development and Evaluation Committee) Reports
43. West Midlands DES (Development and Evaluation Services) Reports

Appendix 2

Search strategies

Biological abstracts

1985–2001
SilverPlatter WebSPIRS
Search undertaken October 2001

#1 (cognitive or behavi* or therap* or psychotherap*)
#2 (comput* or multimedia or interactive voice response or telephone* or phone* or audio)
#3 (anxi* or depress* or panic* or phobi* or agoraphobi*)
#4 #1 and #2 and #3

CDSR and CCTR

2001, Issue 3
The Cochrane Library, Update Software (CD-ROM version)
Search undertaken September 2001

#1 DEPRESSION*:ME
#2 ANXIETY*:ME
#3 ANIXETY-DISORDERS*:ME
#4 (DEPRESSION OR DEPRESSIVE OR DEPRESSED)
#5 (ANXIET* OR ANXIOUS)
#6 PANIC*
#7 AGORAPHOBI*
#8 PHOBI*
#9 #1 OR #2 OR #3 OR #4 OR #5 OR #6 OR #7 OR #8
#10 PSYCHOTHERAPY*:ME
#11 (COGNTIVE NEAR THEARP*)
#12 (BEHAVIOUR* OR BEHAVIOR*) NEAR THERAP*
#13 #10 OR #11 OR #12
#14 #9 AND #13
#15 MEDICAL-INFORMATICS-COMPUTING*:ME
#16 MULTIMEDIA*:ME
#17 DECISION-MAKING-COMPUTER-ASSISTED*:ME
#18 INTERACTIVE NEAR VOICE NEAR RESPONSE
#19 COMPUT*
#20 #15 OR #16 OR #17 OR #18 OR #19
#21 #14 AND #20

CINAHL

1982–2001
Ovid Biomed
Search undertaken September 2001

1. depression
2. exp anxiety/
3. exp anxiety disorders/
4. (depression or depressive or depressed).tw
5. (anxiet$ or anxious).tw
6. panic$.tw
7. agoraphobi$.tw
8. phobi$.tw
9. or/1-8
10. exp psychotherapy/
11. (cognitive adj2 therap$).tw
12. ((behaviour$ or behavior$) adj2 therap$).tw
13. or/10-12
14. 9 and 13
15. exp "computers and computerization"/
16. exp information systems/
17. exp information technology/
18. multimedia/
19. computer-assisted instruction/
20. comput$.tw
21. interactive voice response.tw
22. exp telecommunications/
23. (telephone$ or phone$).tw
24. or/15-23
25. 14 and 24

Citation Indexes (Science and Social Sciences)

1981–2001
Web of Science
Search undertaken September 2001

Title=(depress* or anxi* or panic* or phobi* or agoraphobi*) and (cognitive or behavi* or therap* or psychotherap*) and (comput* or multimedia or interactive voice response or telephone* or phone* or audio); DocType=All document types; Language=All languages; Databases=SCI-EXPANDED, SSCI; Timespan=All Years

CRD Databases (NHS DARE, EED, HTA)

CRD Website – complete databases
Search undertaken September 2001

therap$ or cognitive or behavi$/all fields AND depress$ or anxi$ or agoraphobi$ or panic or phobi$/all fields AND comput$ or multimedia or voice

EMBASE

1980–2001
SilverPlatter WebSPIRS
Search undertaken September 2001

#1 'depression-' / all subheadings
#2 'anxiety-' / all subheadings
#3 explode 'anxiety-neurosis' / all subheadings
#4 explode 'phobia-' / all subheadings
#5 (depression or depressive or depressed) in ti, ab
#6 (anxiet* or anxious) in ti, ab
#7 panic* in ti, ab
#8 agoraphobi* in ti, ab
#9 phobi* in ti, ab
#10 #1 or #2 or #3 or #4 or #5 or #6 or #7 or #8 or #9
#11 explode 'psychotherapy-' / all subheadings
#12 (cognitive near2 therap*) in ti, ab
#13 ((behaviour* or behavior*) near2 therap*) in ti, ab
#14 #11 or #12 or #13
#15 #10 and #14
#16 explode 'computers-' / all subheadings
#17 explode 'automation-computers-and-computer-applications' / all subheadings
#18 explode 'automation-computers-and-data-processing' / all subheadings
#19 comput* in ti, ab
#20 interactive voice response* in ti, ab
#21 'telephone-' / all subheadings
#22 (telephone* or phone*) in ti, ab
#23 #16 or #17 or #18 or #19 or #20 or #21 or #22
#24 #23 and #15

HEED (Office of Health Economic Evaluations Database)

CD-ROM version
Search undertaken September 2001

Search terms:
(depress* or anxi* or panic* or phobi* or agoraphobi*) and (cognitive or behavi* or therap* or psychotherapy*)

Fields searched:
- Abstract
- All data
- Article title
- Book title
- Keywords
- Technology Assessed

MEDLINE

1966–2001
Ovid Biomed
Search undertaken September 2001

1. depression
2. exp anxiety/
3. exp anxiety disorders/
4. (depression or depressive or depressed).tw
5. (anxiet$ or anxious).tw
6. panic$.tw
7. agoraphobi$.tw
8. phobi$.tw
9. or/1-8
10. exp psychotherapy/
11. (cognitive adj2 therap$).tw
12. ((behaviour$ or behavior$) adj2 therap$).tw
13. or/10-12
14. 9 and 13
15. exp medical informatics computing/
16. multimedia/
17. computer-assisted instruction/
18. exp decision-making, computer-assisted/
19. comput$.tw
20. interactive voice response.tw
21. or/15-20
22. 14 and 21

PsycINFO

1967–2001
SilverPlatter WebSPIRS
Search undertaken September 2001

1. explode 'effective-disorders' in de
2. explode 'anxiety-disorders' in de
3. explode 'anxiety-' in de
4. 'anxiety-management' in de
5. explode 'phobias-' in de
6. 'panic-disorder' in de
7. (depression or depressive or depressed) in ti, ab
8. (anxiet* or anxious) in ti, ab
9. panic* in ti, ab
10. agoraphobi* in ti, ab

11. phobi* in ti, ab
12. #1 or #2 or #3 or #4 or #5 or #6 or #7 or #8 or #9 or #10 or #11
13. explode 'psychotherapy-' in de
14. explode 'cognitive-techniques-' in de
15. (cognitive near2 therap*) in ti, ab
16. ((behaviour* or behavior*) near2 therap*) in ti, ab
17. #13 or #14 or #15 or #16
18. explode 'computers-' in de
19. explode 'computer-applications' in de
20. explode 'computer-software' in de
21. 'computer-programming' in de
22. 'human-computer-interaction' in de
23. comput* in ti, ab
24. interactive voice response* in ti, ab
25. #18 or #19 or #20 or #21 or #22 or #23 or #24
26. #12 and #17
27. #25 and #26

Methodological search filters used in Ovid MEDLINE

Economic evaluations

1. economics/
2. exp "costs and cost analysis"/
3. economic value of life/
4. exp economics, hospital/
5. exp economics, medical/
6. economics, nursing/
7. economics, pharmaceutical/
8. exp models, economic/
9. exp "fees and charges"/
10. exp budgets/
11. ec.fs
12. (cost or costs or costed or costly or costing$).tw
13. (economic$ or pharmacoeconomic$ or price$ or pricing).tw
14. or/1-13

Appendix 3

Summary of study results

TABLE 22 *Study characteristics – RCTs*

Study	Description of CCBT	Study quality	Co-therapy or medication	Comparator	Sample size
Bowers *et al.*, 1993[49]	Uses identification of automatic thoughts, cognitive distortions and rational disputation of these; program responds to patient's key words and uses case scenarios; the dialogue of each session is printed out and reviewed as the only homework; no behaviour homework as in the TCBT group	RCT Jadad score: 2 Randomised but no method described Description of drop-outs Blind assessors	All patients received antidepressant medication	TCBT and TAU (mileu therapy, occupational therapy, vocational rehabilitation, informal staff talks)	22 CCBT: 6 TCBT: 8 TAU: 8
Ghosh *et al.*, 1988[51]	Patients planned their exposure treatment; in the first session, they keyed in a list of main phobic situations, and then selected exposure tasks; an appropriate exposure homework sheet was printed out; in subsequent sessions patients keyed in completed homework and selected further tasks	RCT Jadad score: 1 Randomly chosen but no description of method No description of drop-outs Blind assessor	No psychotropic drugs in 2 weeks prior to trial entry	Book instructed exposure therapy and therapist instructed exposure therapy	134 screened, of whom 119 were suitable, 35 refused treatment leaving 84 who accepted 13 dropped out before completion leaving 71 patients: 19 in therapist group, 24 in book group and 28 in computer group
Grime (dissertation), 2001[52]	Revised form of BTB for employed people plus conventional care (included medication and counselling)	RCT Jadad score: 3 Randomised and appropriate method used Description of drop-outs	All participants continued with whatever care they were receiving	Conventional care including medication and counselling	48 recruited, 24 in each group
Jones *et al.*, (unpublished)[53]	Patients were invited for three sessions of unsupervised computer use; they were given a relaxation tape and printed materials equivalent to Stresspac	RCT Jadad score: 2 Randomised with appropriate method described	Not reported	1. Printed Stresspac + three weekly appointments and relaxation tape 2. Current care with GP	170 recruited and 119 completed follow-up Computer group: 121 Printed Stresspac: 24 Current care: 25
Klein & Richards, 2001[54]	Program had two components: the first focussed on the nature, effects and causes of panic and the second on useful and non-useful ways of managing panic; included hyperlinks between sections of text and self-assessment quizzes with immediate feedback; 1 week of monitoring, followed by 1 week of program and finally 1 week of post-intervention assessment	RCT Jadad score: 2 Randomised Description of drop-outs	Nine (41%) reported use of anxiety medication but no alteration in dosage levels No contact with any mental health professional	Self-monitoring	Internet treatment group: 11 Self-monitoring group: 12
Marks *et al.*, (unpublished)[55]	FF: nine self-exposure steps (welcome, beating fear, problem sorting, getting a helper, setting goals, managing anxiety, rehearsing goals, carrying on, troubleshooting); step-by-step personalised exposure programme with homework diaries, feedback on progress and troubleshooting advice	RCT Jadad score: 3 Randomised and appropriate method described Drop-outs described Blinded assessors	Not on benzodiazepine or diazepam equivalent of > 5 mg/day, no change in antidepressants in the last 4 weeks	Clinician-guided self-exposure (CBT) and computer- and audiotape-guided self-relaxation without exposure (Relax)	129 screened and 35 were unsuitable Of the 94 eligibile patients; 90 patients entered study FF: 35; CBI clinician group: 38; Relax relaxation group: 17

continued

TABLE 22 contd *Study characteristics – RCTs*

Study	Description of CCBT	Study quality	Co-therapy or medication	Comparator	Sample size
Newman *et al.*, 1997[56]	The computer served a self-monitoring function (diary only) and contained a therapy component; clients in the CCBT group used the computer in diary only mode during baseline and began the treatment component after the first therapy session; after the fourth therapy session clients continued to use the computer in the treatment plus diary mode for 8 weeks; CCBT clients used the computers whenever they were anxious or wanted to practice and carried at all times In the TCBT group clients used the computer in diary mode only; clients had therapy for 12 weeks	RCT Jadad score: 1 Randomised trial but, method unclear Drop-outs not described	Anxiety medication taken by two clients in CCBT group and two clients in TCBT group	TCBT	20 clients identified, and 18 included (9 clients and 1 drop-out per group)
Proudfoot *et al.*, (in press)[59]	BTB: 15-minute introductory video viewed on computer followed by eight computer sessions in minimally supervised clinical environment; the program was customised to patient's specific problems; each session built on the previous one; homework was generated as well as a summary and progress report; sessions could be repeated and there was a relapse prevention strategy at the end of the program	RCT Jadad score: 3 Randomised and appropriate method described Description of drop-outs	41% in TAU and 42% of BTB group were prescribed antidepressant or anxiolytic medication; after randomisaton, four patients in the BTB group received counselling and four were subsequently prescribed antidepressant medication	TAU, which included medication, discussion of problems with GP, provision of practical/social help, referral to counsellor, practice nurse or mental health professionals or further physical investigation	310 patients referred, 167 met inclusion criteria, 89 randomised to BTB and 78 to TAU
Selmi *et al.*, 1990[60]	Six sessions were used in the therapy; session 1 was used to instruct the participant on using the program; sessions 2–6 included agenda setting, BDI, comparison of current and past weeks; BDI scores, presentation of patient's problems from the computer's memory and verification of homework completion; therapist for the TCBT was an advanced graduate student in clinical psychology; other concepts presented were continuing discussion of the relationship between automatic thoughts and feelings, increasing mastery and pleasure in daily activities, techniques to control automatic thoughts and the role of underlying beliefs in depression	RCT Jadad score: 2 Randomised but no method reported Description of drop-outs	Not reported	TCBT and WLC	36 (12 in each group)
Smith *et al.*, 1997[62]	Three treatment exposure groups, all different versions of the same computer program: 1 = relevant exposure with feedback (used an anxiety thermometer and rewards exposure behaviour involving spiders); 2 = relevant exposure with no feedback (no thermometer and rewards only neutral behaviours); and 3 = irrelevant exposure with feedback (portrays phobia of elevators and includes anxiety thermometer)	RCT Jadad score: 2 Randomised trial Description of drop-outs	No current anxiolytic medication	Three versions of the same computer program were compared	49 subjects met entry criteria; of these 4 dropped out or were excluded and 45 were included in analysis (15 in each group)
Wright *et al.*, (poster), 2001[64]	Program contained core concepts of CBT; handbook used along with software for practice between sessions; same program as described in Wright *et al.*[67]	Jadad score: 1 Randomised but no method described No description of drop-outs	All subjects were drug-free	Standard cognitive therapy or WLC	45 (15 in each group)

TABLE 23 *Study characteristics – non-RCTs*

Study	Description of CCBT	Study quality	Co-therapy or medication	Comparator	Sample size
Carr *et al.*, 1988[50]	Initially the psychiatrist explained the computer exposure treatment and was available at each visit if necessary; each session involved about 200 statements or questions; at the end of each session, the computer printed out a weekly work sheet The therapy group was encouraged to plan and undertake a series of self-administered exposure *in vivo* exercises usually accompanied by the therapist when first exposed to the feared situation; they also received written details of self-exposure homework each week	Comparative study Partially randomised (computer group randomised) Comparator, drop-outs described Blind assessor	Not reported	Exposure therapy with therapist	23 patients in computer group (first to complete formed sample), 20 in therapy group
Osgood-Hynes *et al.*, 1998[57]	Introductory videotape, nine booklets and 11 toll-free calls in the IVR system; three core modules: constructive thinking, pleasant activities and assertive communication with additional information available on specific topics; treatment recommendations and feedback were individualised depending on responses given during calls; patients were able to request clinical feedback or clarification on directions via a message system	Open cohort study No comparator Description of drop-outs All measures self-rated	Eight patients (20%) were on antidepressant medication, on a stable dose	None	41
Proudfoot *et al.*, (unpublished)[58]	15-minute introductory video viewed on computer followed by eight computer sessions in minimally supervised clinical environment; the program was customised to patient's specific problems; each session built on the previous one; homework was generated as well as a summary and progress report; sessions could be repeated and there was a relapse prevention strategy at the end of the program	Pilot study No comparator Drop-outs clearly described	Not currently receiving treatment from a psychiatrist, psychologist, counsellor, community psychiatric nurse, social worker or nurse for depression/anxiety	None	20
Shaw *et al.*, 1999[61]	FF has nine steps: 1 = introduction, FQ, WSA scale, three-item suicide screen and an alcohol questionnaire; 2 = principles of prolonged self-exposure explained, daily homework diary; 3 = problem sorting where personalised triggers are chosen; 4 = hints on how to find an exposure co-therapist; 5 = teaches patients to set goals; 6 = explains anxiety management and relaxation; 7 = rehearsing goals; 8 = rerating goals, feedback, advice and blank homework sheets; 9 = troubleshooting tips Steps 1 and 2 were completed in session 1; steps 3–7 in session 2; sessions 3–12 began with steps 8 and 9 and navigation through other steps as necessary	Cohort studies No comparator Description of drop-outs	Antidepressant medication remained the same	None	Pilot test 1: 17 Pilot test 2: 6

continued

***TABLE 23* contd** *Study characteristics – non-RCTs*

Study	Description of CCBT	Study quality	Co-therapy or medication	Comparator	Sample size
White *et al.*, 2000[63]	Session 1 was an introduction; session based on their on-line assessment in session 2, the computer recommended which options to choose from: learning relaxation, controlling panic attacks, controlling stressful thoughts, getting a good night's sleep, facing up to stress, coping with the future; session 3 was similar to session 2 with patients but was optional, as patients may have seen all they required in session 2; handouts were also given to act as retrieval cues for the material presented	Pilot study No comparator Description of drop-outs	Half were currently using antidepressants, 8% beta-blockers and 12% benzodiazepines	None	33 entered into study, 26 completed treatment

FQ, Fear Questionnaire

TABLE 24 *Therapy details – RCTs*

Study	Recruitment	Number of sessions	Length of sessions	Therapist contact	Professional background of therapist
Bowers *et al.*, 1993[49]	Inpatient psychiatry department after extensive evaluation by admitting team and psychiatrist	Eight	Not reported	Not reported	Senior psychologist and a clinical psychology graduate student delivered TCBT
Ghosh *et al.*, 1988[51]	Phobic outpatients	3–10 Mean number of sessions Therapist group: 3.2 Computer group: 6.2 Book group: no sessions	40–60 minutes	Therapist group: 4.6 hours Computer group: 4.7 hours Book group: 1.5 hours In the computer group, patients saw therapist for 5–10 minutes in each session	Psychiatrist
Grime (dissertation), 2001[52]	36 through occupational health consultations and 12 volunteers from other sources	Eight over 8 weeks	1 hour	Not reported	Not reported
Jones *et al.*, (unpublished)[53]	GP referral	Four	Not reported	Initial interview with researcher to check eligibility	GP, practice nurse and research assistant
Klein & Richards, 2001[54]	Not reported	Not reported but took place during 1 week only	Not reported	Therapist involvement to show participants how to access and navigate the Internet-based program and to check they were accessing it during the active treatment phase	Not reported
Marks *et al.*, (unpublished)[55]	70 (77%) self-referred after seeing advertisements, 15 (17%) GP referrals and 5 (6%) via other health professionals	Six sessions over 10 weeks	1 hour	5 minutes coaching and up to 15 minutes discussing progress and giving extra advice at each session	Clinician
Newman *et al.*, 1997[56]	Advertisements	CCBT group: four weekly individual sessions with therapist; computer used in diary plus therapy mode throughout study TCBT group: 12 weekly 1-hour individual sessions with therapist; computer used in diary mode throughout study	CCBT: first and second session 2 hours, remaining two were 1 hour TCBT: 1 hour	CCBT group: therapist contact during four sessions (6 hours) TCBT: 12 sessions (12 hours)	Advanced PhD students, PhD psychologists or psychiatrists
Proudfoot *et al.*, (in press)[59]	GP recruitment	Nine sessions (including one session with videotape)	Approximately 50 minutes	Nurses were instructed to spend no more than 5 minutes with each patient at the start or end of each computer session; no face-to-face counselling or psychological intervention	Nurse

continued

***TABLE 24* contd** *Therapy details – RCTs*

Study	Recruitment	Number of sessions	Length of sessions	Therapist contact	Professional background of therapist
Selmi *et al.*, 1990[60]	Newspaper announcement	Six	Not reported	Minimal contact with therapist in computer group	The therapist for the TCBT group was an advanced graduate student in clinical psychology
Smith *et al.*, 1997[62]	Newspaper advertisement	Three computer-delivered sessions scheduled every 2 weeks	40–45 minutes each	None reported	Not reported
Wright *et al.*, (poster), 2001[64]	Outpatients with major depression diagnosed by nurse raters	CCBT: nine sessions of therapy plus eight sessions with computer TCBT: nine sessions	TCBT: each session was 50 minutes CCBT: an initial 50 minutes followed by eight sessions of 25 minutes therapy; computer sessions were 25 minutes	Therapist contact in the nine therapy sessions: 50 minutes in initial session followed by 25 minutes in remaining eight sessions	Not reported

TABLE 25 *Therapy details – non-RCTs*

Study	Recruitment	Number of sessions	Length of sessions	Therapist contact	Professional background of therapist
Carr *et al.*, 1988[50]	Phobic outpatients from behavioural psychotherapy unit	Eight weekly sessions	Not reported (patient dependent, average 1 hour)	Computer group received 5 minutes of instruction before each session from clinician	Psychiatrist
Osgood-Hynes *et al.*, 1998[57]	Referrals from mental health and primary care professionals and newspaper advertisements	Initial clinic visit to view videotape, make first two calls and receive explanation of Cope materials; 11 toll-free calls; 12-week final clinic visit	Calls after initial clinic visit lasted 8–23 minutes; length of two clinic visits not reported	Clinician assessment at initial visit	Not reported
Proudfoot *et al.*, (unpublished)[58]	Newspaper article	Eight (two per week, accelerated rate)	Approximately 50 minutes	Not reported	Two research assistants under the supervision of a clinical psychologist
Shaw *et al.*, 1999[61]	Newspaper advertisements, GP or self-referral or phobia self-help organisation	Maximum of 12 sessions	Session 1: 1–2 hours Session 2: 1–2$^{1}/_{2}$ hours Sessions 3–12: 30–60 minutes each	Pilot test 1: No clinical support, but staff available for technical support. Patients were reassessed by psychiatrist at the end of treatment and offered 3-month follow-up appointment Pilot test 2: An administrator, untrained in behaviour therapy, assisted with goal setting	Test 1: Psychiatrist Test 2: Administrator
White *et al.*, 2000[63]	GP referral	Three	40 minutes	None reported	Research assistant with no psychological experience present in the room to offer help if required

TABLE 26 *Study site, follow-up and inclusion/exclusion criteria – RCTs*

Study and setting	Length of follow-up	Numbers lost to follow-up	Reasons for loss to follow-up	Inclusion criteria	Exclusion criteria
Bowers *et al.*, 1993[49] Inpatient psychiatry service, University of Iowa, USA	Not reported	Five from CCBT group	Three did not want to work with computer at beginning of study, two reason for withdrawal not reported but dropped out after two sessions	BDI scores of at least 15 and HRSD scores of at least 15, depressed for at least 4 weeks	Axis II personality disorder, active substance abuse or Axis I disorders other than major depression
Ghosh *et al.*, 1988[51] Psychiatric outpatient clinic, UK	6 months	13	Not reported	Phobias severe enough to cause significant handicap in everyday life; phobias of at least 1 year duration; willingness to come off psychotropic medication; ability to attend clinic regularly	Severe depression, psychosis, personality disorder and severe physical diseases
Grime (dissertation), 2001[52] King's College Hospital Occupational Health & Safety, UK	6 months	CCBT: ten Conventional care: five	Not reported	Employed and had had 10 or more days off work due to unresolved stress, anxiety or depression in the 6 months prior to randomisation and scored 4 or more on the GHQ-12	Psychotic illness
Jones *et al.*, (unpublished)[53] 11 sites (ten public libraries and one health centre), Glasgow, Scotland, UK	6 months	51	Not reported	Not reported	Not reported
Klein & Richards, 2001[54] University of Ballarat, Australia	3 weeks	One	Participant failed to complete the study	Primary diagnosis of panic disorder; no significant physical health problems	Not reported
Marks *et al.*, (unpublished)[55] Behavioural Psychotherapy Unit, Maudsley Hospital, UK	3 months	25	Two moved/uncontactable, four job/study commitments, five difficulties getting to clinic, one medical condition, six other and seven unknown	DSM-IV diagnosis of panic disorder with agoraphobia or agoraphobia without panic, social phobia or specific phobia; rating of 4 or more on a Global Phobia scale, informed written consent	Psychotic illness, suicidal depression or disabling cardiac or respiratory disease, benzodiazepine or a diazepam equivalent dose of > 5 mg/day, > 21 units (men) or > 14 units (women) of alcohol a week

continued

TABLE 26 contd *Study site, follow-up and inclusion/exclusion criteria – RCTs*

Study and setting	Length of follow-up	Numbers lost to follow-up	Reasons for loss to follow-up	Inclusion criteria	Exclusion criteria
Newman *et al.*, 1997[56] Stanford University School of Medicine and University of Newcastle, Australia	6 months	Two	Not reported	Primary diagnosis of panic disorder on the basis of DSM-III-R criteria for panic disorder with or without agoraphobia and the Structured Clinical Interview for the DSM-III-R as well as at least two panic attacks during the week before starting treatment	Unwillingness to either remain on a stable regimen of medication or medication-free during the study, current diagnosis of substance abuse or dependence, OCD, schizophrenia, bipolar mood disorder, organic brain disorder or current suicidality; patients were also excluded if they had previously received adequate dosage of CBT for panic disorder
Proudfoot *et al.*, (in press)[59] Seven general practices in London and south east England, UK	6 months	29 (38%) in computer group (BTB) and 23 (35%) in TAU	BTB: Unhappy with treatment allocated (4), ill or time, work or family problems (3), moved and uncontactable (5), didn't attend (13) TAU: Unhappy with treatment (2), advised not to continue (1), ill or time, work or family problems (9), moved (3), didn't attend (11)	18–75 years, suffering from depression, mixed anxiety/depression or anxiety disorder (including phobias or panic), not currently receiving any form of face-to-face psychological treatment or counselling for the target condition, scored 4 or more on GHQ-12 and 12 or more on Clinical Interview Schedule – Revised	Active suicidal ideas, psychotic disorder, organic mental disorder or alcohol and/or drug dependence, taking medication for anxiety and/or depression continuously for 6 months or more immediately prior to entry, were unable to read or write or were unable to attend eight sessions at the surgery
Selmi *et al.*, 1990[60] Not reported, USA	2 months	0	Not applicable	Depression scores above the 65th percentile for psychiatric outpatients on the SCL-90-R; BDI scores of 16 or above and current Research Diagnostic Criteria diagnoses of major, minor or intermittent depressive disorder based on a modified version of the Schedule for Affective Disorders and Schizophrenia	Items on the SCL-90-R were used to exclude psychosis
Smith *et al.*, 1997[62] Hospital, Tasmania, Australia	6–12 months (mean 9 ± 1.7 months)	Seven	One subject received another treatment for spider phobia and the other had changes in personal circumstances	DSM-III-R entry criteria for simple phobia	Not reported
Wright *et al.*, (poster), 2001[64] Not reported, USA	6 months	Five	Not reported	Major depression	Diagnosis of bipolar disorder, psychosis, dementia, active substance abuse, borderline personality disorder or major depression-chronic subtype, reading difficulties, score of ≥ 2 on suicide item on BDI

GHQ-12, General Health Questionnaire (12-item)

TABLE 27 *Study site, follow-up and inclusion/exclusion criteria – non-RCTs*

Study and setting	Length of follow-up	Numbers lost to follow-up	Reasons for loss to follow-up	Inclusion criteria	Exclusion criteria
Carr *et al.*, 1988[50] Hospital outpatients, UK	6 months	Nine	Two did not attend, one did not complete treatment and one was lost to follow-up at 6 months in computer group Five lost from therapist group at 6-month follow-up	ICD-9 criteria for phobic state	Patients were interviewed by a psychiatrist to rule out other serious illnesses such as depression, drug dependence, alcoholism, psychosis, etc.
Osgood-Hynes *et al.*, 1998[57] Boston, Massachusetts (n = 12), Madison Wisconsin (n = 15), USA, London England (n = 14), UK	12 weeks	13	Two patients did not use Cope after the enrolment visit, 11 used Cope but stopped using it and did not attend the 12 week office visit	Mild-to-moderate depression defined by HAM-D, scores of 12 to 20 were included; 21–75 years old	Current or lifetime psychotic disorder, personality disorder likely to interfere with study participation, substance abuse disorder (in the past 6 months), serious suicide risk or currently undergoing CBT
Proudfoot *et al.*, (unpublished)[58] Hospital, UK	Not reported	Nine	Two obtained jobs, three found journey too long, one did not have time, one thought programme not appropriate for his problems and two were lost to follow-up	No active suicidal ideas, not currently receiving treatment for depression/anxiety, no current or lifetime diagnosis of psychosis or organic mental disorder, no alcohol or drug dependence, age 18–75 years	Not reported
Shaw *et al.*, 1999[61] Pilot test 1: Institute of Psychiatry, London Pilot test 2: Rural GP surgery in Wales, UK	Pilot test 1: Mean of 10 weeks from first to last session (range: 1–31 weeks) Pilot test 2: Three patients attended for seven, ten and 11 sessions, respectively	Pilot test 1: two Pilot test 2: two	Pilot test 1: One failed to return and one continued self-exposure on his own Pilot test 2: Two failed to return	Diagnosis of agoraphobia/ claustrophobia (ICD-10 criteria)	Severe depression, psychosis, personality disorder, major neurological or organic disorder, weekly alcohol intake over 21 units (men) or 14 units (women), illicit drug taking, > 5 mg diazepam-equivalent of benzodiazepines/day
White *et al.*, 2000[63] Clinical psychology primary care service, Scotland, UK	6 months	Seven	Two unable to attend, one unable to return, two did not agree they had an anxiety problem, two lost to follow-up	Principal diagnosis of any DSM-IV anxiety disorder and at least 8 on the HAD-A scale	Evidence of psychosis, marked suicidal ideation, severe drug or alcohol abuse, recent change in psychotropic medication, concurrent secondary-care mental health treatment within 3 years

HAD-A, HADS – Anxiety

TABLE 28 *Patient characteristics – RCTs*

Study	Methods for diagnosis of disorder	Age (years)	Sex Male/ female	Ethnicity	Education/socio-economic background	Patient history	Baseline comparability
Bowers *et al.*, 1993[49]	DSM-III-R criteria for major depression	Range: 18–60	7/15	Not reported	Not reported	Not reported	Yes
Ghosh *et al.*, 1988[51]	ICD-9 criteria for phobia	36 (range: 16–67)	53 (75%) were female	Not reported	42 (59%) married, 19 (27%) single, seven (10%) divorced one widowed and two cohabitating	Mean duration of phobia 11 years (1–50 years); 40 (56%) agoraphobic; 16 (23%) social phobia; 15 (21%) specific phobias	Yes for clinical measures and demographic profile
					32 (45%) skilled workers, 14 (20%) housewives, ten (14%) managerial jobs, two (3%) unemployed due to phobias	40 (56%) had been treated with drugs for their phobias more than once in the past and 14 (20%) had received behaviour therapy, six (9%) had received psychotherapy	
Grime (dissertation), 2001[52]	Not reported	CCBT: 41 ± 10.83 Conventional care: 37 ± 8.27	CCBT: 13/11 Conventional care: 7/17	Not reported	All NHS employees and local authority employees in both management/professional roles or supportive roles	Not reported	Not reported
Jones *et al.*, (unpublished)[53]	Anxiety Depression Interview Schedule, HADS, STAI, BSI, DSM-IV criteria	Range: 17–78	75% women	Not reported	70% lived in areas of deprivation (Carstairs categories 6 and 7), 41% had never used a computer before	18% had been referred to secondary services for anxiety problems	Mean baseline psychological scores were comparable
Klein & Richards, 2001[54]	DSM-IV criteria for panic disorder; Prime MD scale, at least one of the following: fear of future panics, worry about consequences of panic attacks or significant change in behaviour as a consequence of the attacks	Mean for women: 40 ± 13.29 men: 46 ± 20.29	3/19	Not reported	Mean years of schooling: 11.7 ± 2.02	All participants had experienced spontaneous panic attacks in the past 12 months	Not reported
Marks *et al.*, (unpublished)[55]	DSM-IV criteria for phobia/panic disorder	38 ± 12	62 (69%) female	Not reported	Education length 11 ± 2 years	Illness duration 17 ± 12 years; nine (11%) patients were on stable doses of TCAs, five (6%) were on an SSRI, two (3%) were on other antidepressants and four (5%) were on benzodiazepines	Not reported

continued

TABLE 28 contd *Patient characteristics – RCTs*

Study	Methods for diagnosis of disorder	Age (years)	Sex Male/ female	Ethnicity	Education/ socio-economic background	Patient history	Baseline comparability
Newman *et al.*, 1997[56]	DSM-III-R for panic disorder with or without agoraphobia and structured clinical interview for DSM-III-R	38 ± 11.7	3/15	Not reported	Not reported	Mean duration of panic disorder was 7.5 ± 9.9 years; ten clients had received previous treatment with no success	No difference between two groups in duration of panic; no difference in number who met criteria for agoraphobia, had received previous therapy or who were on anxiety medication
Proudfoot *et al.*, (in press)[59]	Clinical Interview Schedule – Revised, PROQSY	BTB: 43.7 ± 14.7 TAU: 45.7 ± 14.1	BTB: 23/66 TAU: 21/57	BTB: Afro-Caribbean: 5 Asian: 0 Other: 4 White: 68 TAU: Afro-Caribbean: 2 Asian: 4 Other: 2 White: 57	Years of education: **BTB** **TAU** < 5: 0, 1 5–10: 8, 10 11–12: 22, 17 13–15: 15, 15 > 15: 39, 28 Employment status: **BTB** **TAU** In work: 49, 40 Unemployed or retired: 35, 34 Previous use of computer: **BTB** **TAU** No: 21, 17 Yes: 67, 59	Not reported	Yes
Selmi *et al.*, 1990[60]	SCL-90-R	CCBT: 28.9 ± 4.89 TCBT: 24.7 ± 4.33 WLCI: 30.9 ± 3.88	CCBT: 5/7 TCBT: 4/8 WLC: 4/8	All participants were non-minorities	Education: **CCBT** **TCBT** **WLC** Some college: 4, 5, 4 College graduate: 2, 5, 6 Graduate work/degree: 6, 2, 2 Work: **CCBT** **TCBT** **WLC** Does not work: 3, 1, 3 Full/part-timework: 3, 5, 6 Student: 6, 6, 3	Duration of current depressive episode was up to 6 months for 18 patients, 6 months to 3 years for ten patients, and more than 3 years for eight patients; of the 36 patients, 28 were chronically depressed, seven had 2–9 episodes of intermittent depression and one was experiencing a first episode; 27 had had previous psychotherapy	No significant difference in pre-treatment depression scores between the groups

continued

***TABLE 28* contd** *Patient characteristics – RCTs*

Study	Methods for diagnosis of disorder	Age (years)	Sex Male/ female	Ethnicity	Education/socio-economic background	Patient history	Baseline comparability
Smith *et al.*, 1997[62]	Respondent administered CIDI-Auto interview for DSM-III-R criteria for simple phobia	34.8 ± 11.57	1/44	Not reported	Not reported	Mean duration of phobia: 22.7 ± 10 years; one subject had received prior treatment with hypnotherapy for spider phobia	Yes, no significant main effects for group at pre-test for age or ratings
Wright *et al.*, (poster), 2001[64]	DSM-IV criteria for major depression	40.2 ± 9.8 (range: 23–58 years)	75.5% female	Not reported	Not reported	Not reported	Not reported

TABLE 29 *Patient characteristics – non-RCTs*

Study	Methods for diagnosis of disorder	Age (years)	Sex Male/ female	Ethnicity	Education/socio-economic background	Patient history	Baseline comparability
Carr *et al.*, 1988[50]	ICD-9 criteria for phobic state	Mean computer group: 35 Therapist group: 37	Computer group 20% male, Therapist group: 30% male	Not reported	Married: Computer group: 80%, therapist group: 70% Both groups ranged in occupation from professional to unskilled workers	Patients had previously completed an average of eight treatment sessions with a nurse therapist	No significant differences in age, sex or marital status but the therapist group had more severe phobic problems and targets rated by their nurse-therapists ($p < 0.05$) and more self-rated anxiety/depression ($p < 0.05$)
Osgood-Hynes *et al.*, 1998[57]	Clinician administered structured clinical interview for DSM-IV criteria for major depression and/or dysthymia/HAM-D score	42 ± 13	12/29	Not reported	18 (44%) were married or cohabiting, 14 (34%) had never been married, 8 (20%) were divorced and 1 (2%) was widowed	Major depression, single or recurrent 25 (61%); dysthymia 11 (27%); double depression (both major depression and dysthymia) 5 (12%) Mean time since onset of first episode of depression was 5 years (range: < 1–22 years); more patients were diagnosed with dysthymia in London than Boston or Madison; London patients were significantly younger; 17 (42%) had previously had psychotherapy for depression; 13 (32%) said depression could be due to death of someone they knew	Not applicable
Proudfoot *et al.*, (unpublished)[58]	Not reported	Not reported	3/8 (completers)	Not reported	All 11 completers had received 11 years or more education, six were unemployed	All had been ill for 2 or more years and the majority had previously received psychotherapy and/or medication for their problems	Not applicable
Shaw *et al.*, 1999[61]	Use of ICD-10 criteria for agoraphobia/ claustrophobia	Pilot test 1: Mean: 38 (range: 21–59 years)	Pilot test 1: Two-thirds of patients were women	Not reported	Pilot test 1: One-third were married; nearly all had used computers	Pilot test 1: Mean duration of agora/ claustrophobia was12 years (range: 2–30); 93% had previously seen a mental health professional before using FF Pilot test 2: Range: 10 months to 40 years for agora/claustrophobia	

continued

TABLE 29 contd *Patient characteristics – non-RCTs*

Study	Methods for diagnosis of disorder	Age (years)	Sex Male/ female	Ethnicity	Education/socio-economic background	Patient history	Baseline comparability
White *et al.*, 2000[63]	DSM-IV for anxiety disorder, HADS	Mean 35 (range: 17–67)	7/19	Not reported	No further education following secondary school: 84%; 62% of patients had used computers at school or at home but none had access to a home computer	45% of patients had had previous treatment either with a psychiatrist (30%) or a clinical psychologist (15%); seven patients (27%) had a principal diagnosis of panic disorder with agoraphobia; two (8%) met criteria for panic disorder without agoraphobia; 12 (46%) GAD, four (15%) had social phobia and one (4%) anxiety disorder not otherwise specified; 38% of patients also met the criteria for major depression and 23% for dysthymia	Not applicable

TABLE 30 *Outcomes and analysis information – RCTs*

Study	Outcomes	Instruments	Measurement periods	ITT analysis
Bowers *et al.*, 1993[49]	Depression ratings	BDI and HRSD	Pre- and post-treatment	No
Ghosh *et al.*, 1988[51]	Improvement in phobias	FQ, two phobic problems, four phobic targets, work and home adjustment and social and private leisure	2, 6, 10, 14, 22 and 34 weeks	No
Grime (dissertation), 2001[52]	Anxiety and depression	HADS anxiety and depression scores, ASQ	Pre- and post-treatment, 1-, 3- and 6-month follow-up	Yes
Jones *et al.*, (unpublished)[53]	Anxiety depression and BSI general symptom index scores and clinically significant change	HADS anxiety and depression scores, STAI, BSI	Pre-treatment and 6-month follow-up	Yes, but ITT results not reported
Klein & Richards, 2001[54]	Panic frequency, anticipatory fear of panic, general anxiety levels, general depression levels, self-efficacy, body vigilance, anxiety sensitivity	Prime MD, panic attack record form, daily record form, Self-Efficacy Questionnaire, Body Vigilance Scale, Anxiety Sensitivity Index	Mean daily rating of week before treatment and mean daily rating in third week (after treatment)	Not reported
Marks *et al.*, (unpublished)[55]	Blind assessment and self-ratings of phobia and/or panic	Main Problem and Goals, Global Phobia item on FQ and WSA	Weeks 1, 2, 4, 6, 8 and 10 and 1-month follow-up	Yes
Newman *et al.*, 1997[56]	Panic and treatment satisfaction	Treatment satisfaction measure, FQ Total Phobia Rating and Agoraphobia subscale, Mobility Inventory for Agoraphobia, Agoraphobic Cognitions Questionnaire, Body Sensations Questionnaire and number of panic attacks during the week previous to each assessment point	Pre- and post-therapy and follow-up	Not reported
Proudfoot *et al.*, (in press)[59]	Depression, anxiety and work and social adjustment	BDI II, BAI and WSA	Pre- and post-treatment and 1-, 3- and 6-month follow-up	Yes
Selmi *et al.*, 1990[60]	Depression	BDI, HRSD, SCL-90-R depression scale, SCL-90-R global symptoms scale, ATQ	BDI was measured weekly, others before and after treatment and at follow-up	Not reported
Smith *et al.*, 1997[62]	Spider phobia severity	SPQ, SQ, Phobic Targets, Work and Adjustment Rating Scales, Homework Questionnaire (designed by the authors)	Pre- and post-treatment (2 weeks after final session) and follow-up (9 ± 1.7 months later)	Not reported
Wright *et al.*, (poster), 2001[64]	Depression	BDI and HRSD	Pre-treatment, 4 weeks, 8 weeks, 3 and 6 months post-treatment	Not reported

ITT, intention-to-treat; ASQ, Attributional Style Questionnaire; SPQ and SQ, Spider Questionnaire

TABLE 31 *Outcomes and analysis information – non-RCTs*

Study	Outcomes	Instruments	Measurement periods	ITT analysis
Carr *et al.*, 1988[50]	Main Fear, Global Phobia, Total Phobia, Anxiety-Depression (all self-rated using a standardised FQ) phobic problems, phobic targets (clinician rated using standard assessment form)	Standardised FQ; clinician-rated standard assessment form	Pre- and post-treatment, 1 month and 6 months	No
Osgood-Hynes *et al.*, 1998[57]	Depression and WSA scores	HAM-D, PGI of Improvement (computer administered) and WSA scale (computer administered)	Baseline, 4, 8 and 12 weeks for computer-administered measures; PGI and HAM-D were also given at weeks 1 and 2	Yes
Proudfoot *et al.*, (unpublished)[58]	Improvement in anxiety and depression	BDI II, BAI, WSA, ASQ	Pre- and post-treatment	No
Shaw *et al.*, 1999[61]	Improvement in phobia	FQ, WSA scale and Suicide Screen, rating of triggers	Not reported	Not reported
White *et al.*, 2000[63]	Anxiety and depression	HAD-A, HAD-D, BSI-GSI, BSI-PST; BAI and BDI were measured at each session	Pre- and post-therapy and 6-month follow-up	Not reported

PGI, Patient Global Impression; HAD-D, HADS – Depression; BSI-GSI, BSI – General Severity Index; BSI-PST, BSI – Positive Symptom Total

TABLE 32 *Results of reported outcomes (psychological symptoms and interpersonal and social functioning) – RCTs*

Study	Results	Other outcome information
Bowers *et al.*, 1993[49]	Depression ratings (± SD) **BDI** Pre-treatment / **BDI** Post-treatment / **HRSD** Pre-treatment / **HRSD** Post-treatment TCBT: 32.9 ± 12.8 / 9.0 ± 6.1* / 20.3 ± 3.3 / 6.2 ± 2.2** CCBT: 32.0 ± 11.2 / 16.8 ± 3.8* / 23.2 ± 2.9 / 13.3 ± 5.1** TAU: 29.6 ± 10.4 / 14.1 ± 5.2 / 21.1 ± 2.6 / 9.3 ± 3.7 * Post-treatment BDI scores differ at $p < 0.046$; ** Post-treatment HRSD scores differ at $p < 0.007$	Remission rates: (MacArthur Foundation criteria with a patient having a BDI score of 8 or less and an HRSD score of 7 or less following treatment) Four patients in TCBT group and one in TAU group experienced remission at the time of discharge; no patients in the CCBT group met criteria for remission; $p < 0.014$
Ghosh *et al.*, 1988[51]	All three treatment groups improved significantly on all measures ($p < 0.001$) by the end of treatment, this continued to 3-month follow-up and was maintained at 6-month follow-up	Patients in age range 25–35 years and who had phobias for more than 5 years improved the most
Grime (dissertation), 2001[52]	Mean ± SD of unadjusted HAD-D scores and mean difference between groups adjusted for baseline depression scores **CCBT** / **CC** / **AMD (95% CI)** / ***p*** Treatment end: 5.38 ± 3.93 (*n* = 16) / 8.61 ± 3.86 (*n* = 23) / –3.07 (–5.79 to 0.35) / 0.028 1 month post-treatment: 5.00 ± 3.32 (*n* = 15) / 8.53 ± 3.82 (*n* = 19) / –2.72 (–5.32 to 0.13) / 0.04 Results at 3 and 6 months post-treatment were NS Mean ± SD of unadjusted HADS anxiety scores and mean difference between the groups adjusted for baseline anxiety scores **CCBT** / **CC** / **AMD (95% CI)** / ***p*** 1 month post-treatment: 8.20 ± 3.95 (*n* = 15) / 12.00 ± 3.61 (*n* = 19) / –3.19 (–5.87 to 0.51) / 0.021 End of treatment and 3 and 6 months post-treatment were NS Mean ± SD of unadjusted negative attributional style scores and mean difference between groups adjusted for baseline negative attributional style scores **CCBT** / **CC** / **AMD (95% CI)** / ***p*** Treatment end: 12.09 ± 3.00 (*n* = 16) / 14.71 ± 2.86 (*n* = 23) / –2.32 (–4.11 to 0.54) / 0.012 1 month post-treatment: 12.75 ± 3.04 (*n* = 15) / 14.87 ± 2.28 (*n* = 19) / –1.95 (–3.77 to 0.13) / 0.037 Results at 3 and 6 months were NS Mean ± SD of unadjusted composite attributional style scores and mean difference between groups adjusted for baseline composite attributional style scores **CCBT** / **CC** / **AMD (95% CI)** / ***p*** Treatment end: 2.89 ± 3.68 (*n* = 46) / 0.01 ± 2.92 (*n* = 23) / 2.21 (0.11 to 4.30) / 0.04 Scores 1, 3 and 6 months post-treatment were NS; positive attributional style scores were NS at any time	No difference between two groups with regard to absenteeism (main outcome); very low rate of participation

continued

TABLE 32 contd *Results of reported outcomes (psychological symptoms and interpersonal and social functioning) – RCTs*

Study	Results	Other outcome information
Jones *et al.*, (unpublished)[53]	Patients offered printed Stresspac (written treatment programme) showed a greater improvement than controls in HAD-A ($p = 0.04$) and HAD-D ($p = 0.01$) scores and in the BSI-GSI (NS); no other results were significant	Of the 119 who responded to 6-month follow-up, 21 (18%) were considered 'normal' (HAD-A score < 8); one of these was in the control group; clinically significant improvement (calculated by improvement in HAD-A divided by SD of HAD-A) at the start showed that the printed Stresspac group improved more than the computer or current care groups
Klein & Richards, 2001[54]	Panic frequency: Condition by time interaction F (1,19) = 12.63, $p < 0.01$; ES 0.40, power 0.92; significant decrease in panic frequency for treatment group only t (8) = –2.53, $p < 0.05$ Anticipatory fear of panic: Condition by time interaction F (1,19) = 12.26, $p < 0.01$; ES 0.39, power 0.91; significant decrease in treatment group only t (8) = –3.30, $p < 0.05$ General anxiety: Condition by time interaction F (1,19) = 8.92, $p < 0.01$; ES 0.32, power 0.81; decrease for treatment group t (8) = –2.68, $p < 0.05$ General depression: Condition by time NS; self-efficacy: condition effect F (1,19) = 13.52, $p < 0.01$ with ES of 0.42 and power of 0.94, time effect F (1,19) = 9.08, $p < 0.01$, ES 0.50, power 0.95, condition by time interaction F (1,19) = 6.52, $p < 0.05$, ES 0.26, power 0.68; significant increase for treatment group only t (8) = –2.92, $p < 0.05$ Body vigilance: Condition effect F (1,19) = 4.94, $p < 0.05$, ES 0.21, power 0.56, significant time effect F (1,19) = 6.61, $p < 0.01$, ES 0.42, power 0.86, condition by time interaction F (1,19) = 7.91, $p < 0.05$, ES 0.29, power 0.76; decrease for treatment group only t (8) = 4.27, $p < 0.01$ Anxiety sensitivity: F (1,19) = 7.46, $p < 0.01$ for both groups together, ES 0.28, power 0.74; no other comparisons statistically significant	None reported

continued

TABLE 32 contd *Results of reported outcomes (psychological symptoms and interpersonal and social functioning) – RCTs*

Study	Results				Other outcome information
Marks *et al.*, (unpublished)[55]	Between group differences on main outcome measures (completers)				In the ITT analysis, using goals as the main outcome measure the mean group differences from pre- to post-treatment (CI) were FF vs CBT: 0.04 (–0.8 to 0.9); FF vs Relax: –1.6 (–2.6 to –0.5); CBT vs Relax: –1.6 (–2.6 to –0.6)
	Pre-treatment:				
		FF	**CBT**	**Relax**	
		(*n* = 35)	(*n* = 38)	(*n* = 17)	
	Self-assessment				
	Main problem	7.2 ± 1.0	7.3 ± 1.0	7.1 ± 0.9	On repeat measures ITT analyses patients improved significantly from pre- to post-treatment on all measures ($p < 0.001$) and multivariate group x occasion effects were significant or nearly significant for most measures
	Goals	7.0 ± 1.1	7.0 ± 1.2	7.1 ± 1.2	
	Global Phobia	5.4 ± 1.0	6.3 ± 1.4	6.7 ± 1.3	
	WSA total	15.7 ± 7.8	16.6 ± 9.0	15.2 ± 8.1	
	Blind assessor				3-month follow-up ratings were available for only 34 (38% of original sample); on repeated measures analyses FF and CBT groups improved significantly and similarly from pre-treatment to 3-month follow-up on all measures; comparisons could not be made with the Relax group as many patients form this group went into computer group; drop-outs from FF, 43%; from CBT group 24%, and from Relax group 6%
	Global Phobia	5.4 ± 1.0	5.6 ± 1.4	5.7 ± 1.1	
	WSA total	14.7 ± 3.9	16.8 ± 9.2	15.8 ± 7.6	
	Post-treatment:				
		FF	**CBT**	**Relax**	
		(*n* = 20)	(*n* = 29)	(*n* = 16)	
	Self-assessment				
	Main problem	3.9 ± 2.0	3.6 ± 1.6	6.4 ± 1.4	Computer guidance cut patient time with clinician by 73%
	Goals	2.9 ± 1.6	3.1 ± 1.7	6.7 ± 1.6	
	Global Phobia	3.8 ± 2.3	3.3 ± 1.8	5.7 ± 1.9	
	WSA total	10.0 ± 10.5	11.8 ± 8.2	11.9 ± 7.7	
	Blind assessor				
	Main problem	3.1 ± 1.5	3.6 ± 1.3	5.8 ± 1.1	
	Goals	2.9 ± 1.9	3.1 ± 1.7	6.8 ± 1.1	
	Global Phobia	3.1 ± 1.2	3.2 ± 1.3	5.3 ± 1.3	
	WSA total	7.2 ± 5.8	10.0 ± 7.1	15.3 ± 7.1	
	1-month follow-up:				
		FF	**CBT**	**Relax**	
		(*n* = 19)	(*n* = 27)	(*n* = 14)	
	Self-assessment				
	Main problem	3.2 ± 2.0	3.4 ± 1.5	6.5 ± 1.4	
	Goals	2.3 ± 1.6	2.5 ± 1.5	6.7 ± 1.4	
	Global Phobia	3.1 ± 1.7	3.2 ± 1.6	5.7 ± 1.7	
	WSA total	7.5 ± 7.8	9.4 ± 7.2	13.4 ± 9.4	

continued

***TABLE 32* contd** *Results of reported outcomes (psychological symptoms and interpersonal and social functioning) – RCTs*

Study	Results			Other outcome information
contd Marks *et al.*, (unpublished)[55]	Between group statistics:	**ANOVA**		*p*
	Self-assessment			
	Main problem	9.2	2,52	< 0.001
	Goals	20.6	2,52	< 0.001
	Global Phobia	5.5	2,51	0.006
	WSA total	0.4	2,51	NS
	Blind assessor:			
	Main problem	17.9	2,60	< 0.001
	Goals	31.0	2,61	< 0.001
	Global Phobia	7.1	2,55	0.002
	WSA total	4.2	2,55	0.019
	Effect sizes from pre- to post-treatment for TCBT and CCBT respectively of 3.6 and 3.9 (Main Problem), 3.3 and 3.9 (Goals), 2.8 and 1.7 (Global Phobia self), 1.9 and 2.1 (Global Phobia blind assessor) and 1.2 and 0. 9 (WSA Total blind assessor)			

continued

TABLE 32 contd *Results of reported outcomes (psychological symptoms and interpersonal and social functioning) – RCTs*

Study	Results					Other outcome information
Newman *et al.*, 1997[56]	Mean (SD)	**Baseline effects (df)**	**Post-test**	**Follow-up**	***F* ratios for time**	Reliable Change Index and Functional Recovery were both calculated; chi-squared analyses of the percentage of individuals meeting criteria showed superiority of TCBT at post-test on the number of panic attacks χ^2 (1, n = 18) = 4.0, $p < 0.05$ and the Body Sensations Questionnaire χ^2 (1, n = 18) –4.0, $p < 0.05$; however, at follow-up there were no longer any differences detected between the two treatments
	Mobility inventory [accompanied subscale]				18.74* (2,32)	
	TCBT	2.39 (0.92)	1.44 (0.39)	1.47 (0.57)		
	CCBT	2.39 (0.93)	1.73 (0.89)	1.83 (0.95)		
	Mobility Inventory [Alone subscale]				28.75* (2,32)	
	TCBT	3.62 (0.71)	1.91 (0.82)	2.01 (0.98)		
	CCBT	2.64 (1.03)	1.82 (0.89)	2.01 (1.01)		
	Agoraphobic Cognitions Questionnaire				10.54* (2,32)	
	TCBT	37.67 (9.11)	28.78 (9.46)	26.00 (7.86)		
	CCBT	31.78 (10.68)	22.67 (6.14)	24.11 (7.10)		
	Panic attacks				26.86* (2,30)	
	TCBT	6.11 (3.92)	0.22 (0.67)	0.44 (0.73)		
	CCBT	6.11 (3.52)	1.56 (2.07)	0.38 (0.74)		
	FQ [Agoraphobic subscale]				20.82* (2,30)	
	TCBT	22.67 (7.95)	10.00 (6.71)	12.13 (9.40)		
	CCBT	16.00 (10.99)	7.56 (8.75)	8.00 (8.17)		
	FQ [Total Phobia Rating]				36.02* (2,30)	
	TCBT	56.44 (19.02)	25.67 (12.63)	26.22 (19.61)		
	CCBT	48.78 (22.24)	25.56 (23.23)	27.22 (24.34)		
	Body Sensations Questionnaire				18.37* (2,30)	
	TCBT	58.56 (9.18)	32.89 (15.67)	34.56 (13.25)		
	CCBT	52.89 (11.06)	34.78 (12.90)	39.89 (12.33)		
	* $p < 0.0005$					

continued

TABLE 32 contd *Results of reported outcomes (psychological symptoms and interpersonal and social functioning) – RCTs*

Study	Results			Other outcome information
Proudfoot *et al.*, (in press)[59]	Mean ± SD (*n*)	**BTB**	**TAU**	There were no interactions of BTB with concomitant pharmacotherapy or duration of illness but evidence on the BAI only of interaction with primary care practice
	BDI			
	Pre-treatment	25.38 ± 11.05 (53)	24.08 ± 9.78 (53)	
	Post-treatment	12.04 ± 10.45 (47)	18.36 ± 12.65 (50)	
	1 month	12.50 ± 12.33 (48)	16.10 ± 11.99 (39)	
	3 months	9.00 ± 9.22 (37)	14.29 ± 11.66 (38)	
	6 months	9.61 ± 10.06 (44)	16.07 ± 13.06 (42)	
	BAI			
	Pre-treatment	18.33 ± 9.61 (51)	19.39 ± 9.72 (51)	
	Post-treatment	10.19 ± 8.92 (43)	14.82 ± 11.57 (44)	
	1 month	10.37 ± 8.64 (41)	12.06 ± 9.98 (36)	
	3 months	8.82 ± 9.36 (33)	11.1 ± 8.46 (37)	
	6 months	8.73 ± 7.66 (40)	11.32 ± 9.61 (38)	
	WSA			
	Pre-treatment	19.89 ± 9.29 (54)	18.46 ± 8.25 (52)	
	Post-treatment	12.21 ± 8.00 (48)	14.82 ± 9.54 (50)	
	1 month	12.02 ± 9.43 (48)	14.54 ± 10.00 (39)	
	3 months	10.16 ± 8.59 (44)	12.21 ± 8.94 (39)	
	6 months	9.11 ± 8.97 (45)	12.10 ± 10.11 (42)	

continued

TABLE 32 contd *Results of reported outcomes (psychological symptoms and interpersonal and social functioning) – RCTs*

Study	Results						Other outcome information
Selmi *et al.*, 1990[60]		**Pre-treatment**	**Post-treatment**	**ES**	**Follow-up**	**ES**	Not reported
	BDI*						
	CCBT	21.42 ± 3.96	10.33 ± 5.18	–0.88	6.17 ± 5.57	–1.47	
	TCBT	23.18 ± 7.19	11.64 ± 8.20	–0.74	8.27 ± 8.84	–1.25	
	WLC	22.92 ± 5.02	18.50 ± 9.32		20.67 ± 9.89		
	HRS*						
	CCBT	14.33 ± 4.01	5.83 ± 2.62	–1.96	4.92 ± 2.31	–1.42	
	TCBT	15.09 ± 4.55	6.36 ± 4.08	–1.58	4.54 ± 2.66	–1.47	
	WLC	15.57 ± 5.00	13.83 ± 4.74		14.50 ± 6.76		
	SCL-90-R Depression†						
	CCBT	1.76 ± 0.61	1.11 ± 0.72	–0.71	0.73 ± 0.57	–1.21	
	TCBT	1.91 ± 0.63	1.16 ± 0.54	–0.64	0.89 ± 0.80	–1.05	
	WLC	1.98 ± 0.55	1.65 ± 0.76		1.92 ± 0.98		
	SCL-90-R Global†						
	CCBT	1.10 ± 0.31	0.67 ± 0.38	–0.45	0.49 ± 0.31	–1.11	
	TCBT	1.02 ± 0.48	0.66 ± 0.33	–0.43	0.53 ± 0.48	–1.02	
	WLC	1.03 ± 0.34	0.85 ± 0.40		0.98 ± 0.44		
	ATQ*						
	CCBT	78.75 ± 20.27	54.33 ± 18.03	–0.91	49.08 ± 16.72	–1.20	
	TCBT	90.73 ± 25.20	62.73 ± 23.53	–0.65	50.64 ± 19.95	–1.15	
	WLC	82.08 ± 17.30	84.17 ± 32.73		85.33 ± 30.23		
	Effect sizes based on control group means and SDs after treatment or at follow-up						
	* Scores of two groups given therapy significantly different at post-treatment and follow-up from control group ($p < 0.05$)						
	† Two groups given therapy were significantly different at follow-up from control group scores ($p < 0.05$)						
Smith *et al.*, 1997[62]	Subjects in each group fell pre-test to post-test and further at follow-up on both the SPQ F (2,70) = 23.0, $p < 0.0001$ and SQ F (2,70) = 27.7, $p < 0.0001$; ratings of phobic problem and four phobic targets all showed significant reduction ($p < 0.001$ for all); the Work and Adjustment Rating Scale rating of general morbidity also showed a significant fall ($p < 0.001$); no significant main effects or interactions between the treatment groups on these outcome measures						All three groups showed improvement in program performance scores (an estimate in computer proficiency)
	On the Homework Questionnaire, subjects in the relevant exposure, no feedback group reported fewer new activities than the other groups but the effect was NS; number of new homework activities correlated significantly with clinical improvement according to the SPQ ($r = –0.441$, $p < 0.01$) but not the SQ or problem and target ratings						

continued

TABLE 32 contd *Results of reported outcomes (psychological symptoms and interpersonal and social functioning) – RCTs*

Study	Results	Other outcome information
Wright *et al.*, (poster), 2001[64]	Mean BDI and HRSD scores in treatment completers, acute treatment phase data (13 patients completed treatment in TCBT and CCBT groups each and 14 in WLC group) **Pre-treatment / 4 weeks / 8 weeks / *p*** BDI TCBT 24.8 / 16.1 / 9.5 / 0.000 CCBT 30.4 / 20.2 / 11.4 / 0.000 WLC 32.6 / 27.1 / 27.4 / 0.01 No significant differences were found between TCBT and CCBT on repeated measures ANOVA; both active treatments were superior to WLC (TCBT vs WLC $p = 0.001$, CCBT vs WLC $p = 0.000$) HRSD TCBT 17.5 / 13.7 / 9.2 / 0.000 CCBT 16.8 / 12.5 / 9.5 / 0.001 WLC 20.0 / 18.3 / 17.9 / 0.20 (NS) No significant differences were found between TCBT and CCBT on a repeated measures ANOVA; both active treatments were superior to WLC (TCBT vs WLC $p = 0.01$; CCBT vs WLC $p = 0.02$)	Follow-up evaluations at 3 and 6 months continued to reveal no significant differences between TCBT and CCBT; there was no evidence of relapse for either active treatment after 3 and 6 months; BDI scores for TCBT (6.1) and CCBT (9.1) at 6 months post-treatment were not significantly higher than 8 week BDI scores; mean HRSD scores for TCBT (8.1) and CCBT (6.3) at 6 months post-treatment were lower than those recorded immediately after completion of treatment

AMD, adjusted mean difference; ANOVA, analysis of variance; CC, conventional care; CI, confidence interval; df, degrees of freedom; SD, standard deviation

TABLE 33 *Results of reported outcomes (psychological symptoms and interpersonal and social functioning) – non-RCTs*

Study	Results	Other outcome information
Carr *et al.*, 1988[50]	At the end of treatment both groups had improved significantly on all six measures ($p < 0.001$); both groups showed similar improvement for Main Fear, Global Phobia, and anxiety/depression; with regard to the clinician-rated scales, Phobic Problems and Phobic Targets, the therapist group had better outcomes ($p < 0.05$); in the self-rated Total Phobia score the therapist group also did better ($p = 0.05$) 80% of computer group and 75% of therapist group reduced their Main Fear score by half or less of its initial value At 6-month follow-up improvement was maintained equally in both groups	Time: 6.5 hours for computer group with computer vs 11.5 hours for therapist group with therapist ($p < 0.01$)
Osgood-Hynes *et al.*, 1998[57]	HAM-D scores: mean (SD) (two-tailed dependent sample *t* test) **n** / **Baseline** / **Week 12** / ***p*** / **Responders** ITT: 41 / 18.9 ± 6.0 / 11.1 ± 8.2 / 0.001 / 20 (49%) Completers: 28 / 18.3 ± 4.6 / 8.8 ± 7.6 / 0.001 / 18 (64%) PGI scores: **n** / **Week 12** / **Responders** ITT: 41 / 2.5 ± 1.3 / 19 (46%) Completers: 28 / 2.1 ± 1.2 / 18 (64%) PGI responders had a score of 1 (very much improved) or 2 (much improved) by week 12 WSA scores: WSA scores improved significantly in each of the five domains (work, home, social leisure, private leisure, family) at 12 weeks from baseline	Significantly more US patients than UK patients completed the study ($p < 0.02$); US patients improved more; most calls (68%) were made outside usual office hours; patients who made the most Cope calls improved the most
Proudfoot *et al.*, (unpublished)[58]	Analysis on 11 completers only; there was clinically significant improvement in BDI scores (20.0 pre-treatment to 13.1 post-treatment) (NS); statistically significant improvement for the private leisure component of the WSA and the ASQ instruments only; all other outcomes were not statistically significant improvement	None reported
Shaw *et al.*, 1999[61]	Pilot test 1: Two patients rated themselves as much improved on some measures against contrary clinical impressions; another two rated themselves as worse yet they seemed better clinically; patients had difficulties with the rating scales; post-treatment scores are not reported Clinical improvement Marked improvement in two patients, moderate in four, slight in three and non-existent in six patients Pilot test 2: Three reduced their Total Phobia (FQ) scores, Global Phobia, agoraphobia and anxiety-depression; fear and avoidance of all triggers were reduced (range 100% down to 12.5%, mean percentage reductions: 94%, 35%, 26%)	Number of sessions did not predict outcome; seven patients completed 3–10 sessions using FF; they tended to enthuse about FF for the first few sessions but found later sessions boring as information was repeated; six patients completed only 1–2 sessions; in test 1, only four patients used FF over 12 sessions, one improved markedly, one moderately and two slightly; one improved markedly after five sessions and two improved moderately after 1–3 sessions; in pilot test 2 only three completed more than six sessions

continued

***TABLE 33* contd** *Results of reported outcomes (psychological symptoms and interpersonal and social functioning) – non-RCTs*

Study	Results					Other outcome information
White *et al.*, 2000[63]	Mean (SD) scores					Not reported
		HAD-A	**HAD-D**	**BSI-GSI**	**BSI-PST**	
	Pre-therapy (n = 26)	15.4 ± 2.19	11.51 ± 3.24	2.05 ± 0.49	45.9 ± 10.02	
	Post-therapy (n = 25)	12.56 ± 2.8	9.00 ± 3.7	1.57 ± 0.47	36.9 ± 11.5	
	6-month follow-up (n = 21)	9.19 ± 2.8	6.76 ± 2.8	1.24 ± 0.48	31.8 ± 8.7	
	Newman-Keuls tests showed significant differences on all measures between pre-therapy and follow-up and between post-therapy and follow-up ($p < 0.05$)					
		BAI		**BDI**		
	Session 1 (n = 26)	28.2 ± 12.2		22.3 ± 11.1		
	Session 2 (n = 26)	25.8 ± 11.4		19.2 ± 10.1		
	Session 3 (n = 14)	29.5 ± 10.3		22.8 ± 10		
	BDI showed significant change between session 1 and 3, no significant change was found for BAI					

TABLE 34 *Patient preferences and conclusions – RCTs*

Study	Patient preference, satisfaction and acceptability of treatment	Conclusions
Bowers *et al.*, 1993[49]	Three patients originally recruited for the study dropped out of treatment after being assigned to the CCBT group stating that they did not want to be involved in treatment with a computer	Only patients in the TCBT group improved; CCBT was no better than TAU
Ghosh *et al.*, 1988[51]	The psychiatrist was rated as more tolerant, understanding and reliable than the computer or book ($p < 0.01$); attitudes towards treatment did not vary between groups	All three groups improved although the computer group had most time with therapist
Grime (dissertation), 2001[52]	BTB was considered acceptable to most participants; however, one-third of those randomised to BTB did not complete all eight sessions of the programme; there was low participation in this study with the BTB being much less popular than counselling	This sample was not necessarily clinically depressed and the main outcome measure for the study was absenteeism; although the BTB group had significant improvement on some scores at the end of treatment and 1 month later these were NS at 3 and 6 months
Jones *et al.*, (unpublished)[53]	47% of patients from the computer and printed Stresspac groups felt that participation in the study had made things better; no difference between the two groups; two people in the computer group thought it made things worse; more in printed Stresspac group (62%) felt they had fewer days off work or days unable to cope after the intervention than computer (33%) or control (8%) groups ($p = 0.02$)	Stresspac written material appeared more effective than computer-based therapy; there were considerable problems with trial design and implementation
Klein & Richards, 2001[54]	Not reported	There were significant reductions in all outcome measures except anxiety sensitivity and depressive affect; this study had a very short follow-up period
Marks *et al.*, (unpublished)[55]	FF patients tended to be more satisfied than relaxation patients and rating of treatment helpfulness did not differ significantly between groups; relaxation had very few drop-outs; patients in FF were less likely to attend all six treatment sessions than those in clinician-therapy group (CBT) group	Both the CBT group and FF group improved more than those in the relaxation group and the CBT group spent 73% more time with the clinician
Newman *et al.*, 1997[56]	Univariate analysis detected no differences between the two treatments in level of post-treatment satisfaction	At the end of treatment TCBT was superior to CCBT on some measures; however, there were no differences at follow-up
Proudfoot *et al.*, (in press)[59]	Not reported	35% of patients dropped out of the BTB group; however, those patients who remained in the BTB group had significant improvement at the end of treatment and maintained this at the end of the 6-month follow-up
Selmi *et al.*, 1990[60]	More patients in the TCBT group than in the CCBT group indicated that they had been exposed to techniques for defining and solving everyday problems ($p < 0.01$) and more TCBT patients than CCBT patients perceived therapist understanding ($p < 0.05$); more TCBT than CCBT patients said they had learned methods for dealing with people ($p < 0.05$)	Both treatment groups improved significantly more than the control group
Smith *et al.*, 1997[62]	Not reported	All groups showed significant improvement
Wright *et al.*, (poster), 2001[64]	Not reported	Both the TCBT and the CCBT groups showed significant improvement from baseline and the CCBT group used significantly less therapist time

TABLE 35 *Patient preferences and conclusions – non-RCTs*

Study	Patient preference, satisfaction and acceptability of treatment	Conclusions
Carr *et al.*, 1988[50]	Attitudes were not assessed in detail but no patients expressed regret at receiving the computer treatment and none subsequently requested treatment from a therapist	Both treatments were effective but the therapist group did significantly better on the clinician scales
Osgood-Hynes *et al.*, 1998[57]	A patient satisfaction scale was filled out by the 28 completers; overall patients felt comfortable with the system, found it easy to use and found the booklets helpful; 21 (75%) of the 28 felt that Cope had improved the quality of their lives	There was a significant improvement in patients using the Cope system although there was no comparison group; 68% of calls were made outside office hours
Proudfoot *et al.*, (unpublished)[58]	91% of completing patients liked the multi-media features; 82% found BTB compared as well if not better than other forms of previous treatment they had had for anxiety and depression	This was a preliminary study with a small sample size using an accelerated method of delivery; there was an improvement in depression and attributional style and private leisure but the length of follow-up is not reported
Shaw *et al.*, 1999[61]	Pilot test 1: 11 of 15 patients completed a satisfaction questionnaire; of the 11, seven rated FF as very or moderately successful at helping them reduce their phobia; ten found FF very or fairly easy to use; seven felt FF would be better used together with human instructed individual or group exposure therapy and six would have liked to be in touch with other FF users Pilot test 2: Three satisfaction questionnaires were available from patients who had improved; all rated FF as either very or moderately successful in reducing their phobias	Completion rates for this study were low; the outcome measures were not reported in pilot test 1 due to difficulties with patient reporting and completion
White *et al.*, 2001[63]	At the end of session 1, all patients reported that they 'got on well'; when compared with a popular anxiety management evening class 44% said they would prefer the computer, 44% said they would accept either and the remaining 12% said they would prefer the class; 83% would recommend the computer approach to relatives and friends	The process measures (BAI and BDI) did not show improvement but HAD-A and HAD-D, BSI-GSI and BSI-PST outcome measures did show improvement

Appendix 4

Additional notes on economic analysis

Modelling the cost of a clinic setting for CCBT

- It is not possible at present to calculate the cost of a clinic that would accommodate more than one computer.
- The cost model presented earlier, which modelled FearFighter in the clinic setting, was based on the assumption that only one computer was used.
- The information provided by the authors of the FearFighter submission suggests that the clinic could accommodate more than one computer.
- Four computers are accommodated in the self-help stress clinic for anxiety and depression, but it is not stated which packages are used and so it is impossible to calculate a cost.
- There is insufficient evidence on the most effective way to organise a clinic, for example, which packages to provide and on how many computers.
- Different packages are also designed for different patient groups.
- There is a mix of evidence and opinion on whether patients would require a dedicated private space in which to use the computer. This makes it impossible to calculate the overhead costs of the accommodation required.
- In order to calculate the cost of a clinic setting, the set-up arrangements need to be known (i.e. which packages would be provided and how many computers there would be). Until this is decided, it is not possible to cost.
- The cost model of the stress clinic in the report assumed that one computer was provided and used the FearFighter package.
- It is possible to make some tentative suggestions about the costs of a clinic with multiple computers, in terms of the various resource categories.

Staff

- Accommodating more than one computer would not necessarily mean savings in staff costs as the amount of staff time needed by each package will not change, hence no economies of scale would arise.
- The data given by Marks regarding staff time is concerned with the clinic operating as a call centre, with an hour of staff time needed over the total treatment episode per patient (Toole S, ST Solutions, personal communication, January 2002). This time is much less than the time required in the other submissions. Much more evidence would be required to verify this before it can be used to allocate costs.
- The number of staff needed is also dependent upon the number of computers in the clinic and the number of patients expected to attend.

Training

- If there was more than one computer providing the same package, then staff would only need to be trained once for this package. If different packages were accommodated, they would need to be trained for each of them.

Licence

- The licence fees given for the packages are per computer, hence no economies of scale for multiple computers would exist.
- There has been a suggestion that a central licence fee for the NHS could be purchased, but there is no cost given.

IT support

- This cost is given in the submissions as the cost per machine, hence no savings would be made as the number of computers increased.

Overheads

- These are not known until the set-up design of the clinic is established (i.e. which packages are to be provided, how many computers are needed, how much space is required to accommodate them and whether they need to be accommodated in private rooms).

Economies of scale

- It has been suggested that economies of scale may be present with a clinic setting. It is not

possible to establish this without calculating the costs of the clinic. The information provided by Marks is largely related to the self-help clinic operating as a call centre and there are no effectiveness data on this to support the suggested costs.

Number of patients treated and number of clinics required

- This would depend entirely upon the set-up arrangements of the clinics (i.e. which packages are provided and on how many computers), as each computer package is for a different patient group and will treat different numbers of patients.

Additional information on clinic setting and GP setting for treatment with CCBT

As there is insufficient information about the set-up of a clinic, in terms of effectiveness and cost, it is extremely difficult to perform any calculations concerning the cost to the UK and the potential number of patients who could receive treatment.

In order to make a very rough estimate, prevalence figures for anxiety, depression, panic and phobias were obtained* and used to calculate how many clinics would be required to treat these numbers.

The best prevalence figures that were available were from 1995 and the population data contain estimates for mid-2000.† Therefore, the following crude estimates must be viewed with extreme caution.

As each package is designed for a different group of patients, calculations have been undertaken for each package separately.

FearFighter was the only submission to contain any information on the set-up of a clinic and what this would involve. As in the previous modelling work, settings have been modelled on the basis of one computer per setting, as there is insufficient information on the costs of more than one computer accommodated within one clinic to be able to estimate the cost of multiple computer of set-up. It is important to bear this in mind when looking at the results.

Methods

For each package, the prevalence rate of the illness that the package is designed for was multiplied by the population estimates for England and Wales in order to give estimates of the total number of patients. These estimates were then divided by the maximum number of patients that could be treated by each package per year, in order to give an estimate of the number of computers that would be required.

The cost of implementing these computer packages is then calculated using the data from the cost modelling exercise in the report. The costs are the cost in the first year, and then the costs in subsequent years.

Beating the Blues is abbreviated to BTB1 for treatment with the support of a practice nurse and BTB2 for treatment with an assistant psychologist (*Tables 36–38*).

Results

(*Tables 36–38*)

Discussion

These figures are extremely rough estimates as there were very limited data that could be used. The data from the previous cost modelling have also been used in the calculations and there is a high degree of uncertainty around these data too.

From the calculations, Beating the Blues would have to be installed on two separate dedicated computers in each GP surgery in England in order to treat everybody. This is clearly not feasible. It is impossible to draw any sound conclusions, as the evidence is too sketchy.

The main advantage of a clinic setting appears to be that more than one computer can be accommodated there, although it is hard to see if there will be any substantial cost savings arising from this arrangement, because the main cost difference would be overheads and training.

If a combination of packages was provided in the clinic, then the training cost would not be reduced, as staff would have to train for all packages. Only if there were multiple machines

* The prevalence of psychiatric morbidity among adults living in private households (Melter *et al.*, 1995; OPCS).

† http://www.statistics.gov.uk/popest_mid00.asp/

TABLE 36 *Estimates used in calculations*

Package	BTB1	BTB2	Stresspac	FF
Illness	Anxiety and depression	Anxiety and depression	Anxiety	Phobia/panic
Setting	GP	GP	GP	Clinic
Cost year 1	£25,192	£21,691	£18,901	£22,574
Cost in subs. years	£15,192	£11,691	£17,351	£12,574
Maximum no. of patients per annum	187	187	750	187
Prevalence rate: England	0.077	0.077	0.031	0.02
Prevalence rate: Wales	0.07	0.07	0.04	0.01
Population England	49,997,100	49,997,100	49,997,100	49,997,100
Population Wales	2,946,200	2,946,200	2,946,200	2,946,200
Prevalence: England	3,849,777	3,849,777	1,549,910	999,942
Prevalence: Wales	206,234	206,234	117,848	29,462

TABLE 37 *Prevalence and estimated maximum patient numbers*

Package	Illness	Prevalence England	Prevalence Wales	Maximum no. of patients per annum	Centres that would be needed: England	Centres that would be needed: Wales
BTB1	Anxiety and depression	3,849,777	206,234	187	**20,587**	**1,103**
BTB2	Anxiety and depression	3,849,777	206,234	187	**20,587**	**1,103**
Stresspac	Anxiety	1,549,910	117,848	750	**2,067**	**157**
FF	Phobia/panic	999,942	29,462	187	**5,347**	**158**

TABLE 38 *Estimated costs in England and Wales*

	England	Wales
Number of GP practices	10,925	520
Cost BTB1	£518,628,741	£27,783,139
Cost BTB1 (year 2)	£312,758,330	£16,754,583
Cost BTB2	£446,553,510	£23,922,041
Cost BTB2 (year 2)	£240,683,098	£12,893,485
Cost Stresspac	£39,059,801	£2,969,927
Cost Stresspac (year 2)	£35,856,654	£2,726,374
Cost FF	£120,709,576	£3,556,552
Cost FF (year 2)	£67,236,742	£1,981,044

running the same packages would any savings arise from training costs. Given that the estimate of training costs is small (£268 per annum), this is unlikely to have any significant impact.

There is an issue with privacy. Although the suggestion from the FearFighter package is that patients do not object to others being in the same room as them when they are using the computers, the impression from other submissions is that patients prefer privacy. These issues would have to be addressed when considering the set-up of a clinic.

As stated previously, there is not enough evidence to estimate the cost of a clinic setting with multiple machines.

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