

Appendix 1



Review of PTSD Programs: International literature review of evidence-based best practice treatments for PTSD

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Table of Abbreviations

Abbreviations:	Meaning:
ACT	Acceptance and Commitment Therapy
ADF	Australian Defence Force
ASD	Acute Stress Disorder
BA	Behavioural Activation
CBT	Cognitive Behavioural Therapy
CPT	Cognitive Processing Therapy
CPT-C	CPT with Cognitive Component Only
DBT	Dialectical Behaviour Therapy
DT	Distress Tolerance
DVA	Department of Veterans Affairs
EMDR	Eye Movement Desensitization and Reprocessing Therapy
FST	Family Systems Therapy
GCBT	Group CBT
IE	Imaginal Exposure
IE	Imaginal Exposure
IE+IR	Imaginal Exposure plus Imagery Rescripting
IE+IVE	Imaginal Exposure + In Vivo Exposure
IE+IVE+CR	Exposure Combined with Cognitive Restructuring
IES-R	Questionnaire with subscales measuring intrusion, avoidance and hyperarousal symptoms.
IRT	Imagery Rehearsal Therapy
ITT	Intention to Treat
IVE	In Vivo Exposure
M-CET	Multiple Channel Exposure Therapy
NHS	National Health Service (UK Health System)
NICE	National Institute for Clinical Excellence
PCT	Present Centred Therapy
PE	Prolonged Exposure
PE+CR	PE with Cognitive Restructuring
PTSD	Post-traumatic Stress Disorder
PTSD Dom	PTSD Domiciliary
R	Relaxation
RCTs	Randomised Controlled Trials
RESPECT-Mil	Re-Engineering Systems of Primary Care for PTSD and Depression in the Military
SC	Supportive Counselling
SIT	Stress Inoculation Therapy

Abbreviations:	Meaning:
SMD	Standardised Mean Difference Effect Size
SS	Seeking Safety
SSRIs	Selective Serotonin Reuptake Inhibitors
ST the I	Supportive Therapy
SUD	Substance Use Disorder
TAU	Treatment as Usual
TF-CBT	Trauma Focused Cognitive Behavioural Therapy
TLDP	Time Limited Psychodynamic Therapy
VAC	Veteran Affairs Canada
VR	Virtual Reality
VRE	Virtual Reality Exposure
VRE-AC	Virtual Reality Exposure with Arousal Control
VVCS	Veterans and Veterans Families Counselling Service
WA	Written Accounts
WHE	Women's Health Education
WL	Waiting List
WTRP	Women's Trauma Recovery Program

Executive summary

This paper is a review of international literature on evidence-based best practice treatment of post-traumatic stress disorder (PTSD) published since the *Australian Guidelines for the Treatment of Adults and Acute Stress Disorder and Posttraumatic Stress Disorder 2007* [1].

The relevant electronic databases were searched for systematic reviews, meta-analyses and randomised controlled trials on effectiveness of therapies for PTSD. For the “grey literature” search, the Australian, Canadian and US Veteran Affairs and Defence Force websites and Google Scholar were searched.

This review includes evaluation of 20 systematic reviews and meta-analyses, 34 randomised controlled trials (RCTs) on the effectiveness of therapies for PTSD, 19 RCTs addressing the issues raised by the Dunt review and numerous electronic and “grey literature” sources on Australian and overseas models of treatment of PTSD in veterans.

Based on the review of all treatment modalities, the Australian Guidelines made the following general recommendations regarding treatment of PTSD in adult populations:

- Trauma-focused psychological therapy (cognitive behavioural therapy or eye movement desensitization and reprocessing in addition to in vivo exposure) should be used as the most effective treatment for Acute Stress Disorder (ASD) and PTSD.
- Where medication is required for the treatment of PTSD in adults, selective serotonin re-uptake inhibitor antidepressants should be the first choice.
- Medication should not be used in preference to trauma-focused psychological therapy.
- In the immediate aftermath of trauma, practitioners should adopt a position of watchful waiting and provide psychological first aid.

The most exhaustive systematic review of psychotherapies for PTSD published since the Australian Guidelines, the Cloitre review [2], confirmed strong evidence for the effectiveness of exposure therapy, cognitive therapy and cognitive restructuring, delivered one-on-one. To facilitate the comparison of treatment effectiveness, the review assigned an ordinal rank to effect sizes on a scale of 1 to 10 and presented the effectiveness of PTSD therapies in a form of league table of ranked effect sizes of PTSD symptom changes from baseline to post-treatment.

Table 1. Effect Size Rank Information for PTSD Symptom Changes by Type of Treatment

Type of treatment	Number of studies	Mean ES rank	ES Rank Range
Exposure therapy	18	7.94 (1.66)	5-10
Exposure + cognitive therapy	14	8.04 (2.09)	3-10
cognitive therapy/cognitive restructuring	6	8.83 (1.17)	7-10
EMDR	9	5.89 (2.65)	4-10
Problem-centred therapy	3	5.67 (2.08)	4-8
Supportive counselling	5	5.00 (2.12)	2-7
Treatment as usual	3	5.00 (2.64)	3-8

EMDR=eye movement desensitization and reprocessing therapy

This league table is in agreement with ranking of therapies performed by Mendes [3] by direct side-by-side comparison of therapies (see section 3.1.3.2)

The Cloitre review noted that several innovative approaches under development utilize advances in technology (e.g., internet) that may be appealing as they provide greater privacy/confidentiality and more flexibility for the traumatized individual regarding when, where, and how often they are used.

In summary, new systematic reviews, meta-analyses and RCTs have drawn conclusions consistent with those outlined in the Australian Guidelines. Some additional evidence was added in support of technology based interventions.

There is very little published information on the on the engagement in treatment of younger veterans and currently serving ADF members. The prevalence of PTSD in Gulf War Veterans assessed at 10–15 years after deployment was 5.4%. Many of those who required treatment did not receive it. The most common barriers to treatment included limited access to mental health professionals, living in remote or underserved areas, economic and time constraints, stigma associated with mental illness, privacy/confidentiality issues and lack of confidence with mental health professionals. Up to 20% of those who had sought mental health care were dissatisfied.

The key indicators and factors that contribute to treatment effectiveness are related to disease severity and presentation, treatment effectiveness and psycho-social condition of the person undergoing treatment. Treatment of military veterans with combat-related PTSD may be particularly challenging. Military culture and training designed to produce effective combatants may promote emotional shut-down, which, together with very common high levels of anger, may interfere with treatment by impairing the development of therapeutic alliance and engaging with trauma-related fear during exposure treatments. These may prevent habituation to fear, which inhibits self-reflection and leads to premature termination of treatment.

The Australian Guidelines recommend trauma-focused psychological therapy, delivered during 90-minute sessions, as the best evidence treatment for PTSD. This type of treatment can be easily delivered in a community setting, given the availability of suitably trained therapists. Department of Veteran Affairs (DVA) and Veterans and Veterans Families Counselling Service (VVCS) operate outreach programs, which provide counselling and support services to Veterans living in rural or remote areas. In the 2003/4, there were approximately 320 DVA-contracted outreach program counsellors. They provided almost 40,000 counselling sessions, while VVCS Outreach provided over 20,000 counselling sessions. Counselling services may be also accessed via Medicare and refunded by DVA. Additionally, Veterans and their families who live in some parts of NSW and WA can access one-to-one counselling services via video conferencing with qualified VVCS staff. There is no information whether this level of services is adequate to the demand for the services. Information about the adherence of therapists to the best evidence treatment standards and waiting period between referral and commencement of therapy is not available. Similarly, there is no information available on treatment outcomes resulting from these services.

Additionally, DVA funds PTSD programs which provide group therapy, mostly in day hospital or residential settings. The Australian Guidelines recommend that group CBT may be provided as adjunctive to, but should not be considered an alternative to individual therapy. Recently, there is limited evidence from two studies indicating that group CBT and group exposure, if modified to the group conditions, may be an effective treatment of PTSD. There is no evidence that inpatient or

residential treatment is more beneficial than outpatient treatment, but there is some evidence that matching of patient symptom severity to the intensity of the program may be beneficial.

The treatment outcomes from PTSD programs appear to be more modest than those achieved by the best practice individual treatments. Additionally, post-treatment improvements for the younger generation of veterans appear to be even lower than for Vietnam veterans.

Table 2. Post-treatment improvement effect sizes for Peacekeepers and Vietnam veterans

Measure	Effect Size (Cohen's d) intake to 3 months	
	Peacekeepers	Vietnam veterans
PCL	0.5	0.7
HADS – Anxiety	0.5	0.6
HADS – Depression	0.3	0.5
AUDIT	0.2	0.3
War Stress Inventory (Anger)	0.3	0.5

There is no conclusive evidence indicating whether the modest improvement outcomes of PTSD programs are result of the lower effectiveness of the interventions offered by these facilities or the difficulties of achieving good treatment outcomes in the veteran population.

There are several international models of PTSD treatment in military veterans. In the UK, veterans' healthcare is primarily the responsibility of the NHS, with only one non-government charity organisation, Combat Stress, providing specialised mental health treatment for veterans. Recently, the Ministry of Defence started to develop a partnership with Combat Stress and NHS aimed at strengthening provision of future services in areas with a high proportion of Veterans.

The US model of PTSD treatment appears to offer a wide range of residential treatments with stays up to three months and numerous Specialised Outpatient PTSD Programs, which provide group and one-to-one treatment. It is difficult to say whether treatment of PTSD relies more heavily on residential or outpatient programs without having accurate statistics on the relative proportion of veterans receiving these treatments.

The Canadian model appears to rely more on the outpatient treatments, with only one civilian clinic offering hospital type treatments, catering to both military and civilian patients.

It appears that the Australian model is more similar to the US model than to the Canadian one, relying more heavily on day hospital programs than on outpatient or community settings for treatment. However, the conclusive comparison of the Australian model of PTSD treatment with models used in other countries is difficult without accurate health utilisation statistics.

In summary, if DVA moves towards purchasing more of specialist treatment for veterans with PTSD and other mental health conditions from a broad range of community based providers, ideally quality assurance processes which regulate types of therapy provided, the length of session and the fee structure, should be in place.

1. Introduction

The aim of this paper is to conduct an international literature review of evidence-based best practice treatment of post-traumatic stress disorder (PTSD) with specific reference to the *Australian Guidelines for the Treatment of Adults with Acute Stress Disorder and Posttraumatic Stress Disorder 2007*.

National Clinical Practice Guidelines 2005 “The management of PTSD in adults and children in primary and secondary care” [4] published by National Institute for Clinical Excellence (NICE) and “Australian Guidelines for the Treatment of Adults with Acute Stress Disorder and Posttraumatic Stress Disorder” [1] published by Australian Centre for Posttraumatic Mental Health in 2007 provided the most comprehensive reviews of major treatment programs up to 2005. Therefore, this review provides an update of studies published since, showing how they relate back to conclusions and recommendations contained in these Guidelines.

To review major PTSD treatment programs that have been put in place in Australia and other western countries, this literature review extends beyond a traditional systematic review methodology to encompass an extensive review of the “grey literature”(papers, reports, technical notes or other documents produced and published by governmental agencies, academic institutions and other groups that are not distributed or indexed by commercial publishers but are available on internet) and unpublished, closed access literature.

Additionally, this review addressed the following issues, including those raised by Professor Dunt in his Review of Mental Health Care in the ADF and Transition through Discharge [5]:

- the engagement in treatment of current and former serving members of the Australian Defence Force who have served in peace keeping/peacemaking missions since 1975 (i.e. the specific needs of younger veterans, including relevant gender issues;
- key indicators and factors that contribute to treatment effectiveness;
- community based treatment options and community integration post treatment;
- challenging nature of treatment;
- access to specialist treatment services in rural and remote regions;
- sustainability;
- evidence-based best practice treatment model(s).

2. Methods

2.1. Search

The search of electronic databases Medline, PILOTS, EMBASE, PsycInfo, Sociological abstracts, CINAHL, Cochrane Collaboration Library and the Cochrane Controlled Trials Register was constructed based on the “PICO” (Population, Intervention, Comparison, Outcome) principles. Databases were searched for articles on effectiveness of therapies (Intervention) for posttraumatic stress disorder (Population), comparing these interventions with “no treatment” or another treatment (Comparison) and investigating clinical outcomes (Outcome). The searches were performed using the keywords and MESH terms for two search strings: PTSD (PTSD, posttraumatic stress disorder, acute stress disorder, Stress Disorders, Post-Traumatic), therapy (therap*, intervention*, counsel*, debrief*, treatment*) and the methodological filter for randomised clinical trials, meta-analyses and

systematic reviews. The keywords were adjusted as needed for each database. The searches were restricted to English language, articles published after 2005 and adult human population. The database searches were performed in September 2010. The Comparison and Outcome parts of the PICO were applied in inclusion/exclusion criteria. Additional papers were recovered by examination of reference lists of relevant review articles and by following published research results of the most prominent authors.

To be included, studies had to fulfil the following criteria:

- systematic reviews, meta-analyses, or individual trials with RCT design.
- report clinical outcomes
- treatment was compared with no treatment or face-to-face treatment
- investigated adult population (18-65 years) with PTSD or acute stress disorder
- no methodological filters were applied to emerging treatments and study designs comparing treatment groups without random assignment were included.

The following studies were excluded:

- those that did not fulfil inclusion criteria
- technical, general, or discussion articles
- case studies
- duplications of previous research

For issues raised by the Dunt review, the searches utilised keywords for PTSD and veterans in articles published since 1992.

Results of combined searches were downloaded to an EndNote library. Duplicates were removed. Inclusion and exclusion criteria were applied successively at the title, abstract and full text level.

For the “grey literature” search, the Australian, Canadian and US Veteran Affairs and Defence Force websites and Google Scholar were searched for relevant information.

2.2. The structure of the present review

The first part of this review is an updated international literature review of published, evidence-based treatments of PTSD.

The Australian Guidelines for the Treatment of Adults with Acute Stress Disorder and Posttraumatic Stress Disorder [6], further in the text referred to as “the Australian Guidelines”, provide a systematic review and meta-analysis of best evidence treatments, which included studies analysed by the NICE assessment [4], studies published in the following year (2004-2005) and some treatments not reviewed by NICE.

The treatment recommendations in the Australian Guidelines were based on the highest level of available evidence, with the highest rank coming from systematic reviews or meta-analyses of randomised controlled trials, followed by individual randomized controlled trials and then by non-randomised controlled trials/cohort studies. When the minimum required level of evidence was not available, recommendations were based on consensus expert opinion of leading Australian traumatic stress specialists, in further text called “expert opinion”.

The first part of this review has the following structure. Interventions are divided into broad groups, similar to those in the Australian Guidelines. In each group, information is presented in the three-tiered order. Firstly, the outcomes of the analysis of interventions from the Australian Guidelines are briefly summarised and their key practice recommendations are presented. The second tier consists of summaries of the main systematic reviews and meta-analyses which contain publications more recent than those in the Australian Guidelines. Twenty systematic reviews and meta-analyses are included in this part. The third tier consists of individual studies so recent that they were not included in any of the systematic reviews. There are 34 randomised controlled trials found by an electronic search included in this part.

Two categories of studies are fully referenced in this review: those that were found by the searches performed for the present review published since 2005 and all studies on veterans, regardless of the date of publication. Some relevant references from systematic reviews, mainly RCTs published before 2005 and studies that did not meet the required standard of evidence (case studies, open label, not comparative) are marked by the name of the author and date of publication and can be found in these systematic reviews.

The second part of this review addresses the issues raised by Professor Dunt in his “Review of Mental Health Care in the ADF and Transition through Discharge”. The content is also based on the published literature. The references were found by performing additional searches with keywords including terms such as prevalence, risk factors, barriers to care, community treatment, etc and by following information and references found in reviews. There are 19 studies included in this section.

The third part of the review, which describes Australian, US and Canadian Veteran Affairs (VA) sponsored programs of PTSD treatment, is based on grey literature and on information gathered from the internet by following links from various national VA websites.

2.3. Outcomes compared

In the Australian Guidelines, the effectiveness of individual treatments was compared by using standardised mean difference effect size (SMD), in this case Hedges’ g , which is computed by subtracting mean scores between any two comparison groups involved and dividing by the weighted pooled standard deviation of these groups, and then adjusting the result for sample size. Effect sizes for individual studies were then combined into a meta-analysis, where each effect was weighted by the inverse of that study’s variance. Other reviews and individual studies may use other standardised mean difference effect size, most notably Cohen’s d .

3. Results

Since publishing the Australian Guidelines, many systematic reviews and meta-analyses assessing interventions for PTSD have been published. The list of these publications is presented in Table 3 below.

Table 3. List of meta-analyses on PTSD treatment published since 2007

Review	Treatment	Time of search	Number of studies, populations and conclusions
Psychological interventions			
Cloitre 2009 [2]	Various	June 2008	56 studies, 13 published between 2006 and 2008.
Powers 2010 [7]	PE compared with waitlist, psychological placebo and each others	March 2009	13 studies, 3 unpublished, 1 published after 2005. All published studies were also included in Cloitre's review. Psychological placebo included: supportive counselling, relaxation, Present Centred Therapy, Time Limited Psychodynamic Therapy, treatment as usual.
Mendes 2008 [3]	CBT compared with other EMDR, ET, CT, SC	2005	23 clinical trials. Comparisons made side by side and to waitlist, ranking calculated from many arms with using random effect model. Effectiveness rank was: CBT=ET=CT>EMDR>supportive.
Benish 2008 [8]	Various, compared with each other	Not clear. None older than 2005	17 studies, only side by side, compared individually. Concluded that bona fide interventions are equally effective.
Bisson 2007 [9] Cochrane and BJP	Various	2004	Trauma focused CBT and EMDR had the best evidence of effectiveness, stress management had limited evidence BJP data is the same as in Cochrane review, was done in preparation for NICE assessment
Albright 2010 [10]	EMDR for combat veterans	April 2008	EMDR for combat veterans is as effective as underlying therapies without eye movement
Taylor 2009 [11]	Various, mostly CBT, for rape victims only	April 2007	8 studies that compared 14 treatments (CB, n=12; EMDR, n=1; SC, n=1) with waitlist group. RCT design of study was not required for the inclusion. Treatment was effective with effect sizes were in the large range ($g = .91$)
Taylor 2010 [12]	Various, mostly CBT, for adults sexually abused as children only	2009	19 studies, treatments compared with control group. RCT design of study was not required for the inclusion. 3 update studies were not RCTs. For most outcome domains, overall effect sizes were consistently moderate range; for PTSD or trauma symptoms ($g = 0.72-0.77$).
Early interventions			
Roberts 2010 Cochrane [13]	Various, to treat ASD	Aug-Sep 2008	15 studies and 2 follow up studies TF-CBT had the best evidence, cognitive restructuring without exposure had weaker evidence. Evidence was good for populations with full diagnostic criteria for ASD or acute PTSD, but bias was not excluded.
Roberts 2010 Cochrane [14]	Various, to prevent PTSD	Aug-Sep 2008	10 studies (population included individuals without symptoms). None of these interventions prevented PTSD
Roberts 2009 AJP [15]	Various, to prevent and treat PTSD	July 2007	This is summary of the two above Cochrane reviews. 25 studies, all of which were analysed previously in two above Cochrane reviews.
Kornor 2008 [16]	To prevent PTSD, Only direct comparison of TF-CBT with SC		7 studies, 5 RCT with 2 FU, 274 patients, Very weak evidence of benefit of TF-CBT over supportive counselling for individuals with an initial ASD diagnosis. All of these studies were included in the Roberts 2010 [14].

Review	Treatment	Time of search	Number of studies, populations and conclusions
Pharmacological interventions			
Berger 2009 [17]	Various	October 2008	Option other than SSRI: not enough evidence to change recommendations in the Australian Guidelines
Stein 2006 Cochrane [18]	Various. Included in the Australian guidelines	August 2005	Medication superior to placebo in reducing the severity of PTSD, co-morbid depression and disability, but less well tolerated. Three maintenance trials suggested that long term medication may be required.
Combined interventions			
Hetrick 2010 [19] Cochrane	Pharmacological and psychological vs. monotherapy	June 2010	Insufficient evidence for benefits and risks of combined pharmacotherapy and psychotherapy for PTSD compared with either modality alone.
Innovative interventions			
Cukor 2009 [20]	Emerging, novelty, Various	Not clear. Contains papers from 2008	Review of emerging therapies (i.e. virtual, pharmacotherapy, alternative, internet) was based on mostly preliminary studies.
Lawrence 2010 [21] Cochrane	Exercise Sport	June 2008	Found 6 studies, all were excluded. No evidence so far.
Veteran population			
Steward 2009 [22]	Various pharmacological and psychological	Not clear. Contains papers from 2008	Suggests that in some populations pharmacological approach may be more effective, but not enough evidence for definitive conclusions.
Albright 2010 [10]	EMDR for combat veterans	April 2008	EMDR for combat veterans is as effective as underlying therapies without eye movement.
Vitzhum 2009 [23]	What treatments are used in Military & peacekeepers	No search, narrative review	Not a systematic review, no formal appraisal of treatment, but population exclusively military and peacekeepers.

3.1. Psychological interventions

3.1.1. Australian Guidelines

3.1.1.1. Trauma- focused psychological interventions

Overall, the findings of more than 30 well controlled studies indicate that trauma-focused Cognitive Behavioural Therapy (CBT), as well as Eye Movement Desensitization and Reprocessing therapy (EMDR) in addition to in vivo exposure, are the treatments of choice for PTSD.

These treatments were found to be effective, not only in the treatment of PTSD symptoms, but also of co-morbid anxiety and depression, as well as achieving improvements in broader quality of life. Effect sizes were generally in the large range (SMDs ranging from 0.76 to 1.20). The effect sizes in this range reflect clinically important improvements.

The findings of additional studies in the Australian Guidelines were largely consistent with the studies identified in the NICE review; thus, the recommendations were also largely consistent with those outlined in the NICE guidelines. However, the Australian Guidelines recommended that in vivo exposure was included explicitly when using EMDR, with the assumption that it is already considered an integral part of trauma-focused CBT.

3.1.1.2. Non-trauma- focused psychological interventions

Anxiety management (AM) and stress inoculation training (SIT) were superior to no treatment in achieving large gains in PTSD symptoms, as well as moderate gains in co-morbid anxiety and depression, but were not as effective as trauma-focused CBT or EMDR in vivo exposure.

Although not as effective as trauma-focused CBT or EMDR when used in isolation, elements of AM and SIT, such as controlled breathing and other coping and symptom management techniques, may be included as part of trauma-focused intervention protocols.

Psycho-education was inferior to trauma-focused exposure-based interventions. However, elements of psycho-education are regularly included as components of trauma-focused CBT interventions.

Brief trauma-focused psychodynamic therapy has not been sufficiently tested in controlled studies to derive practice recommendations.

Supportive counselling and hypnotherapy have not been found to be effective as stand-alone intervention when compared to trauma-focused CBT or EMDR.

3.1.1.3. Key practice recommendations

Based on the review of psychological interventions for adults with PTSD, the following general key recommendations were presented by the Australian Guidelines:

- Adults with PTSD should be provided with trauma-focused interventions (trauma-focused CBT or EMDR in addition to in vivo exposure)
- Non-trauma-focused interventions such as supportive counselling and relaxation should not be provided to adults with PTSD in preference to trauma-focused interventions
- Where symptoms have not responded to a range of trauma-focused interventions, evidence-based non-trauma-focused interventions (such as stress management) and/or pharmacotherapy should be considered
- Sessions that involve imaginal exposure generally require 90 minutes
- Following assessment, diagnosis and treatment planning, eight to 12 sessions of trauma-focused treatment is usually sufficient

3.1.2. Cloitre 2009 [2]

Cloitre presents an updated systematic review of psychotherapies for PTSD, which includes the latest literature on the subject. Altogether, there are 56 studies included in the review and 13 of these studies were published between 2006 and 2008 [24-36]. Although the review does not include an updated meta-analysis, it presents data on sample size, rates of completion and effect sizes of all individual studies.

Therapies in this review are divided into several subcategories, namely cognitive-behavioural approaches, which include mainly exposure and cognitive treatment, anxiety management and problem-solving approaches, EMDR, therapies for chronically traumatised populations and innovative treatments. These groups often overlap by including a common therapy or element of therapy.

3.1.2.1. Cognitive-behavioural approaches compared to wait list, supportive counselling and to each other

Fourteen trials published between 1999-2008 were analysed, including three that were published after 2005: Mueser et al., 2008 [24], Monson et al., 2006 [25], Duffy et al., 2007 [26].

Both exposure and cognitive therapy have demonstrated substantial efficacy against waitlist or supportive counselling. Only one small trial (Tarrier, Pilgrim, Sommerfield et al., 1999;) directly compared exposure and cognitive therapy in their pure forms, and this study revealed a very small advantage for cognitive therapy. Often, exposure and cognitive restructuring interventions are integrated into a single treatment. Such treatments are not only very effective in reducing PTSD symptoms in a variety of trauma populations when compared to waitlist or supportive counselling, but also show a small advantage of the combination over exposure alone.

3.1.2.2. Anxiety management and problem-solving approaches

The review analysed the performance of various stress management and problem-solving approaches including cognitive restructuring, relaxation, behavioural activation, supportive counselling, stress inoculation therapy, behavioural family therapy and problem-centred therapy, alone and in combination. Eight studies published between 1997-2007 were analysed; only one was published after 2005: Schnurr et al., 2007 [27].

Stress inoculation treatment, relaxation and problem-focused interventions were shown to have some benefits compared to waitlist or supportive counselling. However, these therapies have been found inferior when compared to exposure therapy, cognitive therapy, and their combination.

3.1.2.3. Eye movement desensitisation and reprocessing

The review analysed 12 studies published between 1994-2008, including two published after 2005: Hogberg et al., 2007 [28] and van der Kolk et al., 2007 [29].

There is substantial evidence indicating the efficacy of EMDR against waitlist, pill placebo, supportive counselling, relaxation or treatment as usual. In six studies comparing EMDR directly to other trauma-focused CBT, results were mixed. Three studies found an advantage for EMDR as compared to exposure alone and to exposure plus cognitive therapy. Three studies found exposure or its combination with cognitive restructuring and SIT was superior to EMDR.

3.1.2.4. Chronic exposure to trauma

The Cloitre review contains a section devoted to populations that are chronically exposed to traumatic events. These populations include refugees, victims of childhood sexual abuse and victims of chronic interpersonal violence. The review analysed 10 studies, two published after 2005: Bichescu et al., 2007 [30] and Resick et al., 2008 [31].

Studies assessing various forms of treatment for victims of repeated interpersonal violence focused on increasing emotion management and interpersonal skills. A range of treatments including cognitive and cognitive-behavioural interventions with and without exposure elements (4 studies) as well as EMDR (1 study) have been successful in producing substantial reductions in PTSD against wait-list. However, it is not clear whether these studies, selected with regard to specific population, may be generalisable to the population of veterans.

3.1.3. Other meta-analyses

3.1.3.1. Powers 2010 [7]: efficacy of prolonged exposure

Powers' meta-analysis estimated the overall efficacy of prolonged exposure (PE) as a treatment for PTSD compared to wait-list, psychological placebo and other active therapies. Thirteen randomised controlled trials studies with a total sample size of 675 participants were included. Three studies were unpublished. All ten published studies from this review were also included in Cloitre's review.

Treatments were classified as PE if they included multiple sessions of imaginal and in vivo exposure and were based on the manualised treatment developed by Foa et al, 1991. Treatments categorised as psychological placebo included supportive counselling (SC), relaxation (R), present centred therapy (PCT), time limited psychodynamic therapy (TLDP) and treatment as usual (TAU).

Psychological placebo was the control condition in six studies, wait-list in five and two studies included both. Six studies with 262 participants compared PE directly with other active treatments such as EMDR, Cognitive Processing Therapy (CPT), Cognitive Therapy (CT), and SIT. Seven studies with 348 participants performed follow-up assessments that ranged between one and 12 months.

Compared with all control conditions at post-treatment, PE performed better and showed large effects on PTSD symptoms (Hedges's g of 1.08) and on secondary outcome measures e.g. depression ($g=0.77$). Effect size was very large when PE was compared with waitlist ($g=1.51$) and moderate when PE was compared to psychological placebo ($g=0.65$), indicating a beneficial effect of treatments used as psychological placebo.

When post-treatment effects of PE were compared side by side with other active treatments (CPT in one study, EMDR in three studies and SIT in two studies), there were no significant differences between these treatments. However, the question of the relative effectiveness of PE compared to other active psychological treatments for PTSD cannot be definitively answered based on these analyses as there were an insufficient number of eligible studies to obtain a stable estimate of these effect sizes.

At follow up, PE outperformed the control conditions with moderate effect sizes for primary and secondary outcome measures (Hedges's $g=0.68$ and 0.41 , respectively).

Effect sizes were not affected by time since trauma, publication year, dose, study quality, or type of trauma. The average PE-treated patient fared better than 86% of patients in control conditions at post-treatment on PTSD measures.

The review concluded that PE is a highly effective treatment for PTSD, resulting in substantial treatment gains that are maintained over time. Large effect sizes support the status of PE as the first line treatment-of-choice for PTSD.

3.1.3.2. Mendes 2008 [3]: efficacy of CBT in side by side comparisons

Although this review does not contain any trials published after 2005 and cannot be regarded as an update on the Australian Guidelines, the short summary of its findings is included because it specifically conduct systematic review on the efficacy of CBT in comparison with studies that used other psychotherapy techniques. The review included 23 randomised clinical trials with 1,923 patients.

The following meta-analyses were performed:

- CBT vs. exposure therapy, n=5
- CBT vs. cognitive therapies n=2
- CBT vs. EMDR, n= 2
- CBT vs. supportive psychotherapies (relaxation, counselling, and psychoeducation), n=6

CBT was comparable to Exposure Therapy (ET) (RR = 0.90; 95% CI: 0.58; 1.40; p = 0.64), and cognitive therapy (CT) (RR = 1.01; 95% CI: 0.67; 1.51; p = 0.98) in terms of efficacy and compliance.

CBT had better remission rates than EMDR (RR = 0.35; 95%CI: 0.16-0.79) and supportive therapies (RR = 0.43; 95%CI: 0.25-0.74, completer analysis).

The review concluded that therapies such as CBT, exposure therapy and cognitive therapy are equally effective, and more effective than EMDR and supportive techniques in the treatment of PTSD (ranking: CBT=ET=CT>EMDR>supportive) (“supportive” = relaxation, counselling, and psycho-education).

3.1.3.3. Benish 2008 [8]: Efficacy of psychotherapies in side by side comparisons

This meta-analysis includes 17 studies, published between 1989 and 2005. Although there are no new studies compared to the Australian Guidelines, this meta-analysis is important because it represents a different and controversial hypothesis that all bona-fide psychotherapies for PTSD are of equal value. An important aspect of this meta-analysis is that:

- it included only direct side by side comparisons of psychotherapies, on individual basis
- the “other therapies” were disaggregated as follows:
 - only those that were intended to be therapeutic were included, and
 - those that were not intended to be therapeutic were excluded

The final conclusions of Benish meta-analysis were:

- there are not great differences between bona fide psychotherapies for PTSD
- the conclusion that “other therapies” are inferior expressed in earlier meta-analyses is not supported in the present meta-analysis
- the efficacy of exposure treatments for PTSD may be attributed solely to non-specific factors.

These conclusions have been not been supported [2] or have been directly disputed [7] by authors of reviews and meta-analyses published afterwards.

3.1.3.4. Taylor 2009 [11]: Efficacy of psychotherapies in special populations

The Taylor review presents the results of a meta-analysis of psychotherapeutic treatment outcomes in a selected population of sexual assault victims experiencing PTSD or rape trauma symptoms. RCT study design was not required for inclusion. There were eight studies dating from 1988-2005. None of the studies was published later than 2005; therefore this meta-analysis is not an update on the Australian Guidelines. In eight studies that compared 14 treatment conditions with waitlist group, the treatment was cognitive-behavioural (n=12), EMDR (n=1) and supportive counselling (n=1). All 694 participants (383 treated and 311 control) were female and drawn from community samples.

The overall weighted mean effect size for studies comparing treatment with control groups at post-treatment (Hodge’s g) was 0.91 (95% CI 0.75–1.08). The success rate for the treatment groups was

71%, compared with 29% for the control groups. All studies showed treatment to be beneficial but the amount of benefit varied, with mean effect sizes ranging from 0.15 to 2.02 between the studies.

Better outcomes were achieved with individual therapy compared to group approaches and with the use of semi-structured approaches and homework techniques. Effects were maintained at six to 12 months after treatment.

3.1.3.5. Taylor 2010 [12]: Efficacy of psychotherapies in special populations

This paper describes a meta-analysis of treatment outcomes in adults who were sexually abused as children. RCT study design was not required for inclusion. Nineteen studies that compared various psychotherapeutic approaches to control conditions were included (wait-list n=16, minimal attention group n=3). Three of these studies were published after 2005: Hébert and Bergeron (2007); Lundqvist, Svedin, et al. (2006); Sikkema et al. (2007). These studies were not included in Cloitre's meta-analysis, mainly because they were not RCTs and not all study populations had the full diagnosis of PTSD.

For most outcome domains, overall effect sizes were consistently in the moderate range: for PTSD or trauma symptoms ($g = 0.72-0.77$), internalising symptoms ($g = 0.68-0.72$), externalising symptoms ($g = 0.41-0.53$), self-esteem ($g = 0.56-0.58$), and global functioning or symptoms ($g = 0.57-0.60$), but for individual studies mean effect sizes ranged from -0.46 to 1.93 . The success rate for the treatment groups was 77.5%, compared with 22.5% for the control groups.

Effects were largely maintained at follow-up, although relatively few studies provided follow-up data.

3.1.4. Recent RCTs

There were eight new randomised controlled trials investigating psychotherapies for PTSD that were not included in the above systematic reviews and meta-analyses [37-45] (for details see Table 8).

Two of these trials [37, 38] investigated the effectiveness of the group psychotherapy.

Beck et al 2009 [37] compared the effectiveness of group CBT (GCBT) with minimum contact comparison in a population of 33 survivors of serious motor vehicle accident with chronic PTSD. In an analysis performed on completers, GCBT participants showed significant reductions in PTSD symptoms and a higher clinical improvement rate compared to controls (88% vs. 31%), but no changes on anxiety, depression, and pain measures. Treatment-related gains were maintained over a three-month follow-up.

Falsetti et al. (2008) [38] compared group exposure therapy to wait-list in a population of 53 patients. The therapy used in this study, group multiple channel exposure therapy (M-CET), was developed especially to treat PTSD with co-morbid panic attacks. Treatment was associated with significant decreases in PTSD and panic symptoms at post-treatment. Of the treated group, 75% no longer met criteria for PTSD compared to 17% of controls. Between group effect sizes were large for PTSD symptoms ($g=1.24$) and fear of panic ($g=1.15$), and moderate for panic attacks and physical reaction scale. These improvements were maintained over a six-month period. Dropout rates of 36% in the treated and 26% in the control group did not differ significantly.

The authors suggest that attrition and improvements gained from group treatments were comparable with those achieved from individually administered therapies from other studies,

indicating that group CBT and group exposure therapies are beneficial compared with no treatment and may be recommended when individual therapy is not available. However, neither of these studies makes a direct comparison with an equivalent individual therapy; therefore there is still no conclusive evidence to recommend a group therapy over an individual therapy.

Three studies [39-41] investigated combined therapies compared with monotherapies. One trial [41] has been included in the Cloitre review; however it was only reviewed from the standpoint of interventions for chronic interpersonal violence. As in studies published previously, results of the most recent trials are contradictory, with better outcomes achieved by combining therapies by the Bryant group, and no additional benefit by two other groups.

Moser 2010 [40] performed a re-analysis of a previously published trial (Foa and Rauch, 2004) which showed that there were no differences in effectiveness of prolonged exposure (PE) and PE with cognitive restructuring (PE+CR). Surprisingly, the re-analysis showed that patients with more severe pre-treatment trauma-related cognitions and more severe pre-treatment PTSD symptoms at benefited less from exposure combined with cognitive restructuring compared to exposure alone.

Resick (2008) [41] compared the effect of full protocol CPT with its constituent components, cognitive component only (CPT-C) and written accounts (WA) in a population of 150 women with PTSD and co-morbid symptoms. In this large and rigorously performed study, patients in all three treatment conditions improved substantially at post-treatment, with large decreases in PTSD symptoms, depression, anxiety, anger, guilt, shame, and cognitive distortions. Improvements were maintained throughout the follow-up period. The combination of cognitive therapy and WA did not improve upon the final results of either component. Interestingly, there were significant group differences in symptom reduction during the course of treatment: the CPT-C condition reported the fastest and greatest improvement in PTSD symptoms, and the WA condition the slowest.

In another rigorously performed trial, Bryant et al. (2008) [39] compared the effectiveness of exposure combined with cognitive restructuring to exposure alone in a population of 118 civilian survivors of motor vehicle accidents or non-sexual assault. Four groups were compared: (1) imaginal exposure (IE), (2) in vivo exposure (IVE), (3) (IE+IVE), (4) exposure combined with cognitive restructuring CR (IE+IVE+CR). At post-treatment, the proportion of patients with PTSD was numerically lower in the combined therapy IE/IVE/CR group (35%) compared to exposure groups (63%, 65% and 59%), but the difference did not reach significance. At 6month follow-up, the proportion of patients still with PTSD was significantly lower in the combined group (31%) than in the exposure groups (75%, 69%, 63%). Improvements in PTSD and depressive symptoms in the combined IE/IVE/CR group compared to IE were in the moderate to large range ($g=0.5-0.8$).

Several previous studies had contradictory results. Marks et al. 1998, Resick et al. (2002), Foa et al. (2005) and Paunovic & Ost (2001) all found that combining exposure with cognitive restructuring did not provide additive therapeutic gains compared with exposure alone, while Bryant et al. (2003) found greater benefits with the addition of CR to imaginal exposure therapy. This may have occurred as a result of methodological factors in these studies (i.e. time constraints on combined therapy which meant that participants received less exposure and CR, or employing only imaginal exposure). The two latest studies described above [39, 41] carefully compensated for these methodological shortcomings. However, evidence that combined psychotherapies have additive benefits remains inconclusive.

Two studies investigated the effectiveness of a CB therapy, Seeking Safety (SS), developed especially for patients with PTSD and co-occurring substance use [43, 44].

In a large trial of 353 women with PTSD (80% full and 20% sub-threshold PTSD diagnosis) and co-occurring substance use, Hien (2009) [43] compared SS with Women's Health Education (WHE). WHE was designed to provide equivalent therapeutic attention, expectancy of benefit, and an issue-oriented focus, but without theory-driven techniques. Both treatments were associated with large and clinically significant reductions in PTSD symptoms, which occurred rapidly during the acute treatment phase and were sustained over 12 months of follow-up. PTSD outcomes were similar in the two treatment groups. Substance use remained unchanged over time.

Zlotnick (2009) [44] compared SS to TAU in 49 incarcerated women with substance use disorder (SUD) and PTSD (full or sub-threshold). TAU was a mandatory, residential program consisting of 180 to 240 hours of individual and group therapy. Both interventions resulted in significant improvements on all outcomes (PTSD, SUD, psychopathology, and legal problems) but there were no significant differences between treatments. At 6 months after release from prison, 53% of the women in both conditions reported a remission in PTSD.

These two studies suggest that in women with PTSD and co-occurring SUD, trauma-focused programs are not better than intense, non-specific attention programs focused on female problems.

In a small (n=21) study, Feske (2008) [42] investigated the effectiveness of PE compared with TAU (standard counselling) in outpatients with PTSD and psychiatric co-morbidities, carried out in a community setting. Participants were predominantly low income and black women with complex trauma and psychiatric histories. Therapists were community social workers or nurses whose only prior training in CBT for anxiety disorders was 52 hours of training over six months. After nine to 12 sessions of both treatments, the PE group showed greater reductions in symptoms of PTSD, general anxiety, depression, fear of body sensations, anger and general psychiatric distress at post-test and at 6-month follow up. These findings provide preliminary evidence suggesting that PE delivered by community therapists in a front-line services clinic remains an effective treatment for core PTSD symptoms.

In a well designed French study comparing CBT with Rogerian supportive therapy (ST) (sympathetic listening), Cottraux (2008) [45] found that patient retention in treatment was higher in the CBT (87%) than in the ST group (52%). Dropouts in the ST group were mostly due to worsening or lack of effectiveness. Due to the difference in dropouts, CBT was better in the ITT (intention to treat) analysis, but its effects were equivalent to those of ST in completers.

3.2. Early interventions

3.2.1. Australian Guidelines: Prevention of symptom development

Eleven studies explored the question of whether treatment of all persons exposed to a traumatic event is warranted, regardless of symptom development.

Five different types of early non-drug interventions (education, collaborative care, trauma-focused counselling, psychological debriefing and single session counselling) were delivered to all survivors, normally within the first post-incident month.

The data from these studies does not support psychological debriefing in controlling the subsequent development of PTSD symptoms. The benefits of ventilation of emotions and narration of events on a routine basis are not supported by the evidence and, therefore, not recommended by the Australian Guidelines to be delivered on a routine basis. Instead, practitioners are advised to adopt a stance of “watchful waiting” combined with the provision of general psychological first aid, which includes provision of information, as well as emotional and instrumental support as required. Additional assistance should be progressively provided according to individual need.

Two studies of early intervention drug treatments were identified in the NICE review. One study compared using hydrocortisone against placebo and the other used propranolol against placebo. The first study found no difference and the other found results in favour of the placebo condition. Both studies compared intervention against no intervention. No further RCTs were identified in the Australian Guidelines and the current review.

3.2.1.1. Key practice recommendations

Only one recommendation was possible on the basis of the accumulated research evidence:

- For adults exposed to trauma, structured psychological interventions such as psychological debriefing should not be offered on a routine basis.

3.2.2. Australian Guidelines: Treatment of ASD and acute PTSD

There were nine studies that investigated early interventions for acute PTSD and acute stress disorder using five different types of psychological intervention: trauma-focused CBT alone; CBT with hypnosis; CBT with anxiety management; relaxation techniques; and a self-help booklet. CBT was consistently identified as superior in its effect on outcomes to the alternate treatment and control conditions. Based on this evidence, the Australian Guidelines recommend using trauma-focused CBT treatments for ASD and acute PTSD. Additionally, based on expert opinion, recommendations are made with reference to the length and number of sessions, and the time of treatment commencement (not earlier than 2 weeks of trauma exposure).

No studies on pharmacological treatments for ASD were identified in the Australian Guidelines. Therefore, expert opinion suggests that drug treatments should not be used to treat ASD or related conditions (i.e., within four weeks of symptom onset) unless the severity of the person’s distress cannot be managed by psychological means alone.

3.2.2.1. Key Recommendations

- Adults displaying ASD or PTSD reactions at least two weeks after the traumatic event should be offered trauma-focused CBT including exposure and/or cognitive therapy once a clinical assessment has been undertaken.
- For adults with ASD, treatment should be provided on an individual basis.
- For adults with ASD, five to ten sessions of trauma-focused CBT should be provided under normal circumstances.
- For adults with ASD, 90 min should be allowed for sessions that involve imaginal exposure.
- Combination psychological interventions for ASD should not be used routinely.

3.2.3. Latest reviews and meta-analyses

3.2.3.1. Roberts 2009 [14]

This Cochrane review examined the efficacy of multiple session early psychological interventions commenced within three months of a traumatic event aimed at preventing PTSD. One-session interventions were excluded. Eleven RCTs with a total of 941 participants were included and eight were entered into meta-analysis. Only three studies published between 1993 and 2005 were included in the Australian Guidelines and three were published after 2005. Interventions reviewed included CBT, preventative counselling, interpersonal counselling, counselling and education, family therapy, memory restructuring, critical incident stress debriefing, and collaborative care.

There was no significant differences between treatment and control conditions on primary outcome measures at post-treatment (RR 0.84; 95%CI 0.60-1.17). At three to six month follow-up there was a trend for increased self-report of PTSD symptoms in those who received an intervention (SMD 0.23; 95% CI 0.00 to 0.46). Two studies that compared memory restructuring intervention against supportive listening found there was no evidence supporting the efficacy of this intervention.

The authors concluded that no psychological intervention can be recommended for everyone following traumatic events and that multiple session interventions, like single session interventions, may have an adverse effect on some individuals. Conclusions from this meta-analysis are in agreement with those from NICE and the Australian Guidelines.

3.2.3.2. Roberts 2010 Cochrane [46]

This systematic review analysed multiple-session psychological interventions commenced within three months of a traumatic event aimed at treating acute traumatic stress reactions. Single-session interventions were excluded. Participants in these studies were a mixed population of those with ASD, acute PTSD and chronic PTSD.

Fifteen RCTs, two with long term follow-up studies, were included in the review. Eight were previously included in the NICE guidelines and five were studies published after 2005 (Bryant 2008[47]; Bugg 2009 [48]; Foa 2006 [49]; Sijbrandij 2007 [50]; van Emmerik 2008 [51]; Wagner 2007 [52]).

Twelve studies evaluated Trauma Focused Cognitive Behavioural Therapy (TF-CBT), two evaluated structured writing intervention and one each behavioural activation and collaborative care.

- TF-CBT was more effective than a waiting list in six studies with a total of 471 participants (SMD -0.64, 95% CI -1.06, -0.23) and supportive counselling in four studies with 198 participants (SMD -0.67, 95% CI -1.12, -0.23).
- Superiority of CBT over supportive counselling was maintained at 6 month follow-up (four studies, 170 participants; SMD -0.64, 95% CI -1.02, -0.25).
- Structured writing intervention was not more effective than minimal intervention (2 studies, 149 participants; SMD -0.15, 95% CI -0.48, 0.17).

The authors concluded that there was evidence that individual TF-CBT was effective for individuals with acute traumatic stress symptoms compared to both waiting list and supportive counselling interventions. The quality of the study suggests the need for caution in interpreting the results of this review.

The results of these two Cochrane reviews were summarised in a combined paper published in American Journal of Psychiatry in 2007 [15]. The summary conclusion was that those with full PTSD diagnosis benefited from the interventions; for those without full diagnostic criteria there was weak evidence of benefit; while no benefits were found for whole populations. These conclusions were no different from those reached by NICE guidelines previously.

3.2.3.3. Kornor 2008 [16]

This review, based on seven studies reporting results of five RCTs and two follow up studies with 274 patients, found very weak evidence that TF-CBT may have benefits over supportive counselling for individuals with an initial ASD diagnosis. All of studies included in this review were included the Roberts 2010 Cochrane review [14].

3.2.4. Recent RCTs

There were two new randomised controlled trials investigating the effectiveness of early psychological intervention in the prevention of PTSD symptoms [53, 54] that were not included in the previous meta-analyses (see Table 9).

In a large study (n=925) of US peacekeepers deployed to Kosovo, Adler (2008) [53] investigated the effectiveness of critical incident stress debriefing (CISD) compared to stress management class (SMC) and survey-only condition. Interventions were timed to address the entire deployment and were not tied to a specific event. At three and nine months follow up, there were no differences in the reduction of PTSD symptoms between treatment and control conditions. For soldiers with the highest degree of exposure to mission stressors, debriefing was associated with slightly improved PTSD and aggression, higher perception of organisational support but more alcohol problems. Soldiers reported that they liked CISD more than the SMC, and CISD did not cause undue distress.

Bell (2008) [54] investigated the effect of telephone counselling on reducing post-traumatic symptoms in 366 emergency department patients with mild traumatic brain injury acquired in motor vehicle accidents. Over three months following injury, the intervention group received five telephone calls of about eight minutes long each, focused on education, reassurance and return to daily activities. There was no difference in general health outcomes between the groups, but the PTSD symptom composite was lower by about 15% in the telephone counselling group. Out of 28 individual symptoms, five relating to daily functioning were significantly less negatively impacted: work, leisure activities, memory and concentration and financial independence.

The results of these studies are in general agreement with earlier findings. Critical incidence debriefing had no clear benefits, but caused no harm and there was some indication that telephone counselling focusing on symptom management may reduce some chronic symptoms after MTBI. However, there was no clear evidence that early psychological intervention should be recommended for everyone following traumatic events.

One new controlled but not randomised study investigated the effect of pharmacological intervention on the development of PTSD. In a retrospective study of burned US service members, the prevalence of PTSD in patients who received propranolol and in those who did not was similar [55].

3.3. Pharmacological interventions

3.3.1. Australian Guidelines

Altogether there were 28 studies that compared drug treatments against placebo and three studies that compared one pharmacological treatment against another pharmacological treatment.

In general, effect sizes for pharmacological treatments are relatively small. Standardised mean difference effect size (SMD) for the selective serotonin re-uptake inhibitors (SSRIs) compared with placebo were in the range of 0.3-0.5. Such findings should be interpreted cautiously in the context of relatively large placebo responses in many studies.

Since completing the Australian Guidelines review, the Cochrane Collaboration published a review of the evidence regarding pharmacological treatments in PTSD [18] that included 35 short-term randomised controlled trials of PTSD with 4597 participants. Three of these studies contained a maintenance component; five were unpublished. The review concluded that, although no clear evidence exists to show that any particular class of medication is more effective or better tolerated than any other, the greatest number of trials showing efficacy to date, as well as the largest, have been with the SSRIs. On the basis of the data, the review recommended SSRIs as first-line agents in the pharmacotherapy of PTSD, and supported their value in long-term treatment.

Authors of the Australian Guidelines do not recommend one SSRI over another in the treatment of PTSD, leaving the final decision regarding the specific drug to the clinician.

3.3.1.1. Key practice recommendations

The Australian Guidelines made the following recommendations regarding the pharmacological treatment of adults with PTSD:

- Drug treatments for PTSD should not be used as a routine first line treatment for adults, either by general medical practitioners or by specialist mental health professionals, in preference to trauma-focused psychological therapy.
- Where medication is considered for the treatment of PTSD in adults, SSRI antidepressants should be the first choice for both general practitioners and mental health specialists.
- Other new generation antidepressants (notably mirtazapine) and the older tricyclic antidepressants should be considered as a second-line option. Phenelzine should be considered for use by mental health specialists for people with treatment-resistant symptoms.
- When an adult sufferer with PTSD has responded to drug treatment, it should be continued for at least 12 months before gradual withdrawal.

3.3.2. Berger 2009 [17]

This paper systematically reviewed options left for the pharmacological treatment of PTSD when patients do not respond satisfactorily to or tolerate SSRIs. Sixty-three articles were selected, covering the following categories: antipsychotics, anticonvulsants, adrenergic-inhibiting agents, opioid antagonists, benzodiazepines and other agents. All levels of evidence were reviewed.

There were nine RCTs that were published after 2005 : Padala et al. (2006) [56] and Rothbaum et al. (2008) [57], which investigated antipsychotics; Davis et al. (2008) [58], Tucker et al. (2007) [59], Lindley et al. (2007) [60] and Davidson et al. (2007) [61], which investigated anticonvulsants; and

Neylan et al. (2006)[62], Raskind et al. (2007) [63] and Taylor et al. (2008) [64], which investigated adrenergic agents.

The review found that the non-antidepressant agent with the strongest scientific evidence supporting its use in PTSD is risperidone, which can be envisaged as an effective add-on therapy when patients did not fully benefit from previous treatment with SSRIs. Prazosin, an adrenergic-inhibiting agent, is a promising alternative for cases of PTSD where nightmares and insomnia are prominent symptoms. So far, there is no consistent empirical support for using benzodiazepines in the prevention or in the treatment of PTSD, although these drugs could alleviate some associated non-specific symptoms, such as insomnia or anxiety.

Altogether, there is not enough evidence from these studies to change the recommendations for treatment given in the Australian Guidelines.

3.3.3. Cukor 2009 [20]

The authors provide a short review of novel pharmacologic approaches to PTSD treatment, including D-cycloserine, propranolol, ketamine, prazosin, and methylenedioxymethamphetamine. Generally, there is no new evidence compared with the systematic reviews of Berger 2009, with the exception of a study on D-cycloserine. The authors regard partial NMDA agonist D-cycloserine as an agent that offers “exciting possibilities for enhancement of exposure, with preliminary data from other anxiety disorders suggesting that it may significantly reduce time in treatment. Though data for the treatment of PTSD is still in the preliminary stages, if similar results are shown with PTSD patients, it could have a significant impact on treatment compliance, cost of treatment, and disability by reducing the time in treatment.”

3.3.4. Recent RCTs

There were three new small studies not previously included in the Berger (2009) and Cukor (2009) reviews (see Table 10). Hamner (2009) [65] and Davis (2008) [66] found no effect of divalproex and galfacine, respectively, on PTSD symptoms compared to placebo. In a preliminary 6 weeks cross-over study, Heresco-Levy (2009) [67] investigated the effectiveness of D-serine, DSR (NMDA receptor agonist) in subjects with fully diagnosed chronic PTSD, but without major co-morbidities. Compared with placebo, DSR treatment resulted in significantly reduced PTSD and anxiety scores. These preliminary findings indicate that NMDAR glycine site-based pharmacotherapy may be a promising emerging treatment for PTSD warranting further trials.

3.4. Combined psychological and pharmacological interventions

3.4.1. Hetrick 2010

The Australian Guidelines suggest a combination of both psychological therapy and pharmacotherapy may enhance treatment response, especially in those with more severe PTSD or in those who have not responded to either intervention alone.

This Cochrane collaboration review assessed whether the combination of psychological therapy and pharmacotherapy provides a more efficacious treatment for PTSD than either of these interventions delivered separately.

Four trials including 124 participants were included in this review (Cohen 2007 [68]; Otto 2003 [69]; Rothbaum 2006 [70]; Simon 2008 [71]). Three of these trials were published after 2005. One of these trials (n =24) was on children and adolescents [68].

All trials used an SSRI combined with prolonged exposure or a cognitive behavioural intervention, compared with pharmacological treatment alone (n=2) or psychological treatment alone (n=2). Outcomes included changes in total PTSD symptom severity (primary) and changes in functioning, depression and anxiety symptoms, suicide attempts, substance use, withdrawal and cost. Two trials reported a total PTSD symptom score and these data could not be combined into meta-analysis calculations.

There were no significant differences between outcomes in the group receiving combined interventions compared to the group receiving psychological therapy or pharmacotherapy.

The authors concluded that there were too few studies in this review to be able to draw definitive conclusions about whether a combination of psychological therapy and pharmacotherapy results in better outcomes for patients than either of these treatments alone.

3.5. Innovative treatments

3.5.1. Cloitre 2009 [2]

This review investigated therapies which, by virtue of their departure from CBT orientation, can be considered innovative. They include virtual reality, body-oriented therapies utilising acupuncture, yoga, imaginal rehearsal therapy focused on nightmares, Interapy, psychodynamic therapy, psychodynamic -CBT blends and hypnotherapy. The review analysed 11 studies, including five published after 2005: Basoglu at al., (2007) [32], Frueh at al., (2007) [33], Hollifield at al., (2007) [34], Litz at al., (2007) [35], van der Kolk at al., (2007) [36].

Use of virtual reality has been found effective in one study, as has a naturalistic version of virtual reality, namely earthquake simulator using a shake table. Alternative medicine, body-oriented therapies utilising acupuncture and yoga are showing promise. Imaginal rehearsal therapy focused on nightmares, an often overlooked but extremely debilitating symptom of PTSD, has been successful. Interventions utilising the internet have shown substantial efficacy, and the use of real-time video/audio interactions for treatment of combat-related PTSD has been reported as efficacious as same-room therapy. Studies investigating psychodynamic therapy, psychodynamic- CBT blends and hypnotherapy support the efficacy of such approaches, but they are few in number and need replication. Generally, all of innovative therapies are supported by a single study, with the exception of interapy, supported by two studies.

3.5.2. Cukor 2009 [20]

In this review the authors assessed emerging new treatments for PTSD and novel enhancements to established therapies. The authors provided a description of the intervention, and a critical analysis of quality of evidence supporting them, from practical and theoretical points of view. The summary of these findings is provided below, concentrating mainly on therapies with strongest evidence and on studies published recently.

3.5.2.1. Couple and family therapy

Marital and relationship difficulties are common in individuals with PTSD. These problems are of great concern for veterans recently returning from Iraq/Afghanistan wars, with many veterans experiencing aggression toward partners and children, sexual dysfunction and emotional distancing [25, 72-74].

Although some couple and family treatment strategies have been developed in last 15 years, no studies have evaluated the efficacy of these techniques. One of the more promising treatments is cognitive behavioural conjoint therapy for PTSD, designed for couples where one or both partners have PTSD [25]. In the 15-session intervention, couple are treated as a unit using three stages: 1) Psychoeducation and safety building, 2) Confronting avoidance, enhancing relationship satisfaction and improving communication, and 3) Cognitive interventions addressing relationship problems and symptoms of PTSD, focusing on maladaptive thoughts around the trauma. Only one preliminary uncontrolled study has been completed with seven married male Vietnam Veterans and their spouses. Significant improvement in PTSD scores by clinician rating and spouse rating were noted, though not by Veteran rating. Wives also reported marginally greater relationship satisfaction, while Veterans reported improvements in depression and anxiety [75].

An older study (Ford et al. 1998) investigated the application of family systems therapy (FST) in veterans of Operation Desert Storm and their spouses. Five sessions of FST that included goal setting and psycho-education were followed by cognitive restructuring of “extreme beliefs” and strengthening feelings of trust, self-efficacy and safety. The intervention focused on restoring family roles, strategic prescriptions to enhance family members' sense of control, and identifying and reworking dysfunctional marital or parental patterns and sharing narratives of most disturbing military experiences. Veterans indicated improvements in symptoms of anxiety and depression, as well as family systemic adjustment after the intervention. The quasi-control group of untreated veterans, that were tested about one and a half years after demobilisation, reported smaller improvements in psychiatric symptoms and deterioration in family adjustment. The study supports the use of FST as a treatment, however, generalisation from this study is difficult due poor quality of the study.

The authors of the review conclude: “The data on couples and family treatment is scarce, however the theoretical basis for its use in the treatment of PTSD is strong. The application to a military population is compelling: returning service members often report feeling like they don't belong or that they are misunderstood. Engaging the partner and the family is a natural area to intervene. It can increase feelings of acceptance and belongingness, help family members to understand the Veteran's experience and illustrate to the Veteran that they have the support of their loved ones. The family relationship can serve as a support or obstacle in recovery from combat-related distress, underscoring the importance of the family relationship as a target for intervention” [20].

3.5.2.2. Interpersonal psychotherapy

Interpersonal therapy focuses on improving social functioning, which is often disrupted in persons with PTSD. It is theorized that improving broader social and occupational networks will consequently lead to improvements in all symptoms. In an uncontrolled pilot study, 14 subjects with chronic PTSD were treated for 14 weeks. Treatment focused on trust and interpersonal difficulties and was

successful in improving social relationships, reducing symptoms of PTSD and achieving significant clinical improvement in 12 out of 14 subjects (Bleiberg & Markowitz, 2005).

The results of interpersonal group therapy were less encouraging. In an open study, eight-week therapy with 13 subjects improved social functioning, symptoms of depression and general well-being, but was only moderately effective in addressing symptoms of PTSD at post-treatment (Robertson, Rushton et al. 2007). In a controlled study of interpersonal treatment in 48 women randomly assigned to group format or waitlist control, treatment was significantly more effective in treating symptoms of PTSD and depression compared to the waitlist controls [76].

The authors of the review caution that “These mixed preliminary findings highlight the need for further research, including whether an emphasis on the social aspects of PTSD can effectively address PTSD symptoms such as re-experiencing and hyper-arousal or whether interpersonal treatments are best used to augment traditional PTSD treatment.”

3.5.2.3. Behavioural activation

Behavioural activation (BA) entails a structured approach to increasing client engagement in activities, including identifying and scheduling events for homework. The technique may be especially relevant for individuals with PTSD where symptoms of avoidance and social isolation are prominent. In an uncontrolled pilot study, 11 Veterans underwent 16 sessions of BA to: identify avoided situations; plan goals; and practice activities, triggers of anxiety and behavioural and emotional responses to it (Jackupcak et al., 2006). Although all nine completers showed a significant decrease of PTSD symptoms, there was no significant clinical improvement and no changes in mean depression scores.

In a small randomised trial of eight participants with traumatic injury, PTSD symptoms in those receiving four to six sessions of BA within one month after injury improved significantly, but depression scores increased compared to TAU group [52]. This trial was included in the Cochrane review of early interventions [46].

The authors of the review concluded that “These initial results do not seem to imply that the use of BA alone is sufficient to address the entire PTSD symptom picture. At present, BA is best treated as a component of other treatment approaches rather than stand alone treatment for PTSD.”

3.5.2.4. Trauma management

Trauma management therapy, which address negative symptoms of PTSD through psychoeducation, exposure and a social and emotional rehabilitation over 29 sessions, showed promising results in one small study, although the length of treatment seem to be prohibitive in some contexts (Frueh, Turner et al., 1996).

3.5.2.5. Interoceptive exposure

Interoceptive exposure entails inducing harmless physiological sensations that are often associated with arousal, for example, provoking shortness of breath through purposeful hyperventilation. It was investigated in a pilot study of seven patients (Wald & Taylor, 2007). Treatment consisted of 12 sessions, four of interoceptive exposure, four of imaginal exposure and four of in vivo exposure. Although results at a post-treatment assessment showed improvements in PTSD symptoms, anxiety

and depression, which were maintained at one and three month follow-up, the design of the study made it difficult to discern which part of the treatment had the beneficial effect.

3.5.2.6. Mindfulness

Mindfulness entails inducing a state in which one is in touch with the present moment with a full and vivid awareness of sensations and being, which is opposed to the state of depersonalisation characteristic of PTSD. Mindfulness has been incorporated into protocols for the treatment of PTSD (Bormann, Thorp et al., 2008), but its independent contribution has not been yet evaluated.

3.5.2.7. Yoga

Studies are beginning to evaluate the use of yoga and acupuncture for PTSD. Unpublished data on the efficacy of yoga programs found some benefit for yoga in improving depression in a PTSD veteran population, and an added benefit for some intrusive and hyperarousal symptoms with the addition of breathing techniques (Brown & Gerbarg, 2005), though data is scarce.

3.5.2.8. Acupuncture

In one pilot study RCT 73 patients with PTSD were randomly assigned to an acupuncture, group CBT or wait-list condition [34]. The acupuncture condition consisted of two one-hour sessions per week. Significant improvements were noted in the acupuncture group on PTSD, depression, anxiety and global impairment comparable to the group CBT condition and significantly different from the wait-list control group at post-treatment and at a three month follow-up. Treatment effects for self-reported PTSD symptoms were in the large range compared with wait-list (Cohen's $d = 1.29$ for acupuncture and 1.42 for CBT). Acupuncture shows promise as non-exposure treatment option for PTSD.

3.5.2.9. Imagery rescripting

During rescripting the patient is encouraged to imagine the trauma experience from the point of view of an adult entering the room during the trauma and rescuing and protecting the vulnerable child. A randomised trial compared imaginal exposure alone (IE) with imaginal exposure plus imagery rescripting (IE+IR) and a wait-list [77] over ten sessions. Both treatment groups improved more than those in the wait-list at post-treatment. Although the PTSD improvements were similar in the two treatment groups (63% and 62% response rate), the IE+IR group achieved significantly greater anger control and reduction in guilt scores and had fewer dropouts compared to the IE group.

In a non-comparative study (Grunert, Weis et al., 2007), 23 individuals who still had PTSD following treatment with PE were treated with IR. Following IR, significant improvements were noted in self-reported symptoms of PTSD, depression and anxiety.

The authors conclude that IR shows promise as treatment for PTSD which is as effective as IE, but is more palatable and less challenging, based on a lower rate of dropouts. However, the evidence is based on a single study and is not conclusive.

3.5.2.10. Imagery rehearsal therapy

Imagery Rehearsal Therapy (IRT) was created by the Krakow group to treat nightmares presenting in the aftermath of a trauma and most studies describing and evaluating this intervention have been

published by this group. IRT is delivered as group therapy involving one to six sessions. Nightmares are treated as trauma induced behaviours that may be controlled by the individual. After being instructed in pleasant imagery and strategies for coping with unpleasant imagery, participants write down their nightmare with the changes to it they would choose, imagine the changed experience for ten to 15 minutes, present it to the group, and rehearse the new dream daily. IRT has been reasonably well documented as treatment for nightmares in persons with PTSD. One RCT with 168 survivors of sexual assault with PTSD found moderate to large effect sizes in post-treatment nightmare improvement compared to a wait-list control. Additionally, PTSD symptoms decreased in 65% of the treated sample, compared to 31% of controls, with improvements maintained at three and six months (Krakow, Hollifield et al., 2001; Krakow et al., 2000). Improvements in the PTSD symptoms were also found in a study of 62 victims of crime (Krakow, Johnston et al., 2001) and 69 victims of a natural disaster (Krakow et al., 2002).

Applications of IRT to military populations has had mixed results. A promising uncontrolled study of 12 Australian Vietnam combat veterans found improvements in nightmares, PTSD, depression and anxiety symptoms at post-treatment [78] and at 12 month follow-up [79]. A study of 15 US veterans with PTSD and trauma-related nightmares [80] did not find benefits at post-treatment. However, at three months follow up, nightmare frequency and PTSD symptoms were significantly decreased.

The authors concluded that IRT is supported as an effective treatment for nightmares, but conclusions regarding improvements of other PTSD symptoms are not conclusive.

Two therapies focusing on distress tolerance, dialectical behaviour therapy (DBT) and acceptance and commitment therapy (ACT), have been developed. DBT is a variant of CBT developed for individuals diagnosed with borderline personality disorder, which emphasises treatment of emotion dysregulation and focuses on striking a balance between acceptance and change. ACT conceptualises PTSD as a result of ineffectual control of unwanted thoughts, feelings and memories related to the trauma and aims to reduce experiential avoidance and help assimilate the experiences of the trauma memory into a valued life. There are no empirical studies evaluating the effectiveness of these treatments.

So called “Power” therapies, which include thought field therapy, trauma incident reduction and visio kinaesthetic disassociation, have been developed as alternatives to established PTSD interventions. There are no scientific studies evaluating these techniques. They have been criticised as ‘pseudo-science’ in the Devilly’s review [81].

3.5.2.11. Technology based interventions

Technology based interventions, which include video conferencing, internet-based therapy and virtual reality are likely to become more relevant as the technology improves. They may offer treatment to those in remote areas who have limited access to specialised healthcare. They may also be appealing to individuals who are concerned with the stigma of mental health treatment and offer a viable alternative to individuals whose anxiety disorder precludes the travel or social interaction necessary in traditional treatments.

3.5.2.12. Videoconferencing

Videoconferencing is not an intervention per se, but a method of communication between a patient and therapist. Videoconferencing involves the use of a camera to remotely project the image and

sound of the individual onto a computer screen so the therapist and patient can interact by seeing and hearing each other in real time through a live connection. The effectiveness of the therapy is mainly dependent on the effectiveness of the intervention used. The second factor influencing the effectiveness is a potential difference in therapeutic alliance between in-person and remote modes of communication.

One controlled study investigated 46 individuals with PTSD, 32 assigned to receive CBT therapy in-person and 16 receiving the same treatment via videoconferencing over 16 to 25 weeks. At post-treatment, PTSD symptoms improved in both treatment groups and there were no differences in effect between groups [82].

3.5.2.13. Internet and computer based treatments

Interapy is a cognitive behavioural approach developed by Lange's group, utilising exposure and cognitive restructuring techniques delivered via the internet. The treatment consists of ten writing sessions, lasting 45 minutes each, conducted over five weeks. During sessions patients describe their trauma in detail, work on cognitive reappraisal, and work on understanding of the effect of the trauma on their lives. One controlled study assessed the effectiveness of Interapy in a community sample of 102 individuals (Lange et al., 2003). Participants in the treatment group improved significantly more than those in the waitlist control, with large effect sizes for PTSD symptoms and general psychopathology. The limitation of the study was its population: participants manifested mild to relatively severe trauma symptoms, but many did not meet full diagnostic criteria for PTSD.

"DE-STRESS" is an eight week cognitive behavioural -internet-delivered program which entails therapist-guided exploration of self-monitoring triggers, developing a hierarchy of trauma triggers, stress management, in vivo exposure, trauma writing sessions and relapse prevention. It was assessed in a military population by Litz and colleagues [83]. Participants were randomly assigned to the treatment group (N=24) or internet-based supportive counselling (n=21). The DE-STRESS group had significantly greater decreases in symptoms of PTSD, depression and anxiety at six months post-treatment compared to the supportive counselling group. The dropout rate was 30% across both treatment groups, which is comparable to other studies of PTSD.

3.5.2.14. Virtual reality exposure therapy

Virtual reality (VR) integrates real time computer graphics and visual displays and with the use of visual, auditory, olfactory and even tactile stimuli allow users to feel a sense of immersion in the virtual environments. As this artificial environment can be controlled, it is expected that VR exposure may attenuate dropouts associated with avoidance by offering a graded and systematic approach to the avoided stimuli that can be carefully monitored and tailored to the individual patient's needs.

There is a substantial ongoing effort to implement virtual reality to treat U.S. military personnel deployed to Operation Iraqi Freedom/ Operation Enduring Freedom (OIF/OEF). For a generation of active duty personnel which has grown up with gaming technology, VR may represent a palatable variation on the traditional approaches to treatment that could be promoted in a way that reduces the typical stigma associated with seeking mental health treatment.

The first VR application for PTSD, known as Virtual Vietnam, was developed to treat PTSD in Vietnam Veterans. It was initially investigated in a case study of Vietnam veteran still experiencing PTSD symptoms 20 years after the war (Rothbaum et al., 1999). In the open clinical trial of ten veterans,

participants showed significant reductions in PTSD and related symptoms after about 13 VRE sessions, which were maintained at six month follow up [84].

Another VRE program simulated the World Trade Centre attacks of September 11, 2001. Those with direct exposure to the attacks, including fire fighters, disaster rescue, recovery workers and civilians, were randomly assigned either to VRE (n=13) or a waitlist control group (n=8) [85]. Following treatment, the group receiving VRE showed a significant decrease in PTSD symptoms compared to control group. The between-groups post-treatment large effect size of 1.54 was maintained at six-month follow-up. Interestingly, five of the participants in the VRE were non-responders to prior imaginal exposure. In contrast, there was no evidence of reduction in PTSD symptoms in control group.

Other virtual environments have been tested to treat PTSD resulting from motor vehicle accidents (Beck, Palyo et al, 2007, uncontrolled study, n=6; Saraiva et al. 2007, case study) and to treat survivors of terrorist bus bombings in Israel (Josman et al., 2006).

The VR program Virtual Iraq consists of two primary virtual scenarios, a Middle Eastern city and a Humvee scenario. In both environments, the visual stimuli presented via the head-mounted display can be supplemented by directional 3D audio, vibrotactile, and olfactory stimuli. The therapist controls each stimulus while in full audio contact with the patient. This enables a clinician to match or supplement the patient's spoken trauma narrative within the VR simulation and allows for a customised approach that is individually tailored to the patient's experience and treatment progress.

In initial clinical trials of Virtual Iraq, the standard treatment protocol consisted of 90–120 minute sessions, once or twice a week, over five to ten weeks. The VRE exposure exercises followed the principles of graded behavioural exposure and the pace was individualised and patient-driven. Assessment data was obtained at baseline, post-treatment and at three-month follow up.

A reduction in PTSD scores following VRE was observed in two case studies of active duty OIF soldiers [86, 87] and in an open clinical trial of 20 active duty personnel [88]. In this trial, after the average number of 11 sessions, PTSD symptoms decreased by 50% and 16 of the 20 completers no longer met criteria for PTSD: also, anxiety scores decreased by 33% and depression scores by nearly 50%. Notably, two of the successful treatment completers had documented mild and moderate traumatic brain injuries, this suggests that this form of exposure can be useful for this population.

Currently, Virtual Iraq is being implemented clinically and in clinical research trials by using VRE to treat PTSD among Veteran and active duty OIF/OEF Service Members at numerous army medical centres, universities, over 15 Veterans Administration Hospital sites, and eight U.S. Air Force bases around the USA.

3.5.3. Lawrence 2010 [21]

This Cochrane collaboration (Lawrence 2010 [21]) review tried to assess the effectiveness of sports and games in alleviating and/or diminishing the symptoms of PTSD when compared to usual care or other interventions. To be included in this review, all participants had to be diagnosed with PTSD and studies had to be of RCT design. No studies met the inclusion criteria.

3.5.4. Most recent RCT

For more detailed summary of methodologies and outcomes of the most recent studies on innovative therapies see Table 11.

3.5.4.1. Internet

Some additional support has been published for the use of internet-based CBT Interapy developed by the Dutch group of Lange and colleagues (Lange et al., 2003). Previously, in a well designed trial of a German version of Interapy, Knaevelsrud (2007) [89] reported that symptoms of PTSD, depression and anxiety improved much more in the treatment group than in the waiting list, with moderate to large between groups effect sizes (mean ES=0.9). The limitation to the generalisability of this trial lies in the population, which did not have a full PTSD diagnosis (cut-off score on IES-R indicated high distress levels in 70% of subjects and sub-syndromal PTSD in 30%). Recently, a long-term follow up of this trial was published [90], which shows that improvements in symptoms of PTSD, depression and anxiety were sustained for 18months after the treatment.

Additional support for internet-based therapy, PTSD Online, came from a small, open study performed in Australia by Klein and colleagues (2010) [91]. The study recruited 22 participants with a primary clinical diagnosis of PTSD. Following ten weeks of CBT, with average total therapist time of about three hours per patient, significant improvements in PTSD symptoms and PTSD severity ratings were seen. The improvements were maintained at three month follow-up. Although this study is limited by the self-selection of the study population and the lack of a control group, there is an indication that PTSD Online appears to be a promising treatment option for people with PTSD that can be provided entirely remotely, with far less therapist time than traditional face-to-face treatment.

3.5.4.2. Videoconferencing

In a large, well designed and controlled non-inferiority trial, Morland (2010) [92] presented evidence that therapy delivered by live videoconferencing is not inferior to the same therapy delivered in person. The population in the trial was a clinical sample of combat veterans with full diagnosis of PTSD and anger difficulties, living in rural areas of Hawaii. Participants were randomly selected to the same therapy, performed by the same therapists, either in person or by videoconference. Following 12 sessions of group CBT called Anger Management, two per week over six weeks, participants in both groups showed similar reductions in anger symptoms, with post-treatment and three and six month effect sizes ranging from moderate to small (ES=0.12 to 0.63). There were no between-group differences in attrition, adherence, satisfaction, and treatment expectancy, although therapy alliance was higher in the in-person group. Although the effect sizes appear rather modest and lower than expected from individual in-person CBT or exposure therapy, they were similar in both groups and therefore more related to the choice of therapy (group) rather than to treatment delivery. This trial provides compelling evidence that videoconferencing is an effective and feasible way to care for veterans residing in rural or remote locations.

3.5.4.3. Virtual reality

In a study of ten Portuguese older veterans, participants were randomised to virtual reality exposure (VRE), imaginal exposure (IE) and waiting list (WL). VRE involved war scenarios with cues such as ambush, mortar blasting, and waiting for rescue. Patients enrolled in the VRE group showed

statistical reduction of PTSD symptoms. Improvements continued at 6 month follow up. Because of the small sample size, formal comparison was not possible, but VRE appeared to work at least as well as IE and was safe to use in older veteran populations [93].

In a study of 20 of active duty service members with chronic PTSD related to service in Iraq or Afghanistan, half of the patients were randomly assigned to Virtual Reality Exposure with Arousal Control (VRE-AC) therapy, while the others received the standard treatment for combat-related PTSD. Among patients in the VRE group, 70% of experienced at least a 30% drop in symptoms, compared with only 11% in the standard treatment group. The result is encouraging, because most of the participants had failed at least one previous treatment [94].

3.5.4.4. Hypnotherapy

Four sessions of hypnotherapy, used as an add-on to usual psycho- and pharmacotherapy, was more effective than medicating with zolpidem in improving insomnia in patients with chronic, combat-related PTSD [95].

3.5.4.5. TSM

Ten sessions of repetitive transcranial magnetic stimulation produced significant improvements in PTSD and depression symptoms which continued over three month follow-up [96]. The importance of this study is its application to the population, which appeared resistant to previous treatments.

3.5.4.6. Expressive writing

No supporting evidence was found that expressive writing is an effective treatment for PTSD in a population of chronic PTSD sufferers that included combat veterans [97].

3.6. Psychosocial rehabilitation

3.6.1. Australian Guidelines

The Australian Guidelines identified no studies comparing psychosocial rehabilitation alone or in combination to wait-list or to psychological or pharmacological treatment.

3.6.1.1. Key recommendations

Based on expert opinion, the Australian Guidelines recommend that vocational, family and social rehabilitation interventions should be considered as an intervention to prevent or reduce disability and improve functioning even when PTSD symptoms have not responded to evidence-based-treatment.

3.6.2. Reviews and RCTs

There were no new studies on psychosocial rehabilitation. Studies included in the Palic (2010) review of “psychosocial” interventions in refugees were mainly psychotherapies, some alternative treatments and some multidisciplinary treatments. There were no new studies with RCT design on psychosocial rehabilitation.

3.7. Economic considerations

3.7.1. Australian Guidelines

Although twelve papers were retrieved, five of which were considered potentially useful, it was not possible to conduct a full evaluation of the cost-effectiveness of recommended interventions. Instead, key economic considerations and recommendations for further research are outlined in the guidelines.

3.7.1.1. Key recommendations

The Australian Guidelines recommend that a comprehensive assessment of the economic burden associated with PTSD be conducted and that economic evaluation studies should be conducted routinely alongside clinical evaluations of various treatment options. The guidelines also recommend a review of financing arrangements for the treatment of PTSD in Australia.

3.8. Treatments of veterans

3.8.1. Steward 2009 [22]

When implementing any treatment modality it is imperative to recognise that the symptoms of co-morbid disorders could interfere with a veteran's ability to engage in or tolerate psychotherapeutic treatment. Meta-analyses performed on civilian or mixed civilian and veteran populations with PTSD generally showed the superiority of psychotherapies over pharmacological treatments. This meta-analysis was conducted to investigate whether the same conclusions can be reached in a selected population of military veterans. It compared the relative effectiveness of psychological and pharmacological treatments for combat-related PTSD in military veterans. The analysis included 13 pharmacotherapy studies [98-108] and seven psychotherapy studies (with 12 different treatments) [25, 109-116] published between 1988 and 2006. These studies included treatment arms of randomised controlled trials and open label studies without control groups. All participants were assessed at the beginning and end of treatment for severity of PTSD and depression using validated instruments. Primary analysis assessed whether the standardised mean differences for pre-post treatment PTSD symptoms varied significantly between pharmacotherapy and psychotherapy studies.

The mean difference for pharmacotherapy was -1.00 (SD=0.46) and the mean difference for psychotherapy was -0.52 (SD=0.39). Studies of pharmacotherapy treatment efficacy demonstrated a significantly greater decrease in reducing PTSD symptoms, $t(22) = -2.74$, $p = 0.01$, $d = 0.05$. Additionally, without providing further details, the authors stated that a limited analysis indicated that a decrease in depression symptoms was also significantly greater in pharmacotherapy compared than in psychotherapy, $t(16) = -2.26$, $p = 0.04$, $d = 0.16$.

The value of this comparison may be limited by several factors. At baseline, the severity of PTSD for the pharmacotherapy group was significantly greater than that for the psychotherapy group. One possible explanation is the mandatory "wash out" period in pharmacotherapy studies, while psychotherapy participants were allowed to remain on psychotropics. Potential confounders include outcome measures: psychotherapy studies usually used self-reported measures which usually report lower treatment benefits than clinician-reported measures, generally used in pharmacotherapy

studies. Additionally, 22 out of 25 studies were performed on the Vietnam War era veterans with 25-30 years post-combat, indicating chronicity of the problem. Participation in previous programs was not specified. The review does not provide sufficient information on individual study populations to assess additional differences between studies.

Based on this analysis there is not enough evidence to recommend pharmacological treatment over psychotherapy. However, this review indicates the unique problem posed by combat veterans and suggests that individual treatment modalities may not address the entire scope of problems observed in people with PTSD. Given the complex symptoms and comorbidity in PTSD, it may be necessary to implement different types of treatment at different stages of the disorder [117]. In a study examining a combined PTSD treatment approach for Australian Vietnam veterans, psychotropics were used in conjunction with cognitive-behavioural therapy. The authors found that this conjunctive treatment had significantly reduced PTSD and depression symptom severity at post-treatment [118].

3.8.2. Albright 2010 [10]

Prior meta-analyses have suggested that EMDR produces moderate improvements in PTSD symptomatology in widely ranging populations. Its effectiveness appears to be lower than CBT, CT and exposure techniques but superior to supportive counselling [3]. EMDR is now being recommended as a treatment for military combat veterans who suffer from PTSD. This review assessed all studies examining the effects of EMDR on PTSD among military combat veterans published before April 2008. A total of six RCTs and three quasi-experimental studies were included [119-128].

Participants in all studies in the Albright review were Vietnam veterans diagnosed with PTSD recruited from Veteran Administration-related facilities and/or clinics. The size and summary result of these studies are presented in the table below.

Table 4. Summary characteristics of studies included in the Albright 2010 review.

Study	Size	Summary result
Boudewyns et al. (1993)	Total n=20, EMDR n=9, Exposure n=6, Control n=5	No pre-post treatment effect or in comparison to controls.
Jensen (1992, 1994)	Total n=25, EMDR n=13, Control n=12	no difference compared to control
Silver et al. (1995)	Total n=83, EMDR n=13, Relaxation n=9, Biofeedback n=9, and Control n=55	EMDR was superior to control and Biofeedback groups across all measures; and to the Relaxation group in all variables with the exception of Depression
Boudewyns and Hyer (1996)	Total n=61, EMDR n=21, Exposure n=18, and Control n=22	The IES post-test did not show significant change. The CAPS post-test showed a significant drop in all three groups;
Pitman et al. (1996)	Total n=17, EMDR n=9 eyes-fixed components of EMDR n=8.	23% average overall improvement across both component groups, no difference between groups
Macklin et al. (2000)	5-year follow-up on Pitman et al. 1996	PTSD symptoms worsened, still no difference between groups
Carlson et al. (1998)	Total n=35, EMDR n=10, Biofeedback n=13, or Routine n=12.	All of the outcome measures post-test showed significant improvement in the EMDR condition
Devilley et al. (1998)	Total n=51, EMDR n=17 eyes-fixed components of EMDR n=17, SPS standard psychiatric support n=17	no statistically significant differences were found between the three conditions
Rogers et al., (1999)	Total n=12, EMDR n=6 and Exposure n=6.	Difference between groups even not mentioned.

All studies were limited by small sample sizes and a lack of precision, increasing the likelihood of random errors exerting stronger influence and decreasing sensitivity to detect legitimate treatment effects. There were no well designed RCTs comparing EMDR against real-life exposure therapy or against credible placebo-controlled therapies in the veteran population. After critically appraising the methodological quality of each study, the authors concluded that, “The evidence supporting the use of EMDR to treat combat veterans suffering from PTSD is sparse and equivocal, and does not rise to the threshold of labelling the therapy as an empirically supported treatment. It is premature to incorporate EMDR into routine care for veterans to alleviate combat-related PTSD. EMDR needs a considerably stronger evidentiary foundation which includes large-scale RCTs involving credible placebo controlled treatment conditions.”

4. Key conclusions on the best evidence treatments for PTSD

Australian Guidelines

Based on the review of all treatment modalities, the following general key practice recommendations were presented by the Australian Guidelines:

- Trauma-focused psychological therapy (cognitive behavioural therapy or eye movement desensitisation and reprocessing in addition to in vivo exposure) should be used as the most effective treatment for ASD and PTSD.
- Where medication is required for the treatment of PTSD in adults, selective serotonin re-uptake inhibitor antidepressants should be the first choice.
- Medication should not be used in preference to trauma-focused psychological therapy.

- In the immediate aftermath of trauma, practitioners should adopt a position of watchful waiting and provide psychological first aid.

Cloitre 2009

The review draws the following summary conclusions.

- There is strong evidence that psychosocial interventions provide substantial relief of PTSD symptoms.
- Cognitive-behavioural treatments have been shown to be superior to wait-list, supportive counselling, nonspecific therapies and treatment as usual.
- Exposure therapy has been studied in the largest number of trials and has consistently shown beneficial effects.
- Cognitive therapy is associated with the largest effect size, however the limited number of trials using pure cognitive therapy compared to control conditions and compared to exposure suggest that it is premature to draw conclusions about the relative benefits of cognitive therapy vs. exposure.
- Combination treatments of exposure and cognitive therapy show small but consistent advantages over either of the interventions alone.
- EMDR, like exposure and cognitive therapy, has established efficacy. There have been a fairly large number of studies comparing EMDR to exposure and/or cognitive therapy, and the evidence to date does not allow a determination of any particular advantage of one versus the other in terms of PTSD outcome.
- Cognitive-behavioural approaches to the treatment of chronically traumatised populations have been successful.
- Several innovative approaches under development utilise advances in technology (e.g., the internet) that may be appealing as they provide greater privacy/confidentiality and more flexibility for the traumatised individual regarding when, where, and how often they are used.

To facilitate the comparison of treatment effectiveness, the review assigned an ordinal rank to effect sizes on a scale of 1 to 10, with additional gradation of small (up to 0.35), medium (up to 0.79) and large effects. The effectiveness of PTSD therapies was then presented in a league table of ranked effect sizes, pre-post-treatment PTSD Symptom Changes.

Table 5. Effect Size Rank Information for PTSD Symptom Changes by Type of Treatment

Type of treatment	Number of studies	Mean ES rank	ES Rank Range
Exposure therapy	18	7.94 (1.66)	5-10
Exposure + cognitive therapy	14	8.04 (2.09)	3-10
cognitive therapy/cognitive restructuring	6	8.83 (1.17)	7-10
EMDR	9	5.89 (2.65)	4-10
Problem-centred therapy	3	5.67 (2.08)	4-8
Supportive counselling	5	5.00 (2.12)	2-7

EMDR=eye movement desensitisation and reprocessing therapy

Generally, the conclusions drawn by this review do not differ from those drawn by the Australian Guidelines.

Most recent RCT

The conclusions drawn from the most recent RCTs do not differ from those drawn from the Australian Guidelines and systematic reviews. They add some support for emerging, technology-based interventions, but due to the size and quality the evidence from most studies is generally inconclusive.

5. Issues raised by the Dunt review

5.1. The engagement in treatment of younger veterans and currently serving ADF members

There is very little published information on the engagement in treatment of younger veterans and currently serving ADF members. The research in this area is scarce to non-existing and there is a lack of statistical information available. The Longitudinal Health Surveillance Program, a large career-spanning prospective military health study planned in Australia, may answer some of these questions in the future. Not every veteran registered with DVA uses health services provided by the department. Many younger veterans do not register with DVA and their mental health needs remain unmet, or are met outside DVA health services.

At present, the engagement in treatment of younger veterans and currently serving ADF members is inferred from factors such as prevalence of PTSD in relevant populations, vulnerability to developing PTSD, accessibility of treatment, barriers to treatment etc.

5.1.1. Prevalence of PTSD in veteran populations

Older veterans

In a large study of Australian veterans of the Korean War (n=5352), the rates of PTSD were estimated at 15%, and at 17% when co-morbid with depression [129]. The study was limited by reliance on self-reported measures and the necessity for retrospective assessment of some deployment-related factors

Vietnam veterans

Among Australian Vietnam veterans (n=641), the PTSD rates assessed 20–25 years after deployment were around 21% for lifetime prevalence and 12% for current prevalence [130]. It translates into 10,000 Vietnam veterans with PTSD out of the 50,000 Australian servicemen who served [131]. Rates were assessed retrospectively, using structured clinical interview.

Younger veterans

In Gulf War Veterans (n=1871), the current PTSD rates assessed at 10–15 years after deployment was 5.4% [132]. The rate was assessed by structured clinical interviews.

Estimates of PTSD in ADF ground forces serving in Iraq and Afghanistan are as yet unpublished, but Royal Australian Navy estimates of PTSD in the 1739 sailors deployed to the Middle Eastern Area of Operations between 2001 and 2005 was 1.6% in total [133]. It should be noted that PTSD rates in Navy and Air Force personnel are usually lower than for the ground forces or Army populations. For

comparison, the prevalence of PTSD in the general Australian population was estimated at 6.4% by The Australian National Survey of Mental Health and Wellbeing 2007 [134].

The increasing number of women serving in the ADF raises the issue of gender differences in the prevalence of PTSD. Interesting results on new onset of PTSD among about five thousand military personnel deployed in Iraq and Afghanistan, who were free of PTSD at baseline and reported combat exposure at follow up, came from US Millennium Cohort study [135]. Females had a higher rate of new onset of PTSD than males (10% vs. 6%). Interestingly, among those that reported a previous assault at baseline (mostly sexual assault for women and violent assault for men), the rates of PTSD were doubled (22% in women and 12% in men). Although these rates do not translate directly to Australian conditions, they indicate the increased vulnerability to developing PTSD among female members of ADF.

5.1.2. Risk factors for developing PTSD

Longitudinal studies identified the following risk factors for developing PTSD:

- combat exposure: increases risk 3-fold [136]
- previous assault: increases risk 2-fold [135]
- female sex: increases risk almost 2-fold [135]
- low mental or physical health status before combat exposure: increases risk 2-3 fold [137]
- pre-deployment existing mental disorder [138]
- not receiving immediate frontline treatment for combat shock reaction [139]
- delayed development of PTSD was observed in persons experiencing a traumatic event followed by accumulation of negative life events [140]
- co-morbidities such as alcohol, depression and especially anger [141]

5.1.3. Barriers to treatment

The most commonly cited reasons for under-treatment are insufficient numbers of mental health professionals for an increasing demand and limited access to mental health professionals [142].

Limited access to mental health professionals may result from:

- Living in remote or underserved areas
- Economic constraints
- Time constraints
- Physical or psychological impairment
- Stigma associated with mental illness, privacy/confidentiality issues
- Lack of confidence with mental health professionals.

The 2004 Pathways to Care study showed that 30% of veterans recently compensated for a mental health disability were not receiving treatment and that 20% of those who had sought mental health care were dissatisfied. Peacekeepers were over-represented in this group and around 42% of peacekeepers reported that they had stopped treatment. Barriers to health care included difficulty

accepting they had a health problem, previous unsuccessful treatment, uncertainty about what was available and services not being available locally. The key issues regarding the younger group of peacekeepers and veterans appear to be the need to increase the accessibility of treatment and to tailor treatment to meet their particular needs [143].

In a recent study of active duty US Air Force members, it has been found that as the rate of self-reported mental health symptoms increases, they are less inclined to seek help [144]. Females are more likely to receive assistance for mental health problems than males. Barriers to seeking treatment included career concerns, lack of confidence with mental health professionals, especially the “inability of civilian personnel to relate to the deployment experience”. Other significant barriers included difficulty getting to the location, availability of hours, spending an excessive amount of time on paperwork, and privacy/confidentiality issues.

5.2. Key indicators and factors that contribute to treatment effectiveness

The following are predictors of treatment outcome:

- Baseline PTSD symptomatology, number of sessions and therapy type [145]. The Australian Guidelines indicate that: (i) complex cases may require additional sessions, adopting specific treatments to address associated problems as required; (ii) PTSD resulting from exposure to prolonged and/or repeated trauma may require more time to establish a trusting therapeutic alliance, more attention to teaching emotional regulation skills, and a more gradual approach to exposure therapy; and (iii) where symptoms have not responded to one form of trauma-focused intervention, health practitioners may consider an alternative form of trauma-focused intervention.
- Anger at intake [146]
- Comorbidity [141]
- Younger age, lower intelligence, and less education were associated with higher dropout from treatment, while higher depression and guilt at pre-treatment were associated with greater improvement in PTSD symptomatology [147]
- Borderline personality for childhood sex abuse survivors [41]
- Gender: civilian populations with PTSD generally include at least 50% of women, while veteran population are often exclusively male. One possible explanation why treatment effects are larger in civilian population is that women respond better to treatment than men [148]
- Social support: those with better social support showed significantly greater gains from the treatment [149]

5.3. Challenging nature of treatment

The specific challenges of treating the veteran population for PTSD were thoroughly examined by Creamer and Forbes in their 2004 review [150]. This section of the present review is based mainly on their assessment of the subject.

Military veterans with combat-related PTSD form a unique population, and treatment modalities that are appropriate for civilian populations may not be directly transferable. The major distinction between the veteran population suffering from combat-related PTSD and other populations is that veterans may be both “perpetrators and survivors of trauma”. The 2004 review by Creamer and Forbes [150] highlights many of the unique circumstances faced by combat veterans. These circumstances include: (a) a constant presence of threat; (b) prolonged periods of autonomic arousal; (c) hyperarousal as a survival mechanism; (d) a threat appraisal system inappropriate in a noncombat environment; (e) witnessing of violence and death that challenges an individual's worldview; and (f) limited rules of engagement resulting in feelings of frustration, powerlessness, and a lack of control over circumstances. As a result, this population not only has a high prevalence of PTSD, it has a high degree of co-morbidity with other mental conditions such as depression, substance abuse, and panic disorder [141]. Some authors suggest that the extended duration of deployment, with many months of hyper-vigilance and hyperarousal may result in biological changes to the mechanisms associated with threat, and, in effect, in a “treatment-resistant PTSD” [148].

Improvements in PTSD symptoms in veterans following treatment are usually more modest than those achieved in civilian populations. There are many possible explanations for this finding.

Veterans often present for treatment many years after their deployment service. By this time their presentation is very complex with high levels of co-morbidity and deterioration in social and occupational functioning [141]. In such cases, the goal of eliminating all symptoms of PTSD and returning veterans to pre-trauma levels may be unrealistic. Although the empirical data in this area is lacking, it is reasonable to assume that the treatment goal should be redirected towards emphasis on psychosocial rehabilitation, reintegration, relationships and vocational functioning [150].

The development of the therapeutic alliance, which is necessary for treatment success, may be particularly difficult for veterans. Military culture and training designed to produce effective combatants may promote emotional shut-down. Additionally, at least for Vietnam veterans, the negative societal attitudes at the time of homecoming may have damaged their trust of civilians [150].

Many veterans have a high level of anger, which may interfere with treatment in several ways. Anger may impair veteran's ability to engage in therapeutic alliance and to engage with trauma-related fear during exposure treatments, thus preventing habituation to fear, which inhibits self-reflection and leads to premature termination of treatment [150].

Exposure therapy, which was shown to be one of the most effective elements of the treatment for PTSD, has relatively modest treatment benefits in veterans compared to civilian populations. Exposure may be particularly difficult for veterans. Imaginal exposure requires patients to repeatedly narrate their trauma experiences with their eyes closed to facilitate engagement of their imaginative capacities. Avoiding reminders of the trauma is one of the defining symptoms of the disorder, and many patients are unable or unwilling to effectively visualise the traumatic event.

The symptom of numbing may result in the recollection of the traumatic event without the involvement of the affect. Some people who undertake the exposure exercise are unable to engage their emotions or senses, retelling a flat emotionless tale that reflects their numbness and avoidance. These obstacles to engagement may lead to treatment failures, as the theory suggests

that emotional engagement and fear activation plays an essential role in exposure therapy. Poorer emotional engagement in treatment predicts poorer treatment outcome [151].

These problems may possibly be overcome by a novel medium of conducting PE, in the form of virtual reality exposure (see section 3.5.4.3).

5.4. Community treatment

Most studies on the effectiveness of PTSD treatments were conducted in outpatient settings, with participants generally attending twelve individual 90 min sessions, usually bi-weekly over six weeks. Depending on the type of therapy, this form of treatment accumulated the most evidence of effectiveness. Although most of the trial-driven therapies were performed in a clinical or research settings, given the availability of similarly trained therapists, there is no barrier for these treatments to be performed in local hospitals, community health centres or by individual therapists.

A pilot study (Feske, 2008) provided preliminary evidence suggesting that a best evidence therapy, PE, is an effective treatment for core PTSD symptoms, even when delivered by community therapists in a front-line services clinic. In this study, 21 female psychiatric outpatients with chronic PTSD, predominantly low income, African American, with complex trauma and psychiatric histories, were randomly assigned to prolonged exposure or treatment as usual. Therapists were community social workers or nurses whose only prior training in CBT for anxiety disorders was 52 hours of training delivered over six months. Patients in the PE group showed greater improvement in PTSD symptoms, general anxiety, and depression than clients in TAU group, with large effect sizes (range = 0.80 to 1.20) [42].

The Creamer and Forbes study also supports the recommendation that treatment services for veterans with posttraumatic stress disorder should be delivered in the least restrictive environment [152].

In addition to specialised PTSD treatment programs accredited by Australian Centre for Posttraumatic Mental Health (ACPMH) and funded by DVA, Australian veterans with PTSD currently receive care from a range of community based psychiatrists, psychologists, counsellors and general practitioners. The quality assurance mechanisms applied to the PTSD treatment programs do not currently extend to these other service providers.

The Australian Guidelines recommend 90 minute sessions for trauma-focused therapy as the best treatment. Fee structures for GPs, psychiatrists and psychologists have not previously supported consultation times of this length. The briefer consultation times supported by fee structures inevitably favoured brief interactions rather than the recommended trauma-focused interventions. Thus, practitioners were not rewarded for providing evidence-based treatment [1].

In November 2010 DVA introduced: a) statutory registration only for practitioners (psychologists/clinical counsellors, mental health social workers and OTs) who provide services with payments through Medicare (excluding VVCS contracted outreach counsellors), which is a fee structure consistent with Better Access; and b) 90-minute trauma-focused psychological treatment. At this point there is no evidence of the uptake of the longer sessions, although data is expected to be available in 2011.

As DVA moves towards purchasing more specialist treatment for veterans with PTSD and other mental health conditions from a broad range of community based providers, quality assurance processes which regulate types of therapy provided and the length of the session should ideally be in place [131].

5.5. Access to specialist treatment services in rural and remote regions

The process of finding help for combat-related PTSD in Australia is not clear cut. Although information factsheets about PTSD are available on both defence and DVA websites, the path of obtaining specialist help is obscure. Serving members are directed to “Contact your local Medical Centre, Chaplain, Psychologist, Social Worker, Duty Officer/Officer of the Day or your immediate Chain of Command” (<http://www.army.gov.au/woundeddigger/PTSD.asp>), which they may be reluctant to do, because of the concerns outlined in section 5.1.3.

The DVA website carries some information on PTSD in the form of factsheets, but generally veterans are directed to either to Australian Centre for Posttraumatic Mental Health (ACPMH) website or Veterans and Veterans Families Counselling Service (VVCS). In one of its factsheets DVA advises that after the diagnosis of PTSD is made, DVA will cover the cost of psychological or psychiatric treatment sought outside the veteran health system (<http://factsheets.dva.gov.au/factsheets/documents/HSV67%20PTSD%20Benefits.pdf>, DVA Factsheet HSV67).

The ACPMH website provides information on DVA-funded PTSD day hospital programs accredited by ACPMH. These PTSD programs, as tertiary providers, are obliged to demonstrate a capacity to provide clinical support to clinicians outside the program (including psychiatrists, general practitioners, psychologists, VVCS counsellors, and contract counsellors), who are providing follow-up treatment to discharged veterans. In these programs, the process of discharge is treated as vital in ensuring effective continuity of care following the PTSD program. ACPMH recommends that copies of the discharge summary should be made available to the veteran's general practitioner, their VVCS counsellor and any other treating clinician. However, it is assumed that participants have a treating clinician or a counsellor.

On one of its information pages, ACPMH provides a link to Australian Psychology Society webpage (<http://www.psychology.org.au/FindaPsychologist/Default.aspx>). From this site it is possible to obtain a list of clinical psychologists specialising in PTSD treatment. A quick internet search showed a relative abundance of therapists specialising in PTSD treatment around metropolitan areas (within 50 km, a distance arbitrarily chosen as comfortable for travel), while there is a lack of these specialists around more remote or non-metropolitan areas.

The DVA website hosts the information pages for VVCS, which are relatively easy to navigate. There are thirteen VVCS centres, which are based in all capital cities as well as Townsville, Launceston and Albury/Wodonga, Maroochydore, Launceston, Newcastle and Southport. Each VVCS Centre operates a crisis Veteran's Line, a 24 hour, 7-day-a-week telephone counselling service. Besides counselling services operating in each centre, there are doctors available for consultations at some VVCS Centres. The addresses and telephone number of each Centre are provided on each factsheet.

For veterans living in rural and remote regions, VVCS may direct to support groups in country areas and make referrals to other specialised services if necessary VVCS operate VVCS Outreach Program

and VVCS Country Outreach programs, which provide counselling and support services to Veterans and war widows/widowers living in rural, remote and outer metropolitan areas. VVCS Outreach Counselling has a number of contracted counsellors based around the country.

In the 2003–04 financial year, there were approximately 320 DVA contracted outreach program counsellors (OPC) operating in outer metropolitan, rural and remote locations. Over this period, VVCS provided 21,514 centre-based counselling sessions, and OPC provided 39,518 counselling sessions.

To obtain access to these services, or the name of the Area Coordinator in remote areas, potential clients have to contact the nearest VVCS centre by phone. In summary, it is almost impossible to gather information on services available outside metropolitan areas without going personally through the process of referrals.

Recently, VVCS Outreach Program introduced video counselling for veterans in some rural and remote areas. Veterans and their families who live in Orange, Dubbo, Inverell and Glen Innes in NSW or the Wheat Belt, Midwest and Pilbara regions in WA can access VVCS counselling services as part of a pilot program offering free and confidential one-to-one counselling services via video conferencing with qualified VVCS staff. Easy-to-read information on what video conferencing is, why it is used, and what to expect is provided on the VVCS webpage, along with the contact number.

5.6. Sustainability

As at June 2009, out of 165,000 Australian veterans with accepted health disability, 49,000 (30%) were disabled due to mental health conditions, with the most common conditions being Posttraumatic Stress Disorder, Generalised Anxiety Disorder, Alcohol Dependence and Depression [153]. There is very little information on the health care needs of younger veterans, returning from recent deployments in Iraq/Afghanistan and from peacekeeping missions. Adequate and timely provision of mental health care for this population may reduce the need for compensation and disability payments in the future.

One of the most important questions of the health care provision is its sustainability. With limited financial resources the choice of therapy with the best cost-benefit ratio becomes paramount. Cost-effectiveness of all treatments (cost per unit of health outcome improvement) should be assessed. The best treatment model should be chosen, taking into account not only the clinical outcomes of the treatments, but their cost-effectiveness and how their provision affects access to care for others.

This question may be better answered by Phase 2 of the current project. It is impossible to answer the question in the literature review because there is no information available on the cost of running PTSD programs from the sources interrogated by the review.

Below are examples of basic cost analyses performed in some studies. None of them was a proper cost-effectiveness analysis.

Klein (2010) [91] compared the cost of internet-delivered therapy with face-to-face therapy, based on therapist time. On average, therapists from “PTSD Online” spent three hours and 14 minutes per participant, which compares well to the standard 12 hours of face-to-face therapy usually provided by psychologists for a client with PTSD. In terms of cost differences between the two modalities (using the Australian Medicare rebate of AUS \$115.05 per hour), this would equate to AUS \$373 for

PTSD Online and AUS \$1380 individual therapy, making PTSD Online 3.7 times less expensive. The major flaw in this analysis is the assumption that the health outcomes of these two modalities would be the same, which is not possible to demonstrate in an open, one arm trial.

Slightly better comparison of costs is available for videoconferencing versus face-to-face psychiatry. As several studies have demonstrated equivalent health outcomes achieved by these two modalities, the direct comparison of costs is appropriate. A 2003 review of 12 studies concluded that telepsychiatry can be cost-effective and financially viable in selected settings [154]. The comparative cost-benefits of telepsychiatry over in-person consultation were heavily dependent on the distance the psychiatrist had to travel for the consultation. The recently-opened VVCS Outreach Program providing video counselling for veterans in remote areas may provide more definitive answers to the question of comparative costs of providing technology-driven and traditional treatment modalities.

The major implications of being able to effectively deliver PTSD treatment via the internet relate to accessibility and sustainability. In terms of accessibility, online delivery means that anyone in any location with internet access can access effective treatment, and therapists can deliver treatment remotely. The flexibility of online delivery means greater access for populations with no or limited access to treatment programs and/or mental health specialists in their local area. It also means greater accessibility and continuity of treatment for transient populations who are unable to be in one place long enough to receive traditional face-to-face therapy (e.g., armed forces, business travellers) or have limited mobility (e.g., new mothers, single parents, elderly, disabled) [91].

5.7. Evidence based best practice treatment model(s).

5.7.1. Overview of Australian DVA funded PTSD programs

DVA-funded PTSD programs form the basis of Australian models of PTSD treatment. The second part of the Australian model includes the DVA-funded outreach program provided by VVCS and DVA outreach counsellors. The outreach program, which was discussed in sections 5.4 and 5.5, is not covered by quality assurance.

This overview of PTSD treatment programs accredited by the Australian Centre for Posttraumatic Mental Health (ACPMH) and funded by DVA is based on the 2008 overview "Using Mental Health Outcome Measures to Support Quality Assurance of DVA-Funded PTSD Programs" conducted by Phelps, Cooper and Densley [131], PTSD Program Quality Assurance, Annual Report 2008/09 [155] and Accreditation Guidelines For PTSD Programs Purchased by DVA for Veterans [156].

The initial treatment model adopted by Australian programs comprised a four-week inpatient stay followed by an outpatient phase of one day per week for eight weeks. This was designed to provide the opportunity for skills transfer into veterans' normal environment and thus to facilitate veterans' re-integration into the community (Creamer et al., 1996).

The programs were set up to meet the expressed needs of Vietnam era veterans, who were presenting to mental health treatment services with posttraumatic mental health problems, as well as the anticipated needs of other Vietnam veterans who had not yet sought treatment.

To address the prevailing problems of veterans with PTSD and common co-morbidities using best practice treatment, the programs were required to have:

- A multidisciplinary team
- A cognitive behavioural orientation
- A group program with core components including:
 - psychoeducation about PTSD and its treatment
 - trauma focussed work
 - symptom management in areas such as anxiety and depression
 - anger management groups
 - substance abuse and addictive behaviours
 - interpersonal, problem-solving and communication skills;
 - physical health and lifestyle issues
 - relapse prevention
 - education and support to veterans partners
- Individual therapy
- Attention to discharge planning and appropriate follow-up

Program outcomes were measured as changes in PTSD and common co-morbid mental health problems, marital adjustment and quality of life (PCL for PTSD; HADS for depression and anxiety; DAR for anger; AUDIT for alcohol use, ADAS for adjustment; WHOQoL-Brief for Quality of Life) from intake to discharge and at three- and nine-month follow-up.

An early treatment outcome study [111] showed promising results. Modest improvements in core PTSD symptoms, anxiety, depression, alcohol abuse and anger on self report measures, from intake to three- and nine-month follow-up were seen in 419 program participants (PCL: 0.6, HADS-A: 0.6, HADS-D: 0.5, AUDIT: 0.3, Anger: 0.4).

Over time a range of treatment models have evolved including residential programs, day programs and regional outreach programs, with the number of treatment days varying between 20 and 30 days. Despite variations between these different models, a study comparing treatment outcomes in inpatient and day programs found similar improvements in health outcomes [152].

5.7.1.1. Current status of the PTSD programs [155]

5.7.1.1.1. Participant numbers and type

More than 4,000 veterans have already been treated in DVA funded PTSD programs and the number of eligible veterans for whom such programs are suited is declining. The participation rate in PTSD programs reached a peak of 567 participants in 2000/2001 and has declined since that time to 249 veterans in year 2008/09. In parallel, the number of programs reached a peak of 19 in 2002 and declined to 12 programs accredited currently.

While the majority of patients are Vietnam era veterans, there has been a steady increase in younger participants who have served in various overseas deployments since Vietnam. In the 2008/09 financial year, 34% of program participants were post-Vietnam era veterans (under 55 years), up from 30% last year. Some PTSD programs include non-veteran participants in the cohorts, or run separate cohorts for non-veterans. These participants are not reflected in the data provided here.

5.7.1.1.2. Accreditation process

In 2007 the accreditation process changed from a format that included site visits to self-reports. These reports follow a standardised format, which has to address the following issues.

1. Access and targeting
2. Quality of service to veterans and their families
3. Intake, assessment, case management and discharge
4. Treatment
5. Operational management
6. Outputs, review and monitoring
7. Innovation and influence

5.7.1.1.3. Type of services provided by the programs

The types of intervention currently mandated are 20-30 treatment days in duration and are performed in closed cohorts of six to eight veterans. All programs provided can be categorised into three levels of intensity.

1. High intensity programs:
 - Inpatient programs: conducted over approximately 12 weeks, which include an intensive inpatient phase of four to five days per week for one to four weeks, and an outpatient phase of one to two days per week for three to 11 weeks.
 - Residential programs: structurally similar to the inpatient programs, but veterans are housed in local residential accommodation.
 - Regional inpatient: structurally similar to the inpatient programs, but with the inpatient phase conducted in a metropolitan facility and the outpatient phase in the regional facility.
2. Moderate intensity programs:
 - Day Hospital programs: conducted over approximately 12 weeks on an outpatient basis, with an intensive phase of more than two days per week. This may comprise, for example, three to five days a week for four to six weeks, followed by one to two days a week for a further four to six weeks.
 - Regional Outreach Day Hospital programs: conducted on a day hospital basis solely in a regional area.
3. Low intensity programs:
 - Outpatient programs: programs conducted on a once weekly basis over longer than 12 weeks (usually around six months).
 - Older veterans programs: primarily once weekly over three months and then fortnightly for a further three months.

The ACPMH Accreditation Guidelines recommend matching of veteran presentation to program intensity.

Although the PTSD programs are run basically as group intervention, they are expected to provide each veteran with a minimum of eight individual sessions throughout the program. The nature of these interventions is not specified and may vary according to clinical decision.

The interventions should include the following components:

1. Psychoeducation
2. Symptom management
3. Trauma focus/exposure to the traumatic memories
4. Graded in-vivo exposure
5. Alcohol use and relapse prevention
6. Interpersonal skills
7. Partner involvement
8. Physical health and lifestyle issues
9. Concentration and memory
10. Individual treatment
11. Other

The process of discharge is vital in ensuring effective continuity of care following the PTSD program. It is recommended that copies of the discharge summary should be made available to the veteran's general practitioner, their VVCS counsellor, and any other treating clinician.

PTSD programs, as tertiary providers, should demonstrate a capacity to provide clinical support to clinicians outside the program (including psychiatrists, general practitioners, psychologists, VVCS counsellors, and contract counsellors) who are providing follow-up treatment to discharged veterans.

The accreditation may be withdrawn when the program ceases to be viable from the perspective of quality assurance:

- Cohort size: a treatment program should not begin with a cohort of less than five participants
- Cohort frequency: the viability of a program should be in question where it has run less than three programs in a year, or five in two years
- Staff level and experience: each PTSD program should have a minimum of 3.0 effective full time clinical positions. The position of Clinical Director should be filled by a psychiatrist. Ideally, the multidisciplinary team should comprise qualified and suitably trained representatives from psychiatry, psychology, social work, psychiatric nursing and drug/alcohol counselling.

5.7.1.1.4. Assessment of individual programs

The assessment of issues related to the quality assurance of individual programs are available from "PTSD Program Quality Assurance, Annual Report 2008/09" [155], which is available from DVA.

5.7.1.1.5. Treatment outcomes

The following table shows the average magnitude of improvements reported by all veterans participating in PTSD programs across the country since the collection of data at discharge commenced in 2003. The outcomes have remained consistent over time. Small to moderate effect sizes changes were found in all of the key measures and these gains were maintained at follow up, as seen in the table below [155].

Table 6. Average magnitude of improvements in ACPMH-accredited PTSD treatment programs

Measure	Intake to discharge n=2020	Intake to 3 months n=4232	Intake to 9 months n=3832
PTSD	ES=0.5	ES=0.5	ES=0.6
Anxiety	ES=0.5	ES=0.5	ES=0.5
Depression	ES=0.5	ES=0.4	ES=0.4
Alcohol	ES=0.2	ES=0.3	ES=0.3
Anger	ES=0.3	ES=0.4	ES=0.4

The changing demographic content of the participants, from almost exclusively Vietnam veterans to greater involvement of younger veterans, prompted a subgroup analysis of the treatment outcomes. Surprisingly, Vietnam veterans, whose PTSD was chronic and of many years duration, had better treatment outcomes than younger veterans. An initial study indicated that peacekeepers had weaker treatment gains on PTSD symptoms and anger, but comparable gains on anxiety, depression and alcohol use compared to Vietnam veterans undertaking programs in the same facilities (PCL: 0.3 vs. 0.5; HADS-A: 0.3 vs. 0.3; HADS-D: 0.3 vs. 0.3; AUDIT: 0.1 vs. 0.1; DAR: 0.1 vs. 0.4) [157].

More recent data that included 318 peacekeepers combined with veterans of the war in Iraq and Afghanistan confirmed this trend. Peacekeepers and younger veterans present with more severe PTSD and anger, and the magnitude of improvements derived from the programs are smaller [131], as seen in the table below.

Table 7. Treatment outcomes for younger and Vietnam veterans in PTSD programs [131]

Measure	Effect Size (Cohen's d) intake to 3 months	
	Peacekeepers	Vietnam veterans
PCL	0.5	0.7
HADS – Anxiety	0.5	0.6
HADS – Depression	0.3	0.5
AUDIT	0.2	0.3
War Stress Inventory (Anger)	0.3	0.5

In response to the different presentation and needs of younger veterans, a small number of these programs have begun to develop innovative approaches in an attempt to better meet their needs. If this was done on a national level, the clinical experience of Australian programs could be combined with international experience in treating younger veterans and the limited available research to develop best practice treatment guidelines for programs for younger veterans.

5.7.1.2. What is the evidence basis for the PTSD programs format delivery

To evaluate the level of evidence supporting the delivery of DVA sponsored programs, the main elements of the program have to be assessed separately.

5.7.1.2.1. Group therapy

Individual therapy can be costly, difficult for patients to access and require considerable resources with respect to the availability of trained therapists. For disorders that are highly prevalent, group treatments offer the possibility of reaching more patients while using therapist time more efficiently. This treatment modality allows for the provision of care for a large number of individuals while decreasing the demands on clinicians' time. In fact, some health care systems rely almost

exclusively on group treatments, given demand for services and limited number of providers. Additionally, it is thought that group treatments provide the unique benefit of allowing group members to confront several of the secondary problems associated with PTSD, such as lack of trust in others, feelings of detachment, and diminished affect.

However, to date there are no studies examining the effectiveness of group versus individual therapy. There is a small amount of evidence summarised in the NICE guidelines suggesting that group CBT, both trauma focussed or non trauma focussed, is effective compared to wait-list. These findings were supported by the most recent studies on group CBT [37] and group exposure [38] (see section 3.1.4).

Based on the indirect comparison, the Taylor (2009) meta-analysis indicated better outcomes with individual therapies compared to group approaches (see section 3.1.3.4).

The Australian Guidelines recommend that group CBT may be provided as adjunctive to, but should not be considered an alternative to, individual therapy.

In their review of treatment of PTSD in military and veteran populations, Creamer and Forbes noted that “Despite the lack of research supporting the group model, Veteran Affairs mental health services in most countries offer group interventions for PTSD for veterans. Although this may be partly a cost consideration, it stems more from the perception of potential benefits of joining others in the therapeutic effort “. The authors concluded that “While group interventions for veterans may have many benefits (e.g. in terms of providing support and sense of belonging) there is little to recommend them as a treatment of choice for PTSD” [150].

It should be noted that there are some elements of the PTSD programs i.e. education, socialisation, physical therapy, where the group delivery of the program may have a lesser effect on treatment effectiveness compared to elements of therapy when individual attention appears more essential i.e. CBT or imaginal exposure.

Some authors suggest that to be effective, group CBT has to be modified for group conditions. For example, in the Beck (2009) study of group CBT, imaginal exposure was assigned as homework and exposure to the target trauma was conducted in writing [37]. The improvements were comparable to individual CBT in other studies.

5.7.1.2.2. High intensity vs. lower intensity programs

A current large Australian study of 4339 veterans with combat-related PTSD investigated outcomes of five types of group-based cognitive behavioural programs of different intensities and settings [158]. Although significant improvements in symptoms were evident over time for each program type, no significant differences in outcome were evident between programs. However, when PTSD severity was considered, veterans with severe PTSD performed less well in the low-intensity programs than in the moderate- or high-intensity programs. Veterans with mild PTSD improved less in high-intensity programs than in moderate- or low-intensity programs.

Additionally, the data suggest that locally delivered moderate-intensity regional programs appear to demonstrate a trend toward greater improvement in PTSD symptoms than those delivered in metropolitan facilities, both for veterans with more severe PTSD and those with mild PTSD [158].

In summary, the study suggests that outcomes may be maximised when veterans participate in program intensity types that match their level of PTSD severity. When such matching is not feasible,

moderate-intensity programs appear to offer the most consistent outcomes. For regionally based veterans, delivering treatment in their local environment may improve outcomes [158].

5.7.1.2.3. Inpatient or residential therapies

There is very little evidence that inpatient or residential treatment is more beneficial than outpatient treatment. The Australian Guidelines summarise the study by Fontana and Rosenheck (1997), which compared the outcomes and costs of three models of US DVA inpatient treatment for PTSD: 1) long stay specialised inpatient PTSD units; 2) short stay specialised evaluation and brief treatment PTSD units; and 3) non-specialised general psychiatric units. The study included 785 Vietnam veterans from ten programs across the country, with follow up of 66% after one year.

All models demonstrated improvement at the time of discharge, but during follow-up symptoms and social functioning rebounded toward admission levels, especially among participants who had been treated in long stay PTSD units. At follow up, the treatment effects were significantly larger for the veterans in the short stay PTSD units and in the general psychiatric compared to veterans in the long stay PTSD units. Greatest satisfaction with their programs was reported by veterans in the short-stay PTSD units. The least effective long stay PTSD units were also the most expensive; yearly cost was 82% higher than for the short-stay PTSD units, and 53% higher than general psychiatric units. Short stay clinics were more effective, provided the most patient satisfaction and were the least costly. As a result, the authors recommended a systematic restructuring of VA PTSD treatment programs in the USA.

In Australia, the comparison of veterans receiving the same treatment as inpatients and during day hospital intervention, showed no differences in treatment effects between groups [152]. In a quasi-experimental study, Creamer and colleagues (2002) compared the treatment outcomes of inpatient-outpatient programs and day hospital programs for chronic, combat-related PTSD. Data were drawn from 202 Vietnam veterans who had completed treatment at four programs across Australia. Significant improvements on psychological and social variables were seen after treatment and up to the nine month follow up, but there were no differences between groups. The results suggest that inpatient-outpatient programs are not more efficacious than the less expensive day hospital alternatives. The authors conclude that treatment services for veterans with PTSD should be delivered in the least restrictive environment.

In summary, at present there is no published evidence that intensive inpatient or residential PTSD programs are the best treatment option for veterans with PTSD, possibly with the exception of the most severe cases.

5.7.1.2.4. Couple and family therapy

The data on couples and family treatment is scarce; however the theoretical basis for its use in the treatment of PTSD is strong (see section 3.5.2.1.). Families of PTSD sufferers may experience a secondary traumatisation and they bear the first brunt of emotional damage [159]. Family relationships can serve as a support or obstacle in recovery from combat-related distress, underscoring the importance of the family relationship as a target for intervention [20].

The importance of social support has been demonstrated in a recent study of Thrasher 2010 [25], which reanalysed data from a previous trial of Marks (1998). This study found similar improvements in groups of patients with chronic PTSD undergoing exposure, cognitive restructuring and combined

condition therapy. However, when the population within the groups was stratified according to the perceived social support scale, those with better social support showed significantly greater gains from the treatment, indicating that social support is a predictor of treatment outcome.

5.7.1.2.5. Psychosocial rehabilitation and Socialisation

Although there is no conclusive evidence that psychosocial rehabilitation and socialisation improve symptoms of PTSD, there is strong theoretical basis for its use, and expert opinion recommends social rehabilitation interventions to prevent or reduce disability and improve functioning even when PTSD symptoms have not responded to evidence-based-treatment (see section 3.6).

5.7.1.2.6. Sport and physical activity

There is no conclusive published evidence that sport and physical activity improve symptoms of PTSD (see section 3.5.3).

5.7.1.2.7. Physiotherapy and related physical therapies

There is no conclusive published evidence that physiotherapy and related physical therapies improve symptoms of PTSD.

5.7.1.3. Conclusions

The DVA-funded, ACPMH-accredited PTSD programs are primarily residential and day hospital group interventions that attempt to address many aspects of PTSD, including symptoms, family, relationships, socialisation, physical wellbeing and quality of life. The programs have been designed using best clinical practice and the strong theoretical basis for the use of individual therapeutic components. With few exceptions there are no randomised control trials reported in the literature that evaluate the outcomes of residential group treatment programs. The bulk of published evidence is for individual therapies, which are by design not used by the PTSD programs. Since the lack of evidence results from inadequate research in this area, it is difficult to assess the current model based on published literature. Therefore, the evaluation and decisions about the future of these programs will have to be made on basis wider than available published evidence.

5.7.2. Comparison of the Australian model with overseas models

5.7.2.1. Early overseas models

Early PTSD programs in the USA involved long stay inpatient treatment which placed great importance on the therapeutic milieu. Although popular with both veterans and staff, these programs were associated with rather poor treatment outcomes [160].

The Koach project was developed in Israel to treat the chronic PTSD of veterans of the Lebanon War. In this model, the inpatient stay was relatively brief (four weeks) followed by indefinite outpatient follow-up. In line with the U.S. experience, the program was perceived as very positive by veterans and staff but objectively had poor outcomes [161].

5.7.2.2. Recent US model

A simple search using “PTSD” as a keyword on the US Veterans Affairs home webpage leads to a “Where to Get Help for PTSD” webpage (<http://www.ptsd.va.gov/public/where-to-get-help.asp>).

In simple-to-follow hypertext, information is provided on how to locate a mental health care provider. It could be done by using a VA Facility Locator, PTSD Program Locators and Vet Center locator. All of these locators are able to find the nearest facility or a list of facilities situated within 50 km of the searcher's postal code. Each location contains postal and telephone contact details.

Additional information on the webpage (in hypertext) contains advice on:

- Finding and choosing a therapist: What to look for in a therapist and how to find one
- Help for Veterans with PTSD: Answers common questions asked by Veterans and describes treatment resources
- Web resource links: Self-Care and Treatment: More resources to assist you after trauma.
- Treatment of PTSD: Don't know what to expect? This explains the most effective approaches

The DVA sponsors the following programs:

1. Specialised Outpatient PTSD Programs. These outpatient clinics provide group and one-to-one treatment for PTSD for all veterans, for female Veterans only and for veterans with the combined problems of PTSD and substance abuse.
2. Specialised Intensive PTSD Programs, which range from day hospital to residential treatments with stays of one to three months. These programs include:
 - PTSD Day Hospitals: outpatient clinics, one-to-one and group treatment, 4-8 hours/day, patients come in daily or several times a week
 - Evaluation and Brief Treatment of PTSD Units: provide PTSD treatment for 14 to 28 days
 - PTSD Residential Rehabilitation Programs: provide PTSD treatment and case management for 28 to 90 days
 - Specialised Inpatient PTSD Units: provide trauma-focused hospital treatment for 28 to 90 days
 - PTSD Domiciliary (PTSD Dom): provide live-in treatment for a set period of time, with the goal of helping the veteran get better and move to outpatient mental health care.
 - Women's Trauma Recovery Program (WTRP): established in Palo Alto, CA, in 1992 it is a live-in 60-day program focused on war zone-related stress as well as Military Sexual Trauma
3. Other options:
 - Some VA medical centres are now offering walk-in clinics, where a veteran can walk into the primary care clinic and be seen that day by a mental health provider
 - Community-based outpatient clinics

5.7.2.3. RESPECT-Mil

"Re-Engineering Systems of Primary Care for PTSD and Depression in the Military" (RESPECT-Mil), tested the feasibility of a systems-level approach to mental health in military primary care [162]. The key elements included universal primary care screening for PTSD and depression, brief standardised primary care diagnostic assessment for those who screen positive, and use of a nurse "care facilitator" to ensure continuity of care for those with unmet depression and PTSD treatment needs. The care facilitator assisted primary care providers with follow-up, symptom monitoring, and treatment adjustment and enhanced the primary care interface with specialty mental health services. The RESPECT-Mil model was implemented in one of the primary care clinics located at Fort

Bragg, North Carolina, which supports a large number of Army units undergoing frequent deployments, mostly to Iraq and Afghanistan.

In RESPECT-Mil, active duty soldiers attending sick call were given a paper form and asked to respond yes or no to six questions. Two questions addressed depression, asking about recent depressed mood and anhedonia. Four questions addressed PTSD, asking about nightmares, avoidance, arousal, and numbness. Those that responded yes to at least one depression questions and at least three of the PTSD questions were asked to complete depression and PTSD Checklist questionnaires (PHQ-9 and PCL), which required approximately five minutes and was usually handled by a nurse before seeing the primary care provider. Completed forms were reviewed and scored by the primary care provider for that visit.

Those with these presumptive diagnoses were offered primary care management, a psychiatrist-supervised follow-up or were referred directly to mental health services. The impact of implementation and care facilitation efforts was tracked over 16 months.

Participating primary health providers, mental health professional and care facilitator received up to four hours of training. The care facilitator was chosen for excellent people and telephone skills, but required no medical background.

The clinic screened about 4,000 primary care active duty patient visits. Approximately 10% were positive for depression, PTSD, or both. Sixty-nine patients participated in collaborative care for six weeks or longer, and the majority of these patients experienced clinically important improvement in PTSD and depression, although very few soldiers had achieved total remission of symptoms by 12 weeks of treatment.

With basically only the added resource of a care facilitator, the program was able to screen and identify soldiers with depression and/or PTSD who would likely have gone undetected and untreated.

This model, however relevant for the serving member of the military, is less relevant to veterans who made the transition to civilian life and dispersed around the country.

5.7.2.4. Canadian model

The Canadian model encompass a transparent three-tier system of treatment centres, clinics and referrals that ensure continuity of PTSD care from active military to transition of veteran to civilian life. The system operates:

1. Post-Deployment Clinics
2. Operational Trauma and Stress Support Centres (OTSSC)
3. Operational Stress Injury Clinics

Post-Deployment Clinics

Post-Deployment Clinics were established at several bases across Canada in 1998, when they replaced the Gulf War Clinics. There are now five Post-Deployment Clinics, situated in Halifax, Valcartier, Ottawa, Edmonton and Esquimalt. The website (<http://www.cmp-cpm.forces.gc.ca/cen/ps/mho-smb/osi-ssb/pdc-cpd-eng.asp>) provides user friendly information on who is entitled to access these clinics and how to do it, including the necessary contact numbers.

Currently serving members who have a medical problem they feel is related to an operational deployment and whose medical diagnosis is not yet clear, can request a referral to one of these clinics by contacting their local medical facilities.

Retired service members who have medical problems they feel are related to an operational deployment and whose medical diagnosis is not yet clear, can request a referral to one of these clinics through a Pension Officer of Veteran Affairs Canada (VAC) with the recommendation of a District VAC Medical Officer.

The Post-Deployment Clinic will evaluate veterans (serving or retired) of any Canadian deployment, who feel they have a medical problem that may have been a result of their deployment and, whose diagnosis is not yet clear. The Post-Deployment Clinics will perform whatever lab, x-ray, or specialist referrals necessary to arrive at a diagnosis. This includes referral to the OTSSC for assessment of deployment related stress problems.

Operational Trauma and Stress Support Centres (OTSSC)

Operational Trauma and Stress Support Centres are operated by Canadian Department of National Defence (DND). OTSSCs are situated in the same five locations as Post-Deployment Clinics. The OTSSC are adjunct treatment centres to current Mental Health Services. Their purpose is to provide individualised assessment, education, and initial treatment for members suffering from Posttraumatic Stress Disorder. The Canadian Armed Forces web site (<http://www.forces.gc.ca/health-sante/ps/mh-sm/otssc-cstso/faq-eng.asp>) explains the basic difference between the Post-Deployment Clinics and the OTSSC and provides easily accessible information in the user-friendly form of OTSSC Frequently Asked Questions about who is entitled to assistance at OTSSC, who provides it and how to access the services.

Operational Stress Injury (OSI) Clinics

OSI clinics are outpatient facilities where clients, who live with mental health conditions, and their families, can find comprehensive clinical assessment and treatment services under one roof. Funded by Veterans Affairs Canada, these clinics are staffed with fully trained teams of mental health care professionals who work closely together to provide specialised care. Information on OSI clinics is provided at the Canadian Veteran Affairs website at <http://www.vac-acc.gc.ca/youth/sub.cfm?source=mental-health/support/osi-clinics-support>.

There are currently eight OSI clinics, which form a network across Canada. Postal and telephone contact details for each clinic are provided. Ste. Anne's Hospital National Centre for Operational Stress Injuries is responsible for the development and management of these clinics.

Each clinic has a professional team of psychiatrists, psychologists, social workers, mental health nurses and other specialised clinicians. They develop personalised treatment plans in collaboration with each client. While continuing to live in their community, clients attend periodic appointments at the OSI clinic (except for the residential and inpatient stabilisation treatment programs). The spouse and close family members can also be involved in the treatment process.

In addition to clinical assessment, clients are offered a variety of treatment options including individual therapies, group sessions, psycho-education sessions and access to other resources. Clients may be referred to an addiction treatment centre for specialised counselling services if alcohol dependency, substance abuse, or gambling difficulties require more intensive treatment.

The team works closely with other health care or community organisations to ensure appropriate follow-up as the treatment at the OSI clinic comes to an end.

Telemental Health

Veterans' Affairs Canada operates the Telemental Health programs, which take advantage of modern technology to ensure clients in rural or remote areas can get the help they need without leaving their community. The technology used can range from a simple telephone call to more advanced technology like patient portals and handheld devices. Most often, telemental health services are delivered through video-conferences linking clients with counsellors and other health professionals.

Inpatient PTSD treatment

There is one inpatient treatment program for adults with PTSD available in Canada. It is situated in Homewood Health Centre, Guelph, Ontario. The program, "Program for Traumatic Stress Recovery", is underwritten by Canada's universal health insurance system. This six week program, based on the Sanctuary Model developed by Philadelphia psychiatrist Sandra Bloom, M.D, has been in existence for a decade and, to date, has treated some 3,000 PTSD patients, from child-abuse survivors and motor-accident victims to peacekeepers who have witnessed atrocities [163].

The program staff include a psychiatrist, family physician and addiction specialist, nurses, psychologists, social workers, occupational therapists, recreation therapists, creative arts therapists, a chaplain, and even a horticultural therapist—altogether some 30 people, a number of whom split their time between the PTSD program and other duties at the Homewood Health Centre.

Medications constitute frontline therapy in the program. Usually the SSRIs plus mood stabilisers are used, as well as atypical antipsychotics for agitation and paranoid ideation. Other kinds of treatments are offered as well, usually in a group format, for instance, cognitive-behavioural therapy, eye-movement desensitisation and reprocessing, art therapy for nightmares, and help for substance abuse.

5.7.2.5. UK model

Veterans' health care in the UK until recently was based on the premises that there is little evidence that veterans generally suffer different mental health disorders from the rest of the community nor that these require different treatments when seen in veterans. Therefore, veterans' healthcare is primarily the responsibility of the NHS.

However, some veterans are reluctant to seek help from civilian health professionals. They feel that they lack understanding of military life or the context of their injuries. This delay in help-seeking means that successful treatment may be more difficult. Additionally, with so many demands on the NHS, local facilities may not offer specialist trauma-focused services, or be able to manage veterans in a contextually sensitive environment. There are currently very few specialist services to meet the treatment needs of this veteran group.

Recently, the Department of Health has signed a partnership agreement with the Ministry of Defence and Combat Stress and this aims to strengthen local NHS provision in areas with a high proportion of veterans.

Combat stress (<http://www.combatstress.org.uk/index.php>)

Combat Stress is a charity organisation, which was established in 1919, after the First World War to help returning service men suffering the effects of what was then known as "shell shock". Over the past 90 years Combat Stress has supported almost 100,000 Veterans with service-related mental health problems. The organisation has been receiving new referrals at the rate of 1,000+ per year. At present, more than 4,400 Veterans are registered with the organisation. The average age of new referrals last year was 43 years and 3.3% of veterans were female. The member veterans represent every military and peace-keeping operation that British Forces have been involved in since the Second World War, which include Northern Ireland, the Falklands, Gulf War 1, the Balkans, Iraq and Afghanistan.

Combat Stress provides two types of services:

- Short stay residential treatment centres in Shropshire, Surrey and Ayrshire. Individuals generally stay for up to two weeks at a time, although this may vary according to need. Each centre has 25-30 beds and provides a range of treatments including psychiatric support and occupational therapy.
- Community outreach service, delivered by teams of Mental Health Practitioners, Community Psychiatric Nurses, and Regional Welfare Officers. Combat Stress Community Outreach service centres have now established mental health teams working in Scotland, the North East, the North West, Wales & the Midlands and Anglia.

The services provided by Combat Stress are free of charge. Services are accessed by calling a regional centre; contact details are provided.

MoD pilot scheme (http://www.veterans-uk.info/mental_health/faq.html#vets2a)

The new pilot scheme will open and operate six new places at Stafford, Camden & Islington, Cardiff, Newcastle, St Austell and Scotland. The sites will be based at NHS primary care and community mental health facilities and will be linked variously to centres of military expertise, academic centres and Combat Stress. At the heart of each facility will be a Community Veterans Mental Health Therapist. Following initial triage clients will be directed to relevant treatment and support. Some will have social needs; others can be dealt with by the GP or community mental health services with or without the support of the community therapist or others with relevant military expertise/experience. Some with complex and severe needs may require specialist assessment and treatment. This may be provided by the community veterans' mental health specialist or elsewhere including, in some cases, in-patient referral to a Combat Stress home.

The new model is based on a holistic approach to mental health and wellbeing. It is multidisciplinary, with links to local social services and ex-service charities, especially the regional welfare officers of Combat Stress and the Veterans Welfare Service. The aim is to provide help with social integration, financial issues, relationships, housing, job seeking, training education physical fitness, sports and recreation.

The MoD partnership with the Department of Health will work on wider dissemination of information about the pilot services to GPs, service leavers, veterans, ex-service organisations and health professionals.

The funding for the scheme will be initially provided by MoD, which will provide start up costs to the six pilot sites that will participate in the scheme. The remainder of costs will then be the responsibility of the local NHS trusts.

In summary, the UK model of veterans' care relies heavily on the national civilian health care, with a new organisational model being developed presently. Beside a statement that NHS mental health treatments are based on the evidence-based recommendation by NICE, there is no easy to access information for potential patients on types of treatment they may expect, whether delivered by NHS, Combat Stress or MoD pilot schemes.

5.7.2.6. Comparison of models and conclusions

The US model of PTSD treatment appears to offer a wide range of both residential treatments with stays up to three months and outpatient treatments. However, it is difficult to say that the treatment model relies more heavily on the residential programs without having accurate statistics on the proportion of veterans receiving these treatment compared with those that receive outpatient or community treatments.

Information presented on the US VA web pages is user friendly and easy to access. Information for potential patients is exhaustive, offering them a choice of treatments, explaining the treatments and informing them about what to expect.

The Canadian model appears to rely more on the outpatient treatments, with only one civilian clinic offering hospital-type treatments, catering to both military and civilian patients. The process of obtaining treatment in Canada appears to be transparent and easy to access at any stage, both for active service members and veterans. This impression results from the user friendly presentation of information on the Canadian VA web pages.

It appears that the Australian model is more similar to the US model than to the Canadian one, relying more heavily on day hospital programs than on outpatient or community settings for treatment. There is some information on PTSD on the DVA site and as it is not in form of hypertext it is rather difficult to follow. To get any information about treatments potential patients are directed to the ACPMH website, which is not a specifically military site. There is a reasonable amount of information the ACPMH website about residential and day hospital programs accredited by ACPMH, but following it requires considerable skills. There is very little information on any alternatives to PTSD programs. Although potential patients are informed that the cost of privately obtained psychological treatment, referred by a doctor, will be refunded by DVA, there is no advice on how to find and choose a specialist. Patients are not informed about what to expect. Most information is obscured by the statements "talk to your doctor", or "contact VVCS" and "discuss treatment options with them". Links to user friendly information like the PTSD Treatment Table provided by The University of Queensland's Centre of National Research on Disability and Rehabilitation Medicine (CONROD) at

<http://www2.som.uq.edu.au/som/Research/PTSD/treatments/Pages/TreatmentTable.aspx> are difficult to find. Compared with the US and Canadian VA websites, on the subject of PTSD treatment, the Australian DVA website is relatively uninformative and not user friendly.

However, this is an impression formed on the basis of the presentation of information seen from the perspective of a potential patient. Without exhaustive research and access to comparative statistics on care utilisation, there is no conclusive evidence that the actual access to treatment and the treatment quality differs between countries.

6. Extraction Tables: Summary of methodologies and outcomes of included RCTs on interventions for PTSD

Table 8. Psychological interventions for PTSD

Study	Study characteristics: N, groups, Aim, Population	Number of sessions, follow up, dropouts, factors in study quality	Instruments	Results
Beck 2009 [37] <u>group CBT</u> US	N=33 2 groups (n=17, n=16) Aim: to compare the effectiveness of <u>group CBT</u> (GCBT) with minimum contact comparison (MCC) Population: Survivors of serious motor vehicle accident with chronic PTSD.	14 weekly sessions, 2 h each Treatment assessed at post-treatment and at 3-month follow-up Blinded assessment, rand. Method not clear. No ITT, analysis on completers (44 randomised, 25% dropout).	CAPS, IES-R, BDI, AI	Compared to the controls, GCBT participants who showed significant reductions in PTSD symptoms, on clinical interview or a self-report measure, and higher clinical improvement rate (did not satisfy criteria for PTSD at post-treatment) 88% vs. 31%. No changes were seen on anxiety, depression, and pain measures. Treatment-related gains were maintained over a 3-month follow-up. Authors suggest that attrition and improvements from this treatment was comparable with individually administered CBTs from other studies, <i>but it is not direct comparison.</i>
Falsetti 2008 [38] <u>group exposure</u> US	N=53 2 groups: (1) <u>Group</u> multiple channel exposure therapy (M-CET), especially developed to treat PTSD with <u>co-morbid panic attacks</u> (2) Waitlist Aim: to assess the efficacy of group exposure therapy Population: patients with PTSD and <u>co-morbid panic attacks</u>	12 sessions. Treatment assessed at post-treatment and at 6-month follow-up. Randomisation method not clear, no blinding, ITT analysis.	CAPS SCID ADIS-R MPSS-SR PRS BDI	Treatment was associated with significant decreases in PTSD and panic symptoms at post-treatment, with treatment participants rating their symptoms as less frequent and severe and describing less distress and interference associated with panic attacks. At post-treatment, no longer met criteria for PTSD: 75% of treated and 17% of controls. Between the group effect sizes were large for PTSD symptoms ($g=1.24$) and fear of panic ($g=1.15$), moderate for panic attacks and physical reaction scale. These improvements were maintained over a 6-month period. Dropout rates were 36% in the treated and 26% in control group, did not differ significantly. Conclusions: Group multiple channel exposure may be an effective way to treat patients with PTSD and co-morbid panic attacks.
Moser 2010 [40] US	N=54 2 groups: prolonged exposure (PE) and PE with cognitive restructuring (PE+CR) Population: patients with severe negative trauma-related cognitions and severe PTSD	9 to 12 weekly sessions, 90 to 120 minutes each	PSS-I PSS-SR PTCI	This paper is a reanalysis of the data reported in Foa and Rauch (2004). Patients more severe pre-treatment trauma-related cognitions and more severe pre-treatment PTSD symptoms at pre-treatment benefited less from an exposure combined with cognitive restructuring compared to exposure alone. This suggests that a simpler treatment (i.e., PE alone), which may be more transportable and cost-effective, may also benefit a broader array of patients.

Study	Study characteristics: N, groups, Aim, Population	Number of sessions, follow up, dropouts, factors in study quality	Instrum ents	Results
Resick 2008 [31] CBT components US	N=150 3 groups: (1) full cognitive processing therapy (CPT), (2) cognitive therapy only (CPT-C) and (3) written accounts (WA) Aim: To compare the effect of full protocol of CPT with its constituent components CPT-C and WA Population: Women with PTSD and co-morbid symptoms	CPT and CPT-C: 12 sessions, 60 min each, 2 per week for 6 weeks; WA: 7 sessions, in the 1st week, two separate 60-min sessions; thereafter, 2 hr sessions once a week. Treatment assessed at post-treatment and at 6 months follow up Dropout 15% at post-test, 43% at 6 months Good randomisation, blinded assessment, ITT	CAPS SCID STI BDI ESS PBRS PDS STAI STAIX	Patients in all 3 treatments improved substantially at post-treatment, with large decreases in PTSD symptoms, and also in depression, anxiety, anger, guilt, shame, and cognitive distortions. Improvements were maintained throughout the follow-up period. The combination of cognitive therapy and WAs did not improve upon the results of either component. However, there were significant group differences in symptom reduction during the course of treatment: CPT-C condition reported the fastest and greatest improvement in PTSD, and the WA condition the slowest. CONCLUSIONS: Both components of CPT as well as the full protocol were successful in treating PTSD.
Bryant 2008 [39] <u>Combined therapies</u> Australia	N=118 4 groups: (1) imaginal exposure (IE), (2) in vivo exposure (IVE), (3) (IE+IVE), (4) exposure combined with cognitive restructuring CR (IE+IVE+CR). Aim: to compare combined therapy with monotherapy Population: consecutive civilian trauma survivors with PTSD.	8 individually administered sessions Treatment assessed at post-treatment and at 6-month follow-up. 82% completed treatment, and 71% completed the 6-month follow-up assessment Good randomisation, blinding and power, ITT and completers.	CAPS, BDI, IES, STAI, CCQ	At post-treatment, a proportion of patients with PTSD was numerically lower in the combined IE/IVE/CR group (35%) compared to exposure groups (63%, 65% and 59%), but the difference was not significant. At 6 -month follow-up, the proportion of patients still with PTSD At 6 -month follow-up was: IE=75%, IVE=69%, IE/IVE=63% and IE/IVE/CR=31%, significantly lower in combined group than in exposure groups. There was no differences between imaginal exposure and in vivo exposure groups. The IE/IVE/CR condition resulted in larger effect sizes than each of the other conditions in terms of PTSD and depressive symptoms: IE/IVE/CR compared to IE was 0.5%-0.8%, moderate to large, while IVE vs. IE was small to moderate Conclusions: Combining CR with exposure therapy resulted in greater treatment effects for both PTSD and depressive symptoms than did exposure alone.
Hien 2009 [43] CBT <u>co-morbid substance use</u>	N=353 2 groups: Seeking Safety CBT (SS) and Women's Health Education (WHE) Population: women with PTSD and co-occurring substance use, with full (80%) and sub-threshold PTSD diagnosis, different stages of drug use	12 sessions of both; mean attended=6 for both, treatments delivered by community-based counsellors Treatment assessed at post-treatment and at 3, 6, and 12 months follow up. good randomisation, no blinding, ITT	CAPS, PSS-SR, substance use inventory	Both treatments were associated with large and clinically significant reductions in PTSD symptoms (CAPS and PSS-SR effect sizes were $d = 1.94$ and 1.12 , respectively), which occurred rapidly during the acute treatment phase and were sustained over 12 months of follow-up. There were no overall differences in PTSD outcomes between the treatments. Substance use: no difference over time, or between groups Trauma-focused program is not better than non-specific attention program focused on understanding female body

Study	Study characteristics: N, groups, Aim, Population	Number of sessions, follow up, dropouts, factors in study quality	Instrum ents	Results
Zlotnick 2009 [44] <u>co-morbid substance use</u> US	N=49 2 groups: Seeking Safety CBT (SS) plus treatment-as-usual (TAU) with TAU alone Population: incarcerated women with substance use disorder (SUD) and PTSD; full or sub-threshold.	SS: in prison: 25 group sessions, 90 min each, 3/week, over 6 to 8 weeks, 3-5 women per group. After release: release: 12 weekly individual sessions, 60-min each. Treatment was voluntary. TAU: 180 to 240 hours of individual and group treatment over 6 to 8 weeks. Treatment was mandatory, residential. Assessments occurred at intake, 12 weeks after intake, and 3 and 6 months after release from prison. 10% dropout. Good randomisation, no blinding, ITT	CAPS, THQ TSC-40 SCID ASI TLHB	Both interventions resulted in significant improvements on all outcomes (PTSD, SUD, psychopathology, and legal problems) from intake to later time points; but there were no significant differences between treatments. At 6 months after release from prison, 53% of the women in both conditions reported a remission in PTSD. At follow-up there was a trends for PTSD symptoms and psychopathology to continue to improve in SS participants, while worsening or not improving in TAU. However, alcohol use improved more for TAU during follow-up. Satisfaction with SS was high, and a greater number of SS sessions was associated with greater improvement on PTSD and drug use.
Feske 2008 [42] PE <u>co- morbidities</u> Community treatment	N=21 2 groups: PE=9, TAU=12 Aim: To assess the efficacy of prolonged exposure in PTSD patients with psychiatric co- morbidities. Population: predominantly low income and black women with complex trauma and psychiatric histories, outpatients	9 to 12weekly sessions of both conditions. PE: 90-min TAU: 60-min standard clinic counselling. Treatment assessed at post-treatment and at 6-month follow-up. Therapists were community social workers or nurses whose only prior training in CBT for anxiety disorders was 52 h of training over 6 months. Randomisation method not clear, no blinding, no ITT (14% dropout)	PDS-I IES-R BAI BDI	PE was significantly more effective than TAU in reducing symptoms of PTSD, general anxiety, and depression at post-test and follow up, and it produced large effect sizes (range = 0.80 to 1.20) for these symptoms. PE was also superior in reducing fear of body sensations, anger, and general psychiatric distress at both post-test and follow-up. Effect sizes for the secondary outcome measures ranged from 0.73 to 1.23. These findings provide preliminary evidence suggesting that PE is an effective treatment for core PTSD symptoms, even when delivered by community therapists in a front-line services clinic.
Cotraux 2008 [45] CBT vs. ST France	N=60 2 groups, CBT and Rogerian supportive therapy (ST) Population: Outpatients with chronic PTSD, full diagnosis, no co- morbidities or major medication	CBT: 16 weekly individual sessions of 1-2h each. ST: 16 1-h sessions of sympathetic listening Treatment assessed at post-treatment and at at 1 and 2 year follow up Dropout 30% at post-test, 37% at 1y and 58 at 2 y. Good randomisation, blinded assessment, ITT	PCLS HAM-A BDI QuoL.	At post-test, patient retention rate were higher in CBT (87%) than in ST group (52%). Dropouts in the ST group were mostly due to worsening or lack of effectiveness. On ITT analysis at post-test, patients in the CBT group showed greater improvement in PTSD and anxiety symptoms, but there were no between-group difference in the primary outcome (proportion of patients with PCLS score <44). Follow-up only in completers: showed sustained improvement in both groups, without between-group differences at weeks 52 and 104. CONCLUSIONS: CBT retained significantly more patients in treatment than ST, but its effects were equivalent to those of ST in the completers. CBT was better in the dimensional intent-to-treat analysis at post-test.

Table 9. Early interventions for PTSD

Study	Study characteristics: N, groups, Aim, Population	Number of sessions, follow up, dropouts, factors in study quality	Instrum ents	Results
Adler 2008[53] US peacekeeper s debriefing	N=925 3 groups: 1. Critical incident stress debriefing (CISD) 2. Stress management class (SMC) 3. Survey-only (SO) condition. Population: U.S. peacekeepers deployed to Kosovo	Interventions were timed to address the entire deployment and were not tied to a specific event. Assessed at pre-deployment, and then at 3 months after re-deployment (35% drop out) and 9 months after re-deployment (71% drop out). Group randomisation, completer analysis, between group comparison and longitudinal paired analysis	PCL CES-D, CTS, SUDS PTE	There were no differences in reduction of PTSD symptoms between treatment and control conditions. In paired analysis, for soldiers with highest degree of exposure to mission stressors, CISD was associated with slightly improved PTSD and aggression (vs. SMC), higher perception of organisational support (vs. SO), and more alcohol problems than SMC and SO. Soldiers reported that they liked CISD more than the SMC, and CISD did not cause undue distress. CONCLUSIONS: CISD had no clear benefits, but caused no harm. Limitation: group with low exposure, may not required intervention.
Bell 2008 [54] US	N=366 The effect of telephone counselling on reducing post-traumatic symptoms after mild traumatic brain injury; Population: Survivors of motor vehicle accident with mild brain injury recruited from hospital ED.	Five telephone calls over 3 months following injury, average=8 min, focused on education, reassurance and return to daily activities. Blinded assessment at 6 months after injury. 85% follow-up completion rate	SF-12 MBTI PHQ-D PHQ-A	The PTSD symptom composite was significantly lower in the telephone counselling group than in controls (mean difference =6.6, about 15%), but there was no difference in general health outcome. Out of 28 individual symptom, 5 relating to daily functioning were significantly less negatively impacted: work, leisure activities, memory and concentration and financial independence. Conclusions: Telephone counselling, focusing on symptom management, was successful in reducing some chronic symptoms after MTBI. CONCLUSIONS: Very weak support for telephone counselling focusing on symptom management in reducing some chronic symptoms after MTBI.
McGhee 2009 [55] US	N=65 The effect of propranolol on PTSD <u>Population:</u> burned service members with self-reported PTSD	not RCT, retrospective	PCL-M	There was no significant differences in the prevalence of PTSD In patients receiving propranolol compared to those who did not (32% vs. 26%).

Table 10. Pharmacological for PTSD

Study	Study characteristics: N, groups, Aim, Population	Number of sessions, follow up, dropouts, factors in study quality	Instruments	Results
Heresco-Levy (2009) [67] Israel	N=22 D-serine, DSR (NMDA receptor agonist)	6 weeks cross-over double-blind, placebo-controlled, crossover trial with 30 mg/kg x d DSR used as monotherapy or add-on pharmacotherapy.	CAPS HAM-A HAM-D MISS	Compared with placebo administration, DSR treatment resulted in significantly reduced PTSD and anxiety scores (HAMA, p=0.007; MISS, p=0.001, a trend in CAPS total, p=0.07).
Hamner 2009 [65]	n=29 (16 divalproex and 13 placebo). divalproex = Valproate-used in bipolar chronic PTSD patients	8-week double-blind, placebo-controlled treatment with divalproex ITT	CAPS	There were no significant differences between groups in mean change from baseline to end point on the CAPS total score or subscales. There was a significant decrease in avoidance/numbing scores with <u>placebo</u> . CONCLUSIONS: Divalproex was not superior to placebo in this study.
Davis 2008 [66] guanfacine not done	guanfacine, adrenergic agonist, Patients with chronic PTSD predominantly male combat veterans with PTSD.	8-week double-blind, placebo-controlled treatment of guanfacine followed by a 2 month open label extension phase.	CAPS MADRS CGI-S CGI-I DTS	There were no significant differences in the drug versus placebo responses

Table 11. Innovative interventions for PTSD

Study	Study characteristics: N, groups, Aim, Population	Number of sessions, follow up, dropouts, factors in study quality	Instruments	Results
Knaevelsrud 2007 [89] Internet German adaptation of Interapy	N=96 2 groups (n=49, n=47) Community recruiting in German speaking population for survivors of a traumatic event with cut-off score on IES-R indicating high distress levels in 70%, sub-syndromal PTSD in 30%.	CBT Interapy, Therapist input by email, personalised feedback and psychoeducation, ≥ 7 emails, but specific data not provided). Dropout: 16% and 2% at FU. ITT analysis	IES-R (intrusions, avoidance and hyper-arousal subscales) BSI Secondary: SF-12, WAI	Symptoms of PTSD (intrusions, avoidance, hyperarousal), depression and for anxiety improved in time for both groups. Improvements in the treatment group were much larger, so between the groups ES was in the large to medium range (Intrusion: 1.1, Avoidance: 0.7, Arousal: 1.1, Anxiety: 0.9, Depression: 0.7). Improvements continued at 3-months FU. Recovery rate (based at cut-off <35 on IES subscales of avoidance and intrusions) 74% of those with initial PTSD treated by Interapy changed diagnostic category, compared to 21% of controls. Between the groups Effect sizes large. Mean ES=0.9
Knaevelsrud 2009 [90] As above	N=34 This is 18 months FU of the treatment group from the previous study.	CBT Interapy Dropout: 32% from baseline to 18-month FU. ITT analysis	As above	Reductions in symptoms of PTSD, depression, and anxiety found at post-treatment were sustained during the 18-month follow-up period.
Klein 2010 [91] Internet Australia online	N=22 Open trial Population: Community recruitment, primary clinical diagnosis of PTSD, no major co-morbidities.	10-week CBT Average total therapist time was 194.5 min Re-assessed at post-treatment and 3-month follow-up. Dropouts: 27% ITT	CAPS IES-R DASS WHO-QOL-BREF Dissociation anger, treatment credibility	Significant improvements PTSD symptoms and PTSD severity ratings at post-assessment and maintained at 3-month follow-up. clinically significant improvement (no longer meet diagnosis criteria for PTSD) seen in 69% of the sample at post-assessment and in 77% of the sample at 3-months. all other general psychological measures were numerically improved but changes were not significant Overall, treatment satisfaction was good (69%), participant therapeutic alliance ratings were high (87.5%). Conclusions: PTSD Online appears to be an efficacious treatment option for people with PTSD that can be provided entirely remotely, with far less therapist time than traditional face-to-face treatment, and without compromising therapeutic alliance. Limitation: not clear how long had PTSD, improvement could be time-related, improvement not expressed as ES

Study	Study characteristics: N, groups, Aim, Population	Number of sessions, follow up, dropouts, factors in study quality	Instruments	Results
Morland 2010 [92] US, Hawaii Videoconferencing	N=125 2 groups: Videoconferencing vs. face to face, Non-inferiority RCT Population: male rural combat veterans with full diagnosis of PTSD and anger difficulties but no major co-morbidities. Conducted at 3 Veterans Affairs outpatient clinics. Stratified by war era (Vietnam 75%, Desert Storm and Other)	<u>Group</u> CBT called Anger Management is a 12 session CBT, 2 per week over 6 weeks Re-assessed at post-treatment and 3-and 6 month follow-up. Dropouts:11%, 16% and 26% respectively ITT	PCL-M at baseline + post-treatment only. Primary: reduction of anger on scales: STAXI-2 and NAS-T.	Participants in both groups showed significant and clinically meaningful reductions in anger symptoms, with post-treatment and 3 and 6 months effect sizes ranging from 0.12 to 0.63. Videoconferencing condition was not inferior in the reduction in anger symptoms compared to in-person groups (secondary post-hoc analyses actually showed numerically better results for video-conferencing) There were no between-group differences in attrition, adherence, satisfaction, and treatment expectancy. Therapy alliance was higher in the in-person group. CONCLUSIONS: Rigorous trial provides evidence that videoconferencing is an effective and feasible way to care for veterans residing in rural or remote locations. Limitation: trial focused on alleviating anger problems not on all PTSD symptoms.
Gamito (2010) [93] Portugal Virtual Reality	N=10 three groups: virtual reality exposure therapy (VRET), imaginal exposure (IE) and waiting list (WL) (N=5, 2, 3, respectively) Population: Portuguese veterans from Angolan wars, > 30 years ago.	VRET involved war scenarios with cues such as ambush, mortar blasting, and waiting for rescue. RCT	IES SCL-90-R BDI CAPS	Patients enrolled in the VRET group showed statistical reduction of PTSD-associated disorders like depression and anxiety. VRET appeared to work at least as well as IE. Improvements continued at 6 month follow up. Study inconclusive due to small size, but promising. Safe to use in old war veteran populations. Most comparisons made within the VRET group: pre-post-treatment
Abramowitz 2008 [95] Israel Hypnotherapy (combined)	N=32 2 groups: symptom-oriented hypnotherapy vs. Zolpidem 10 mg nightly for 14 nights, Population: male combat veterans consecutively admitted to a military clinic with chronic PTSD and insomnia, treated with SSRI and supportive psychotherapy.	Hypnotherapy (add on): twice-a-week 1.5-hour sessions for 2 weeks. Re-assessments at post-treatment and 1 month follow-up	PDI IES BDI Sleep Quality Questionnaire	There was a significant main effect of the hypnotherapy treatment with PTSD symptoms as measured by the Posttraumatic Disorder Scale. This effect was preserved at follow-up 1 month later. Additional benefits for the hypnotherapy group were decreases in intrusion and avoidance reactions and improvement in all sleep variables assessed. Conclusions: hypnotherapy is an effective adjunct to psycho- and pharmacotherapy for chronic insomnia and sleep disorders in a group of patients suffering from chronic combat-related PTSD. Limitation: only patients with moderate “hypnotisability” are suitable, small size of the study
Smyth 2008 [97] Expressive writing	N=25 2 groups: experimental group wrote about their traumatic experience, control about neutral topic. Population: veterans and rape victims with chronic PTSD recruited at treatment centres	3 writing sessions in 1 day, 20 minutes in length, with a 15-minute rest interval between each session. Re-assessments at 3 month after writing	PSS-I	There were no differences in PTSD diagnosis or symptoms between significant improvements in mood (tension and anger and trends towards lower depression) from baseline to 3 month follow up. Conclusions: No evidence from this study that expressive writing is an effective treatment for PTSD

Study	Study characteristics: N, groups, Aim, Population	Number of sessions, follow up, dropouts, factors in study quality	Instruments	Results
Boggio 2010 [96] Brazil TMS transcranial magnetic stimulation	N=30 3 groups: TMS-R, TMS-L, sham TMS RCT, blinded, placebo controlled Population: with chronic PTSD, community recruitment and referrals	10 sessions, 5/week over 2 weeks of 20 Hz repetitive transcranial magnetic stimulation of either right or left dorso-lateral prefrontal cortex (DLPFC). Assessments during and after treatment and at 1, 2 and 3 month follow up Dropouts 13%, ITT.	PCL PTSD treatment outcome scale HAM-A HAM-D	Both active conditions induced a significant decrease in PTSD symptoms compared to sham TMS. Right TMS induced a larger effect as compared to left TMS. There was a significant improvement of mood after left TMS (HAM-D) and a significant reduction of anxiety (HAM-A) following right TMS. Improvements in PTSD symptoms continued over 3-month follow-up. TMS was safe and did not affect cognitive function. CONCLUSIONS: There is preliminary evidence that high-frequency TMS of right prefrontal cortex might be an effective treatment strategy for PTSD
McLay (2010) [94] Virtual Reality	N=20 2 groups: Virtual Reality Exposure with Arousal Control (VRE-AC), and standard treatment for combat-related PTSD Population: active duty service members with chronic PTSD related to service in Iraq or Afghanistan,	There are no details available about the treatment, as the UQ library could not trace the conference paper. The information presented here was extracted from the interview given by McLay.		Among patients in the VRE group, 70% of experienced at least a 30% drop in symptoms (as measured by CAPS), compared with only 11% in the standard treatment group (P<0.01). The result is encouraging, because most of the participants had failed at least one previous treatment.
Thrasher 2010 [149] UK Social support This is re-analysis of Marks 1998 trial	N=87 4 groups: 1)exposure, 2)cognitive restructuring, 3)both, 4)relaxation Aim: To investigate predictors of good outcome in psychiatric treatments. Population: with chronic PTSD.	exposure therapy and (or) cognitive restructuring, compared with relaxation, Re-assessments at post-treatment only Dropouts:11%, Completers analysis (n=77)	CAPS SOS: significant Other Scale, a measure of perceived social support	From Marks 1998 trial: exposure, cognitive restructuring and combined conditions produced similar improvements in CAPS scores with large effect sizes, higher than relaxation with moderate ES, 3)both, 4)relaxation More social support on SOS significantly predicted better outcome on the CAPS (dose response), in all three active treatment groups. Social support was not a predictor of outcome for participants in the relaxation condition. Conclusions: Better social support is associated with significantly greater gain following cognitive restructuring and (or) exposure therapy for PTSD. Future interventions should consider augmenting social support as an adjunct to treatment.

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