

## **Integrated Literature Reviews: 2002-2012**

- Changes in criteria for posttraumatic stress disorder, major depressive disorder, and alcohol use disorder in DSM-5
- Efficacy of E-health interventions for posttraumatic stress disorder, depression and alcohol use disorder
- Longitudinal course of posttraumatic stress symptoms

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This document presents an integrated review of the literature over the past decade relating to three key areas specified by the Department of Veterans' Affairs (DVA), namely, DSM-5 changes to posttraumatic stress disorder, major depressive disorder and alcohol use; the effectiveness of E-health; and the longitudinal course of posttraumatic stress symptoms. The summary was produced for the Australian Government, Department of Veterans' Affairs (DVA), by the Australian Centre for Posttraumatic Mental Health.

### **Disclaimer**

The material in this report, including selection of articles, summaries, and interpretations is the responsibility of the consultants, the Australian Centre for Posttraumatic Mental Health, and does not necessarily reflect the views of the Australian Government.

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## Executive summary

This literature review has been produced by the Australian Centre for Posttraumatic Mental Health (ACPMH) at the request of the Department of Veterans' Affairs (DVA) which identified three key areas of interest. This document contains a review of the research literature spanning the past decade pertaining to: (i) proposed DSM-5 changes to posttraumatic stress disorder (PTSD), major depressive disorder and alcohol (substance) use disorder; (ii) the efficacy of E-health interventions in the areas of PTSD, depression and alcohol use disorder; and (iii) the longitudinal course of posttraumatic stress symptoms. A summary of the key points made in the three integrated reviews is provided below.

### DSM-5 changes: Posttraumatic stress disorder, major depressive disorder and alcohol use disorder

- DSM has previously used Roman numerals to signify the version (e.g., DSM-IV-TR). In the fifth edition, DSM will be known as DSM-5 to reflect the limitations of using roman numerals.
- DSM-5 is due for publication in 2013 and is currently undergoing a final public consultation and review. While changes to the diagnostic criteria for major depressive disorder (MDD) have not been proposed, substantive changes have been proposed to diagnostic criteria for posttraumatic stress disorder and alcohol (substance) use disorder.

#### Posttraumatic stress disorder (PTSD)

- PTSD will be moved from the Anxiety Disorders section to a new section titled Trauma and Stressor Related Disorders. A long held criterion requiring a subjective response to a traumatic event that includes intense fear, helplessness or horror (Criterion A2) has been removed.
- DSM-5 will see the symptom criteria for PTSD change from three to four clusters. This change reflects the empirical research which distinguishes avoidance and numbing symptoms. That is, active avoidance symptoms such as avoiding trauma-related thoughts and activities, which were traditionally grouped together with numbing symptoms, such as diminished interests and restricted affect, will be separated to form distinct symptom clusters.
- Additional symptoms of persistent distorted blame of self or others, persistent negative emotional state and reckless or self-destructive behaviour are also included as new PTSD symptoms. Specifier criteria (e.g., acute, chronic) seen in DSM-IV have



also been removed in DSM-5. Preschool and Dissociative subtypes have been added.

- Very preliminary research has examined the implications of the separation of the avoidance and numbing symptoms in the PTSD diagnostic criteria. It suggests this separation will increase the specificity of the diagnosis (that it is less likely to identify someone as having PTSD when they do not have PTSD), subsequently reducing PTSD prevalence rates and rates for comorbid depression. These findings are cautionary though, as other findings that model the full changes in symptoms in a non-clinical sample suggest the change to criteria will minimally impact prevalence rates (that is, increase the prevalence marginally).

## Major depressive disorder

- Although there are no changes to the key symptom criteria for major depressive disorder (MDD) in DSM-5, some notations have been amended to reiterate functional impairment and to clarify ambiguity between an understandable response to an event involving significant loss and the presence of an MDD. The 'chronic' specifier is removed and the 'severe' from 'with psychotic features' specifier is also removed, reflecting the recent empirical research.
- As recommended by one study, the DSM-5 includes a 'Persistent Complex Bereavement-Related Disorder' into a section which details disorders being considered for future versions that currently require further research.
- The continuity between DSM-IV to DSM-5 diagnostic criteria suggests minimal impact on diagnostic rates for MDD. However, additional notations may discourage some clinicians from diagnosing MDD in patients who have recently suffered bereavement, or those who are not experiencing motor retardation, suicidal ideation or severe functional impairment.

## Alcohol use disorder

- The section previously named, Substance-Related Disorders in DSM-IV is renamed in the DSM-5 as 'Substance Use and Addictive Disorders'.
- In DSM-5, 'substance abuse' and 'substance dependence' disorders have been combined into a single classification of 'substance use disorders'. A severity scale will replace the separation of these disorders to define disorder by counting the number of criteria endorsed. For example, less than two criteria would indicate no diagnosis, while more than two criteria will indicate substance use disorder. The type of the substance use disorder is identified by a specifier – e.g., alcohol use disorder.
- The new criteria for alcohol use disorder will comprise of 11 symptoms, 10 of which were part of the DSM-IV 'substance abuse' and 'substance dependence' disorders. The current DSM-IV includes a symptom related to the experience of legal problems



associated with alcohol use, but this symptom will be replaced with the symptom, 'craving or a strong desire or urge to use alcohol' in DSM-5.

- The DSM-5 rationale to developing a one-dimensional construct around severity in substance abuse responds to concerns in the literature that persons with a severe substance problem might not meet criteria for either category of abuse or dependence, and that the demarcation between disorders was inhibiting identification of those with a severe problem. Two papers, one with a large US community sample and one with a large Australian population sample, observed that requiring endorsement of only two criteria to meet diagnosis may lead to increases in prevalence rates.

## E-health interventions

- E-health (or e-mental health) comprises a range of technologies that are posed as alternatives to in-person therapeutic care. E-health aims to increase the likelihood that veterans will engage in evidence-based therapies by reducing barriers to care.

## Telephone-based interventions

- Review studies concerned with the efficacy of telephone-based interventions across a range of mental health disorders in general non-veteran samples have found that it is an effective means of delivering psychological intervention. Furthermore, telephone therapies may have fewer dropouts than in-person interventions.
- Regarding veterans, one randomised controlled study found no significant treatment effects for depression in telephone delivered cognitive behavioural therapy compared with a treatment-as-usual condition. This study suggested that veterans may respond less strongly to telephone treatment than the mostly civilian populations described in review papers. This finding stands alone in the literature on telephone therapies.
- In contrast, another study showed large treatment effects (comparable to those seen in previous studies for in-person exposure), for veterans given telephone delivered exposure therapy for posttraumatic stress, anxiety and depression. This study had methodological limitations but does provide preliminary support for the efficacy of telephone delivered exposure therapy.

## Videoconference technology

- Exposure therapy delivered via videoconference has been found to be an acceptable, practical, and safe modality for delivering therapy to veterans.
- One pilot study showed while effective in markedly reducing PTSD symptoms, video conferencing treatment effects were smaller than in-person treatment and had higher dropout rates. In contrast to this, a similar study found that veterans receiving cognitive behavioural therapy for PTSD via videoconference showed similar treatment



gains and attrition rates as those who received in-person therapy. They were however, less likely to complete homework and less comfortable talking to their therapist.

- Other studies have extended the use of videoconferencing to group therapy settings. In respective studies, group cognitive behavioural therapy and group cognitive processing therapy delivered via videoconferencing was as successful in treating veterans' anger and PTSD symptoms as in-person delivered group therapy.
- Our review found good support for the efficacy of telephone delivered psychological interventions across psychiatric disorders within community samples. There are fewer trials involving veterans, and those studies that do, report mixed results. Further research is required to test whether this modality is effective with veteran populations. Video delivery of intervention to individuals and groups shows promise, with a number of trials being conducted with veteran samples.

## Internet / web-based interventions

- While many papers describe the evolution and implementation of web-based interventions, there are fewer efficacy or effectiveness studies with veterans/military personnel. One exception was a study that showed a web intervention called Drivers Check-up to be successful in reducing alcohol problems in military personnel. The favourable outcomes were attributed to the use of personalised feedback in the context of norms among military personnel.
- Either a whole program, or components of cognitive behavioural therapy delivered online have also been shown to be beneficial to military personnel. Two programs, Stress Gym and DE-STRESS were associated with a reduction in stress, PTSD, depression and anxiety. However, further replication with more methodologically rigorous designs is required.
- One web-based intervention helped to improve the PTSD knowledge of military family members, and foster actions that helped service members with their symptoms. Another online self-administered cognitive behavioural therapy training program for mental health practitioners working with US veterans was also beneficial in helping them treat PTSD.
- Meta-analyses and systematic review studies in internet based alcohol/substance and addiction treatments are finding small to moderate effect sizes for controlled trials of computer based interventions. These large studies incorporating data from non-veteran samples show that the psychological gains from the use of web/computer based modalities can be comparable to in-person delivered care. The growing availability of internet interventions provides an opportunity for improved access to interventions, particularly in those less likely to access traditional services.



- The majority of web-based intervention studies utilise cognitive behavioural techniques which are proven to be effective in reducing traumatic stress symptoms. Web-based delivery of these indicates that they may be useful to veterans, particularly in reducing stigma associated with seeking face-to-face treatment. A caveat though, is that ethical and safety considerations need to be applied. Overwhelmingly, studies agree that increased rigour with respect to study design and methodologies are required to further confirm web-based interventions as efficacious or effective.

## Virtual reality

- Virtual reality exposure therapy is a novel alternative to imaginal and *in vivo* exposure therapy for treating anxiety disorders. Systematic reviews of virtual reality exposure therapy across a range of disorders show that it is effective for specific phobia cases. In more complex anxiety, such as panic disorder or social phobia, results are promising, but rigorous research is still needed before the status of these treatments can be determined.
- Meta-analyses show that virtual reality exposure for anxiety can produce large treatment effect sizes in studies where virtual reality exposure is compared with control conditions. Small effect sizes are also found for virtual reality exposure over *in vivo* exposure (that is, using traditional techniques).
- Studies testing virtual reality therapies specifically with veterans and military personnel show wide ranging methodologies spanning single case reports, uncontrolled trials, open clinical trials and randomised controlled trials, rendering findings difficult to interpret.
- A small randomised controlled trial compared virtual reality exposure therapy with present-centred therapy (nonspecific therapy involving no traumatic content) in Vietnam veterans with chronic posttraumatic stress disorder and did not find any significant treatment effects. Among a group of Operation Enduring Freedom/ Operation Iraqi Freedom (OEF/OIF) service members with treatment resistant posttraumatic stress disorder, it was instrumental in producing marked improvements in posttraumatic stress symptoms. These findings suggest virtual reality exposures may benefit those with treatment resistant PTSD, but this needs to be replicated.
- Only one study examined virtual reality relative to prolonged exposure therapy (currently regarded as best practice treatment for PTSD). This retrospective case series study found no difference between those receiving either form of intervention.
- One study to date has investigated the impact of virtual reality on anxiety and depression levels in US OEF/OIF active duty members. Significant symptom improvement was seen in PTSD, anxiety and depression symptoms, but a high dropout rate occurred which may suggest intolerance of this treatment modality by a subgroup of treatment seekers.



- Virtual reality exposure therapy is still in its early phase of testing, with more rigorous studies required to establish its efficacy. It is important that it is tested against current best practice interventions (e.g., trauma-focussed cognitive behavioural therapy or cognitive processing therapy). Preliminary findings are producing promising benefits to veterans, presumably because these therapies allow emotional engagement with traumatic memories in a graduated and controlled manner. Virtual reality exposure therapies could improve engagement in therapy for the newer generation of veterans who may be versed in gaming style technologies. A major limitation however, may be its cost, particularly when compared with traditional in-person therapy.

## Longitudinal course of posttraumatic stress symptoms

- Regarding the course of PTSD symptoms, the early literature highlighted an understanding that those who experience early trauma symptoms generally recover, and those with few early symptoms tend to remain asymptomatic. Later studies focused on acute stress disorder (an early form of PTSD with a focus on dissociative symptoms) as a specific risk for later development of PTSD. However, it was subsequently recognised that most individuals who developed PTSD did so in the absence of acute stress disorder. Hyperarousal symptoms were confirmed in the literature as specifically predictive of future posttraumatic symptoms. Later studies identified two distinct trajectories of PTSD symptoms over time: (1) low levels of PTSD symptoms with little increase over time, or (2) higher level initial symptoms which increase significantly over time.
- Most recent studies are painting a more complex picture. A large 2012 study compared the symptom trajectories of US military service members including active duty, reserve and National Guard personnel who deployed to the OEF/OIF conflicts. The most common trajectory was: (a) a low symptom presentation over time - 'resilience'; followed by, (b) a moderate symptom presentation that improved over time; (c) a worsening symptom presentation which became chronic over time; (d) a high symptom presentation which was maintained over time; and (e) a high symptom presentation which improved over time.
- The effects of combat stress reactions and posttraumatic stress symptoms on self-rated health trajectories over 20 years post-war exposure was examined in a sample of Israeli veterans. Health measures indicated an improvement over time, yet those who reported combat stress symptoms originally had comparatively lower health scores. A study followed up these veterans and found that the combat stress group reported higher levels of stress reactions and higher somatisation than the control group veterans. These findings suggest combat stress reactions do not occur as a transient episode which rapidly subside, but rather can act as markers for continued vulnerability many years after war.
- Another study showed that veterans diagnosed with severe PTSD in 1984 (Vietnam theater) had an increased likelihood of being diagnosed with severe PTSD in 1998.



When the number of years since serving in South East Asia was accounted for, the association between combat exposure and PTSD was unchanged, suggesting this as a major factor in longer term chronic conditions of PTSD. That is, almost 30 years after return from combat, 10% of veterans from this era continue to experience chronic severe PTSD symptoms. Among prospective studies with non-veteran samples, one study showed that over time, survivors of interpersonal (versus non-interpersonal) trauma, reported higher scores on PTSD symptoms associated with fear and threat. The authors suggested that fear conditioning is instrumental in persistent PTSD associated with interpersonal trauma.

- Early interventions that target fear reactions and threat cognitions following trauma may play a role in the prevention of PTSD. Chronic trajectories of symptoms over time suggest that a focus on the early reduction of hyperarousal symptoms may be a beneficial approach to therapy.





## Introduction

The Commonwealth Government, Department of Veterans' Affairs (DVA) requested the Australian Centre for Posttraumatic Mental Health (ACPMH) produce an integrated review of the research literature over the past decade (2002-2012) with respect to three key areas of interest to DVA: (i) proposed DSM-5 changes to posttraumatic stress disorder (PTSD), major depressive disorder (MDD) and alcohol use disorder; (ii) e-health interventions for PTSD, depression and alcohol use problems, and (iii) the longitudinal course of posttraumatic stress symptoms. The key questions posed by DVA around each of these three interest areas are:

- What are the proposed changes to the DSM-5 diagnoses of PTSD, MDD, and alcohol use disorders that are particularly relevant to DVA?
- What is the efficacy of e-health interventions for PTSD, depression and substance/alcohol use disorders? Do these technologies improve access to care?
- What are the PTSD symptom trajectories over time, and what are the implications for the treatment of chronic PTSD?

The reviews provided are an informed, critical review of the literature rather than a comprehensive, systematic review. The literature included in this summary has met the broad inclusion criteria based on regular standards of academic review, but a systematic evaluation of all research published in 2002-2012 on these topics has not been made. The report addresses the questions posed by DVA and provides an overview of the literature to date in the key areas, but we caution the reader against assuming that a single paper is sufficient to provide conclusive information. We recommend the reader source the original papers if they are interested in particular findings.

## Methodology

The methodology used across the three integrated reviews consisted of a number of steps to increase the rigour associated with the findings of the review. This included having a defined search strategy and *a priori* inclusion/exclusion criteria.

### Literature search strategy

The literature was sourced using the scientific databases of Medline, Web of Science and PsycINFO. Table 1 below outlines the search descriptors used for each of the three key questions.



**Table 1. Search descriptors used for each of the three key areas**

DSM-V Changes	E-health interventions	Trajectories of PTSD
DSM-V OR DSM-5, posttraumatic stress disorder OR PTSD, depression, alcohol use disorder OR substance use disorder, veteran OR defence OR defense OR military OR combat	E-health, intervention OR treatment, posttraumatic stress disorder OR PTSD, depression, substance use disorder OR alcohol use disorder, telehealth, telephone, teleconference, videoconference, virtual reality, web OR internet OR, online, apps, veteran or defense OR defence OR military OR combat	Trajectory, posttraumatic stress disorder OR PTSD, longitudinal, course, chronic, veteran OR defence OR defense or military OR combat

### Inclusion and exclusion criteria for papers selected

Papers included in each of the three integrated reviews were selected according to specific inclusion and exclusion criteria. These are presented in Table 2. Two assessors were used to provide quality assurance checks for the selection of papers. Papers which could not be agreed upon for inclusion were assessed by a third independent assessor, who also checked the final list of abstracts to be included in each of the three summaries. The total number of abstracts yielded from the literature search contrasted with the number of papers selected for inclusion is shown in Table 3.

**Table 2. Inclusion and exclusion criteria for selection of papers across the three integrated reviews**

Inclusion criteria	Exclusion criteria
Literature published between 2002-2012	Qualitative studies without empirical data
Studies incorporating empirical data and findings	Single case studies
Relevant review papers (e.g., systematic reviews, meta-analyses)	Grey literature (e.g., reports, newsletters, conference proceedings)
Expert commentary pieces	Studies with no direct relevance to veteran and military populations



**Table 3. Comparison of the number of abstracts yielded from the literature search and number of papers selected for inclusion in the three integrated summaries**

Key interest area	Number of abstracts yielded	Number of papers selected for review
Changes to DSM-5	211	52
E-health interventions	319	38
Longitudinal course of posttraumatic stress symptoms	343	14





# DSM-5 Changes: Posttraumatic stress disorder, major depressive disorder and alcohol use disorder

## Posttraumatic stress disorder

The traditional Roman numeral attached to DSM has been removed in the proposed DSM-5. This was done for two reasons. First, to recognise that technology now allows immediate electronic dissemination of information worldwide, limiting the applicability of Roman numerals. Second, research advances will continue to require text to be revised in DSM, and a TR designation, as was done with DSM-IV-TR, can only be appended once. After DSM-5 is published in 2013, future changes will be signified as DSM-5.1, DSM-5.2 and so on.

The scheduled introduction in 2013 of the Diagnostic and Statistical Manual for Mental Disorders, fifth edition (DSM-5) signifies important changes to disorder criteria. In this review, the following question will be addressed:

- What are the proposed changes to the DSM-5 diagnoses of posttraumatic stress disorder (PTSD), major depressive disorder (MDD) and substance/alcohol use disorders that are particularly relevant to DVA?

## Overview of the changes to PTSD

In the proposed DSM-5, major changes have been outlined for PTSD criteria and a few studies have examined the implications of the new changes. For reference, a comparison of the DSM-IV criteria with the proposed DSM-5 criteria for posttraumatic stress disorder is presented in Table 4, located in the Appendix of this document.

In DSM-5, posttraumatic stress disorder has been removed from the 'Anxiety Disorders' section and included in a new section named 'Trauma and Stressor Related Disorders'. Criterion A1 (the experience of a trauma event) has been reworded to clarify and tighten the definition of a 'traumatic event', while criterion A2 (subjective response to the traumatic event) has been removed.

There are a small number of changes to the re-experiencing (Criterion B) symptoms. Criterion B1 (recurrent recollections of the event) has been revised to define 'intrusive recollection' and remove depressive rumination symptoms. Criterion B2 (recurrent dreams) has been rephrased to be more pertinent across cultures. Criterion B3 (acting/feeling of event recurring) has been amended to reflect that dissociative symptoms and flashbacks occur on a continuum.



## Avoidance and numbing

In relation to criterion C from DSM-IV, the avoidance and numbing items have been separated into two clusters in DSM-5. DSM-IV items C1-C2 (avoidance of trauma-related thoughts, and avoidance of trauma-related activities) are now criteria C (an active avoidance cluster) in DSM-5. Items C3-C7 (inability to recall aspects, diminished interests, feelings of detachment, restricted affect) form criterion D (a passive avoidance cluster) in DSM-5. This passive avoidance cluster has been re-named 'negative alterations in cognitions and mood associated with traumatic event(s)', and also includes reference to new items including, negative beliefs about oneself, others and the world, persistent distorted blame of self or others, and persistent negative emotional state.

## Arousal

Due to the split in the DSM-IV C criteria noted above, the D criteria (arousal cluster) from DSM-IV will become criterion E in DSM-5. As a result, DSM-5 incorporates four, rather than three distinct diagnostic clusters.

Criterion E is likely to include a new item (E2) which refers to reckless or self-destructive behaviour. The DSM-IV criterion relating to 'irritability or outbursts of anger' will be clarified to refer specifically to behaviour, either irritable or aggressive.

## Other changes

The acute versus chronic specifier, which was set at three months in DSM-IV, has been removed altogether from DSM-5. The specifier was controversial in choosing three months to describe 'chronic PTSD' and did not add anything to treatment or management. A 'Preschool' subtype of PTSD, with slightly modified criteria, is likely to be added for children less than six years of age. A Dissociative subtype, in which PTSD criteria are met along with dissociative symptoms such as derealisation and depersonalisation, is also likely to be added.

## The removal of PTSD from 'Anxiety Disorders' to 'Trauma and Stressor Related Disorders'

Since the advent of the PTSD diagnosis in the DSM-III (1980), there has been considerable discussion regarding where this disorder should fit within the DSM. The literature revealed a push among researchers to group psychiatric disorders based on empirical studies rather than the descriptive characteristics employed in DSM-IV. These studies have repeatedly observed that PTSD shares phenomenological features with major depressive disorder (MDD) and generalised anxiety disorder (GAD), leading to the suggestion that these disorders be grouped together in DSM-5<sup>1,2</sup>. Another body of



literature has highlighted the considerable alteration in diagnostic criteria from DSM-III to DSM-5, indicating uncertainty as to what exactly constitutes PTSD<sup>3</sup>. This led to the proposal that PTSD be placed in the manual's appendix for experimental criteria sets until the criteria are more stable<sup>3</sup>. Ultimately, DSM-5 did not follow either proposal, but it did remove PTSD from the anxiety disorder group and created a new class of 'Trauma and Stressor Related Disorders' which includes PTSD. This move recognises the fact that PTSD, characterised by features of depression, anxiety, and often dissociation, does not fit neatly into the main existing categories. There is little to suggest that any practical implications will flow from this decision.

## Changes to criterion A

The most prominent change for criterion A (the experience of a trauma event) is the proposed removal of criterion A2 which referred to a person's subjective response to an event as incorporating intense fear, helplessness or horror. This was criticised in the literature as being too restrictive for an essential criterion. For example, a study of 202 military personnel returning from Iraq found endorsement of A2 was not predictive of experiencing PTSD symptoms<sup>4</sup>. This finding was supported by one study which found that a substantial minority of persons who developed PTSD symptoms failed to recall their emotional experience during the traumatic event (criterion A2)<sup>5</sup>.

It is proposed that item A1 (the objective experience of a traumatic event) be replaced with four items (A1-A4) to more clearly specify the meaning of a 'traumatic event'. These changes reflect the criticism in the literature of DSM-IV criterion A that the definition permitted an excessively broad range of experiences to meet PTSD criteria<sup>6</sup>. For instance, Long and colleagues<sup>7</sup> found non-DSM-IV criterion A1 stressful events were more strongly associated with PTSD than DSM-IV criterion A1 stressful events. The finding supports concerns with the broadness of events that can meet A1. However, no research was found which assessed the association of the DSM-5 criterion A events with PTSD. This precludes commenting definitively on any expected impacts following the changes to items within the criterion.

The proposed wording ("*exposure to actual or threatened death, serious injury, or sexual violation...*") is unlikely to exclude any of the more common military-related stressors. The additional specifier A4, however, ("*experiencing repeated or extreme exposure to aversive details of the traumatic event...*") includes examples of police officers being repeatedly exposed to child abuse, and notes that this exposure may occur through electronic media, provided that the exposure is work related. Although claims for PTSD by, for example, body handlers or radio operators may have been attempted under DSM-IV, their interpretation under the A criteria will be easier in the revised version.



## Changes to criteria B, C and D

The changes to criterion B, C and D are threefold, the first of which is the move from three groups of criteria to four (by splitting the old criterion C in DSM-5). Second, is the inclusion of additional items, and third is the rewording of certain items. Past empirical research strongly supports that PTSD symptoms fall into four clusters and not the three DSM-IV clusters<sup>8-10</sup>. Additionally, studies with Australian community samples and US OEF/OIF combat veteran samples replicate these findings<sup>11-14</sup>. In DSM-5, an important change is the requirement to endorse an active avoidance item (the new criterion C) whereas, under DSM-IV a PTSD diagnosis could be obtained with only passive avoidance (or emotional numbing) symptoms. Because these symptoms overlap strongly with depression, there was a high risk of inappropriate diagnosis and the change is to be commended. In a large Australian study of injury survivors, this change led to an increased predictive validity and improved diagnostic specificity of the PTSD diagnosis<sup>15</sup>.

Our review of the literature found two dominant models proposed for DSM-5 to reflect the four clusters of PTSD symptoms<sup>8,9</sup>. King and colleagues recommended splitting DSM-IV criterion C items into two groups of items – emotional numbing (C3-7) and the effortful avoidance items (C1-2) to generate the additional criterion<sup>8</sup>. Whereas Simms and colleagues suggested items D1-D3 be combined with C3-C7 to create a ‘dysphoria’ criterion, with items C1-C2 and D4-D5 separately forming two additional criteria<sup>9</sup>. DSM-5 follows the King recommendation with additional items included. This may reflect findings that suggest the King model is preferred in clinical PTSD samples and that the Simms model may exclude legitimate PTSD cases<sup>10,12</sup>.

Some authors proposed removing items from PTSD criteria which refer to shared symptomology with mood disorders<sup>6</sup>. However, studies have found dysphoric symptoms are an integral component of PTSD and therefore should remain despite their shared features with other psychological disorders<sup>16</sup>. The rewording of item D2 (persistent and exaggerated negative beliefs or expectations about oneself, others, or the world) and the inclusion of items D3 (persistent distorted blame of self or others, cause or consequence of traumatic event) and D4 (persistent negative emotional state) may reflect a desire to represent dysphoria within a specific criterion for PTSD. Although the addition of item E2 (reckless or self-destructive behaviour) was justified on the basis that DSM-5 should include PTSD symptomology that reflects the developmental processes in school aged children<sup>17</sup>, such behaviour is also seen in adults with PTSD (particularly young males).



## Research into the impacts of altered criteria

Three papers were found in our review that attempted to estimate how changes to general PTSD criteria and the particular splitting of active and passive avoidance (numbing) symptoms might alter prevalence rates. The first paper estimated the rates of PTSD diagnosis would be reduced by 12-16%<sup>10</sup>. The authors equated this adjustment to reducing PTSD's lifetime prevalence by around 1% in adults and between 1-2.5% in adolescents. The use of a community based sample is a noteworthy limitation of the study.

The second study examined data from 835 traumatic injury survivors and applied both DSM-IV and DSM-5 shared criteria for PTSD diagnosis<sup>18</sup>. Using DSM-IV criteria, the prevalence rates for PTSD were 9% at three months post injury, and 10% at 12 months. Applying DSM-5 split into active avoidance and numbing criteria, the prevalence rates were 7% at both time periods. This represents a reduction in PTSD diagnosis by 26% at 12 months post trauma. Additionally, the study observed the change in PTSD criteria reduced the incidence of comorbidity between PTSD and a major depressive episode: 44% using DSM-IV criteria compared with 34% using DSM-5<sup>18</sup>. A noted limitation of the study was the inability to utilise the new items in DSM-5 criteria. An important strength in comparison with the first paper was the longitudinal design and its sample of trauma-exposed participants compared with a general community sample.

The third study examined the effects of modelling all the proposed DSM-5 criteria on prevalence rates (n=216) in a non-clinical university sample. The study produced evidence contradicting the studies above<sup>19</sup>. That is, rather than a reduction in prevalence rates, this study found that prevalence rates under DSM-5 criteria for PTSD increased by 0.4-1.8%. It also found that trauma exposure prevalence would decrease under changes to criterion A. It is notable that this study comprised a non-clinical university sample, which was mostly female, and that gender has been found to directly impact on PTSD prevalence rates. The authors in this study nonetheless concluded that whilst DSM-5 criteria represent a modest improvement over DSM-IV criteria, the improvements are incremental and relatively minor. As such, the changes are unlikely to have a meaningful impact on prevalence rates. The purported improvements to specificity may assist in treatment outcome, with greater chance that PTSD treatment will be applied only to those who actually have the disorder (rather than those with depression who have been inappropriately diagnosed with PTSD).

Given the highly preliminary nature of these findings, and that none of these studies utilised a military/veteran sample, the implications for how prevalence rates will change for military/veteran populations remains unknown. There is, however, little reason to suggest there will be substantial differences.



Finally, the literature search returned articles that discussed sub-threshold or partial PTSD; the relationship between complicated grief and PTSD; the research into pre-school PTSD; and, and whether acute stress disorder would be better subsumed under adjustment disorder. These topics may be of interest in the future, but were deemed outside the scope of this review.

## Conclusions regarding DSM-5 changes to PTSD criteria

There is only preliminary research that has examined the implications of the changes in PTSD diagnostic criteria associated with DSM-5. The research to date would suggest that the new DSM criteria for PTSD will increase the specificity of the diagnosis (that is, it is less likely to identify someone as having PTSD when they do not have PTSD). Very preliminary data from two studies suggests that the prevalence rates of PTSD will drop, as will the comorbidity with depression. These findings, however, are tempered by one non-clinical study which showed evidence to the contrary.

## Major depressive disorder

### Overview of changes from DSM-IV to DSM-5

Unlike PTSD, there are no changes proposed in the key symptom criteria for major depressive disorder (MDD) in DSM-5. Some of the notations (general descriptive text that accompanies the DSM criteria) have changed. A notation is included that reiterates the functional impairment associated with a major depressive episode (MDE). Additionally, the notation clarifies the ambiguity between an understandable response to an event involving significant loss and the presence of an MDE. The 'chronic' specifier is removed, along with the term 'severe' from the 'with psychotic features' specifier, reflecting the recent MDD research<sup>20</sup>. A hierarchical preference is created for mood incongruent features. The period for the postpartum onset specifier is extended to six months in line with contemporary studies<sup>21,22</sup>. A comparison of DSM-IV and proposed DSM-5 criteria for depression can be seen in Table 5, located in the Appendix.

The continuity between diagnostic criteria from DSM-IV to DSM-5 suggests minimal impact on diagnostic rates for MDD. However, the additional notation may discourage some clinicians from diagnosing MDD in patients who have recently suffered a personal loss, or those who are not experiencing motor retardation, suicidal ideation or severe functional impairment.

### Proposed restructure of sections for MDD

A body of research is beginning to find shared features of distress between disorders such as major depressive disorder (MDD), generalised anxiety disorder (GAD) and



PTSD<sup>2</sup>. The ensuing recommendation is that the structure of DSM-5 be altered to align 'distress' based disorders in a single section<sup>23,24</sup>. A study reviewed this issue and noted that, while biological data delineates the categories in cases of extreme pathology, the more common forms of GAD and MDD observed in clinical settings are closely related<sup>25</sup>. However, DSM-5 is proposing to maintain the existing DSM-IV structure such that depression will be included in the broad category of Depressive Disorders.

## Bereavement

In DSM-IV, major depressive episode (MDE) cannot be diagnosed after bereavement, because the presence of bereavement is an exclusion criterion. Recent research suggests that this 'bereavement exclusion' be removed, as depression related to bereavement is seen to be similar to depression unrelated to bereavement<sup>26,27</sup>. Alternatively, it was recommended the bereavement exclusion not apply when a person endorses seven of the nine symptoms required for a MDE<sup>28</sup>. Contrastingly, some research found evidence to support maintaining this exclusion criteria<sup>29</sup>. The proposed wording for DSM-5 continues to acknowledge the understandable response to bereavement and the overlap with depressive symptoms, allowing a diagnosis of MDD to be applied following bereavement provided the depression is sufficiently severe (specifically, in the presence of worthlessness, psychomotor retardation and severe functional impairment).

Additionally, a body of research has proposed that DSM-5 define a new disorder for the prolonged experience of bereavement related grief<sup>30,31</sup>. However, the appropriate criteria for a grief related disorder is still being debated<sup>32,33</sup>. As recommended by Goodkin and colleagues<sup>34</sup>, the DSM-5 has chosen to include 'Persistent Complex Bereavement-Related Disorder' in Section III which details disorders being considered for future versions that currently require further research.

## Clinical significance criteria

One study of 2071 individuals tried to determine whether the clinical significance criterion included in DSM-IV for major depressive episode improves diagnostic accuracy<sup>34</sup>. They found 97.2% met criteria for distress and 96.2% met criteria for impairment, thus concluding the clinical significance criterion is redundant in the context of the symptoms listed for diagnosis and should therefore be removed from DSM-5. Other researchers, however, concluded the clinical significance criterion is necessary to avoid pathologising normal human distress<sup>35</sup>.



## Conclusions regarding changes to major depressive disorder

There are no proposed changes in DSM-5 to the diagnostic criteria for major depressive disorder, and only a few changes to the text notation. Given the lack of changes to the key DSM criteria for a major depressive disorder at this point, it would appear that few changes to the prevalence rates will occur when the DSM-5 is published. No obvious implications for management or treatment of major depression are apparent.

## Alcohol (substance) use disorder

### Overview of changes from DSM-IV to DSM-5

This section will review the proposed changes with respect to alcohol use disorders. The proposed DSM-5 criteria for misuse of substances other than alcohol followed a similar rationale. This report will limit discussion to changes related to alcohol use disorders.

In DSM-5, 'alcohol abuse' and 'alcohol dependence' disorders have been combined into a single classification of 'alcohol use disorders'. Rather than separate disorders, a severity scale has been defined by counting the number of criteria endorsed. That is, less than two criteria indicate no diagnosis; and two or more criteria indicate alcohol use disorder. The new criteria comprise 11 symptoms, 10 of which were part of the DSM-IV 'alcohol abuse' and alcohol dependence' disorders. The current DSM-IV includes a symptom related to the experience of legal problems associated with the alcohol use (e.g., being charged with a drink driving offence). This symptom is replaced with 'craving or a strong desire or urge to use alcohol' in DSM-5.

In DSM-5, the disorders are contained within the section 'Substance Use and Addictive Disorders'. This section was previously named Substance-Related Disorders in DSM-IV. A comparison of DSM-IV criteria with proposed DSM-5 criteria for alcohol use disorder can be found in Table 6, located in the Appendix.

### Elimination of the 'legal problems' criterion and subsequent inclusion of 'craving' criterion

The argument against the 'legal problems' criterion is that previous research has found that the relationship between legal problems and the remaining alcohol use disorder criteria was very low<sup>36</sup>. Craving, on the other hand, is a common symptom that clinicians attend to during treatment<sup>37</sup>. Furthermore the craving symptom is included in the International Classification of Disease, tenth edition (ICD-10) adding further weight to its support in DSM-5.



Studies found the replacement of the 'legal problems' criterion with 'cravings' did not alter the previously noted uni-dimensionality of the alcohol use disorder concept<sup>36,37</sup>. Furthermore, a US study of current drinkers aged over 17 (n=18,352) concluded the new criteria, while valid, would have little impact on diagnostic rates<sup>37</sup>.

## Difficulties with the abuse-dependence distinction

Under DSM-IV, concerns were raised that persons with a severe alcohol problem might not meet criteria for either the abuse or dependence category, and the demarcation between disorders was inhibiting identification of those with a severe problem<sup>38,39</sup>. The DSM-5 approach (i.e., to view the disorder as a continuum) can be understood as primarily a response to these concerns.

A collection of studies applying various statistical techniques across multiple populations has found that the alcohol abuse and alcohol dependence constructs are better understood as a single concept<sup>40-44</sup>, confirming the DSM-5 approach. This includes a large (n=5409) sample derived from an Australian population<sup>45</sup> and a study of Israeli household residents (n=1338)<sup>46</sup>. These findings suggest the new diagnostic criteria are relevant across cultures and in countries with varying levels of average alcoholic consumption.

The proposed diagnostic and severity measure scale is largely supported by the literature<sup>36,42,47</sup>. Concerns, however, have been raised about using two criteria for a diagnosis, and that it may lead to a substantial increase in diagnoses. Mewton and colleagues<sup>48</sup> evaluated the proposed DSM-5 changes using Australian national data (n=7746). The study observed an increase in prevalence of alcohol use disorders by 61.7% (DSM-IV 6.0% compared with DSM-5 9.7%) when the diagnostic threshold was set at two criteria, whereas setting the diagnostic threshold at three criteria maximised agreement in diagnostic rates between DSM-IV and DSM-5. Similarly, a US study of 29,993 lifetime drinkers aged 21 years or older concluded that only requiring endorsement of two criteria for diagnosis would likely lead to an increase in prevalence rates<sup>49</sup>.

Some research supports a dimensional approach to understanding alcohol use disorders (i.e., criterion rated on severity). This research suggests that dimensional ratings should be included in a decision algorithm to determine both diagnosis and severity<sup>44,50,51</sup>. This approach, however, has not yet been adopted by DSM-5.

## Conclusions regarding changes to alcohol use disorder

There is a substantial change proposed to the approach taken to substance use disorders in DSM-5. This includes moving from two diagnostic disorders (abuse and



dependence) to a single dimensional disorder which requires two or more symptoms for diagnosis. Clinically significant impairment or distress is still required for a diagnosis, which should limit the prevalence, if appropriately applied.



## E-health interventions

E-health (or e-mental health) comprises web-based interactive interventions, video, audio and text-based online therapies, delivered by a desktop computer or portable electronic device. It also incorporates therapeutic software that simulates 'virtual' therapy via computer, handheld or gaming platforms, and a range of assorted technologies such as social networking, smart phone apps, blogs, video sharing and podcasting<sup>52</sup>. All of these have varying degrees of therapist involvement<sup>52</sup>. Although telephone modalities are not necessarily considered within this framework, they are included in this review as they inform a range of alternative methods to delivering mental health intervention, particularly for veterans in rural areas. It is noted that the literature search on e-health interventions did not yield any empirical studies evaluating 'Applications' or 'Apps'.

This review will address the following question:

- What is the efficacy of e-health interventions for PTSD, depression and substance/alcohol use disorders? Do these technologies improve access to care?

### Telehealth: Telephone and videoconferencing

Telehealth involves using telecommunication technology to provide assessment and treatment to patients. It has been shown to demonstrate numerous advantages over standard in-person care, including reduced costs to patients and providers (e.g., reduced travel time, transportation)<sup>53</sup>. These advantages are perceived to increase the likelihood that veterans will engage in evidence-based therapies which typically require nine to 12 sessions<sup>54</sup>. Originally developed to help treat chronic and physical diseases, telehealth technologies are now being used to treat PTSD, depression, substance/alcohol abuse, and suicide ideation<sup>55</sup>.

#### Telephone delivery

The effectiveness of telephone intervention was discussed in a general review paper published in 2008<sup>56</sup>, which included thirty-three telephone intervention studies spanning a range of mental health disorders including anxiety, depression, alcohol disorder, dementia, schizophrenia, eating disorders, suicide and smoking. The samples included mostly non-veteran samples. The authors concluded that study quality was generally high and that overall it was an effective means of service delivery<sup>56</sup>. A review of telemedicine (not specific to mental health) published in 2010 found it to be effective for monitoring health, enhancing access to healthcare, enabling provider-patient interaction; and facilitating treatment involving multiple providers<sup>57</sup>.



A meta-analysis<sup>58</sup> examining telephone interventions targeting depression (utilising primarily cognitive behavioural therapy and some emotion-based and interpersonal therapy) found telephone interventions significantly reduced depressive symptoms compared to control conditions. The samples were primarily civilian samples and the reduction was similar to in-person therapies. The study also found attrition rates among depressed patients to be around 8% in the telephone trials compared to rates of up to 64% reported in trials of in-person therapy. The authors noted, however, that telephone and in-person delivery were not directly compared in any of the studies included in the review. Two studies published since, have compared telephone with in-person delivery for the treatment of insomnia and obsessive compulsive disorder. These studies found equivalent clinical outcomes for patients in either intervention<sup>59-62</sup>. Telephone therapy sessions in both studies were half the length of in-person sessions, suggesting that reducing the cost of therapy may be feasible using a telehealth model.

Contrary to the evidence presented above, however, in a randomised controlled trial with US veterans recruited from community-based outpatient clinics (n=85) no significant effects were found for a 16-session course of telephone delivered cognitive behavioural treatment for depression, compared with a treatment-as-usual group (continuation of care usually received by the outpatient clinic and any other non-VA care received, including face-to-face therapies)<sup>63</sup>. Importantly, this trial was performed by a research group which has conducted a number of telephone delivered trials for depression with civilian samples that have found support for this mode of intervention. Findings suggest that veterans may be more refractory to treatment than other populations, and that in-person interventions may be more effective<sup>63</sup>. These authors did not report any characteristics of their sample of veterans that might constitute them being more 'refractory' (i.e., chronic depression sufferers or Vietnam veterans).

While the above study did not find an effect for depression interventions delivered by telephone to veterans, another study did find this modality useful for treating PTSD with veterans<sup>53</sup>. In this study, US veterans recruited from a VA Medical Centre received 12 sessions of exposure therapy delivered over the telephone (n=62) or in-person (n=27). Telephone-delivered exposure therapy was shown to be effective in reducing depressive, anxiety, posttraumatic stress and impairment symptoms with large treatment effect sizes across all outcomes. The authors noted the effect sizes were comparable to those seen in previously published work on exposure for PTSD. The effects, however, were smaller than the treatment effects for the in-person condition, which were notably two times higher than most published studies<sup>53</sup>. There were a number of methodological limitations with this study, including non-randomised allocation of participants, but the results provide preliminary support for the effectiveness of telephone-delivered exposure therapy<sup>53</sup>.



## Video delivery

Videoconferencing involves the use of a camera to remotely project the image and sounds of the individual onto a computer screen so a therapist and client can interact in real time. One pilot study explored the effectiveness of video teleconferencing (n=12) in delivering prolonged exposure relative to in-person delivery (n=35) to combat veterans<sup>64</sup>. The videoconferencing method produced significant reductions in PTSD and depression symptoms with large effect sizes. Exposure delivered via videoconference was acceptable, practical, and safe. However, the treatment effects were substantially higher in the in-person group and dropout rates were higher in the videoconferencing condition<sup>64</sup>.

A second study with a similar sample size found that veterans receiving cognitive behavioural therapy for PTSD via videoconference showed similar treatment gains and attrition rates as those who received in-person therapy<sup>65</sup>. However, they were less likely to complete homework and were less comfortable talking to their therapist at post-treatment than their counterparts in the in-person group. It is worth noting that in both of the abovementioned studies, participants conducted the videoconference at their local Veterans' Affairs clinic, so these studies do not necessarily test whether this delivery form decreases barriers to accessing care.

Other studies have extended the use of videoconferencing to group therapy settings<sup>66,67</sup>. One of these, a randomised controlled trial compared group cognitive behavioural therapy via videoconferencing (n=61) with group cognitive behavioural therapy (n=64) delivered in-person for anger related to PTSD in rural veterans<sup>66</sup>. The group videoconferencing was as successful in treating anger as the in-person group therapy, and these effects were maintained at six months follow-up. Furthermore, the drop-out rate was low. However, a slightly stronger therapeutic alliance was observed between participants and the group leader in the in-person method. Nevertheless, other process variables indicated acceptability and feasibility for veterans living in rural areas.

Another study reported pilot findings in an ongoing four year randomised controlled trial related to the evaluation of group cognitive processing therapy (CPT) for PTSD, delivered via videoconference<sup>67</sup>. Active duty, reserves and veterans living in rural areas in Hawaii being treated at a VA Center were randomly assigned to the videoconferencing CPT group or the in-person CPT group. Significant reductions in PTSD symptoms were observed in both interventions following treatment and at six month follow-up. No differences were observed between the groups, though the small sample size probably limited statistical power to produce any differential group effects, suggesting caution should be taken to over interpret these preliminary findings.



## Concluding remarks about telehealth interventions

Telehealth approaches appear to be a familiar, practical and feasible method for delivering evidence-based interventions and providing support, particularly for those living in geographically dispersed areas. There is good support for the effectiveness of telephone-delivered psychological interventions across a number of psychiatric disorders within community samples. There is, however, uncertainty as to whether these findings generalise to veteran samples. There is a lack of veteran trials, and those studies that utilise veteran samples report mixed results. Although further research is required to test whether this modality is effective with veteran populations, it shows substantial promise for those in rural and remote locations. Video delivery of intervention shows promise, with a number of individual and group intervention trials being conducted with veteran samples. Funding models may need to be modified to promote the possibility of adopting telephone therapy when indicated.

## Internet / Web-based / Online applications

### Veteran-specific studies

The internet and other networked multimedia technologies now offer a rich expert resource for providers, and a potentially anonymous, more accessible, and less stigmatising venue for self-management of service members, veterans and their families<sup>68</sup>. Our literature search yielded a range of interesting publications describing the evolution, nature, and implementation of online programs, but fewer efficacy or effectiveness studies regarding such interventions with veterans/military personnel.

A notable exception was the evaluation of two web-based interventions for alcohol related problems. This study compared the Alcohol Savvy program and the Driver's Check-up program in US active military personnel (n=3070). The Alcohol Savvy program uses modules aimed at increasing awareness of risk behaviours and motivation to encourage smart decisions about alcohol use. It incorporates interactive exercises and video vignettes directed at providing skills towards moderate alcohol consumption. The Driver's Check-up is also a motivationally based program which targets two populations – a lower risk and a higher risk group. In the higher risk intervention, participants are presented with decisional balance exercises (e.g., pros and cons), questions related to negative impacts of alcohol use, and personalised feedback regarding their alcohol use compared with peers and other impacts. The low risk module delivers information about myths of alcohol consumption, effects of alcohol use and potential risks for developing alcohol problems. The study found only the Driver's Check-up intervention to be useful, attributing the favourable outcomes to the nature of personalised feedback given in the context of norms. Although fairly typical of follow-up studies with military personnel, the



low response rate across the follow-up periods in this study was notable. This study supports an earlier web-based alcohol intervention developed for the US military, which showed personalised feedback and tailored information was effective in marine corps ratings of how alcohol training was delivered (i.e., preferred over classroom training)<sup>69</sup>.

In a different study utilising technology enhanced relaxation techniques with medical military personnel (n=60), the learning of relaxation skills (fundamental to anxiety management) via a video clip of virtual reality relaxing scenes (e.g., 'dream island') produced significant improvements in states of anxiety when compared to a control group<sup>70</sup>. Similarly, Stress Gym, an online internet program using cognitive behavioural therapy to reduce stress, has also shown to be effective in enlisted sailors/officers (n=142)<sup>71</sup>. The program resulted in reductions in stress levels and reported participant satisfaction. Future studies regarding Stress Gym are required using control condition.

Cognitive behavioural treatments for PTSD delivered as a whole via the internet have also been tested in two randomised controlled studies<sup>72,73</sup>. The first study treated service members in the US Defence Department for PTSD arising from the September 11 attacks or the Iraq conflict in a 'proof of concept trial'. The internet-based self-management cognitive behavioural therapy condition, called 'DE-STRESS' (n=24) was shown to improve symptoms of posttraumatic stress disorder, depression and anxiety, with effects maintained at six month follow-up when compared to the control condition of supportive non-trauma-specific counselling (n=21)<sup>73</sup>. Thirty-three per cent of those who completed the internet intervention achieved higher states of functioning at six months.

One web-based intervention aimed to improve the posttraumatic stress disorder knowledge of military family members, and to foster actions that could help service members with their symptoms<sup>74</sup>. In this study, an educational website was shown to be beneficial in increasing correct knowledge about posttraumatic stress symptoms. Of the 497 family members who used the website, 217 returned to the website about ten days after their initial visit. Over half had taken actions, such as discussing with service members' their symptoms or persuading them to seek medical attention. This study demonstrated the feasibility of web-based content to impact on knowledge and behaviour<sup>74</sup>. In a similar study using a randomised controlled design that also utilised the support systems of veterans and service personnel, online self-administered cognitive behavioural therapy training for mental health practitioners working with US veterans was beneficial in increasing the knowledge and skill of participants in treating posttraumatic stress disorder<sup>75</sup>.



## Meta-analyses and systematic reviews of substance/alcohol internet interventions (non-veteran samples)

The majority of research conducted to date that examines the efficacy of internet interventions is in the area of alcohol and tobacco use. A meta-analysis conducted in 2009 of internet alcohol/substance use treatments revealed that among four controlled studies, there was an overall reduction of symptoms with a moderate effect size ( $d=.75$ )<sup>76</sup>. Another meta-analysis of thirty-four randomised controlled trials of computer-based interventions for alcohol and tobacco use ( $n=10,632$ , mostly young adult populations), found substance use interventions to be significant in reducing substance use<sup>77</sup>. Although the weighted effect size was small, these authors argued such effects translated to meaningful impacts. That is, in studies of smokers, reductions represented a proportion of participants who achieved abstinence, and in studies targeting alcohol use, substantial reductions in drinking consumption across a large number of participants was evident. The psychological gains from the use of these modalities were comparable to in-person delivered care<sup>77</sup>.

Two systematic review papers were published in 2010 and 2011 examining online alcohol interventions and online addiction interventions respectively<sup>78,79</sup>. The first study, into alcohol interventions using stringent criteria, yielded 17 studies. The samples were mainly university students who were at-risk, heavy, or binge drinkers<sup>79</sup>. The collated evidence suggested that users benefited from online alcohol interventions and that this approach could be particularly useful for groups less likely to access traditional alcohol-related services. The second systematic review was a first to evaluate internet-based therapy for treating addictions<sup>78</sup>. Seven high quality papers (i.e., randomised controlled trials) were yielded which reported on tobacco cessation, pathological gambling and substance abuse. Papers primarily reported on cognitive behavioural and motivational interviewing based interventions, which, these authors concluded, are effective in enabling behaviour change and symptom reduction when delivered via the internet. These findings are important as they speak to the large proportion of individuals with substance abuse problems who do not seek therapy. According to the authors, the growing availability of internet interventions provides an opportunity for improved access to interventions<sup>78</sup>.

## PTSD interventions

The studies reviewed in this section are echoed in a review paper looking at internet-based interventions for specific traumatic stress reactions<sup>80</sup>. This paper critically reviewed the extant literature in the period leading up to 2008. It found that internet or computer-based interventions were yielding effect sizes that were comparable to traditional interventions, although this finding should be interpreted cautiously. Many



studies, for example, involved non-clinical populations, and internet treatments have notoriously high drop-out rates. The authors found that most interventions took a cognitive behavioural framework which includes the core components of psychoeducation, cognitive restructuring, goal setting and exposure. The authors concluded that further research is required to identify the active treatment ingredients associated with web interventions, investigate dose-response effects to determine the time patients need to devote to treatment for maximal benefit, and the utility of clinician contact<sup>80</sup>.

## Concluding remarks about web-based interventions

There is growing evidence of the efficacy of web-based interventions designed to target alcohol and tobacco use. Much of this research has been conducted in veteran/military samples. There is also growing evidence of the efficacy of web-based interventions designed to target traumatic stress symptoms. These traumatic stress studies indicate that they may be useful to veterans, particularly in terms of reducing stigma in seeking professional face-to-face treatment. A caveat to the use of web-based online applications, particularly for self-management, is that ethical and safety considerations need to be applied, particularly to the issue of individuals engaging in help strategies in the absence of professional monitoring<sup>68</sup>. Overwhelmingly, studies and review articles tend to conclude that increased rigour with respect to study design and methodologies are required to further confirm these interventions as efficacious or effective.

## Virtual reality

Virtual reality exposure therapy (VRET) has been posed as an interesting alternative to imaginal and *in vivo* exposure therapy for treating anxiety<sup>81</sup>. Pioneered by the work of Barbara Rothbaum<sup>82,83</sup>, virtual reality therapies are designed to create a range of scenarios that deliver information to all sensory processes, creating a sense of presence and immersion that can activate the fear/emotional structure associated with anxiety, and in the case of posttraumatic stress disorder, with the traumatic memory. Most of the studies conducted to date are with anxiety disorders (the majority being specific phobias and panic disorder), and in non-veteran samples.

## Systematic reviews

A systematic review of 13 high quality papers published in 2010 aimed to determine the efficacy of virtual reality exposure therapy with anxiety disorders, including specific and social phobia, panic disorder and posttraumatic stress disorder<sup>81</sup>. It found that only in specific phobia cases (such as flying or acrophobia) was virtual reality therapy effective<sup>81</sup>. The review did note, however, that in more complex anxiety, such as panic



disorder or social phobia, results of first studies using virtual reality exposure therapy are promising but that rigorous research is still needed before the status of these treatments can be determined. The systematic review noted that a limitation in assessing virtual reality exposure therapies is that protocols often vary in their components. Also, because virtual reality exposure is often combined with other techniques, dismantling research methodology is needed to separate the contribution of various components<sup>81</sup>.

A meta-analysis examined 21 controlled, uncontrolled, randomised, and non-randomised papers and found that virtual reality therapies resulted in reductions across major anxiety disorders including social phobia, specific phobia, panic disorder, agoraphobia and posttraumatic stress disorder<sup>84</sup>. A more rigorous meta-analysis published in the same year (2007) using 13 studies found virtual reality exposure for anxiety produced a large effect size among studies when compared with controls<sup>85</sup>. Small effect sizes were also found for virtual reality exposure over *in vivo* exposure (that is, using traditional techniques)<sup>85</sup>.

## Veteran / Military studies

Studies testing virtual reality therapies specifically with veterans and military personnel have echoed the findings of the reviews above. However, the wide ranging methodologies spanning single case reports, uncontrolled trials, open clinical trials and randomised controlled trials, render findings difficult to interpret. For example, two studies show that PTSD symptoms improve in veteran samples utilising virtual reality exposure therapy<sup>86,87</sup>. However, neither study used a control group, which limits the conclusions that can be drawn.

A small randomised controlled trial compared virtual reality exposure therapy with present-centred therapy (nonspecific therapy not involving traumatic content) in Vietnam veterans with chronic posttraumatic stress disorder (n=11). This study did not find any significant treatment effects<sup>88</sup>, but this could have been a function of the small sample size. An interesting finding from this study was the difficulty in recruiting Vietnam veterans to the study, which may suggest resistance from some groups towards this form of intervention.

Another small randomised controlled trial utilised OEF/OIF service members with treatment resistant posttraumatic stress disorder (n=20)<sup>89</sup>. In the virtual reality condition, 70% of members showed marked improvement in their posttraumatic stress symptoms relative to 12.5% of those in the usual care condition. These preliminary findings may suggest virtual reality exposures may benefit those with treatment resistant PTSD, but this needs to be replicated in a larger study.



Only one study has examined virtual reality relative to prolonged exposure therapy (currently regarded as first line treatment for PTSD)<sup>90</sup>. This non-randomised, retrospective case series design study found no difference between those receiving either form of intervention (n=10). The methodological limitations of this study prevent firm conclusions being drawn. They do, however, suggest that future studies testing virtual reality against current best practice interventions are required to see whether virtual reality treatments offer additional improvements.

Only one study to date has investigated the impact of virtual reality on anxiety and depression levels (in addition to PTSD symptoms) in US OEF/OIF active duty members<sup>91</sup>. In a small, single group study (i.e., no control group), participants completed 12 to 15 sessions over ten weeks (twice weekly at 90-120 minutes per session) of virtual reality exposure therapy (n=20). Significant symptom improvement was seen in PTSD, anxiety and depression symptoms. There was, however, a high dropout rate, which may suggest intolerance of this treatment modality by a subgroup of treatment seekers<sup>91</sup>.

### Concluding remarks about virtual reality

Our review suggests that virtual reality exposure therapy is still in its early phase of testing, and more rigorous studies are required to establish its efficacy in terms of alleviating psychiatric symptoms. It is also important that it is tested against current best practice interventions (e.g., trauma-focussed cognitive behavioural therapy or cognitive processing therapy). Nonetheless, preliminary findings are producing promising benefits to veterans, presumably because these therapies allow emotional engagement with traumatic memories in a graduated and controlled manner. The literature is suggesting virtual reality exposure therapies could improve engagement in therapy for the newer generation of veterans who may be versed in gaming style technologies. A major limitation of this therapy, however, may be in its cost, particularly when compared with traditional in-person therapy. It would be premature to invest substantial funds until there is rigorous data to suggest it is more effective than therapist-delivered exposure therapy.





## Longitudinal course of posttraumatic stress symptoms

This section will review longitudinal and prospective studies to provide an understanding of the trajectory of posttraumatic stress symptoms. The following question is addressed:

- What are the PTSD symptom trajectories over time and what are the implications for the treatment of chronic PTSD?

### Review studies in the course of posttraumatic stress symptoms

Longitudinal studies concerned with the trajectory of posttraumatic stress symptoms were discussed in an important review paper in 2006<sup>92</sup>. This paper examined studies across three time periods: 1988-1997, 1998-2002, and 2002-2005. From 1988-1997, studies showed those who experienced early trauma symptoms generally recovered while those with few early symptoms predominantly remained asymptomatic. This provided the impetus for detecting specific early symptoms that may be indicative of later PTSD. From 1998-2002, longer-term outcomes associated with specific early trauma symptoms were studied. Acute stress disorder (an early form of PTSD with a focus on dissociative symptoms) was identified as a specific risk for developing PTSD, though most individuals who developed PTSD did so in the absence of acute stress disorder<sup>92</sup>.

In the 1998-2002 period, longitudinal studies began to investigate the relationship between PTSD and depression, with studies finding that only when trauma exposure led to PTSD was a person at increased risk for depression. Trauma exposure in the absence of PTSD was not generally related to depression. Studies published since this early research have found that depression can occur independently after trauma, although it is recognised that PTSD and depression frequently occur together<sup>93</sup>.

During 2002-2005, the review reported two distinct trajectories following trauma in a large cohort of Gulf War veterans. These trajectories identified veterans with low levels of PTSD symptoms with little increase over time, or higher level initial symptoms which increased significantly over time.

### Symptom trajectories in military/veteran and other high risk population samples

A recent large 2012 study compared the symptom trajectories of US military service members, including active duty, reserve and national guard personnel who deployed either once (n=3393) or multiple times (n=4394) to the OEF/OIF conflicts<sup>94</sup>. Self-reported symptoms of posttraumatic stress were obtained prior to deployment and at two follow-



ups spaced three years apart. This study revealed five distinct symptom trajectories. The most common trajectory was, (1) low symptoms over time - 'resilience' (83.1% single deployers, 84.9% multiple deployers), followed by (2) a moderate symptom group that improved over time (8.0%, 8.5%), (3) worsening symptoms which became chronic over time (6.7%, 4.5%), (4) high symptoms which were maintained over time (2.2% single deployers only), and (5) high symptoms which improved over time (2.2% multiple deployers only). Trajectories were similar across those deployed once or multiple times.

The authors note the low incidence in the worsening-chronic course of PTSD may reflect resilience generated from the specific training common to US military personnel. PTSD in multiple deployers showed greater improvement over time compared with single deployers, and fewer personnel in the multiple deployers group experienced elevated posttraumatic stress. The authors proposed that these findings may indicate that some service members who deploy multiple times can participate in repeated deployments because they are healthier, or possibly perceive themselves as physically and mentally prepared for deployment.

Consistent with the previous finding, another study examined the course of PTSD symptoms in 178 active-duty police officers following exposure to a life threatening event<sup>95</sup>. In this prospective study, participants were evaluated at baseline (academy training), and six, 12, 24, and 36 months after commencement of training. Analysis revealed three distinct trajectories: (1) resilient (88%), (2) initial distress-improving (10%), and (3) initial distress-worsening (2%). The resilient group reported lower scores on peri-traumatic dissociation compared with both the distress-improving group and the distress-worsening group. Similar to the paper described above<sup>94</sup>, the high rate of resilience in this police sample was explained by workplace characteristics, including high social and institutional support. Both studies support an early intervention approach for those with potentially worsening symptoms in a small but significant number of personnel.

The effects of combat stress reactions (CSR) and posttraumatic stress symptoms on self-rated health trajectories over 20 years post-war exposure was examined in another study<sup>96</sup>. The sample of Israeli male veterans was divided into those who experienced CSR at the time of deployment and those who did not (n=504). Participants were followed up after one, two, three, and 20 years after the 1982 Lebanon war. Participants in the CSR group were initially more impaired on measures of self-rated health, and had higher rates of PTSD, than those with no combat stress reaction. Despite improvement over the 20 years, the combat stress group continued to score lower than the no combat stress group on self-reported health measures, and higher on PTSD, at all four time points. There were however, different levels of improvement within the combat stress group which suggested that the level of vulnerability within this group was not uniform.



Importantly, both groups showed a fluctuating but chronic course: PTSD rates dropped three years postwar and rose again 17 years later. At the 20-year point, 27% of veterans with a CSR during the war still met criteria for PTSD, compared with 7% of those without a CSR.

The sample of Lebanon war veterans mentioned above was followed up in a study published in 2011<sup>97</sup>. Inter-relationships between posttraumatic stress reactions and somatisation symptoms were assessed at four time points. Veterans from the combat stress group reported higher levels of stress reactions and higher somatisation than the control group veterans. The authors suggested that combat stress reactions did not occur as a transient episode which rapidly subsided, but that they are a marker for continued vulnerability many years after war.

## Studies of delayed-onset PTSD

One study investigated delayed-onset PTSD using the same sample of Lebanon war veterans described above. The paper found strong support for a delayed-onset PTSD with 16.5% of the sample developing delayed-onset PTSD, some up to 20 years later. Delayed-onset PTSD was associated with both the stress reactions during combat and the number of recent stressful life events<sup>98</sup>. This finding supported a previous study which found evidence for delayed-onset PTSD in a prospective study of 1040 US peacekeepers in Somalia<sup>99</sup>.

These findings are important because PTSD is often thought to be detectable early after a traumatic event. The studies recognise that some individuals may not present with trauma symptoms early after a traumatic event but they may develop PTSD in the future. Further research is required, however, to determine whether delayed onset, which is considered to be rare, is simply an exacerbation of subsyndromal PTSD or a distinctive presentation<sup>100</sup>. An excellent review of delayed onset PTSD is provided by Andrews et al<sup>100</sup>.

## Studies of posttraumatic stress symptoms in Vietnam veterans

A follow-up study using the American Legionnaires sample described earlier in the review paper<sup>101</sup>, noted that between 1984 and 1998, severe PTSD rates in this Vietnam theater sample dropped slightly from 11.8% to 10.5%. Being diagnosed with severe PTSD in 1984 increased the likelihood by 14 times of being diagnosed with severe PTSD in 1998, although some veterans changed PTSD status across time. At both time points combat exposure showed a dose-response relationship with severe PTSD symptoms. The association between combat exposure and PTSD was unchanged when the number of years since serving in South East Asia was accounted for<sup>101</sup>.



Chronic PTSD was associated with worse family functioning, less life satisfaction and happiness, greater smoking and alcohol use, greater mental health service use, and nonspecific health complaints. A limitation of this study was that the sample was selected randomly from a veterans' service organisation, wherein veterans with PTSD are less likely to be members. But what it does show is that almost 30 years after their return from combat, 10% of veterans continue to experience chronic severe PTSD symptoms<sup>101</sup>. These findings are consistent with Australian research suggesting an increase in lifetime PTSD prevalence from 21% to 25% in Vietnam veterans between 1990 and 2005<sup>102</sup>.

## Studies of posttraumatic stress symptoms in non-veterans

One prospective study examined PTSD symptoms in 715 injury patients whose mechanism of injury was either interpersonal or non-interpersonal (n=715). Participants were assessed at three, 12 and 24 months post-injury<sup>103</sup>. Survivors of interpersonal trauma were more likely to present with PTSD than survivors of non-interpersonal trauma across each time point except 24 months. Across time, survivors of interpersonal trauma demonstrated significantly higher scores on PTSD symptoms associated with fear and threat. The authors suggested that fear conditioning may be instrumental in persistent PTSD associated with interpersonal trauma. Early interventions targeting these fear reactions and threat cognitions may play a role in the prevention of PTSD that may develop following interpersonal trauma.

A different study examined the role of hyperarousal in the course of PTSD symptoms in a sample of young adults who had experienced community violence. Respondents with most pronounced hyperarousal at baseline displayed lower overall symptom improvement, relative to those who presented with less prominent early hyperarousal symptoms. Hyperarousal also emerged as the best predictor of future symptom severity with a direct influence on all other symptoms over time. While absolute levels of all four clusters of PTSD symptoms (re-experiencing, avoidance, numbing and hyperarousal) declined over time, re-experiencing symptoms declined most rapidly. The authors proposed that as hyperarousal appeared to initiate ensuing symptoms, reducing these symptoms early after a traumatic event may be a beneficial approach to therapy. Intervention strategies that include relaxation training and anxiety management might be particularly beneficial<sup>104</sup>.

## Concluding remarks about the trajectory of posttraumatic stress symptoms and implications for treatment of chronic PTSD

While acute stress disorder and high levels of dissociation indicate high risk for later PTSD, many people who develop PTSD do not report dissociation or acute stress



disorder shortly after the traumatic event. Studies reviewed here have found hyperarousal symptoms are specifically predictive of future posttraumatic symptoms.

The trajectories of PTSD symptoms were varied across the studies reviewed here which probably reflect changes in analytical methods over the years along with differences in sample characteristics. Earlier studies describe two trajectory classes: low level of symptoms with little increase over time, or higher levels of initial symptoms with larger increases over time<sup>92</sup>. Later, three classes were identified with a clear majority being resilient to trauma experiences (up to 88%), those who initially show distress but improve (up to 10%), and those who report initial distress which worsens over time (up to 2%)<sup>95</sup>.

Most recently, five trajectory classes among US military service members have been identified. These classes in order of proportion were, resilient (one or multiple deployments), moderate-improving (one or multiple deployments), worsening-chronic (one or multiple deployments), high-stable (one deployment only), and high-improving (multiple deployments only). Across all these studies there is a class of people who have little or no symptoms after a traumatic event and who remain healthy, and there is a class which have a distressful response which can worsen with the passage of time. The primary difference across the studies is the number of additional classes that reflect medium levels of symptoms in the acute phase and what levels of improvement are obtained.





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## Appendices

1. Table 4. Comparison of DSM-IV and proposed DSM-5 diagnostic criteria for posttraumatic stress disorder
2. Table 5. Comparison of DSM-IV and proposed DSM-5 diagnostic criteria for major depressive disorder
3. Table 6. Comparison of DSM-IV and proposed DSM-5 diagnostic criteria for alcohol (substance) use disorder



**Table 4. Comparison of the DSM-IV criteria with the proposed DSM-5 criteria for posttraumatic stress disorder**

DSM-IV criteria for PTSD	Proposed DSM-5 criteria for PTSD
<p><b>Posttraumatic Stress Disorder</b></p> <p><b>Criterion A: stressor.</b> The person has been exposed to a traumatic event in which both of the following have been present:</p> <ol style="list-style-type: none"> <li>1. The person has experienced, witnessed, or been confronted with an event or events that involve actual or threatened death or serious injury, or a threat to the physical integrity of oneself or others.</li> <li>2. The person's response involved intense fear, helplessness, or horror. Note: in children, it may be expressed instead by disorganized or agitated behavior.</li> </ol> <p><b>Criterion B: intrusive recollection.</b> The traumatic event is persistently reexperienced in at least <b>one</b> of the following ways:</p> <ol style="list-style-type: none"> <li>1. Recurrent and intrusive distressing recollections of the event, including images, thoughts, or perceptions. Note: in young children, repetitive play may occur in which themes or aspects of the trauma are expressed.</li> <li>2. Recurrent distressing dreams of the event. Note: in children, there may be frightening dreams without recognizable content.</li> <li>3. Acting or feeling as if the traumatic event were recurring (includes a sense of reliving the experience, illusions, hallucinations, and dissociative flashback episodes, including those that occur upon awakening or when intoxicated). Note: in children, trauma-specific re-enactment may occur.</li> <li>4. Intense psychological distress at exposure to internal or external cues that symbolize or resemble an aspect of the traumatic event.</li> <li>5. Physiologic reactivity upon exposure to internal or external cues that symbolize or resemble an aspect of the traumatic event.</li> </ol> <p><b>Criterion C: avoidant/numbing.</b> Persistent avoidance of stimuli associated with the trauma and numbing of general responsiveness (not present before the trauma), as indicated by at least <b>three</b> of the following:</p> <ol style="list-style-type: none"> <li>1. Efforts to avoid thoughts, feelings, or conversations associated with the trauma.</li> </ol>	<p><b>Posttraumatic Stress Disorder</b></p> <p><b>Criterion A.</b> Exposure to <b>actual</b> or threatened a) death, b) serious injury, or c) sexual violation, in one or more of the following ways:</p> <ol style="list-style-type: none"> <li>1. Directly experiencing the traumatic event(s).</li> <li>2. Witnessing, in person, the traumatic event(s) as they occurred to others.</li> <li>3. Learning that the traumatic event(s) occurred to a close family member or close friend; cases of actual or threatened death must have been violent or accidental.</li> <li>4. Experiencing repeated or extreme exposure to aversive details of the traumatic event(s) (e.g., first responders collecting human remains; police officers repeatedly exposed to details of child abuse); this does not apply to exposure through electronic media, television, movies, or pictures, unless this exposure is work-related.</li> </ol> <p><b>Criterion B.</b> Presence of one or more of the following intrusion symptoms associated with the traumatic event(s), beginning after the traumatic event(s) occurred:</p> <ol style="list-style-type: none"> <li>1. Spontaneous or cued recurrent, involuntary, and intrusive distressing memories of the traumatic event(s). (Note: In children, repetitive play may occur in which themes or aspects of the traumatic event(s) are expressed.)</li> <li>2. Recurrent distressing dreams in which the content or affect of the dream is related to the event(s). (Note: In children, there may be frightening dreams without recognizable content.)</li> <li>3. Dissociative reactions (e.g., flashbacks) in which the individual feels or acts as if the traumatic event(s) are recurring (such reactions may occur on a continuum, with the most extreme expression being a complete loss of awareness of present surroundings. (Note: In children, trauma-specific re-enactment may occur in play.)</li> <li>4. Intense or prolonged psychological distress at exposure to internal or external cues that symbolize or resemble an aspect of the traumatic event(s).</li> <li>5. Marked physiological reactions to reminders of the traumatic event(s).</li> </ol> <p><b>Criterion C.</b> Persistent avoidance of stimuli associated with the traumatic event(s), beginning after the traumatic event(s) occurred, as evidenced by avoidance or efforts to avoid one or more of the following:</p> <ol style="list-style-type: none"> <li>1. Distressing memories, thoughts, or feelings about or closely associated with the traumatic event(s).</li> <li>2. External reminders (i.e., people, places, conversations, activities, objects, situations) that arouse distressing memories, thoughts, or feelings about, or that are closely associated with, the traumatic event(s).</li> </ol>



2. Efforts to avoid activities, places, or people that arouse recollections of the trauma.
3. Inability to recall an important aspect of the trauma.
4. Markedly diminished interest or participation in significant activities.
5. Feeling of detachment or estrangement from others.
6. Restricted range of affect (e.g., unable to have loving feelings).
7. Sense of foreshortened future (e.g., does not expect to have a career, marriage, children, or a normal life span).

**Criterion D: hyper-arousal.** Persistent symptoms of increasing arousal (not present before the trauma), indicated by at least **two** of the following:

1. Difficulty falling or staying asleep.
2. Irritability or outbursts of anger.
3. Difficulty concentrating.
4. Hyper-vigilance.
5. Exaggerated startle response.

**Criterion E: duration.** Duration of the disturbance (symptoms in B, C, and D) is more than one month.

**Criterion F: functional significance.** The disturbance causes clinically significant distress or impairment in social, occupational, or other important areas of functioning.

*Specify if:*

**Acute:** if duration of symptoms is less than three months.

**Chronic:** if duration of symptoms is three months or more.

**With or without delay onset:** Onset of symptoms at least six months after the stressor.

**Criterion D.** Negative alterations in cognitions and mood associated with the traumatic event(s), beginning or worsening after the traumatic event(s) occurred), as evidenced by two or more of the following:

1. Inability to remember an important aspect of the traumatic event(s) (typically due to dissociative amnesia that is not due to head injury, alcohol, or drugs).
2. Persistent and exaggerated negative beliefs or expectations about oneself, others, or the world (e.g., "I am bad," "No one can be trusted," "The world is completely dangerous"). (Alternatively, this might be expressed as, e.g., "I've lost my soul forever," or "My whole nervous system is permanently ruined").
3. Persistent, distorted blame of self or others about the cause or consequences of the traumatic event(s).
4. Persistent negative emotional state (e.g., fear, horror, anger, guilt, or shame).
5. Markedly diminished interest or participation in significant activities.
6. Feelings of detachment or estrangement from others.
7. Persistent inability to experience positive emotions (e.g., unable to have loving feelings, psychic numbing).

**Criterion E.** Marked alterations in arousal and reactivity associated with the traumatic event(s), beginning or worsening after the traumatic event(s) occurred, as evidenced by two or more of the following:

1. Irritable or aggressive behaviour.
2. Reckless or self-destructive behaviour.
3. Hypervigilance.
4. Exaggerated startle response.
5. Problems with concentration.
6. Sleep disturbance (e.g., difficulty falling or staying asleep or restless sleep).

**Criterion F.** Duration of the disturbance (Criteria B, C, D, and E) is more than 1 month.

**Criterion G.** The disturbance causes clinically significant distress or impairment in social, occupational, or other important areas of functioning.

**Criterion H.** The disturbance is not attributed to the direct physiological effects of a substance (e.g., medication, drugs, or alcohol) or another medical condition (e.g., traumatic brain injury).

*Specify if:*

**With delayed expression:** If the diagnostic threshold is not exceeded until at least 6 months after the event (although the onset and expression of some symptoms may be immediate).

NB. Subtypes are not included here.



**Table 5. Comparison of the DSM-IV criteria with the proposed DSM-5 criteria for depression**

DSM-IV criteria for major depressive episode and disorder	Proposed DSM-5 criteria for major depressive episode and disorder
<p><b>Major Depressive Episode</b></p> <p><b>Note:</b> This is <u>not</u> a codeable disorder.</p> <p><b>A.</b> Five (or more) of the following symptoms have been present during the same two-week period and represent a change from previous functioning; at least one of the symptoms is either, (1) depressed mood or (2) loss of interest or pleasure.</p> <p><b>Note:</b> Do not include symptoms that are clearly due to a general medical condition, or mood-incongruent delusions or hallucinations.</p> <ol style="list-style-type: none"> <li>1. Depressed mood most of the day, nearly every day, as indicated by either subjective report (e.g., feels sad or empty) or observation made by others (e.g., appears tearful). Note: In children and adolescents, can be irritable mood.</li> <li>2. Markedly diminished interest or pleasure in all, or almost all, activities most of the day, nearly every day (as indicated by either subjective account or observation made by others).</li> <li>3. Significant weight loss when not dieting, or weight gain (e.g., a change of more than 5% of body weight in a month), or decrease or increase in appetite nearly every day. Note: In children, consider failure to make expected weight gains.</li> <li>4. Insomnia or hypersomnia nearly every day.</li> <li>5. Psychomotor agitation or retardation nearly every day (observable by others, not merely subjective feelings of restlessness or being slowed down).</li> <li>6. Fatigue or loss of energy nearly every day.</li> <li>7. Feelings of worthlessness or excessive or inappropriate guilt (which may be delusional) nearly every day (not merely self-reproach or guilt about being sick).</li> <li>8. Diminished ability to think or concentrate, or indecisiveness, nearly every day (either by subjective account or as observed by others).</li> <li>9. Recurrent thoughts of death (not just fear of dying), recurrent suicidal ideation without a specific plan, or a suicide attempt or a specific plan for committing suicide.</li> </ol> <p><b>B.</b> The symptoms do not meet criteria for a Mixed Episode.</p> <p><b>C.</b> The symptoms cause clinically significant distress or impairment in social, occupational, or other important areas of functioning.</p>	<p><b>Major Depressive Episode</b></p> <p><b>Note:</b> This is <u>not</u> a codeable disorder.</p> <p><b>A.</b> Five (or more) of the following criteria have been present during the same two-week period and represent a change from previous functioning; at least one of the symptoms is either, (1) depressed mood, or (2) loss of interest or pleasure.</p> <p><b>Note:</b> Do not include symptoms that are clearly due to a medical condition.</p> <ol style="list-style-type: none"> <li>1. Depressed mood most of the day, nearly every day, as indicated by either subjective report (e.g., feels sad, empty, or hopeless) or observation made by others (e.g., appears tearful). Note: In children and adolescents, can be irritable mood.</li> <li>2. Markedly diminished interest or pleasure in all, or almost all, activities most of the day, nearly every day (as indicated by either subjective account or observation).</li> <li>3. Significant weight loss when not dieting, or weight gain (e.g., a change of more than 5% of body weight in a month), or decrease or increase in appetite nearly every day. Note: In children, consider failure to make expected weight gain.</li> <li>4. Insomnia or hypersomnia nearly every day.</li> <li>5. Psychomotor agitation or retardation nearly every day (observable by others, not merely subjective feelings of restlessness or being slowed down).</li> <li>6. Fatigue or loss of energy nearly every day.</li> <li>7. Feelings of worthlessness or excessive or inappropriate guilt (which may be delusional) nearly every day (not merely self-reproach or guilt about being sick).</li> <li>8. Diminished ability to think or concentrate, or indecisiveness, nearly every day (either by subjective account or as observed by others).</li> <li>9. Recurrent thoughts of death (not just fear of dying), recurrent suicidal ideation without a specific plan, or a suicide attempt or a specific plan for committing suicide.</li> </ol> <p><b>B.</b> The symptoms cause clinically significant distress or impairment in social, occupational, or other important areas of functioning. (<i>Language regarding “impairment” may change for consistency with DSM-IV conventions.</i>)</p>



**D.** The symptoms are not due to the direct physiological effects of a substance (e.g., a drug of abuse, a medication) or a general medical condition (e.g., hypothyroidism).

**E.** The symptoms are not better accounted for by Bereavement, i.e., after the loss of a loved one, the symptoms persist for longer than 2 months or are characterized by marked functional impairment, morbid preoccupation with worthlessness, suicidal ideation, psychotic symptoms, or psychomotor retardation.

**C.** The episode is not attributable to the direct physiological effects of a substance or another medical condition.

**D.** The Major Depressive Episode is not better accounted for by Schizoaffective Disorder and is not superimposed on Schizophrenia, Schizophreniform Disorder, Delusional Disorder, or Psychotic Disorder Not Elsewhere Classified.

**E.** There has never been a Manic Episode or a Hypomanic Episode.

Specify *with Mixed Features*.

**Note:** The normal and expected response to an event involving significant loss (e.g, bereavement, financial ruin, natural disaster), including feelings of intense sadness, rumination about the loss, insomnia, poor appetite and weight loss, may resemble a depressive episode. The presence of symptoms such as feelings of worthlessness, suicidal ideas (as distinct from wanting to join a deceased loved one), psychomotor retardation, and severe impairment of overall function suggest the presence of a Major Depressive Episode in addition to the normal response to a significant loss.

#### Major Depressive Disorder, Single Episode

**A.** Presence of a single Major Depressive Episode

**B.** The Major Depressive Episode is not better accounted for by Schizoaffective Disorder and is not superimposed on Schizophrenia, Schizophreniform Disorder, Delusional Disorder, or Psychotic Disorder Not Otherwise Specified.

**C.** There has never been a Manic Episode, a Mixed Episode, or a Hypomanic Episode.

Note: This exclusion does not apply if all of the manic-like, mixed-like, or hypomanic-like episodes are substance or treatment induced or are due to the direct physiological effects of a general medical condition.

If the full criteria are currently met for a Major Depressive Episode, *specify* its current clinical status and/or features:

*Mild, Moderate, Severe Without Psychotic Features/Severe With Psychotic Features*

*Chronic*

*With Catatonic Features*

*With Melancholic Features*

*With Atypical Features*

*With Postpartum Onset*

#### Major Depressive Disorder, Single Episode

**A.** Presence of a single Major Depressive Episode

**Note:** The normal and expected response to an event involving significant loss (e.g, bereavement, financial ruin, natural disaster), including feelings of intense sadness, rumination about the loss, insomnia, poor appetite and weight loss, may resemble a depressive episode. The presence of symptoms such as feelings of worthlessness, suicidal ideas (as distinct from wanting to join a deceased loved one), psychomotor retardation, and severe impairment of overall function suggest the presence of a Major Depressive Episode in addition to the normal response to a significant loss.

**B.** The Major Depressive Episode is not better accounted for by Schizoaffective Disorder and is not superimposed on Schizophrenia, Schizophreniform Disorder, Delusional Disorder, or Psychotic Disorder Not Otherwise Specified.

**C.** There has never been a Manic Episode or a Hypomanic Episode.

Note: This exclusion does not apply if all of the manic-like, mixed-like, or hypomanic-like episodes are substance or treatment induced or are due to the direct physiological effects of a general medical condition.



If the full criteria are not currently met for a Major Depressive Episode, *specify* the current clinical status of the Major Depressive Disorder or features of the most recent episode:

*In Partial Remission, In Full Remission*

*Chronic*

*With Catatonic Features*

*With Melancholic Features*

*With Atypical Features*

*With Postpartum Onset*

**Note:** The normal and expected response to an event involving significant loss (e.g. bereavement, financial ruin, natural disaster), including feelings of intense sadness, rumination about the loss, insomnia, poor appetite and weight loss, may resemble a depressive episode. The presence of symptoms such as feelings of worthlessness, suicidal ideas (as distinct from wanting to join a deceased loved one), psychomotor retardation, and severe impairment of overall function suggest the presence of a Major Depressive Episode in addition to the normal response to a significant loss.

If the full criteria are currently met for a Major Depressive Episode, *specify* its current clinical status and/or features:

*Mild, Moderate, Severe Without Psychotic Features/With Psychotic Features*

*Criteria for Severity .x3 Severe without Psychotic Features:* Several symptoms in excess of those required to make the diagnosis, and symptoms markedly interfere with occupational functioning or with usual social activities or relationships with others.

*Criteria for Severity .x4 With Psychotic Features:* Delusions or hallucinations. If possible, specify whether the psychotic features are mood-congruent or mood-incongruent.

*Mood-Congruent Psychotic Features:* The content of all delusions and hallucinations is consistent with the typical depressive themes of personal inadequacy, guilt, disease, death, nihilism or deserved punishment.

*Mood-Incongruent Psychotic Features:* Delusions or hallucinations whose content does not involve typical depressive themes of personal inadequacy, guilt, disease, death, nihilism or deserved punishment are present with or without mood-congruent psychotic features.

*Chronic* (The group is proposing the elimination of this specifier. Please see the criteria for Chronic Depressive Disorder, formerly DSM-IV Dysthymia)

*With Mixed Features*

*With Catatonic Features*

*With Melancholic Features*

*With Atypical Features*

*With Anxiety, mild to severe*

*With Suicide Risk Severity*

*With Postpartum Onset* (can be applied to the current or most recent Major Depressive, Manic, or Mixed Features in Major Depressive Disorder, Bipolar I Disorder, or Bipolar II Disorder; or to



Brief Psychotic Disorder). Onset of episode within 6 months postpartum. ([Read more here.](#))

If the full criteria are not currently met for a Major Depressive Episode, *specify* the current clinical status of the Major Depressive Disorder or features of the most recent episode:

*In Full Remission:*

*With Mixed Features*

*With Catatonic Features*

*With Melancholic Features*

*With Atypical Features*

*With Anxiety, mild to severe*

*With Suicide Risk Severity*

*With Postpartum Onset* (can be applied to the current or most recent Major Depressive, Manic, or Mixed Features in Major Depressive Disorder, Bipolar I Disorder, or Bipolar II Disorder; or to Brief Psychotic Disorder). Onset of episode within 6 months postpartum.



**Table 6. Comparison of the DSM-IV criteria with the proposed DSM-5 criteria for alcohol use disorder**

DSM-IV criteria for alcohol abuse and alcohol dependence	Proposed DSM-5 criteria for alcohol use disorder
<p><b>Substance Abuse</b></p> <p><b>A.</b> A maladaptive pattern of substance use leading to clinically significant impairment or distress, as manifested by one (or more) of the following, occurring within a 12-month period:</p> <ol style="list-style-type: none"> <li>1. recurrent substance use resulting in a failure to fulfill major role obligations at work, school, or home (e.g., repeated absences or poor work performance related to substance use; substance-related absences, suspensions, or expulsions from school; neglect of children or household).</li> <li>2. recurrent substance use in situations in which it is physically hazardous (e.g., driving an automobile or operating a machine when impaired by substance use).</li> <li>3. recurrent substance-related legal problems (e.g., arrests for substance-related disorderly conduct).</li> <li>4. continued substance use despite having persistent or recurrent social or interpersonal problems caused or exacerbated by the effects of the substance (e.g., arguments with spouse about consequences of intoxication, physical fights).</li> </ol> <p><b>B.</b> The symptoms have never met the criteria for Substance Dependence for this class of substance.</p> <p><b>Substance Dependence</b></p> <p>A maladaptive pattern of substance use, leading to clinically significant impairment or distress, as manifested by three (or more) of the following, occurring at any time in the same 12-month period:</p> <ol style="list-style-type: none"> <li>1. tolerance, as defined by either of the following:             <ol style="list-style-type: none"> <li>(a) a need for markedly increased amounts of the substance to achieve intoxication or desired effect</li> <li>(b) markedly diminished effect with continued use of the same amount of the substance</li> </ol> </li> <li>2. withdrawal, as manifested by either of the following:             <ol style="list-style-type: none"> <li>(a) the characteristic withdrawal syndrome for the substance (refer to Criteria A and B of the criteria sets for Withdrawal from the specific substances)</li> <li>(b) the same (or a closely related) substance is taken to relieve or avoid withdrawal symptoms.</li> </ol> </li> </ol>	<p><b>Alcohol Use Disorder</b></p> <p><b>Criterion A.</b> A problematic pattern of alcohol use leading to clinically significant impairment or distress.</p> <p><b>Criterion B.</b> Two (or more) of the following occurring within a 12-month period:</p> <ol style="list-style-type: none"> <li>1. Alcohol is often taken in larger amounts or over a longer period than was intended.</li> <li>2. There is a persistent desire or unsuccessful effort to cut down or control alcohol use.</li> <li>3. A great deal of time is spent in activities necessary to obtain alcohol, use the substance, or recover from its effects.</li> <li>4. Recurrent alcohol use resulting in a failure to fulfill major role obligations at work, school, or home (e.g., repeated absences or poor work performance related to alcohol use; substance-related absences, suspensions, or expulsions from school; neglect of children or household).</li> <li>5. Continued alcohol use despite having persistent or recurrent social or interpersonal problems caused or exacerbated by the effects of the substance.</li> <li>6. Important social, occupational, or recreational activities are given up or reduced because of alcohol use.</li> <li>7. Recurrent alcohol use in situations in which it is physically hazardous (e.g., driving an automobile or operating a machine when impaired by substance use).</li> <li>8. Alcohol use is continued despite knowledge of having a persistent or recurrent physical or psychological problem that is likely to have been caused or exacerbated by the substance.</li> <li>9. Tolerance, as defined by either or both of the following:             <ol style="list-style-type: none"> <li>(a) A need for markedly increased amounts of alcohol to achieve intoxication or desired effect</li> <li>(b) Markedly diminished effect with continued use of the same amount of the substance</li> </ol> </li> <li>10. Withdrawal, as manifested by either of the following:             <ol style="list-style-type: none"> <li>(a) The characteristic withdrawal syndrome for alcohol (refer to Criteria A and B of the criteria set for Withdrawal)</li> </ol> </li> </ol>



3. the substance is often taken in larger amounts or over a longer period than was intended.
4. there is a persistent desire or unsuccessful efforts to cut down or control substance use.
5. a great deal of time is spent in activities necessary to obtain the substance (e.g., visiting multiple doctors or driving long distances), use the substance (e.g., chainsmoking), or recover from its effects.
6. important social, occupational, or recreational activities are given up or reduced because of substance use.
7. the substance use is continued despite knowledge of having a persistent or recurrent physical or psychological problem that is likely to have been caused or exacerbated by the substance (e.g., current cocaine use despite recognition of cocaine-induced depression, or continued drinking despite recognition that an ulcer was made worse by alcohol consumption).

Specify if:

With Physiological Dependence: evidence of tolerance or withdrawal (i.e., either Item 1 or 2 is present).

Without Physiological Dependence: no evidence of tolerance or withdrawal (i.e., neither Item 1 nor 2 is present).

*Course specifiers* (see text for definitions):

Early Full Remission

Early Partial Remission

Sustained Full Remission

Sustained Partial Remission

On Agonist Therapy

In a Controlled Environment

(b) Markedly diminished effect with continued use of the same amount of the substance

11. Craving or a strong desire or urge to use alcohol.

Specify the following:

**Early Remission.** This specifier is used if, for at least 3 months, but for less than 12 months, the individual does not meet any of the criteria 1-10 for a Substance Use Disorder (i.e. none of the criteria except for Criterion 11, “Craving or a strong desire or urge to use a specific substance”).

**Sustained Remission.** This specifier is used if none of the criteria 1-10 for a Substance Use Disorder have been met at any time during a period of 12 months or longer (i.e. none of the criteria met except for Criterion 11, “Craving or a strong desire or urge to use a specific substance”).

The following specifier applies as a further specifier of remission (e.g. “early remission in a controlled environment”, and “sustained remission in a controlled environment”) if the individual is in remission and in a controlled environment:

**In a Controlled Environment.** This additional specifier is used if the individual is in an environment where access to alcohol and controlled substances is restricted, and no criteria for a Substance Use Disorder have been met. Examples of these environments are closely supervised and substance-free jails, therapeutic communities, and locked hospital units.