INTRUSIVE COGNITIONS, ANXIETY AND CANCER.

KATRIINA. L. WHITAKER
DEPARTMENT OF PSYCHOLOGY
UNIVERSITY COLLEGE LONDON (UCL)

SUPERVISORS
PROF. CHRIS R. BREWIN
DR. MAGGIE WATSON

THESIS SUBMITTED FOR THE DEGREE OF DOCTOR OF
PHILOSOPHY (PH.D.)
AT UNIVERSITY COLLEGE LONDON

SEPTEMBER 2008

Signed declaration

I, Katriina Lucy Whitaker, confirm that the work presented in this thesis is my own. Where information has been derived from other sources, I confirm that this has been indicated in the thesis.

Signed:

Date:

ABSTRACT

Since the recognition (DSM-IV; American Psychiatric Association, 1994) of life-threatening illnesses as a stressor that can precipitate posttraumatic stress disorder (PTSD), research has focussed on the issue of PTSD following cancer. Although the utility of a trauma framework has been questioned, understanding symptoms associated with PTSD such as intrusive cognitions may be critical in understanding psychological distress in cancer patients. Research has found that cancer patients experience negative intrusive thoughts, which are associated with marked distress. However, studies have rarely explored the content or nature of intrusions. In addition to verbal intrusions, intrusive memories of illness have been reported in cancer patients. More recently, intrusive imagery has been found in populations of anxious patients and reported to have a causal role in the maintenance of anxiety. Based on the recognition of cancer as a protracted experience involving multiple stressors, future-oriented visual intrusions, as well as intrusive memories and thoughts may play a role in psychological functioning.

Chapter 1 is an overview of the literature assessing the presence of posttraumatic stress and posttraumatic stress symptoms in cancer patients. Chapter 2 is a cross-sectional study which showed that anxious prostate cancer patients (N=65) were significantly more likely to report intrusive cognitions compared to matched non-anxious (N=65) prostate cancer patients. Intrusive cognitions were frequent, uncontrollable and associated with significant distress and maladaptive adjustment. Chapter 3 is a cross-sectional study (N=139), which showed that factors such as how patients appraise intrusive cognitions affects anxiety severity and intrusion-related distress, after controlling for intrusion frequency. Chapter 4 provides a discussion of the use of imagery in psychological therapy and how imagery has been used with cancer patients in therapy. Chapter 5 presents two single-case studies of cancer patients completing a short therapy for anxiety, imagery rescripting, aimed at reducing negative properties of intrusive cognitions whilst also alleviating anxiety and depression. The final chapter provides a general discussion of the thesis and presents ideas for future research.

ACKNOWLEDGEMENTS

CONTENTS

TABLES

FIGURES

Chapter 1

Posttraumatic stress disorder and intrusive symptoms
in cancer patients.

Recent research in posttraumatic stress disorder (PTSD), depression and anxiety has emphasised an important role of intrusive cognitions and avoidance in the elicitation and maintenance of psychological disorders and distress. The current review aims to investigate whether theoretical models and experimental findings within the existing literature can be effectively applied to the traumatic experience of being diagnosed and coping with cancer. In order to achieve this, PTSD theories and definitions are described and previous research applying these conceptual issues to patients with cancer are discussed. Limitations of the research conducted so far are covered in order to highlight the next important steps in elucidating the value of applying PTSD models and intrusion research to the experience of cancer.

1.1. Posttraumatic stress disorder (PTSD): Theory and definitions

Before describing work concerning PTSD and cancer (see Kangas, Henry, & Bryant, 2002 for a review) and intrusive thoughts and cancer, it is important to summarise relevant stress response models and PTSD theories. In order to meet PTSD criteria, individuals must have been exposed to, or witnessed a traumatic event which invoked intense fear and helplessness, experience intrusive memories, nightmares and a sense of reliving the event, experience avoidant symptoms (e.g. inability to recall trauma, avoidance of thoughts), and experience arousal symptoms (e.g. insomnia, irritability). These symptoms must be present for at least one month following trauma and must cause significant impairment to daily functioning for the individual (DSM IV: American Psychiatric Association, 1994).

Although there are several cognitive and information processing theories of PTSD (Brewin, Dalgleish, & Joseph, 1996; Brewin, 2001; Brewin & Holmes, 2003), the present discussion uses Brewin et al's (1996,2001) dual representation theory as a framework and also discusses Horowitz's stress response syndromes model (Horowitz, 1986), which has previously been applied to the PTSD literature (e.g. Gurevich et al., 2004; Manne, Glassman, & Du Hamel, 2000) and precedes dual representation theory of PTSD. Ehlers & Clarks' more recent synthesis of PTSD models is also considered (Ehlers & Clark, 2000).

Table 1 Conceptualisation of intrusive cognitions used in present research

Type of intrusion	Definition
Memory	Intrusive memories (in pictorial/ visual form) of a specific event that has occurred in the past
Thought	Intrusive thoughts can relate to the past, present or future but are in verbal form (*"like a silent conversation in your head";* (Nelson & Harvey, 2003)
Image	Images in general have been defined as mental contents that possess sensory qualities (Horowitz, 1970). For the present study, intrusive images refer to pictures in the mind concerning the past present or future but past images are distinguished from memories because they lack autobiographical context and have been described as an *"abstracted essence of the memory"* (Hackmann, Clark, & McManus, 2000, p605).

Horowitz's stress response theory (Horowitz, 1986) suggested that symptoms associated with PTSD, namely intrusive cognitions may exist due to the requirement for integration of experience into current schemata. Intrusive cognitions can be defined as mental phenomenon that repeatedly intrude into our minds and interrupt ongoing mental activity. They are difficult to control and can be attributed to an internal origin (Rachman, 1981). Other key properties of intrusive cognitions are that they easily capture attentional resources and are associated with negative affect (Clark & Rhyno, 2005). Table 1 provides a more detailed conceptualisation of intrusive cognitions adopted for the present research. After an initial trauma, Horowitz (1986) argued that there is information overload, in which thoughts, memories and images from the trauma cannot be integrated with current schemata. In defence, psychological mechanisms exist which try to numb the experience of the trauma. However, the tendency for completion (i.e. need to accommodate new information) means that cognitions automatically and uncontrollably break through the numbing system and intrude into consciousness in the form of intrusive cognitions, including memories of the event, thoughts and images. Such intrusions may be adaptive in aiding completion of processing, but if information processing continues to fail, (by continued inadequate integration of the trauma experience), individuals may experience chronic stress response reactions that require psychological treatments. Horowitz's model (1986) is especially relevant to the present

discussion, because the widely used scale, the Impact of Events Scale (IES: Horowitz, Wilner, & Alvarez, 1979) was developed to reflect the conceptualisation of stress response following trauma and has been consistently used in cancer research (see section Intrusive thoughts and Cancer, p29).

However, dual representation theory of PTSD (Brewin et al., 1996; Brewin & Holmes, 2003) argued that although Horowitz provided a comprehensive model of stress response syndromes, there are several limitations of the approach. For example, Horowitz failed to explain the nature of existing schemata structures and the precise ways that integration of information fails. In particular, stress response theory does not address the differences between flashbacks and ordinary memories of trauma. Although the model emphasised the importance of processes such as social support, there is little explanation as to how these environmental processes operate. The model is also passive and therefore excludes the importance of individual subjective interpretation of stressful events.

Brewin et al (1996) addressed these limitations by incorporating increased explanatory value into PTSD theory. In particular, dual representation theory distinguished between two different memory representations, one verbally accessible and one automatically accessible via significant situational cues. Verbally accessible memories (VAMs) about trauma refer to a person's conscious experiences, such as sensory features of the trauma, emotional and physiological reactions to the trauma and perceived meaning, which are controlled, deliberately retrievable and easily edited. VAMs interact with autobiographical knowledge and are thus represented in a personal context reflecting past, present and future. Although these representations are available for verbal communication, the information that these representations contain are restricted due to the involvement of limited capacity resources such as attention (Brewin, 2001).

On the other hand, situationally accessible memories (SAMs) refer to traumatic knowledge that is not consciously accessible, but has been processed at a lower perceptual level (e.g. visuospatial information that has received little conscious processing). These affect-laden representations are automatically triggered by contextual internal and external cues (e.g. consciously thinking about the trauma and hearing about the trauma from an external source) and are associated with emotions such as fear and helplessness, that were felt during the trauma, rather than later (as in the case of VAMs). SAMs are considered to be informationally encapsulated, so that

they do not necessarily interact with general autobiographical knowledge (Brewin, 2001).

In addition to having different characteristics, and behaving in different ways, these two types of memory systems have different neural bases and respond to different types of treatment (Brewin, 2001). Based on neuroanatomical data of fear responses (e.g. LeDoux, Iwata, Cicchetti, & Reis, 1988), and the distinction/ dissociation between declarative (e.g. explicit, conscious) and non-declarative (e.g. implicit, automatic, outside of conscious recall) memory (Gabrieli, Fleischman, Keane, Reminger, & Morrell, 1995), Brewin (2001) argued that it may be possible to infer that the two memory representations described in dual representation theory may be processed in different ways within the brain. For example, it is suggested that the hippocampus (which has been implicated in the processing of declarative memory), may be responsible for the development of integrated representations of conscious experience, whereas different routes to the amygdala (e.g. the thalamo-amygdala route) may be responsible for information that is processed at a lower level and without conscious awareness or possibility for deliberate recall. Memories formed by less sophisticated routes in the brain may be automatically triggered by cues, such as perceptual cues central to original processing.

Functional neuroimaging studies have found several trends in neural correlates of PTSD, including decreased medial prefrontal cortex activation, increased amygdala activation and decreased hippocampal activity in PTSD patients during symptom provocation (Hull, 2002; Francati, Vermetten, & Bremner, 2007). Symptom provocation or "script-driven imagery" is where PTSD patients are exposed to scripts or images of their trauma that they have previously provided and asked to vividly imagine the events as they are played (Brewin, 2007). Francati et al (2007) explained that the medial prefrontal cortex activates and modulates the initial threat response, but when activation is absent or depleted, the amygdala does not receive adequate inhibitory feedback, resulting in higher autonomic arousal found in PTSD patients. Higher amygdala activation is responsible for increased fear conditioning, sensitisation and trauma memories in PTSD patients (Elzinga & Bremner, 2002). Other consequences of decreased prefrontal cortex activation include decreased working memory capacity, decreased inhibition of emotions and increased intrusive cognitions (Elzinga & Bremner, 2002). Altered functional activity in the hippocampus is linked to decreased

declarative memory, increased fragmentation of memories and trauma-related amnesia (Elzinga & Bremner, 2002).

Using Positron Emission Tomography (PET), Bremner et al (2004) found that women who had PTSD as a result of sexual abuse exhibited less anterior cingulate activation during an emotional stroop task requiring trauma-related processing compared to victims without PTSD. The anterior cingulate has been implicated in brain function associated with the medial prefrontal cortex which consists of several other related areas including the orbitofrontal cortex and anterior prefrontal cortex (Bremner et al., 2004). Their function is to mediate the extinction of fear response, which in PTSD is disrupted and results in SAMs (i.e. intrusive imagery). It has been argued that emotional stroop studies have provided evidence consistent with reports of trauma-related intrusive thoughts, as despite instructions to attend to word colour, the meaning of trauma-related words intrude, capture attention and slow colour naming (McNally, 2006).

In terms of adequate trauma processing, dual representation theory (Brewin, 2001) argued that the activation of highly accessible and automatic SAMs initially functions to aid the process of cognitive processing of the trauma experience, by transferring information from the non-hippocampally dependent SAM store to the hippocampally-based VAM store. Adequate trauma processing would involve the integration and assimilation of information in SAM form, to information in VAM form. If this processing is successful, the individual is relieved from a sense of immediate threat and the trauma experience is placed within a complete and elaborated personal context. In order for trauma processing to occur and amygdala inhibition to be successful, Brewin (2001) argued that repeated flashbacks and "hotspots" of the trauma may be necessary, due to limited processing resources of the VAM system. .

According to dual representation theory (Brewin et al, 1996), maladaptive coping strategies, such as sustained avoidance of both SAMs and VAMs can result in *"chronic emotional processing"* and *"premature inhibition of processing"* (p 679). Chronic emotional processing may occur when integration is not possible, due to the severity or length of trauma exposure. If VAMs and SAMs are chronically processed, memories may not be integrated and thus individuals will continue to experience negative intrusive memories, with little change to existing representations (Brewin et al, 1996). Further, chronic processing is linked to over-accommodation (Brewin, 2001), in which a person generalises their reaction to the specific trauma to a variety of other

harmless situations which also have the potential to trigger cognitions related to trauma and thus a sense of current danger. Premature inhibition processing is another possible outcome following trauma, where active emotional processing is stopped, or restricted to a minimised and potentially distorted version of events (Brewin, 2001). Rather than over-accommodation, premature inhibition may result in over-assimilation, where these existing knowledge structures are maintained and not integrated with VAMs and autobiographical knowledge.

Evidence for a distinction in memory systems, and the importance of the visual system in trauma processing has come from research investigating the effects of distracter tasks on desensitization to emotive memories (Andrade, Kavanagh, & Baddeley, 1997; Kavanagh, Freese, Andrade, & May, 2001). Andrade et al (1997) found that participants reported less vivid negative images when concurrently engaging in visuospatial tasks involving eye movements, such as identifying a particular letter on a computer screen, but not when engaging in a task involving another component of working memory, the phonological loop (e.g. counting). It was suggested that the reduction in imagery vividness was due to the disruption of the visuospatial sketch pad (a component of working memory used to process visual information) and that such distraction could aid treatment of PTSD.

Kavanagh et al (2001) provided further support for the finding that competing visuospatial tasks have a potential role in therapy. In a within subjects design, 18 participants were initially asked to recall three situations in which they were happy (e.g. meeting romantic partners) and three situations in which they were fearful or distressed (e.g. illness or death or family of friends). Participants were required to rate these images at baseline, for vividness (ranging from 0 = no image at all to 10 = perfectly clear, as vivid as normal vision) and emotional response (ranging from -10 extremely negative to +10 extremely positive). Participants then completed three distracter (visuospatial) task conditions, including eye movement, visual noise and exposure alone (control) in order to assess the effects of concurrent eye movements on the distress associated with repeated exposure to emotive memories. Kavanagh et al (2001) found that when participants engaged in rapid eye movements while creating images of emotive experiences, the subjective vividness of the image was reduced and participants reported less extreme emotion than when recalling an image without a concurrent task. The application of distracter techniques to reduce distress in patients could be appropriate both within and outside the therapy environment. For example, distressing

images of the trauma could be made easier to confront and process if vividness and associated negative emotional response were reduced and further, patients could be helped to control intrusive images outside of the therapy session (Kavanagh et al., 2001). A recent study has replicated the finding that concurrent rapid eye movements reduced vividness and emotional intensity of visual images (Kemps & Tiggemann, 2007).

Whilst investigating the appropriateness of dual representation theory for understanding PTSD, Brewin & colleagues (e.g. Holmes, Brewin, & Hennessy, 2004) have provided support for the importance of the visuospatial sketchpad for trauma processing. Holmes et al (2004) investigated traumatic processing in a non-clinical population asked to view traumatic films of road traffic accidents, including images of trapped victims, dead bodies and body parts among car wreckages. They showed that competition from one specific kind of distraction task (visuospatial tapping task), while watching a traumatic film significantly reduced the extent to which distressing images from the film intruded in the following week but other kinds of distraction task actually increased the intrusions (e.g. counting backwards in threes). The findings were explained using dual representation theory's conceptualisation of memory as two distinct systems, verbal (VAMs) and visual (SAMs). Visuospatial tapping tasks may reduce SAM representations, as they compete for the same resources, culminating in a reduction of intrusive images over the following week. Conversely, competition for verbal processing resources may impoverish VAM representations and reduce their ability to suppress SAMs in the following week. Subsequent research replicated the disruptive effects of a concurrent visuospatial task on intrusive images using a within-subjects design and an alternative task, moulding plasticine (Stuart, Holmes, & Brewin, 2006).

Other research with PTSD patients supported these findings. Hellawell & Brewin (2002) found that PTSD patients performed less well on specific tasks when they were interrupted during narratives of intrusive vivid images and asked to complete a visuospatial task (trail-making) compared to a verbal task (counting backwards in threes). This same disruption to performance was not found when patients were interrupted during a narrative of ordinary autobiographical memories (Hellawell & Brewin, 2002). A comparison of flashbacks and ordinary autobiographical memories found a greater number of sensory and motion words associated with involuntary

compared to voluntary memories (Hellawell & Brewin, 2004), providing further support for their independence (Brewin, 2007).

Other models of PTSD, such as the cognitive model, also emphasised the distinction between voluntary and involuntary memory systems (Ehlers & Clark, 2000). According to Ehlers & Clark (2000), the nature of traumatic memories is influenced by encoding processes including conceptual encoding and data-driven encoding. Conceptual encoding is focused on meaning and contextualising the traumatic event which facilitates integration of trauma information with the autobiographical memory system. Data-driven processing, on the other hand, is focussed on sensory stimuli and leads to memories that are hard to retrieve deliberately. Resulting intrusive memories are visual, uncontrollable, lack elaboration and contextualisation and are accompanied by physical and emotional sensations experienced during the actual event. Individuals thus experience a sense of reliving, as though the event were happening all over again, right now. A wide variety of cues may trigger the experience of intrusive memories, including cues that are temporally (e.g. spatial, olfactory cues), rather than semantically associated with the event.

The experience of repetitive intrusive memories, and the negative appraisal of these memories, is thought to contribute to the persistence of PTSD. The formation of intrusive memories is explained within the dual representation theory of PTSD (Brewin et al, 1996), where inadequate processing of the initial trauma and subsequent maladaptive behaviour (e.g. suppression, rumination, avoidance) in response to intrusive memories, leads to their formation and persistence. Other problems in persistent PTSD include the strength of associations between stimulus-stimulus (S-S) and stimulus-response (S-R) and the lowered perceptual threshold for temporally associated stimuli. S-S and S-R associations may develop between stimuli present shortly before or during the trauma and the feeling of current danger and these associations may not be consciously accessible and thus trigger intrusive recollections unexpectedly. Lowered perceptual threshold refers to a form of implicit memory, where stimuli that are temporally associated with the trauma trigger traumatic memories because they are more likely to be noticed (Ehlers & Clark, 2000).

Ehlers & Clark (2000) suggested that a sense of current threat is crucial for PTSD to develop and there are two possible ways that current threat is realised; individual differences in appraisal of trauma and individual differences in the nature of memory of the event. Strategies intended to avoid current threat paradoxically lead to

feelings of current danger because of subsequent negative appraisal of trauma and poorly processed memories of trauma. Negative appraisal of trauma include the inability to see the event as time-limited, over-generalisation of event to other neutral activities and the appraisal of self as someone that bad things happen to. In addition to negative appraisal of the traumatic event, idiosyncratic appraisals of subsequent stress responses may also contribute to the persistence of PTSD. For example, patients may interpret flashbacks and intrusive recollections as a sign they are going mad, and high arousal (e.g. irritability) as a sign that their personality has fundamentally changed or they can no longer relate to close family and friends. Individuals may also negatively appraise other people's reactions, for example, positive reactions as a sign that they are unable to cope on their own, or negative reactions as a sign that nobody is there to support them. Steil & Ehlers (2000) described negative self-appraisals as a frame of mind termed "mental defeat" and suggest that it is a risk factor for negative appraisal of trauma and trauma-related factors and thus ultimately a risk factor for the feeling of current threat and ensuing maintenance of PTSD (Steil & Ehlers, 2000).

The psychological treatment of PTSD aims to address two elements of the experienced trauma; repeated exposure to traumatic information to aid integration and modification of maladaptive beliefs developed from inadequate processing (Brewin, 2001). Thus therapy may involve acting upon different types of memory representation, using therapeutic techniques such as reliving (Foa, Rothbaum, Riggs, & Murdock, 1991) and eye movement desensitisation and reprocessing (EMDR; Shapiro, 2001). Reliving involves confronting flashbacks, rather than avoiding them, so that information in the SAM becomes recoded in the VAM and given a temporal context. After repeated sessions, information in SAM may be matched with information in the VAM, which indicates that immediate threat is not imminent, but rather, located in the past. In terms of neural activity, Brewin (2001) suggested that when the VAM system is activated, inhibitory pathways from the prefrontal cortex prevent inappropriate amygdala activation and the accompanying feelings of fear. EMDR is a method where individuals are asked to visualise the worst moments of trauma whilst holding a negative cognition concerning the trauma and attending to a concurrent stimulus such as the therapist's finger movement in front of the face at the same time. Patient's attempts to distance themselves from the trauma and associated cognitions allows for more thoughts and images to be integrated and processed (Brewin, 2001).

In contrast to other contemporary theories of PTSD (Brewin & Holmes, 2003), dual representation theory does not assume that trauma memories are extinguished altogether but can be contextualised and incorporated into a more complex framework. In particular, Brewin (2006) suggested that recovery is seen as introducing retrieval competition between new and old memories, where new trauma memories are developed during therapy and are given a retrieval advantage because the new memories are well rehearsed and distinctive (Brewin & Holmes, 2003). Therapies for patients experiencing traumatic intrusive memories include imagery rescripting (Hackmann, 1998; Arntz, Tiesema, & Kindt, 2007) which involves developing a competing image which has strong associations to the negative image, will effectively compete with the distressing image and involves positive affect and less toxic meaning (Wheatley et al., 2007). It is important to recognise that in this account, SAM memories remain intact and can still be retrieved with the right set of cues. However, therapy aims to reduce the possibility of negative intrusive memories winning the retrieval competition (Brewin, 2006).

In summary, PTSD is caused by the onset of an extreme stressor and has a complex aetiology with core symptoms of intrusion (e.g. flashbacks), avoidance and arousal (e.g. hyperresponsivity). Theories of PTSD development and maintenance posit the presence of two distinct memory systems which are central to understanding the disorder. Therapies aimed at alleviating PTSD symptoms focus on exposure and integration of the trauma and modification of maladaptive beliefs and appraisals in order to aid inadequate processing.

1.2. PTSD and cancer

1.2.1. Incidence of cancer-related PTSD

Psychological trauma is caused by events that are sudden, unexpected and which the individual perceives as a dramatic loss of personal control and personal safety (Ehlers & Steil, 1995). Cancer can be encompassed within this definition (Brennan, 2001) because such an extreme life event threatens core assumptions about the world including the belief that a) the world is benevolent; b) the world is meaningful and c) the self is worthy (Janoff-Bulman, 1992). Since the introduction of life-threatening illness as a potential PTSD stressor in the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV; APA, 1994), the application of posttraumatic stress disorder

models to the cancer experience has been the focus of considerable research interest (Kangas et al., 2002). In terms of dual representation theory of PTSD (Brewin et al., 1996), individuals diagnosed with cancer may be at risk of developing pathological stress response symptoms due to a potentially severe and prolonged stressor. Individuals diagnosed with cancer may have existing assumptions about health and well-being violated and struggle to incorporate new, traumatic information into pre-existing schemata. Indeed, the types of events that Brewin et al (1996) included within their trauma framework involve signals that the world is unpredictable and uncontrollable and includes *"major illness or disability"* (p675). Kangas et al (2002) also noted that denial as part of the response process may represent the avoidance aspect of models of PTSD and further inhibit emotional processing via maladaptive information integration.

Prevalence rates for cancer-related PTSD vary according to when and how PTSD is assessed. For studies using the Structured Clinical Interview for DSM-IV (SCID; First, Gibbon, Spitzer, & Williams, 2002), estimates of current PTSD vary from 0 (Mundy et al., 2000) to 6% (Andrykowski, Cordova, Studts, & Miller, 1998). Participants had been diagnosed with breast cancer and were assessed 12 months post-treatment, 6-72 months post-treatment respectively. A study investigating PTSD in a sample of breast cancer patients 3-15 months post-surgery reported prevalence of current cancer-related PTSD at 3.9%, also using the SCID (Matsuoka et al., 2005) and 2.4% of post-surgery breast cancer patients (*N*=127) met criteria for cancer-related PTSD (Mehnert & Koch, 2007).

Other measures of PTSD include the PTSD Civilian Version Checklist (PCL-C: Weathers, Huska, & Keane, 1991), which is a 17 item inventory of PTSD symptomatology, including measures of avoidance (e.g. "avoiding activities or situations because they reminded you of the cancer experience"), re-experiencing/intrusion (e.g. "suddenly acting or feeling as though the cancer experience was happening again"), numbing (e.g. "trouble remembering important parts of the cancer experience") and hyper-arousal (e.g. "having difficulty concentrating"). There are two methods to determine a PTSD diagnosis, the cut-off method (where cut-off score must be greater than 50) and the symptom method (where at least moderate ratings are given for one re-experiencing symptom, three avoidance-numbing symptoms and two arousal symptoms).

Studies using the PCL-C and cut-off method have reported current cancer-related prevalence rates of 5% (Andrykowski et al., 1998; Cordova et al., 1995; Smith,

Redd, DuHamel, Vickberg, & Ricketts, 1999a), 12% (Jacobsen et al., 1998) and 17% (Levine, Eckhardt, & Targ, 2005). Studies using the symptom method have reported current PTSD prevalence rates of 6% (Andrykowski et al., 1998), 13% (Smith et al., 1999a), 19% (Jacobsen et al., 1998) and 26% (Levine et al., 2005).

Some studies have used the Clinician Administered PTSD Scale-Structured Interview (CAPS-I: Blake et al., 1995) to assess the prevalence of PTSD in cancer patients. Prevalence reports ranged from 14% (Pitman et al., 2001) to 22% (Kangas, Henry, & Bryant, 2005) and 32% (Naidich & Motta, 2000).

In addition to the prevalence rates of current cancer related PTSD, studies have retrospectively estimated lifetime prevalence rates of PTSD, where patients are asked if they have experienced any PTSD symptoms since their cancer diagnosis. Mundy et al (2000) reported the highest rates of lifetime PTSD with 35% prevalence in their breast cancer patient sample. However, when the criteria were made more stringent, by excluding, for example, the symptom "sense of foreshortened future", the prevalence rate in this sample dropped to 24%. This is similar to another study of female cancer patients, which reported 22% of the sample meeting criteria for lifetime PTSD (Alter et al., 1996). One other study considering lifetime rates of PTSD found much lower prevalence of 3% (Green et al., 1998) and this was also with more stringent criteria (e.g. intrusive thoughts concerning fear of recurrence were excluded).

Green et al (1998) elaborated on the observed discrepancy between their finding and Alter et al's (1996) finding, by reporting that although arousal and re-experiencing symptoms were at similar levels in both samples, the percentage of each sample that met full avoidance/numbing criteria was 8% and 30% respectively. Green et al (1998) argued that avoidance may therefore have been assessed quite differently in both studies. Alternatively, the time of assessment may have had an impact, as Green et al (1998) assessed patients at 4-12 months post-treatment and Alter et al (1996) assessed patients at 3 years post-treatment.

Based on the low prevalence rates reported, Green and colleagues suggested that having cancer may not truly "fit" a trauma model (Green, Epstein, Krupnick, & Rowland, 1997; Green et al., 1998). However, this does not preclude the possibility that cancer patients may experience PTSD symptomatology. Indeed, several studies have reported a significant number of patients endorsing at least one, and often more symptom clusters (e.g. Amir & Ramati, 2002: 56% of women endorsed 2/3 symptom clusters). Also, studies that have reported low prevalence rates of current PTSD (e.g.

Matsuoka et al., 2005: 3.9%; Palmer, Kagee, Coyne, & DeMichele, 2004: 4%), have also reported that 63% and 67% of their samples reported recurrent, intrusive and distressing recollections.

1.2.2. Predictors of PTSD symptoms in cancer patients.

Kangas et al (2002) reviewed predictors of PTSD symptomatology, which included individual risk factors and trauma-related factors (Smith, Redd, Peyser, & Vogl, 1999b). Individual risk factors include previous negative life stressors (Andrykowski, Cordova, McGrath, Sloan, & Kenady, 2000), increased psychological distress prior to diagnosis (Epping-Jordan et al., 1999), female sex (Hampton & Frombach, 2000; Deimling, Kahana, Bowman, & Schaefer, 2002), younger age at diagnosis (e.g. Green et al., 1998; Tjemsland, Soreide, & Malt, 1998), fewer financial resources (Cordova et al., 1995) and poor social support (Andrykowski & Cordova, 1998; Butler, Koopman, Classen, & Spiegel, 1999). However, studies have also reported mixed findings (e.g. gender and younger age as risk factors) and the relative contribution of various risk factors has not been assessed (Gurevich, Devins, & Rodin, 2002). In terms of previous stress levels affecting PTSD symptoms, Gurevich et al (2002) suggested this may be due to a diminished stress tolerance, whereas social support may lead to a reduction in PTSD symptoms due to facilitated affect regulation and information integration (Lepore, Ragan, & Jones, 2000).

In terms of trauma-related risk factors, Gurevich et al (2002) and Kangas et al (2002) suggested that greater proximity to treatment (e.g. Andrykowski et al., 1998), greater treatment intensity (e.g. aggressiveness, duration: Smith et al., 1999b) and recurrence (e.g. Cella, Mahon, & Donovan, 1990) have been associated with more severe symptoms of PTSD. Stage of disease has also been considered and found to be positively related to PTSD symptomatology (Andrykowski et al., 1998; Andrykowski & Cordova, 1998; Epping-Jordan, Compas, & Howell, 1994), although others have not found such an association (Alter et al., 1996).

An important consideration when discussing risk factors associated with PTSD development in cancer patients is a possible overlap of vulnerability factors for PTSD and cancer, such as excessive smoking and alcohol use (Kangas et al., 2002). Further limitations of cancer-related PTSD research will now also be addressed.

1.2.3. Limitations of cancer-related PTSD research

Although the PTSD framework may apply to cancer patients in some respects (e.g. sudden and unexpected news about having cancer, traumatic treatment options, denial about having cancer), the experience of having cancer may be qualitatively different from other PTSD stressors (Green et al., 1997; Gurevich et al., 2002). Reviews by Kangas et al (2002), Gurevich et al (2002), Green et al (1997) and limitations from studies investigating prevalence rates of PTSD in cancer patients will be considered in order to provide a summary of theoretical and methodological issues of using a PTSD framework for understanding the cancer experience.

I. Application of PTSD models

Although the incidence of cancer-related PTSD has been extensively investigated, there has been limited application of PTSD models to cancer patients. As previously mentioned, functional neuroimaging trends in neural correlates of PTSD seemingly map two distinct memory systems described within dual representation theory of PTSD (Brewin, 2001). In line with functional neuroimaging studies conducted with other PTSD populations, research investigating the volumes of hippocampus (Nakano et al., 2002) amygdala (Matsuoka, Yamawaki, Inagaki, Akechi, & Uchitomi, 2003) and medial prefrontal cortex (orbitofrontal cortex; Hakamata et al., 2007) have found that these brain areas are significantly smaller in breast cancer survivors with a history of intrusive recollections compared to breast cancer survivors with no such history and healthy controls (Hakamata et al., 2007). These brain areas are implicated in the activation and modulation of the initial threat response (Francati et al, 2007). For example, decreased prefrontal cortex activation leads to decreased working memory capacity and decreased inhibition of emotions, which are associated with increased intrusive cognitions (e.g. Holmes et al, 2004). However, altered brain activity does not necessarily imply abnormal function and thus research linking symptom severity with brain function would demonstrate a clearer relationship between specific brain areas and intrusive cognitions (Matsuoka et al., 2003).

The emotional stroop task has also previously been used to elucidate brain areas relevant to processing in PTSD (Bremner et al., 2004). The only study to use the stroop paradigm in relation to intrusive cognitions in cancer patients (Naidich & Motta, 2000) found that breast cancer patients responded significantly slower to trauma related words (e.g. breast, sick) compared to other emotional stroop words (e.g. dirty, filthy).

However, the same pattern of results was observed in the control group of women without breast cancer and others have suggested that the stroop task measures hyperresponsivity to threat rather than intrusive cognitions (Vythilingam et al., 2007).

Although functional imaging studies using script-driven imagery have yet to be conducted with cancer patients, physiological measures such as heart rate, skin conductance and corrugator electromyogram responses were elevated for PTSD patients compared to non-PTSD patients presented with personal scripts of their breast cancer experience (Pitman et al., 2001). This paralleled previous findings previously reported in other PTSD populations, including combat veterans (Shalev, Orr, & Pitman, 1993), victims of terrorist attacks (Orr, Pitman, Lasko, & Herz, 1993) and motor vehicle accidents (Blanchard & Hickling, 1997). Pitman et al (2001) argued that this provides evidence of a characteristic physiological response found in PTSD and thus evidence that a PTSD framework is applicable to cancer patients (Pitman et al., 2001). However, caution could be taken in interpreting the results of this study, as sample sizes were small (*N*=37), and the PTSD group's larger mean physiological responses during breast cancer imagery was heavily influenced by two patients.

Kangas et al (2002) emphasised the importance of placing cancer within the PTSD framework as informed by PTSD models (e.g. Brewin et al., 1996). Previous research investigating PTSD in cancer patients has often failed to take this model, and other theoretical directions into account. It is suggested that future research should conceptualise psychological distress in response to cancer using models such as dual representation theory to guide research and facilitate specific hypotheses-testing. For example, it may be necessary to identify and distinguish SAMs and VAMs and to show that, as with previous research in PTSD populations, the hotspots (the moments in the trauma associated with the highest amount of emotional distress) of trauma are associated with more perceptual characteristics (e.g. perceptual words such as "red" and mention of fear; Hellawell & Brewin, 2004). Also, research identifying whether concurrent visuospatial tasks cause more interference during flashbacks than during ordinary memory description, as found in other samples of PTSD patients (Hellawell & Brewin, 2002), would provide evidence for the existence of PTSD processes in cancer patients and allow for cross-study comparison.

Another application issue of PTSD and cancer research is how appropriate existing treatment approaches are for cancer patients with PTSD (Kangas et al., 2002). For example, exposure therapy may unnecessarily provoke, rather than alleviate

anxiety, and challenging negative thoughts about the future may be inappropriate if future cognitions are rational.

II. Type of stressor

One of the main issues regarding the use of a PTSD framework for the cancer experience is the qualitatively different type of stressor that cancer itself presents (Kangas et al., 2002; Green et al., 1997). Cancer is a chronic, rather than acute stressor (Gurevich et al., 2002) and presents a series of different traumatic events over time, including diagnosis, disease progression, treatment, adverse physical effects (e.g. disfigurement) and recurrence (Kangas et al., 2002). However, although the nature of cancer as a stressor may be distinctive, Smith et al (1999b) argued that some characteristics may not be unique to the cancer experience. For example, combat veterans may experience a number of stressful events over a long period of time, and fear of recurrence may also be true of other victims, such as victims of floods or hurricanes (Smith et al., 1999b).

However, as well as being prolonged, Green et al (1997) argued that the cancer experience is different because it represents an internal, rather than external threat (e.g. in the case of a natural disaster such as a Tsunami), where the threat arises from within rather than from an outside source and is thus impossible to separate from oneself. Green et al (1997) also suggested that the cancer experience can be conceptualised as an informational as well as an immediate threat, so that initial emphasis may be on thinking about the future and information pertaining to prognosis, and later experiences (e.g. surgery to remove cancer) may represent more immediate threat to the self.

III. Assessment considerations

There are several assessment issues concerning the measurement of PTSD in cancer populations including the lack of theoretical underpinning, the use of prospective studies, self-report and retrospective data, inconsistent methodology, small sample sizes, lack of adequate control groups, and lack of detail with respect to clinical significance of PTSD prevalence rates.

For example, Kangas et al (2002) recognised that although cross-sectional research may be useful, it limits the causal inferences that can be made concerning prevalence of PTSD in cancer patients and the demarcation of the importance of various stressors. Kangas et al (2005) subsequently conducted a prospective study of Acute Stress Disorder (ASD) and PTSD in 82 patients with head and neck or lung malignancy.

ASD is a diagnosis used to identify traumatic symptoms in the month following trauma and its purpose was to find people at risk of developing PTSD. However, Kangas et al (2005) found that although 53% of individuals diagnosed with ASD went on to develop PTSD at six months follow-up, 36% of patients with PTSD at six months follow-up, were not given an initial diagnosis of ASD.

Another key issue is the differential use of assessment tools, in particular the PCL-C, which can be used to diagnose PTSD in two different ways, one of which (cut-off method) leads to lower prevalence rates than the other (symptom method). Also, specific assessment items, such as questions pertaining to a foreshortened future and intrusive symptoms such as fear of recurrence or dreaming about dying (i.e. future, rather than past-oriented intrusions) have been omitted in some studies (e.g. Green et al, 1998) but not in others (Alter et al., 1996) and this makes studies difficult to compare (Kangas et al, 2002). Further, scales such as the PCL-C do not measure criterion A2 of the DSM-IV PTSD diagnosis: *"intense fear, helplessness and horror"*, and when this criterion is assessed, it is not necessarily endorsed alongside symptoms of PTSD. For example, Palmer et al (2004) found that 41% of their breast cancer sample (*N*=160), endorsed this criterion, but 67% reported experiencing intrusive distressing thoughts. Further, the level of interference associated with reported symptoms (criterion F) is not measured using these scales. Others have specifically criticised the PCL-C as a method of screening for PTSD, arguing that it demonstrates low sensitivity and positive predictive power based on a high number of false negative and positive PTSD diagnoses (Widows, Jacobsen, & Fields, 2000).

So far, studies investigating PTSD in cancer patients have not used another validated scale, the Posttraumatic Stress Symptom Scale (PSS: Foa, Riggs, Dancu, & Rothbaum, 1993). The PSS, like the PCL-C, is a 17-item scale corresponding to symptoms of PTSD including re-experiencing, avoidance and arousal. However, in addition, the PSS also assesses questions relevant to criterion A (i.e. describing the event), and includes questions pertaining to criterion F (how interfering symptoms are in daily life).

Gurevich et al (2002) argued that another reason that PTSD studies are not comparable is because operationalisations vary dramatically. For example, time points labelled with the same name such as "post-treatment" reflected assessment at 6 weeks in some research (e.g. Tjemsland et al., 1998) and assessment at an average of 6.7 years post-treatment in other studies (e.g. Lewis et al., 2001)

Kangas et al (2002) also referred to sampling issues, suggesting that the majority of studies have focused on female cancer patients, often with early to middle stage breast cancer. Perhaps different types of cancer and different stage of disease and prognosis would be associated with more severe PTSD reactions. Kangas et al (2002) also argued that the timing of assessment of PTSD is important, as individuals experience a range of stressful and varied events from diagnosis.

Another important consideration is that individuals may perceive various stages of the cancer experience in different ways (Gurevich et al., 2002). For example, Mundy et al (2000) found that women who underwent bone marrow transplantation perceived the experience as life affirming rather than life threatening. Although in this case, PTSD theory was not used to explain this finding, it follows the proposition (Brewin et al, 1996) that the appraisal of a stress provoking situation may be key to the development of stress response symptoms. Other issues include the suggestion that clinicians and researchers should be aware of comorbidity of PTSD with other disorders (e.g. anxiety, depression) and that specific symptoms of PTSD may overlap with symptoms associated with treatment (e.g. insomnia) and with typical grief reactions in response to a cancer diagnosis (Kangas et al., 2002). A study investigating symptom clusters in cancer patients according to the PCL-C (Shelby, Golden-Kreutz, & Andersen, 2005) concluded that 4 PCL-C items (*"Feeling your future will be cut-short"; "Being super-alert, watchful, on guard"; "Having physical reactions to reminders"; "Having difficulty concentrating"*) confounded with illness and treatment related symptoms and vigilance for symptoms of recurrence (Shelby et al, 2005).

IV. Symptoms associated with PTSD

According to Kangas et al (2002), symptoms associated with PTSD, including avoidance, intrusion and arousal may not have the same meaning when described by cancer patients, compared to other PTSD populations. For example, based on the suggestion that cancer represents an internal threat (Green et al., 1997), patients with cancer may be unable to avoid reminders of the trauma. Also, other external factors such as attending outpatient appointments and monitoring physical well-being present constant reminders of the trauma that may not occur in other trauma-related circumstance. A second avoidance symptom, dissociative amnesia, may also not be appropriate to cancer patients as protracted experience may make forgetting unlikely (Kangas et al., 2002). Alternatively, patients may forget aspects of their trauma but for

reasons such as concentration deficits and fatigue caused by treatment rather than due to a stress response reaction. Further, a "sense of foreshortened future" may not be an irrational fear for patients with cancer and may therefore be an inappropriate question to ask in order to assess PTSD and PTSD symptomatology. Kangas et al (2002) suggested that questions concerning avoidance symptoms need to be investigated for sensitivity and specificity as otherwise avoidance may be measured inaccurately, both in terms of underestimation and overestimation.

Arousal symptoms present similar difficulties, as symptoms associated with PTSD such as concentration deficits, irritability and insomnia may also be side-effects of treatment and medication (Kangas et al., 2002; Gurevich et al., 2002). Green et al (1997) also emphasised that arousal symptoms may exist but take a different form in cancer patients. For example, rather than becoming hypervigilant to external surroundings, individuals with cancer may become hypervigilant to physical health and bodily sensations. Green et al (1997) drew a parallel between this type of hypervigilance and the type of hypervigilance found in people with hypochondriasis. For example, individuals may be checking for additional lumps far more often than would be necessary for routine examination.

Finally, Green et al (1997) suggested that a potential problem in assessing PTSD in cancer patients may relate to potential differences in intrusive thinking. Specifically, intrusive cognitions and re-experiencing symptoms assessed as part of PTSD usually apply to a specific traumatic event that has occurred in the past (Kangas et al., 2002). However, for patients with cancer, intrusive thinking (thoughts, memories, images), may not refer to actual recollections of an event, but to future oriented anxiety concerning fear of recurrence, possible physical problems, treatment-side effects and death (Brennan, 2001).

V. General controversy in PTSD research

As well as attending to issues specific to cancer-related PTSD, is may also be useful to consider more general criticisms of the PTSD framework. For example, McNally (2003) provided an extensive discussion of pertinent issues, including "conceptual bracket creeping" and "the dose-response model of trauma." McNally (2003) suggested that the definition of trauma has broadened widely and increasingly more life events are considered traumatic. Broadening the definition of trauma is problematic in several ways such as undermining chances of understanding

psychobiological mechanisms underlying PTSD and assigning causal significance to the stressor (McNally, 2003). In terms of cancer, this may be important because there are several different types of stressor associated with cancer (e.g. financial concerns, job loss) which are not necessarily equated with the perception of cancer as a life-threatening event. The difference between traumatic stressors and critical life events was defined in recent PTSD research (Birrer, Michael, & Munsch, 2007), where critical life events were considered normative experiences that naturally happen to individuals (e.g. divorce, job loss), whilst traumatic events were considered non-normative; rare or unexpected experiences (e.g. life-threatening illness).

Further, the dose-response model assumes that PTSD symptom severity increases as the severity of the stressor increases. For cancer patients, the severity of the stressor is difficult to operationalise as it may relate to disease prognosis, severity of treatment, risk of recurrence and other social factors such as impact of diagnosis on family and work.

1.2.4. Summary

Major limitations of using a PTSD framework to understand the cancer experience include the qualitatively different nature of stress response in patients with cancer compared to other trauma groups (in particular, the importance of future as well as past events), assessment considerations such as inconsistent approaches and inadequate measurement tools and symptom and psychological disorder overlap. Although relatively low prevalence rates of PTSD have been documented in cancer patients (e.g. Palmer et al., 2004), these do not necessarily imply a lack of clinically significant distress (Green et al., 1998). As Green et al (1998) argued- having cancer may precipitate a specific stress reaction but that this does not necessarily fit with a PTSD trauma model. Thus, it may be important to consider symptoms of PTSD in cancer patients, rather than full PTSD diagnoses. Previous research has also considered the incidence, course and importance of intrusive and avoidance symptomatology in cancer patients and this research will now be discussed in relation to cancer patients.

1.3. Intrusive thoughts and cancer

1.3.1. Prevalence and impact on psychological functioning

Several studies have considered the prevalence of intrusive thoughts in cancer populations, mainly using the IES (Horowitz et al., 1979). The IES is a 15-item self-

report scale, developed to measure subjective distress in relation to a specific event. There are two sub-scales representing avoidance (8 items, e.g. "I stayed away from reminders of it") and intrusive thoughts (7 items, e.g. "I thought about it when I didn't mean to.") Estimates of the frequency of intrusive thoughts in cancer populations have varied from 10-43%, (see Kangas et al., 2002), according to time of measurement (e.g. immediately post-diagnosis vs. 3 month follow-up) and gender (females generally report significantly higher numbers of intrusive thoughts than males; Kaasa et al., 1993; Hampton & Frombach, 2000). Additionally, research using questions from the SCID (First et al., 2002) in a sample of breast cancer patients 3 years post-surgery, found that 46% of women had reported experiencing intrusive thoughts at some time (Matsuoka et al., 2002).

Moreover, cross-sectional studies on people with cancer have found intrusive thoughts to be associated with psychological distress (Baider, Denour, & Kaplan, 1997), anxiety (Kelly et al., 1995; Nordin & Glimelius, 1998), depression (Primo et al., 2000), maladaptive adjustment (e.g. anxious preoccupation: Matsuoka et al., 2002), spouse avoidance (Manne, 1999), social constraint (Cordova, Cunningham, Carlson, & Andrykowski, 2001) and worse physical functioning (Kaasa et al., 1993). Thus, intrusive thoughts may negatively impact on both mental and physical functioning (Devine, Parker, Fouladi, & Cohen, 2003).

Prospective studies have found that intrusive thoughts contribute to psychological distress longitudinally. For example, level of intrusive thoughts in women with breast cancer two months post-surgery predicted psychological distress at 2 years post-diagnosis (Bleiker, Pouwer, van der Ploeg, Leer, & Ader, 2000) and intrusive thoughts were associated with anxiety and depression at baseline, 3 month and 6 month follow ups in mixed stage breast cancer patients (Epping-Jordan et al., 1999). In a prospective study of ovarian cancer patients, perceived social support and intrusive thoughts were associated with anxiety at 3 month follow-up after chemotherapy, whilst disease stage and measures of physical functioning post-treatment were not associated with worse psychological outcome (Hipkins, Whitworth, Tarrier, & Jayson, 2004).

Explanations for the contribution of intrusive thoughts to psychological distress include a moderating role of support seeking (Lepore & Helgeson, 1998; Lepore et al., 2000). Based on the assumption that intrusive thoughts are a marker of incomplete cognitive processing (Lepore, Silver, Wortman, & Wayment, 1996), and experiences of such intrusions signifies maladaptive coping to a stressful event (in this case, the

experience of coping with cancer), social support may reduce levels of reported intrusions by facilitating effective psychological processing of the event. For cancer patients, there is not an isolated incident that needs adequate processing but a number of ongoing and highly stressful experiences, including diagnosis, disclosure of diagnosis to family and friends, uncertainty about the future, treatment side-effects and fears of recurrence.

The recognition of social support as a mediating factor in the relationship between intrusive thoughts and psychological distress has led to intervention research (e.g. Scott, Halford, & Ward, 2004). Scott et al (2004) found that a couple coping intervention for adjustment to breast or gynaecological cancer led to a reduction in avoidance of negative intrusive cognitions in the intervention group. Understanding cognitive processes underlying psychological distress in patients with cancer may lead to improved interventions and thus effective positive change in quality of life. Other possible treatment strategies aimed at reducing distress associated with negative intrusive thoughts may include thought stopping and distraction techniques or cognitive restructuring (Lewis et al., 2001).

1.3.2. Intrusive thoughts and prostate cancer patients

Although most research concerning intrusive thoughts has been with breast cancer patients (e.g. Bleiker et al., 2000), research has looked at intrusive thoughts in other patient groups, including prostate cancer patients. For example, Lepore & Helgeson (1998) found that for men who felt socially constrained in terms of talking about cancer (e.g. "some of my friends or relatives avoided talking with me about cancer"), intrusive thoughts were significantly associated with decreased mental health. Further, social support was found to be inversely related to level of intrusive thoughts in men with localised prostate cancer (Roberts, Lepore, & Helgeson, 2005). Specifically, baseline social support was related to mental functioning at 3 month follow-up and this relationship appeared to be mediated by cognitive processes including, intrusive thoughts. Roberts et al (2005) suggested that social support may aid complete cognitive processing, and thus increase mental functioning. In a sample of 420 men with prostate cancer, for each intrusion item on the IES the percentage of men who responded sometimes or often was between 24 and 27% (McBride, Clipp, Peterson, Lipkus, & Demark-Wahnefried, 2000).

McBride et al (2000) were also interested in how the impact of cancer diagnosis affects health related behaviours. It was found that men with a lower impact score (impact referring to total score on IES), exercised more frequently. Although the directionality of this relationship could not be determined (McBride et al., 2000), the relationship may be important for several reasons. For example, exercise may provide a beneficial distraction technique from negative intrusive thoughts. On the other hand, having avoidant cognitions may lead to avoidance of behaviours aimed at improving physical quality of life and confronting the disease. Support for this explanation comes from the finding that high scores on the IES in male prostate, colon and lymphoma patients was associated with behavioural avoidance (Hampton & Frombach, 2000). Also, as McBride et al (2000) suggested, the cancer diagnosis may have led to greater distress in patients who were not engaging in positive health behaviours and who felt that their behaviours had contributed to their diagnosis.

As yet, the importance of intrusive thoughts in prostate cancer patients has not been established and further, little is known about the subjective experience of prostate cancer patients generally (McBride et al., 2000). Also, previous research investigating intrusive thoughts in prostate cancer patients and in other cancer populations has several limitations, which will now be considered.

1.3.3. Limitations of intrusive thoughts research with cancer patients.

Universal criticisms of the IES include the suggestion that the scale may be an inaccurate measure of subjective distress as some items can be perceived as neutral (e.g., item 6, "I had dreams about it": Joseph, 2000). Moreover, the IES may be an ineffective way of measuring negative intrusive thoughts specifically, not only because of the existence of more neutral items, but also because the IES was originally developed as a measure of general subjective trauma-related distress. However, it has been suggested that the main usefulness of the IES is as a measure of intrusive and avoidant symptoms, that mediate between trauma experience and subsequent adjustment (Joseph, 2000). Yet due to lack of content measurement, it is not clear whether intrusive thoughts are positively, negatively or neutrally valenced in nature (Raphael, 1997) and further, the IES does not allow for the possibility that there may be more than one type of intrusion (e.g. automatic versus controllable: Joseph, 2000; Brewin et al., 1996). It has been suggested that in order to establish the frequency,

nature and content of idiosyncratic thoughts, interview methods may be most appropriate (Clark & Purdon, 1995).

Other limitations of the IES to measure intrusive thoughts include, lack of content information concerning reported intrusions, and lack of separation between type of intrusions that may occur. For example, within the posttraumatic stress disorder literature it has been argued that few studies distinguish between type of intrusive cognition such as verbal versus imaginal intrusions or thoughts versus memories (Reynolds & Brewin, 1998). Others (e.g. Ehlers, Hackmann, & Michael, 2004; Ehlers & Clark, 2000) have argued that describing intrusive memories as thoughts is misleading, as intrusive memories mainly consist of brief sensory fragments of the traumatic experience.

Previous research that has delineated different intrusions in a non-clinical population (Brewin, Christodoulides, & Hutchinson, 1996) found that both intrusive thoughts and memories were common (with thoughts being most frequent), but the most intrusive thought was more often associated with fear and the most intrusive memory was most often associated with sadness or happiness. The different emotions found to be associated with different types of cognition supports the notion that different types of cognitions should be defined and investigated separately.

There are also specific problems that arise due to the use of the IES to investigate intrusive thoughts in cancer patients. For example, attempting to make cross-study comparisons on intrusive thoughts frequency may be futile, as studies documenting the frequency of intrusive thoughts in a wide range of cancer patients (e.g. breast cancer, acute leukaemia, prostate cancer, ovarian cancer) have administered the IES at different time stages of the disease, for example, two months post-surgery and 2 years post-surgery in breast cancer patients; (Bleiker et al., 2000); post-recurrence (Cella et al., 1990); and five year post-treatment (Green et al., 1997; Greenberg et al., 1997). Often studies have very different initial research questions (e.g. predictors of psychological distress in cancer patients, cancer recurrence as a traumatic event and assessing trauma related disorders in medical settings for the aforementioned studies).

Further, across clinical populations, intrusions may not concern a specific event that has occurred, but rather, concern future-oriented cognitions. This is particularly pertinent to cancer patients, as the cancer experience spans a wide time scale and involves several different types of stressor. For example, one study, looking at intrusions in cancer patients within a posttraumatic stress disorder framework (Cordova

et al., 1995) found that reported intrusive memories and dreams were related to fears of recurrence, as well of fears of surgery and treatment side-effects. Further, Greenberg et al (1997) found that scores on the IES significantly correlated with fears of recurrence, indicating that although the IES was developed to measure subjective distress to a specific event, the specific event (e.g. diagnosis of cancer) has implications for possible future negative events that may also trigger a stress response reaction featuring negative intrusive cognitions.

More generally, it has been argued that although unwanted distressing memories of trauma are considered a core symptom of PTSD, relatively little is known about their phenomenology (Michael, Ehlers, Halligan, & Clark, 2005). Phenomenology refers to the nature of intrusive cognitions, including for example, content (e.g. specific versus general memories, form (e.g. thoughts, images, flashbacks) and other characteristics such as accompanying emotions/physical sensations and vividness (Reynolds & Brewin, 1998; Reynolds & Brewin, 1999).

1.3.4. Intrusive memories and cancer patients

One exception to studies that have failed to address details surrounding the nature of intrusions has shown that depression in cancer patients is associated with negative intrusive memories (Brewin, Watson, McCarthy, Hyman, & Dayson, 1998a). Following from research that found a high frequency of intrusive memories in depressed patients (e.g. Kuyken & Brewin, 1994; Brewin, Hunter, Carroll, & Tata, 1996), Brewin et al (1998a) suggested that a more stringent confirmation of the conclusion that intrusive memories are specifically related to depression itself, rather than present life stresses in general, would require the inclusion of a control group to compare matched samples of depressed and non-depressed patients who have experienced a common stressor.

Brewin et al (1998a) interviewed matched samples of depressed and non-depressed cancer patients about life events and identified intrusive memories concerning illness, injury and death which were more frequently reported in the depressed group compared to controls. Intrusive memories qualified if they consisted of visual images of a specific scene that had taken place. Participants were matched on age, sex, type of cancer and stage of disease. Not only were there more frequent reports of intrusive memories in the depressed group, in general, when depression was controlled for, greater numbers of intrusive memories were associated with maladaptive adjustment

(measured by the Mini-Mental Adjustment of Cancer Scale: Watson et al., 1994). For example, higher numbers of intrusive memories were associated with more anxious preoccupation, more cognitive avoidance, more fatalism and more hopelessness and helplessness. Further, memories were usually reported to be vivid, lasted for minutes, occurred once a week or less and 76% of the memories reported were related to illness, injury and death and 44% of all memories concerned cancer specifically (Brewin et al., 1998a).

When examined longitudinally 68% of patients who had experienced intrusive memories at diagnosis (23%) continued to experience intrusive memories six months later (Brewin, Watson, McCarthy, Hyman, & Dayson, 1998b). Experiencing intrusive memories at Time 1 was associated with greater anxiety at follow-up, especially if there was high avoidance of the initial memories. Brewin et al suggested that one possible explanation for this finding is that the existence of highly accessible specific memories, mainly about illness and death, exacerbates feelings of anxiety and makes negative outcomes seem more likely. Brewin et al (1998b) also noted that intrusive cognitions predicted anxiety but not depression at follow-up, suggesting that memories may revolve to a greater extent around future threat than around past loss.

1.3.5. Summary

Although research has shown that the prevalence of PTSD is low in cancer patients, evidence suggests that intrusive thoughts are common and contribute significantly to psychological distress. Limitations of intrusion research with cancer patients include over-reliance on the Impact of Events Scale to measure intrusive symptomatology and the sampling of limited cancer populations, mainly women with breast cancer. Future research following Brewin et al (1998a) is required to further understand the phenomenology of intrusive cognitions, including distinguishing between different forms of intrusion (e.g. verbal versus visual) and intrusion time scales (e.g. past oriented versus future oriented). In particular, the present research aimed to address the following questions:

1. Do anxious cancer patients experience repeated intrusive thoughts and images and is their content in some way related to the disease?
2. Is the presence of intrusive cognitions associated with anxiety and maladaptive adjustment?

3. What are the characteristics of intrusive cognitions in cancer patients and how do they compare to clinical and non-clinical populations?

4. How do cancer patients cope with intrusive cognitions; do they use beneficial or ineffective distraction techniques?

5. Can therapeutic interventions targeted at intrusive cognitions help alleviate their frequency and impact?

Chapter 2

Intrusive cognitions and anxiety in prostate cancer
patients.

In order to extend previous research investigating intrusive thoughts and memories in cancer patients, this chapter introduces intrusive imagery as a form of intrusive cognitions distinguishable from thoughts and memories and so far unexplored in cancer patients. The relationship between imagery (which includes both images and memories) and emotion is discussed and the identification of intrusive imagery in anxiety is described. Finally, the chapter presents a cross-sectional study conducted with prostate cancer patients at the Royal Marsden NHS Foundation Trust.

2.1. Intrusive images

2.1.1. Intrusive images and anxiety

Based on the premise that future oriented cognitions may be at least as important as past oriented cognitions in patients with cancer, further research is required to assess whether future oriented intrusive images are reported in cancer populations (Matsuoka, Nagamine, & Uchitomi, 2006). Intrusive images are distinguishable from intrusive memories because i) they can be future oriented and ii) they may represent a "snapshot", rather than a contextualised autobiographical memory (Patel et al, 2007). Although the importance of imagery in precipitating and perpetuating emotional disorders has been recognised for some time (e.g. Beck, 1976; Lang, 1977), until recently, imagery in the context of anxiety disorders has received very little attention (Hackmann & Holmes, 2004).

Research suggests that imagery has an important role in representing emotionally charged material (Kosslyn, 1994). For example, verbal thoughts about emotional material evoked little cardiovascular response compared to images of the same material (Vrana, Cuthbert, & Lang, 1986). Further evidence was provided in a series of studies by Holmes and colleagues (e.g. Holmes & Mathews, 2005). Holmes & Mathews (2005) compared reactions to threatening information in a group asked to focus on verbal text and a group asked to imagine the event. Participants in the imagery condition reported more anxiety and rated new descriptions as more emotional than those in the verbal condition (Holmes & Mathews, 2005). This finding was replicated when positive images where shown to have a greater impact on emotion that verbal representations of the same material (Holmes, Mathews, Dalgleish, & Mackintosh, 2006).

One potential criticism of previous research was that both verbal and imagery conditions provided verbal descriptions and thus the effect of imagery on emotion may be due to the additional method of representation provided in the imagery condition. A recent study addressed this concern, by combining pictures and words at the initiating event and requiring participants to combine them in a single image or sentence (Holmes, Mathews, Mackintosh, & Dalgleish, 2008). Two studies were conducted where participants saw a series of pictures, each accompanied by a word designed to yield a negative or neutral meaning when combined. In Study 1, participants were free to combine pictures and words as they desired and in Study 2, participants were instructed to integrate them using either a descriptive sentence or mental image. In Study 1, greater self-reported use of imagery was associated with a greater emotional response than verbal processing of the same material. In Study 2, increases in anxiety due to negative picture-word combinations were greater following imagery than verbal encoding instructions. Conversely, decreases in anxiety due to neutral picture-word combinations were greater following imagery than verbal encoding instructions. Study 2 provided the first evidence that imagery causes changes in emotion, rather than the reverse and this extends beyond negatively valenced material (Holmes et al, 2008).

One possible explanation for the emotional effect of imagery is that imagery copies real-life perceptual events (Kosslyn, 1994) and thus has access to representations of related emotional states stored in autobiographical memory (Conway, 2001). Images may therefore be particularly effective cues for re-activating related episodes in memory and associated emotions (Holmes et al, 2008). Indeed, Holmes et al (2008) found that integrating word-picture stimuli using imagery was associated with greater self-involvement and stronger associations with autobiographical memories.

Research in anxious populations has found that people with anxiety report experiencing negative intrusive imagery (e.g. social phobia: Hackmann et al., 2000; health anxiety: Wells & Hackmann, 1993; agoraphobia: Day, Holmes, & Hackmann, 2004; obsessive compulsive disorder: Speckens, Hackmann, Ehlers, & Cuthbert, 2007). According to Hackmann & Holmes (2004), imagery in other anxiety disorders is similar to imagery found in PTSD, as images are often vivid, persistent, distorted and uncontrollable and occur in various modalities (e.g. visual, bodily sensations, sounds, touch, taste and smell). Also, across anxious populations, intrusive imagery may not only be future-oriented but often representative of specific abstracted aspects of

memories which hold important meanings to the individual (e.g. a negative childhood experience such as being bullied or feeling rejected).

Hackmann et al (2000) studied the frequency and nature of intrusive imagery in 22 social phobic individuals and found that all participants reported intrusive negative imagery in various modalities, including visual, body sensations and sounds. Of these participants, all but one reported having a particular memory which they felt was closely linked to the recurrent image (e.g. being bullied) and the majority (82%) of recurrent images were rated as a clear visual picture by the interviewer. One limitation of previous research was the lack of a control group. However, studies including a control group have shown almost identical patterns of results. For example, Day et al (2004) compared a group of agoraphobic patients (*n*= 20) with a group of non-anxious matched controls (*n*= 20) and found that all patients with agoraphobia and no control participants reported having negative intrusive images in agoraphobic situations. Moreover, images involved several sensory modalities (including, visual and body sensation perceptions) and, in most cases, were linked with unpleasant memories.

The link between memories and current imagery may be explained by the conceptualisation of images as goals, either goals referring to the past or goals referring to the future (Conway, Meares, & Standart, 2004). Conway et al (2004) suggested that images may reflect self-defining moments when goals have been challenged and a discrepancy exists in the self-memory system. Conway et al (2004) utilised Carver & Scheier's (1998) behavioural self-regulation theory to explain how such a discrepancy occurs. Self-regulation is based on the assumption that behaviour is defined by individual's concrete and abstract goals. Goals determine action because goals serve as reference values for feedback processes (Scheier & Carver, 2003). A feedback loop consists of four elements; an input function (perception), a reference value (goal), a comparator (compares input and referent) and an output function (behaviour). There are two types of feedback loop, discrepancy reducing (negative feedback loops) and discrepancy enhancing (positive feedback loops). Carver & Scheier (1998) suggested that for negative feedback loops, the referent is what is intended to be reached and thus decreasing discrepancy, by doing well, leads to feelings of elation and doing poorly leads to feelings of depression. For positive feedback loops, the referent is what is to be avoided and thus doing well, by increasing the discrepancy between input and referent leads to feelings of relief, whilst doing poorly is associated with anxiety (Carver & Scheier, 1998).

By conceptualising intrusive images as goals (referents), Conway et al (2004) suggested that such images form the basis of positive feedback loops. For example, a patient diagnosed with cancer may have goals about physical well-being challenged and thus have negative intrusive imagery of themselves in hospital, looking weak and frail after receiving chemotherapy. The image of the self as weak is an undesirable goal and thus one to be avoided. According to Conway et al (2004) intrusive imagery leads to distress because positive feedback loops have no boundaries; the referent is to be avoided as far as possible. However, in many circumstances, positive feedback loops are constrained by negative feedback loops which helps the loop become more stable. Conway et al (2004) suggested that problems may arise when discrepancy enhancing systems are not constrained by discrepancy reducing systems. They proposed that therapies aimed at augmenting the process of constraining positive feedback loops may lead to a reduction in negative intrusive imagery. For example, imagery rescripting therapy which introduces positively-valenced imagery associated with positive affect provides an avenue for negative imagery to be associated with new desirable goals. Further, adopting new goal-referents through imagery rescripting can lead to positive emotions due to recalibration of the affect-generating systems described above.

Some (Hirsch, Mathews, Clark, Williams, & Morrison, 2003; Hirsch, Meynen, & Clark, 2004) asserted a causal role of negative imagery in the maintenance of anxiety. Hirsch et al (2003, 2004) manipulated the use of negative imagery in participants with low and high social anxiety in order to investigate whether imagery has a causal role in the maintenance of social phobia. Participants with low social anxiety (Hirsch et al, 2003) were allocated to either a negative image or control condition and required to read six long descriptions of being interviewed about a job. At certain time points, participants were required to perform lexical decisions on ambiguous threatening or non-threatening information. Compared to the control group, participants holding a negative image in mind lacked non-threatening inferential bias and also experienced a higher level of anxiety.

Participants with high social anxiety had two conversations with another volunteer, one where they held a negative image in mind and one where they held a less negative self-image in mind (Hirsch et al, 2004). For the negative image, participants recalled a situation where they felt socially anxious and for the control image, participants recalled a situation where they felt relaxed. The study showed that holding a negative image in mind was associated with higher levels of state anxiety and greater

use of safety behaviours such as avoiding eye contact. Also, when holding a negative image in mind, participants with high social anxiety were more likely to report poor perceived behavioural (e.g. "sweating", "hands trembling") and conversational (e.g. uncomfortable pauses) performance which were partially confirmed by partner ratings of performance. However, socially anxious volunteers were likely to overestimate how poorly they performed compared their conversational partner.

These findings are consistent with research emphasising the causal influence of imagery on emotion (Holmes et al, 2008) and fit with previous prospective research, which has suggested that intrusive negative cognitions may help maintain psychopathological disorders, including posttraumatic stress disorder (Jones, Harvey, & Brewin, 2007) and depression (Brewin, Reynolds, & Tata, 1999). For example, Brewin et al (1999) found that at 6 month follow-up in a sample of 62 depressed patients, the amount of intrusion and avoidance associated with intrusive memories predicted subsequent depression, after controlling for initial depression severity.

Hackmann & Holmes (2004) argued that intrusive images may maintain anxiety due to the failure to update goals and integrate new and possibly contradictory information. They suggested that following appraisal of an intrusive image, individuals may engage in behaviours intended to reduce the imminent threat, and in doing so, fail to update the original and negative content of the image. This approach is consistent with dual representation theory of PTSD (Brewin et al, 1996) and the cognitive model of PTSD (Ehlers & Clark, 2000), where intrusions are conceptualised as a failure of adequate processing of the trauma and avoidance is considered a maladaptive process to integration and thus a contributor to recurrent negative intrusions. This failure of updating also corresponds to Conway et al (2004) conceptualisation of images as goals. Failure to update negative imagery leads to positive feedback loops aimed at enlarging perception-referent discrepancies. When this fails, individuals may experience anxiety. By changing the meaning of intrusive imagery and thus changing the referent to one that is desirable, the positive feedback loop is constrained by a negative feedback loop which, if successful leads to positive affect (Carver & Scheier, 1998).

As imagery has a causal relationship with emotion and is important in other anxious populations, perhaps the existence of intrusive images, in addition to intrusive thoughts is associated with psychological distress in cancer populations. The abundance and consensus of recent findings in the anxiety literature (see Hackmann & Holmes, 2004) means that investigating whether there are increased reports of negative intrusive

imagery in anxious cancer patients is an important next stage in formulating treatment strategies aimed at improving quality of life.

2.2. Study 1

The general aim of the present research was to investigate to what extent the insights gained from the study of intrusive cognitions in other clinical groups (e.g. anxiety disorders) are relevant to anxious cancer patients and can be used to improve their quality of life. Additionally, the present study aimed to address some of the issues that have arisen in previous research concerning intrusive cognitions and cancer patients.

In addition to interviewing anxious cancer patients, the present research aimed to interview matched non-anxious patients in order to specifically relate intrusive cognitions to anxiety. This research not only extends the cancer literature by investigating future-oriented intrusive imagery in this population for the first time, but also extends research that has found a higher frequency of intrusive images in anxious patients. Although some previous research has included a control group (e.g. Day et al., 2004), the control group in the present study is more appropriate, as control patients have experienced the same stressor, without developing clinical levels of anxiety.

Key research questions included:

1. Do anxious cancer patients experience intrusive thoughts and memories and how frequent/vivid/controllable/interfering are they, how long do they last, how distressing are they and what are the major themes?

2. Are there a higher number of intrusive images experienced by patients with high anxiety scores? What is the nature of these images? Specifically, how frequent/vivid/controllable/interfering are they, how long do they last, how distressing are they and what are the major themes?

3. Are intrusions associated with more maladaptive adjustment?

2.2.1. Summary of background literature

Previous research found that cancer patients experience negative intrusive thoughts, which were associated with marked distress (Kangas et al., 2002). However, studies have rarely explored the content or nature of intrusions. In addition to verbal intrusions, intrusive memories of illness have been reported in cancer patients and

found to be associated with maladaptive adjustment (Brewin et al., 1998a; Brewin et al., 1998b). More recently, intrusive imagery has been found in populations of anxious patients (e.g. Hackmann et al, 2000). Intrusive imagery can be distinguished from intrusive memories, as an intruding image is not of a specific event from the past, but a future-oriented image, or de-contextualised image related to a specific memory. Investigating the presence of intrusive imagery more broadly is important as it has been suggested that imagery may have a causal role in the maintenance of anxiety (Hirsch et al., 2004). Based on the recognition of cancer as a protracted experience involving several different stressors (Kangas et al., 2002), future oriented visual intrusions, as well as intrusive memories and thoughts may play a crucial role in psychological functioning. The present investigation was designed to ascertain more detailed information pertaining to verbal intrusions reported by cancer patients and to investigate for the first time, whether intrusive imagery is also important.

Brewin and colleagues (e.g. Reynolds & Brewin, 1998; Reynolds & Brewin, 1999) have investigated the characteristics of intrusive memories in non-clinical, depressed and PTSD samples. In both depressed and PTSD groups, reports of vivid, frequent and distressing memories have been found, which have unusual characteristics such a sense of reliving (Brewin, 1998). When depression was controlled for, greater numbers of intrusive memories were associated with maladaptive adjustment, including anxious preoccupation, cognitive avoidance, fatalism and hopelessness and helplessness in cancer patients (Brewin et al, 1998a). More recently, research has found that large numbers of patients with various types of anxiety disorder report the presence of negative intrusive imagery, which is not of a specific autobiographical event from the past, but a fragment of sensory information relating to the past, present or the future (Hackmann et al., 2000; Day et al., 2004). Identifying intrusive imagery in anxious populations is important, because of its suggested role in the maintenance of anxiety (Hirsch et al., 2004) and the possibility that psychological treatments tailored to target intrusive imagery may help to reduce anxiety (e.g. imagery rescripting; Arntz et al, 2007).

Although relatively low prevalence rates of PTSD have been documented in cancer patients (Mundy et al, 2000; Andrykowski et al, 1998), these do not necessarily imply a lack of clinically significant distress (Green et al, 1998), as intrusive symptoms are often reported in the absence of full PTSD criteria (Palmer et al, 2004, Matsuoka et al, 2005). Previous research has found that cancer patients also experience negative

intrusive thoughts (Kangas et al., 2002), which are related to psychological distress, anxiety and maladaptive adjustment (Kangas et al., 2002; Baider et al., 1997; Matsuoka et al., 2002; Nordin & Glimelius, 1998). Further, the presence of intrusive thoughts and memories predicts anxiety and depression at follow-up (Brewin et al, 1998b; Epping-Jordan et al., 1999; Hipkins et al., 2004).The consensus is that intrusive cognitions have a significant role in the psychological distress reported by cancer patients; therefore, evaluation of and intervention of these symptoms may have significant implications for psycho-oncology services (Matsuoka et al., 2006).

Although most research investigating intrusive thoughts in cancer patients has been with women, prostate cancer patients have been studied. For example, intrusions were found to be associated with poor mental health in men with prostate cancer (Lepore & Helgeson, 1998). Social support in prostate cancer patients has been related to mental functioning (vitality and/or energy level/ role limitations due to emotional health, problems in social functioning and mental health) and this relationship was mediated by cognitive processes, including intrusive thoughts (Roberts et al, 2005).

Almost all studies investigating the presence of intrusive thoughts in cancer patients have used the IES (Horowitz et al., 1979), which was developed to measure subjective distress associated with a traumatic event and includes intrusion and avoidance items. One limitation of the IES is that it does not distinguish between types of intrusion or provide further information on the content or nature of intrusions.

Another issue surrounding intrusion research and one that is important for ethically sound research practice is whether it is acceptable for patients to be questioned about their intrusions. Previous research has investigated the ethical implications of asking about trauma, including participant attitude towards childhood maltreatment trauma questions (Newman, Walker, & Gefland, 1999; Walker, Newman, Koss, & Bernstein, 1997) and domestic abuse trauma questions (Johnson & Benight, 2003). A review summarising the findings of twelve trauma-related studies and their assessment of reaction to research (Newman & Kaloupek, 2004) concluded that patients from various populations reported benefits from participating in trauma related studies, moderately low distress levels and lack of regret in participating. It is not known whether cancer patients interviewed about intrusions find the experience distressing, or whether there are positive outcomes.

I. Aims and hypotheses

Although intrusive thoughts and memories have been assessed in patients with cancer, investigations have typically involved female cancer patients, and lacked detail surrounding intrusions. The present study aimed to investigate the presence of intrusive cognitions in prostate cancer patients, as men are understudied in this area of research. Looking at the presence of intrusions in people diagnosed with cancer also provides important insights into cognitive processes in those dealing with an ongoing sense of threat.

This investigation sought to obtain more detailed information about intrusive thoughts and memories and for the first time, to ask patients about future-oriented intrusive imagery. In this study it was predicted that there would be a higher number of intrusive thoughts, memories and images in anxious patients compared to non-anxious matched controls, and all intrusions were expected to be associated with maladaptive adjustment. Based on previous research (Newman et al., 1999), it was also predicted that asking participants about intrusive phenomena would not be associated with elevated levels of distress.

2.2.2. Method

I. Patients

Of 764 prostate cancer patients approached in urology clinics at the Royal Marsden NHS Foundation Trust, 574 (75%) completed and returned the Hospital Anxiety and Depression Scale. Patients who scored ≥ 8 or above on the anxiety sub-scale (15.8%), were categorised as anxious (Zigmond & Snaith, 1983) and selected for the second interview stage of the study. For each anxious patient interviewed, a control patient was selected, based on a score of ≤ 4 or below on the anxiety sub-scale. Controls were matched on age, stage of disease, current treatment and time since diagnosis. Where more than one patient was suitable for control they were selected at random.

At the screening phase of the study, 14 (1.8%) patients declined to participate: three felt too ill, two were recently widowed and were too upset to participate, one person felt too anxious to take part, three did not like filling in questionnaires and five did not give a reason. A further 176 (23%) patients failed to return the screening scale; thus the overall response rate for screening was 75%. There were no significant difference between responders and non-responders on age [$t(762)=0.22$, $P= .83$] time since diagnosis [$t(751)=1.00$, $P= .32$] and disease stage [$\chi_2(1) =2.00$, $P = .16$].

However, non-responders were significantly more likely to come from a different ethnic origin than be White British [$\chi_2(2) = 42.59$, $P < .01$].

Among 219 patients invited to the second interview 15 (7%) declined to participate; 1 did not want to talk about their illness, 3 did not have enough time and 11 did not specify a reason for their refusal. A further 53 patients (26%) did not respond to invitations to interview and the overall take-up rate for interviews was 67%. There were no significant differences between responders and non-responders on age [$t(217) = 0.44$, $P = .66$], time since diagnosis [$t(217)=0.92$, $P = .93$] or ethnic origin [$\chi_2(1) = 0.04$, $P = .84$]. Responders were significantly more likely to have early-stage or advanced disease than locally advanced disease [$\chi_2(2) = 14.87$, $P < .01$], and responders were more likely to be anxious than non-responders [$\chi_2(1) =12.02$, $P < .01$].

A priori power calculations indicated that to detect a medium effect size between two groups (d = 0.50) at α = .05, a total of 130 patients yields statistical power of 0.88 (Cohen, 1988).   One hundred and forty six patients were interviewed , but 5 non-anxious patients were excluded as they did not match patients in the anxious group, 10 anxious patients were excluded from the sample as they no longer met criteria for anxiety on the HAD scale and 1 anxious patient was excluded due to incomplete interview data. The final sample consisted of 65 anxious patients and 65 controls.

II. Measures

Screening

The HADS (Zigmond & Snaith, 1983) is a 14-item self report scale which was developed specifically for the measurement of depression and anxiety in physically ill populations. The scale has two subscales consisting of 7 items, one for anxiety and one for depression, with a score range of 0-21. Items overlapping with possible physical symptoms (e.g. problems sleeping) are excluded in order to provide an unbiased scale. A large scale validation study of the HADS (Spinhoven et al., 1997) was conducted on various age groups of Dutch participants ($N= 6165$) and revealed a clear 2 factor solution corresponding to anxiety and depression sub-scales. Across age groups (e.g. 18-65 years, 57-65 years, >65 years), the reliability of the scale was high with Cronbach's alpha coefficient ranging from .82-.84 for the anxiety subscale, .71-.79 on the depression subscale and .84-.88 on the total HAD score. The scale also showed high test re-test reliability (after a mean interval of 22 days) with a Pearson product moment

correlation coefficient of .89, .86 and .91 ($P < .001$) between test and retest subscale scores for anxiety, depression and total score respectively.

The subscale scores of depression and anxiety have also been validated in cancer patients. For example, principal components analysis in a sample of 568 cancer patients revealed a 2 factor solution corresponding to anxiety and depression and high internal consistency ($\alpha > .70$) (Moorey, Greer, & Watson, 1991). The HADS has also been found to be an effective screening instrument and measure of psychological distress when compared to the SCID (Payne, Hoffman, Theodoulou, Dosik, & Massie, 1999).

Interview session

Mini-Mental Adjustment of Cancer Scale (Mini-MAC)

The Mini-MAC (Watson et al., 1994) is a 29-item self report scale used to assess patients coping responses to a cancer diagnosis. It has 5 sub-scales: helplessness-hopelessness, cognitive avoidance, fighting sprit, anxious preoccupation and fatalism. The scale reveals good construct validity with an inverse correlation between helplessness and hopelessness ($R = -.50$) and fighting spirit and a positive association between helplessness-hopelessness and anxious preoccupation ($R = .52$). Thus although the subscales are associated to some extent, they do not measure identical dimensions (Watson et al, 1994). Internal consistency was also acceptable with Cronbach's alpha for subscales as follows; helplessness-hopelessness, $\alpha = .87$, anxious preoccupation, $\alpha = .88$, cognitive avoidance, $\alpha = .74$, fighting spirit, $\alpha = .76$ and fatalism, $\alpha = .62$.

A more recent study validating the use of the Mini-MAC in an Italian sample ($N = 157$, sub-sample of 430 patients; Grassi et al., 2005), has also found high test re-test reliability after a 3 month period (all correlations were significant at $P < .001$ and there were no significant differences between any of the scales between the two time intervals, $P > .05$). Factor analysis, using Varimax rotation confirmed the use of a 5 factor solution and this has also been supported by validation of the scale in a Greek sample using structural equation modelling (Anagnostopoulos, Kolokotroni, Spanea, & Chryssochoou, 2006). In the present study Cronbach's alpha for subscales were; hopelessness/helplessness, $\alpha = .81$; anxious preoccupation, $\alpha = .85$, cognitive avoidance, $\alpha = .86$; fighting spirit, $\alpha = .62$ and fatalism, $\alpha = .48$.

Impact of Events Scale

The IES (Horowitz et al., 1979) is a 15-item self report scale which examines subjective distress as a result of a specific event. The IES is made up of two sub-scales of intrusion and avoidance and each item is rated on a four-point scale from not at all, rarely, sometimes or often. The intrusion subscale measures a traumatic response type which involves forbidden thoughts and images, strong feelings and repetitive behaviour. The avoidance subscale measures a traumatic response type involving ideational constriction, denial of meanings, blunted sensation and awareness of emotional numbness (Horowitz et al, 1979).

Sundin & Horowitz (2002) statistically analysed 23 studies which have evaluated the psychometric properties of the IES. In terms of reliability, internal consistency is high, with Cronbach's alpha of α= .86 for IES intrusion and α=.82 for avoidance. Stability of the IES is also sound, with high test re-test reliability (.87 and .79 for intrusion and avoidance sub-scales respectively). Content and construct validity is acceptable, with the majority of published studies suggesting an underlying structure of two factors (Sundin & Horowitz, 2002). Further, in the initial report on the IES (Horowitz, 1976), the correlation between intrusion and avoidance was .41, indicating a substantial level of variable independence. In more recent studies, the mean correlation was .63, which still suggests that each subscale is measuring a different type of stress reaction (Sundin & Horowitz, 2002).

Following Brewin and colleagues, participants in the present study were asked to complete the IES in response to the most intrusive memories, thoughts and images (e.g. Reynolds & Brewin, 1998; Brewin et al, 1998a). According to Sundin & Horowitz (2002), the IES is a useful measure of stress reactions after a range of traumatic events and thus conceptualising intrusive cognitions as a traumatic stressor in their own right still lends itself to the use of the IES.

Intrusive Cognitions

A structured interview (Patel et al., 2007) was employed for the assessment of intrusive cognitions over the past week. Intrusive cognitions were defined as consisting of memories, images and thoughts that occurred repeatedly. "Memories" were defined as visual pictures of specific event that occurred to the individual in the past. Memories were elaborated and contextualised (e.g. a memory of being in hospital on a particular day with a family member who is dying) (Patel et al, 2007). "Images" were defined as

specific visual pictures relating to the past, present or future. Unlike memories, images from the past consisted of brief snapshots with no surrounding context (e.g. of a family member's ill face). Visual intrusions were coded as either memories or images, and there was complete agreement between two independent raters ($\kappa = 1.00$). "Thoughts" was defined as verbal content referring to the past, present or future. If more than two intrusions were reported, patients were asked to identify and concentrate on the two most distressing intrusive cognitions.

Questions asked in relation to all intrusive cognitions included a description of the intrusion, associated emotions (i.e. sadness, guilt, shame, anger, anxiety and helplessness; 0 = *not at all*, 100 = *very much so*), frequency (0 = *none of the time*, 100 = *all of the time*), duration (1= *seconds*, 2 = *minutes*, 3 = *hours*), interference with daily life (0 = *not at all*, 100 = *severely*), uncontrollability (0 = *not at all*, 100 = *completely*) and associated distress (0 = *not at all*, 100 = *severely*).

A validity check was conducted for intrusive thoughts, to ensure that repetitive intrusive thoughts were being reported, rather than general rumination and worrying with regards to the cancer experience. Patients were asked to rate whether the intrusive thought they were reporting was always the same or whether it varied; 0 = *always different*, 100 = *always the same*. Overall, participants reported that the intrusive thoughts were nearly always the same (mean = 83.68, S.D. = 19.21), and no individual report, was lower than 60 (mostly the same).

For memories and images, participants were asked how vivid the image was (0 = *hazy memory*, 100 = *clearest and vividest memory*). For images of past events, patients were asked whether it felt as though they were reliving the memory (0 = *not at all*, 100 = *very much so*) and accompanying emotional and physical sensations (0 = *not at all*, 100 = *very much so*). For images that were not past events, patients were asked if the image was related to an event that had actually happened.

The Research Participation Questionnaire (RPQ)

The RPQ used in the present study was based on the reactions to research participation questionnaires for Parents (RRPQ-P; Kassam-Adams & Newman, 2002), comprising 12 items ranked on a 5 point Likert scale from *strongly disagree* to *strongly agree*. Examples of questions include *"Being in this study made me feel upset or sad"*, *"I am sorry I was in this study"* and *"I knew I could stop at anytime"*. The possible range of scores was from 0 (*very poor feedback*) to 60 (*completely positive feedback*).

The RRPQ-P had an internal consistency of between $\alpha = 0.78$ and $\alpha = 0.80$ and factor analysis revealed factors including knowing one's rights and making a contribution through research practice and other positive or negative appraisals of participating in research. Adults reported high acceptability and comprehension of the questionnaire (Kassam-Adams & Newman, 2002) .

III. Procedure

Ethical approval for the study was obtained from the Local Research Ethics Committee. A consecutive series of outpatients attending follow-up urology clinics were invited to participate. Patients were given the HADS to complete in clinic, or to complete at home and return by mail. Patients subsequently identified as anxious were contacted and invited to participate in an interview, either on the telephone or at the Royal Marsden Hospital. Control patients matched on age, stage of cancer, treatment and time since diagnosis, using information from the hospital computer systems, were selected for interview. If a time lapse of more than 21 days had passed since the initial screening, participants were asked to repeat the HADS questionnaire, to ensure eligibility. Patients interviewed also completed the IES in response to any reported intrusions (see Reynolds & Brewin, 1998). Participants were asked to complete the Mini-MAC scale and RPQ.

2.2.3. Results

I. Characteristics of the groups

The demographic, clinical and psychological characteristics of the total sample, non-anxious group, and anxious group are presented in Table 2.

Table 2 Demographic, clinical and psychological characteristics [*n* (%)], of the total sample (*N*=130), non-anxious (*n*=65) and anxious groups (*n*=65).

Characteristic	Total sample	Non-anxious group	Anxious group	Difference between anxious and non-anxious groups
Age	67.07 (6.70)	67.34 (6.10)	66.80 (7.29)	$t(128) = 0.45$, $P = .65$
Ethnic Origin				
White British	123 (94.6)	64 (98.5)	59 (90.8)	$\chi2(1) = 3.78$, $P = .06$
Other	7 (5.4)	1 (1.5)	6 (9.2)	
Marital status				
Married/Living with a partner	105 (80.8)	56 (86.2)	49 (75.4)	$\chi2(1) = 2.43$, $P = .12$
Other	25 (19.2)	9 (13.8)	16 (24.6)	
Education				
Left school before 15	19 (14.6)	9 (13.8)	10 (15.4)	$\chi2(3) = 4.50$, $P = .21$
Secondary education	34 (26.2)	13 (20.0)	21 (32.3)	
College or specialised training	30 (23.1)	16 (24.6)	14 (21.5)	
University or equivalent	40 (30.7)	25 (38.5)	15 (23.1)	
Unknown	7 (5.4)	2 (3.1)	5 (7.7)	
Employment				
Employed full-time	11 (8.5)	6 (9.2)	5 (7.7)	$\chi2(2) = 0.13$, $P = .94$
Employed part-time	27 (20.7)	14 (21.5)	13 (20.0)	
Retired	91 (70)	45 (69.2)	46 (70.8)	
Unknown	1 (0.8)	0 (0)	1 (1.5)	
Occupation				
Manual	18 (13.8)	10 (15.4)	8 (12.3)	$\chi2(2) = 1.66$, $P = .44$
Non-manual	65 (50)	35 (53.8)	30 (46.2)	
Unknown	47 (36.2)	20 (30.8)	27 (41.5)	

Table 2 continued (clinical and psychological variables)

Characteristic	Total sample	Non-anxious group	Anxious group	Difference between anxious and non-anxious groups
Time since diagnosis (months)	39.98 (33.04)	40.35 (32.88)	39.60 (33.44)	$t(128) = 0.13$, $P = .90$
Cancer Stage				
Early	89 (68.5)	45 (69.2)	44 (67.7)	$\chi2(2) = 0.05$, $P = .98$
Locally advanced	14 (10.7)	7 (10.8)	7 (10.8)	
Advanced	27 (20.8)	13 (20)	14 (21.5)	
Treatment				
Active surveillance	35 (26.9)	19 (29.2)	16 (24.6)	$\chi2(2) = 1.60$, $P = .45$
On treatment	45 (34.6)	25 (38.5)	20 (30.8)	
Post-treatment	44 (33.8)	19 (29.2)	25 (38.5)	
Undecided	6 (4.6)	2 (3.1)	4 (6.2)	
Interview type In-person	60 (46)	30 (46)	30 (46)	
Telephone	70 (54)	35 (54)	35 (54)	
Time since HAD completion (days)	7.63 (6.90)	7.90 (6.86)	7.66 (6.99)	$t(128) = 0.05$, $P = .96$
HADS- depression	3.71 (3.55)	1.43 (1.42)	5.98 (1.42)	$t(128) = 9.53$, $P < .01$, $d=1.67$ $t(128) = 25.21$,
HADS- anxiety	6.06 (4.81)	1.69 (1.39)	10.43 (2.42)	$P < .01$, $d= 4.44$

II. Number and type of intrusive cognitions

Thirty patients (23%) reported an intrusive cognition, of whom four reported at least one additional intrusion. Of these, two patients reported an additional intrusion which was the same type as the first, one patient reported an intrusive memory and an intrusive image and one reported an intrusive memory and an intrusive thought. Of the 34 intrusions reported in total, 8 were intrusive memories, 7 were intrusive images, and 19 were intrusive thoughts. There was no significant difference in whether patients reported intrusive cognitions according to whether patients were interviewed on the telephone or in person [$\chi2$ (1) = 0.23, $P = .63$].

III. Content of intrusions

Twenty-five (74%) of the intrusive cognitions related to the person's own experience of having cancer and five (15%) of the intrusions were in relation to a relative's illness, injury and death (three specifically from cancer). In total 82% of reported intrusions were specifically related to cancer. Four (11%) of the intrusions were unrelated to illness and death but were all related to feelings of past or future failures. The presence of intrusive cognitions was not related to disease stage [R=.00, P = .98]; thus, cancer-specific intrusions may represent more general subjective threats of the disease rather than threats specific to prognosis. For intrusive imagery, four of seven reported images were related to a past event. Of the three reported images that were not related to past events, all were future oriented. For intrusive thoughts, the majority (12 of 19) of intrusions were future oriented, 3 were related to past events, 2 were related to present concerns, and 2 were both past oriented and future oriented (see Table 3 for type, content, and timescale of each intrusion).

Table 3 Description type, content and time-scale of intrusive cognitions.

Intrusive Memories	Timescale
Father lying in bed, dying of cancer	Past oriented
Being informed of mother's death	Past oriented
Being trapped in a magnetic resonance imaging (MRI) scanner	Past oriented
Watching two men dying of cancer while staying in a hospice for treatment	Past oriented
Stomach operation going wrong, and stomach bursting open	Past oriented
Girlfriend leaving him over 50 years ago	Past oriented
Sitting in the doctor's surgery and reading a newspaper article about misdiagnoses.	Past oriented
Being told that sister had suffered a stroke and was severely ill	Past oriented

Intrusive Images/ "Snapshots"	Timescale
Self in hospital	Past oriented
Self having a biopsy	Past oriented
Self as an old man sitting at desk at school	Past oriented
His own face as his fathers face, who died from	Past oriented

prostate cancer

House falling apart	Future oriented
Self dying, deteriorating health	Future oriented
Self being ill, and cancer spreading	Future oriented

Intrusive Thoughts	Time-scale
Prostate specific antigen (PSA) level and worrying about health, concerns about what the doctor will say at next 3 monthly meeting	Future oriented
Health concerns and fears about the future	Future oriented
Wife, who recently died of cancer	Past oriented
How things will be further down the line, if disease progresses.	Future oriented
"I am going to die"	Future oriented
Uncertain future and worries concerning cancer and implications	Future oriented
Money and the future	Future oriented
Recurrence of cancer, cancer getting worse and the possibility of dying.	Future oriented
Telling his daughters about the illness, fear of things getting worse.	Future oriented
Cancer and progressing, worries about wife, can't imagine her without him	Future oriented
Death	Future oriented
"I am going to die"	Future oriented
Dying, the ultimate end. Described it as "a blockage called death".	Future oriented
The future, how treatment seems to have failed and fear of death. Thoughts about brother, who died of prostate cancer.	Past & future oriented
Operation and problems with having a catheter	Past oriented
Being a failure and not achieving in life and feeling frustrated with health	Past oriented
Recent treatment for radiotherapy and feeling weaker than before, fears of dying. Thoughts surrounding friend's death from prostate cancer	Past & future oriented

| Leg pain and what cancer must be doing in order to cause the pain | Present oriented |
| Treatment options; concerns about aches and pains and cancer spreading | Present oriented |

IV. Characteristics of intrusive cognitions

Of the 34 intrusive cognitions 6 lasted only seconds, 23 lasted minutes and 5 lasted hours. Intrusions were reported to occur just over half the time in the past week (mean = 55.00, S.D. = 24.59) and interfere moderately with daily life (mean = 47.20, S.D. = 33.62). Intrusions were reported to be severely uncontrollable (mean = 70.00, S.D. = 35.40), and moderately-severely distressing (mean = 58.53, S.D. = 32.44). Mean subjective distress associated with intrusions, measured by the IES was 17.76 (S.D. = 8.88) for avoidance, 18.06 (S.D. = 7.41) for intrusion and 35.82 (S.D = 12.70) for total IES score. Analyses investigating the difference between visual and verbal intrusions on impact of intrusions found no significant differences ($P > .05$) for frequency, interference, uncontrollability, associated distress or IES scores.

For the 30 patients reporting intrusive cognitions, it was investigated to what extent certain emotions were associated with the intrusions (Table 4). A repeated-measures analysis of variance (ANOVA) was conducted. For patients reporting two intrusive cognitions, one intrusion was chosen at random to be included in the analysis. There was a significant difference between how strongly various emotions were associated with intrusive cognitions [$F(2, 145) = 25.14$, $P < .01$, $\eta_p^2 = 0.46$]. Sadness, anxiety and helplessness were most strongly associated with intrusive cognitions and least significant difference (LSD) pair wise comparisons revealed that there were no significant differences between these three emotions. Guilt and shame were least strongly associated with intrusive cognitions and LSD pair wise comparisons revealed that these were not significantly different from each other. All other LSD pair wise comparisons were significant at $P < .01$, although the difference between sadness and anger was significant at $P < .05$.

Table 4 Emotions associated with intrusive cognitions (*n=30*)

Emotion	Mean (S.D.)
Sadness	56.83 (31.03)[a]
Guilt	13.83 (25.31)[c]
Shame	8.00 (19.72)[c]
Anger	35.50 (32.55)[b]
Anxiety	64.17 (29.04)[a]
Helplessness	58.17 (34.05)[a]

Range, 0 (*not at all associated*) to 100 (*very much so associated*). Means followed by different letters differ significantly, according to how much they are associated with intrusive cognitions ($P < .05$)

V. Specific characteristics of intrusive memories and images

Intrusive memories were reported to be vivid (mean = 88.75, S.D. = 21.00; 0 = *hazy memory,* 100 = *clearest and vividest memory*). In addition, patients reported that when they experienced the memory, it felt as though it was not just a past event but happening all over again (mean = 70.00, S.D. = 36.65; 0 = *not at all,* 100 = *very much so*). Patients reported "somewhat" (mean = 62.50, S.D. = 33.70) re-experiencing emotions the same as or very similar to those reported during the actual event, whilst re-experiencing of physical sensations was rare, (mean = 27.50, S.D. = 36.55; 0 = *not at all* and 100 = *very much so*). Intrusive images were also reported to be vivid (mean = 70.71, S.D. = 23.00).

VI. Intrusive cognitions and anxiety

Fisher's Exact Tests were conducted in order to assess differences in the likelihood of anxious and non-anxious patients reporting each type of intrusive cognition. These confirmed that anxious patients reported significantly more intrusive imagery (7 of 65), than non-anxious patients (0 of 65) ($P < .01$), significantly more intrusive thoughts (18 of 65) than non-anxious patients (1 of 65), ($P < .01$) and significantly more intrusive memories (7 of 65) than non-anxious patients (1 of 65), ($P < .05$).

In order to investigate any linear relationship between the number of intrusive cognitions and anxiety level, the total sample was divided into 3 groups; non-anxious (n = 65, HADS ≤ 4), mildly anxious (n = 41, HADS ≤10) and moderate to severely anxious (n = 24, HADS > 10). This classification follows Snaith and Zigmond's (1994)

criteria for identifying mild (8-10), moderate (11-14) and severe (15-21) cases of anxiety using the HADS (Snaith & Zigmond, 1994). A one-way ANOVA indicated a significant overall effect of anxiety category on number of intrusive cognitions reported [$F(2,127) = 22.63$, $P < .01$, $\eta_p^2 = 0.26$]. A polynomial contrast analysis revealed a significant linear trend (contrast estimate = 0.48, $P < .01$) of intrusive cognitions across ordered levels of the anxiety variable.

VII. Intrusive cognitions and coping with cancer

Biserial correlations between the presence and the absence of intrusive cognitions and Mini-MAC score for adjustment to cancer showed that, when anxiety was statistically controlled for, the presence of intrusive cognitions was significantly correlated with helplessness-hopelessness and anxious preoccupation (Table 5).

Table 5 Correlations between the presence and the absence of intrusive cognitions and coping with cancer (*N*=130)

Mini-MAC subscales	Presence/absence of intrusive cognitions	Presence/absence of intrusive cognitions (controlling for anxiety)
Helplessness-hopelessness	0.47**	0.27**
Anxious pre-occupation	0.55**	0.34**
Fighting spirit	0.06	0.15
Cognitive avoidance	0.35**	0.14
Fatalism	0.03	0.04

**P < .01, one-tailed

VIII. The RPQ

Of 130 participants, 129 completed the RPQ; feedback was positive, with a range of scores from 44 to 60 (mean = 55.71, S.D. 3.71), out of a maximum score of 60. There was no significant difference on average RPQ score [$t(127) = 0.11$, $P = .91$, between anxious (mean = 55.75, S.D. = 3.94) and non-anxious (mean = 55.68, S.D. = 3.50) patients and no significant difference on average RPQ score [$t(127) = 0.99$, $P = .32$] between those reporting intrusive cognitions (mean = 56.30, S.D. = 2.77) and those not reporting intrusive cognitions (mean = 55.54, S.D. = 3.94).

2.2.4. Discussion

In this study, the presence of intrusive cognitions in prostate cancer patients was shown to be related to higher levels of anxiety, and not to stage of disease. The frequency of intrusions in the present study is similar to the frequency of intrusive memories found in a matched sample of depressed and non-depressed cancer patients (Brewin et al, 1998a). Moreover, the content of intrusive cognitions matches the pattern of results described by Brewin et al (1998a). Intrusive cognitions were most often related to personal experience of illness or were related to a relative's illness, injury or death. The most common type of intrusion reported was thoughts, supporting previous research in a non-clinical population, which also found that intrusive thoughts were more common than intrusive memories (Brewin et al., 1996). Although it is unclear why intrusive thoughts are most common, the finding that there are differences in the amount that different types of intrusion were reported supports the utility of distinguishing between them. The finding also contrasts with research in PTSD samples, where intrusive imagery is more common than intrusive thoughts (Ehlers & Steil, 1995). This is important, because firstly intrusive thoughts were initially investigated in cancer patients following the inclusion of cancer as a stressor that could precipitate PTSD and thus it is unclear why other research has failed to assess the presence of intrusive imagery in cancer patients. Secondly, if the types of intrusive cognitions reported by cancer patients are different from individuals with PTSD, this may be further evidence for moving away from a strict PTSD framework to understand psychological distress in cancer patients. Rather, research could focus on the phenomenology of intrusive cognitions in order to understand how these intrusions are similar as well as different from intrusive symptoms reported by other populations, including psychiatric and non-psychiatric samples.

The findings that patients reported future oriented intrusive imagery and that the majority of intrusive thoughts were future oriented also have significant implications for clinical practice and for research investigating cancer-related distress within a PTSD framework (Kangas et al, 2002). Asking about future-oriented intrusions is equally as important as asking about intrusive distressing recollections and flashbacks of events that have occurred in the past.

In line with previous findings, the experience of intrusive memories was associated with feelings that the memory was not just a past event but was happening all over again, "right now" (e.g. Hackmann, Ehlers, Speckens, & Clark, 2004). Hackmann

et al (2004) suggested that the subjective feeling of "nowness" is consistent with the notion that intrusive memories result from a lack of information updating, as described by theories of PTSD and intrusive phenomena (Brewin et al, 1996; Horowitz, 1986). The characteristics found to be associated with intrusive images paralleled previous work (e.g. Hackmann et al., 2000) which found across several anxious groups that intrusive imagery is extremely vivid and, whilst lacking context, can be related to meaningful events such as a past episode of bullying (Hackmann et al, 2000). In the present study, the majority of reported images were related to a meaningful event in the past such as a parent's death or previous negative experiences of hospitals.

Importantly, the correlations between intrusive cognitions and aspects of coping were similar to results reported elsewhere (Brewin et al, 1998a), where anxious pre-occupation and helplessness/hopelessness were associated with an increased number of intrusive memories. Previous research has also found in a sample of depressed women that reporting intrusive memories of negative events from childhood was significantly associated with avoidant coping (Kuyken & Brewin, 1999). This implies that targeting intrusions using distraction (e.g. Andrade et al., 1997) or imagery techniques (Arntz et al, 2007) may alleviate their impact and reduce psychological distress.

In addition to the similarities, there were also some differences between the present findings and previous research. For example, while prostate cancer patients in the anxious group reported significantly more intrusions than prostate cancer patients in the non-anxious group, overall, anxious patients reported fewer intrusions than found in other populations and reported less overall impact of intrusions (Reynolds & Brewin, 1998). This is consistent with research on intrusive memories in cancer patients (Brewin et al, 1998a), which emphasised that depressed cancer patients did not report intrusive memories as often as depressed psychiatric patients (Brewin, 1998).

A possible explanation may be that patients in the anxious group were less anxious compared to patients in the psychiatric populations previously studied. The significant linear trend in this sample between the number of intrusive cognitions and level of anxiety suggests that highly anxious cancer patients would report equivalent levels of verbal and visual intrusions as other anxious groups.

Another possible explanation for the reduced frequency and impact of intrusive cognitions is that the perceived meaning of intrusive cognitions may be qualitatively different for patients with cancer, compared to other anxious groups. For example, it has been suggested that the patient's interpretation of intrusive cognitions determines

intrusion-related distress and negative intrusion appraisal can lead to increased intrusion frequency due to associated maladaptive coping and inadequate processing of trauma related information (Ehlers & Steil, 1995). Future research investigating intrusive cognitions in cancer patients should take intrusion appraisal into account in order to clarify this further. Further research may also be required to illuminate whether there is a difference in the impact of intrusive cognitions between visual and verbal intrusions, as the reported non-significant difference may have been due to small numbers.

Another notable difference was that individuals reporting intrusive memories in the present study did not appear to re-experience physical sensations experienced during the traumatic event. A possible explanation for this unexpected response is that the traumatic experience may be different from other stressors and thus patients may not have experienced accompanying physical sensations at the time of the reported memory and so do not re-experience them later. Some of the memories reported were of an event that was happening to someone else, for example, of watching someone else suffering from cancer. In addition, some of the memories related to experiences of hospitals, where physical sensations may have been inhibited due to pain killers or other medication. This account requires clarification with further research, as a relatively small number of memories were reported overall. Another possible explanation for relatively low levels of reexperiencing in cancer patients is provided by Holmes & Bourne (2008), who suggested that the fleeting nature of typical stressors (e.g. physical assault) leads to intense focus on sensory components experienced at the time of trauma. For cancer patients, the ongoing nature of the stressor may not allow for this intense focus, so subsequent reexperiencing of sensations is rare.

The present study was not without its limitations. For example, the sample was demographically homogenous; including mainly White British, married, retired and well educated men and thus it is unclear whether the results are applicable to more diverse populations. Particularly, previous research has suggested that women are more likely to experience PTSD symptomatology (Hampton & Frombach, 2000; Deimling et al., 2002) and thus there is a possibility that female cancer patients would report higher numbers of intrusive cognitions than prostate cancer patients. These limitations should be addressed by sampling more diverse groups of cancer patients. It may also be that intrusive symptoms are more common in different groups of patients such as advanced cancer patients compared to early stage cancer patients. Previous research has reported mixed findings in terms of the impact of disease stage on PTSD symptoms (e.g.

Cordova et al., 1995; Kelly et al., 1995) and this remains an issue for future research. Another limitation is the use of a cross-sectional design as prospective research is important for elucidating causal relationships between intrusive symptoms, anxiety and maladaptive adjustment. Furthermore, the present study did not assess the participants' psychiatric history of PTSD and depression, both of which have been shown to be associated with intrusive memories and thoughts. Finally, future research may benefit from making a distinction between cancer-related distress and anxiety unrelated to the cancer experience.

In conclusion, the present study confirmed the link between intrusive cognitions and psychological morbidity in an under-researched group; men with cancer. The study extended previous findings by providing further information on the nature and content of these intrusions and by illuminating the potential role of intrusive imagery and future-oriented intrusive thoughts in psychological distress among cancer patients. Consistent with previous trauma-related research (Newman et al., 1999), there was no evidence to suggest that participants found being questioned about their intrusions distressing; indeed the interview was often perceived as beneficial. The results show that treatment approaches targeted at various types of intrusive cognitions, such as imagery rescripting, may have a useful part to play in the management of some anxious cancer patients.

Chapter 3

The role of negative appraisal of intrusive cognitions and coping in cancer patients

Study 1 found that anxious cancer patients experienced negative intrusive cognitions, including thoughts, memories and images which were often associated with feelings of sadness, helplessness-hopelessness and were interfering and difficult to control. However, intrusions were less common than found in psychiatric populations (e.g. Hackmann et al., 2000) and were associated with less distress. Possible explanations for the finding that intrusive cognitions were less impacting for anxious cancer patients include the relatively mild levels of anxiety reported in the sample population and the possibility that patients with cancer appraised cognitions in a qualitatively different way from other groups. Negative appraisal of intrusive cognitions has been identified as a key cognitive mechanism that mediates the management of intrusive cognitions in PSTD (Ehlers & Steil, 1995; Ehlers & Clark, 2000) and depression (Starr & Moulds, 2006). In Study 1, cancer patients reported experiencing negative intrusive cognitions, often about illness, injury or death. However, because cancer patients have the concrete and ongoing stressor of a physical illness, intrusions may be appraised as a normal stress response reaction, rather than a sign of mental fragility. It is important to further apply cognitive models (e.g. Ehlers and Steil, 1995) of intrusive symptoms to cancer patients, in order to ascertain whether intrusive cognitions are qualitatively different for physically ill patients, compared to patients with depression or anxiety disorders. As the present research has shown that experiencing intrusive cognitions is related to anxiety in cancer patients, understanding the mechanisms involved in their maintenance is key to uncovering ways to alleviate intrusive cognitions and associated psychological distress.

The present study aimed to further investigate intrusive cognitions in a group of anxious cancer patients by investigating a larger, more diverse sample of intrusions and by investigating, for the first time, how cancer patients appraise and cope with intrusive cognitions.

3.1. Study 2

3.1.1. Negative appraisal of intrusive cognitions

I. Negative appraisal of intrusions in PTSD

Although intrusive thoughts have been extensively investigated in cancer patients (Kangas et al., 2002) and the presence of intrusive imagery has now also been considered in more detail in Study 1, the appraisal of such cognitions has yet to be investigated. Understanding appraisal of intrusions is important for therapeutic reasons, because modifying negative appraisals may be a successful treatment approach for reducing anxiety (Steil & Ehlers, 2000). The concept of intrusion appraisal was first discussed by Ehlers & Steil (1995) in their cognitive approach to posttraumatic stress disorder. Based on previous research, (e.g. Mayou, Bryant, & Duthie, 1993), it was suggested that in addition to the frequency of intrusive cognitions, the idiosyncratic meaning of intrusions may have an impact on the development of PTSD and PTSD severity (Ehlers & Steil, 1995). For example, Mayou et al (1993) found that if patients described their intrusive cognitions of road traffic accidents as "horrific", they were likely to meet criteria for PTSD at 1 year follow-up. According to Ehlers & Steil (1995) the meaning attributed to the experience of intrusive recollections determines how distressing the intrusions are (e.g. "horrific" is taken as a sign of distress in the previous example) and the extent to which patients engage in coping strategies to control the intrusions. Coping strategies are implicated in symptom maintenance, as they prevent a change in the meaning of the trauma and subsequent recollections.

Negative appraisal of intrusive recollections is described as the belief that the presence of uncontrollable intrusions indicates something negative about the self (e.g. "I am going mad"), or the world. In particular, Ehlers & Steil (1995) suggested that although some patients view intrusive cognitions as a normal stress response reaction to trauma, other patients interpret intrusions in a negative way, for example as an indication that they cannot cope. Further, they suggested that patients who appraise intrusive cognitions negatively are more likely to engage in maladaptive behaviour such as avoidance. In turn, maladaptive coping strategies maintain intrusive symptoms in patients with PTSD by preventing adequate processing of trauma related information and thus increasing intrusion frequency (Ehlers & Steil, 1995).

Research supporting the notion that appraisal is an important factor in the maintenance of intrusive symptoms includes several cross-sectional and prospective

studies. Clohessy & Ehlers (1999) found that 49% of ambulance workers reported experiencing intrusive memories and negative interpretation of intrusions (e.g. "some day I will go out of my mind") was significantly associated with PTSD severity and general psychiatric symptoms. Negative appraisal was also associated with distress reported in relation to intrusions, even when intrusion frequency was controlled for. Further, negative appraisal was significantly associated with rumination (e.g. "I dwell on it", "I think about what I could have done differently"), suppression (e.g. "I try to push it out of my mind") and dissociation (how detached or numb they felt when the memories occurred), after controlling for intrusion frequency (Clohessy & Ehlers, 1999). Research assessing the prevalence of PTSD in staff working in an accident and emergency department found that negative appraisal of intrusive cognitions was associated with PTSD severity (Laposa & Alden, 2003).

A cross-sectional study investigating the cognitive factors involved in the onset and maintenance of PTSD was conducted with individuals who had experienced a physical or sexual assault in the past 3 months (Dunmore, Clark, & Ehlers, 1999). Individuals were interviewed and divided in to two groups, according to whether they currently met criteria for PTSD or not. Questionnaires were devised to assess participant's appraisal of various aspects of the assault, including their appraisal of PTSD symptoms, such as intrusions (e.g. "Something terrible will happen if I do not try to control my thoughts about the assault"). In terms of intrusion appraisal, it was found that the PTSD group reported significantly more negative appraisals of their symptoms in the month after the assault compared to the no PTSD group. Negative appraisal of symptoms was shown to be associated with both the onset and maintenance of PTSD.

Prospective research was also conducted by assessing fifty seven victims of physical or sexual assault for cognitive factors at 4 months, 6 months and 9 month follow-up (Dunmore, Clark, & Ehlers, 2001). As predicted, negative appraisal of PTSD symptoms predicted PTSD severity and this relationship remained significant when gender and perceived assault severity were statistically controlled. Other cognitive factors implicated longitudinally in the onset and maintenance of PTSD were cognitive processing style (e.g. detachment) during assault, appraisal of perceived negative responses from others, negative beliefs about the self and the world and maladaptive coping strategies such as avoidance. Dunmore et al (2001) argued that the role of negative appraisal of post-trauma symptoms in PTSD severity has been an especially robust finding.

Further prospective research also supported the importance of intrusion appraisal as an indicator of subsequent psychological distress. For example, a prospective longitudinal study investigated psychological factors that could predict chronic PTSD after a motor vehicle accident (MVA) (Ehlers, Mayou, & Bryant, 1998). A large cohort of patients who had attended an emergency clinic after a MVA were assessed for various factors including, PTSD, trauma severity, emotional response during trauma, negative interpretations of intrusive cognitions, rumination and thought suppression and anger. Negative appraisal was measured with the mean of two items; "I must be going out of my mind" and "I will never get over it". Participants also completed questionnaires at 3 months and 1 year follow-up. Ehlers et al (1998) found that participants assigning negative meaning to their intrusive symptoms were more likely to suffer from PTSD symptoms at 3 month and 1 year follow-up and rumination and suppression of intrusive cognitions at 3 months and 1 year follow-up were correlated with PTSD diagnosis and severity. Overall intrusion appraisal, maladaptive coping, anger and persistent health and financial problems were the key predictors of PTSD at 1 year. Also, negative appraisal of intrusions predicted a proportion of the variance at 1 year that could not be explained by PTSD severity at 3 months, underlying the importance of appraisal as a maintaining variable. A further 3 year follow-up conducted on this sample (Mayou, Ehlers, & Bryant, 2002) found that negative interpretations of intrusions, rumination and thought suppression and anger cognitions remained important predictors of PTSD persistence at 3 year follow-up.

Steil & Ehlers (2000) found that negative idiosyncratic meaning (e.g. "I might go crazy") of posttraumatic intrusion symptoms was significantly related to intrusion-related distress, avoidance strategies and PTSD severity in large samples of MVA survivors. Correlations between negative meaning, distress, avoidant behaviours and PTSD severity remained significant when intrusion frequency, accident severity and general anxiety related cognitions were controlled for. Steil and Ehlers (2000) argued that if intrusions are seen as a normal reaction to trauma and part of recovery, distress is less likely than if a person interprets intrusive symptoms as a sign that they are mentally unstable or incompetent. Avoidant strategies are adapted if someone perceives their reaction as indicative or poor adjustment, but the strategies paradoxically lead to persistent intrusive symptoms and more severe PTSD reactions. Steil and Ehlers (2000) suggested that interventions aimed at identifying, restructuring and changing

idiosyncratic meaning of intrusive symptoms may prevent the use of maladaptive coping and help alleviate distress.

II. Negative appraisal of intrusions in bereavement and depression

Besides research investigating negative appraisal of intrusions in PTSD patients, the role of appraisal has also been considered in bereavement research (Boelen, van den Bout, & van den Hout, 2003). In a sample of bereaved participants, Boelen et al (2003) found that negative interpretation of grief reactions (e.g. "I am going crazy") was strongly related with associated distress, avoidance strategies such as rumination and overall traumatic grief and depression. Further, recent research has emphasised the importance of negative appraisal in the maintenance of intrusive symptoms in depression and subsequent depressed mood (Starr & Moulds, 2006). Eighty-four non-clinical participants were interviewed about intrusive memories and asked to complete the Response to Intrusions Questionnaire (RIQ, Clohessy & Ehlers, 1999). The RIQ measured intrusive memory frequency, associated distress, the meaning attributed to intrusive memories and the extent of avoidant coping strategies. Starr & Moulds (2006) found that 83% of the sample reported an intrusive memory of an unpleasant event within the past seven days. Negative appraisal was related to intrusion associated distress, after controlling for intrusion frequency. Negative appraisal was also related to maladaptive and avoidant coping strategies, including rumination and suppression. Finally, negative appraisal was related to depression, even when intrusion frequency and memory severity were statistically controlled for. Further multiple regression analyses revealed that negative appraisal of intrusions was the best predictor of depression over and above intrusion frequency.

Williams & Moulds (2007) presented a replication and extension of Starr & Moulds' (2006) findings by assessing the presence of intrusive memories in a sample of 250 students and including a broader array of cognitive avoidance and appraisal measures. Of the sample, 60% of participants reported a negative intrusive memory. Negative appraisal of intrusive memories was positively associated with intrusion-related distress, level of depression and cognitive avoidance mechanisms (Williams & Moulds, 2007).

Research investigating the role of negative appraisal of intrusions as an important factor predicting psychological outcome illuminates the possible need for appraisal-targeted treatments. For example, a recent study investigating the efficacy of

an imaginal reliving intervention on changing the frequency and of intrusive memories associated with PTSD found that negative interpretation of PTSD symptoms was one of several factors predicting poorer outcome in patients (Speckens, Ehlers, Hackmann, & Clark, 2006). Poorer outcome referred to a smaller reduction in intrusion frequency with reliving. Speckens et al (2006) suggested that although overall reliving showed a positive and gradual change in intrusive memory frequency, vividness sense of "nowness" and associated distress in patients with PTSD, people who interpreted intrusions as indicative of mental weakness may be more unwilling to participate in reliving and thus show a poorer response (Speckens et al., 2006).

3.1.2. Negative appraisal and cancer

Although intrusion-appraisal has not yet been considered in cancer patients, the cognitive model of adjustment (Moorey & Greer, 2002) predicted that negative appraisal (i.e. negative meanings that individuals assign to the cancer experience) may influence emotional responses, which include experiences such as intrusive cognitions. In line with this, the meaning of events to an individual with cancer has been highlighted as key to understanding anxiety (Stark & House, 2000) and previous research has found a link between the negative appraisal of disease-threat and severity of stress response scores (Hampton & Frombach, 2000; Stuber, Meeske, Gonzalez, Houskamp, & Pynoos, 1994; Widows et al., 2000). Also, it was found that it was not the presence of cancer related concerns but threat- appraisal that was predictive of later affective disorders (Parle, Jones, & Maguire, 1996).

In the previous study investigating the presence of intrusive cognitions in anxious prostate cancer patients (Study 1), it was found that although intrusions were reported, they were associated with less distress than in other clinical populations. One possible explanation for this finding was that patients were mildly anxious compared to other groups. However, another explanation is that patients with cancer may appraise intrusive cognitions in a less negative way, and thus report less associated distress. No research to date has examined cancer patient's appraisals of intrusive cognitions and thus the present study aimed to investigate the presence of intrusive cognitions in an anxious group of cancer patients and for the first time, ask patients how they appraise intrusive cognitions.

3.1.3. Coping strategies and intrusive cognitions.

Coping strategies implicated in the maintenance of anxiety disorders have included suppression and neutralising (e.g. Freeston, Ladouceur, Provencher, & Blais, 1995) (Salkovskis, 1985; Salkovskis, 1989). Freeston et al (1995) interviewed non-clinical participants about the strategies used to control intrusive thoughts and found that seven types of strategy were used frequently included physical action, thought replacement, analyse, talk about, replace, thought stopping and trying to convince oneself that the thoughts are unimportant.

Research investigating the types of coping strategies used in patients with depression, PTSD or non-clinical groups (Reynolds & Brewin, 1998) found that depressed and PTSD patients were most likely to use suppression and distraction techniques, whilst non-clinical participants were most likely to use thinking through and talking. Overall, participants reported that they used coping strategies from 40-60% of the time. Differences were found in reported effectiveness of coping strategies, where patients with depression or PTSD rated all strategies as less effective than the non-clinical group. For the clinical groups, talking through, distraction and writing were the most effective techniques and suppression was the least effective. Reynolds & Brewin (1998) argued that findings were consistent with previous research which has shown that distraction is associated with a decrease in reported intrusions (Salkovskis & Campbell, 1994) and suppression is associated with an increase in intrusion frequency (the rebound effect: Wegner, Schneider, Carter, & White, 1987). Although very few participants reported the use of writing as a coping strategy, the finding that writing was an effective method of dealing with intrusions is in line with research conducted by Pennebaker and colleagues (e.g. Pennebaker, 1992; Pennebaker, 1997; Pennebaker, Kiecolt-Glaser, & Glaser, 1998), which has shown that disclosure through writing is an effective method of reducing distress (Smyth, 1998).

Research considering negative appraisal of intrusions has also investigated cognitive strategies used in order to control intrusions (Steil & Ehlers, 2000). Strategies such as rumination, suppression, distraction and avoidance of accident reminders were all significantly related to PTSD severity in a large sample of motor vehicle accident survivors (Steil & Ehlers, 2000). Starr & Moulds (2006) found that negative interpretation of intrusive memories was significantly related to depression severity and cognitive avoidance (e.g. suppression and rumination) in a non-clinical group of participants. Williams & Moulds (2007) replicated this finding and reported a

significant positive relationship between dysphoria and cognitive avoidance mechanisms employed in response to negative intrusive memories. Specifically, coping strategies such as suppression ("I try to push the intrusions out of my mind"), rumination ("I dwell on it") and dissociation ("I feel numb") were associated with depression level after taking account of intrusion frequency. Research with high dysphoric individuals (Moulds, Kandris, Williams, & Lang, 2008) explored the use of safety behaviours in response to intrusive memories and concluded that cognitive and behavioural safety behaviours were common (particularly distraction) and these prevented negative interpretations of intrusive memories from being challenged and led to increased intrusion frequency.

In cancer patients, previous research has found that the number of reported intrusive memories is significantly associated with maladaptive adjustment such as helplessness-hopelessness, cognitive avoidance, anxious pre-occupation and fatalism (Brewin et al, 1998a). Study 1 showed that the presence of intrusive cognitions was significantly associated with helplessness-hopelessness and anxious pre-occupation in anxious prostate cancer patients. However, the Mini-MAC (Watson et al., 1994) was designed to ascertain how cancer patients are coping in general and patients have yet to be asked to describe their ways of coping with intrusions specifically. Further research is required in order to identify whether other types of cognitive strategy that have been identified in other clinical groups such as depressed or PTSD patients are associated with intrusive cognitions in cancer patients.

3.1.4. Aims and hypotheses

The aim of this study was to broaden our understanding of the presence and phenomenology of intrusive cognitions in cancer patients. To do this, negative appraisal of intrusive cognitions in anxious cancer patients was assessed for the first time and patients were asked how they cope with intrusive cognitions. The secondary aim was to further explore the relationship between intrusive cognitions and maladaptive adjustment in cancer patients.

Key research questions included:

1. Is the linear relationship between anxiety and intrusions replicable in an anxious sample of cancer patients?

2. How do anxious cancer patients appraise intrusive cognitions?

3. Is negative appraisal associated with intrusion-related distress and anxiety severity?

4. Is negative appraisal related to the extent to which patients engage in maladaptive coping strategies?

5. Is the relationship between the presence/absence of intrusions and maladaptive adjustment replicable?

It was predicted that in an anxious group of cancer patients there would be a positive linear relationship between the number of intrusions reported and anxiety severity. Following previous research, it was predicted that there would be a significant positive association between negative appraisal of intrusive cognitions and anxiety severity and negative appraisal of intrusive cognitions and intrusion associated distress after controlling for intrusion frequency. It was also predicted that negative appraisal of intrusive cognitions would be associated with the extent to which patients engaged in coping strategies and engaging in cognitive avoidance mechanisms would be associated with higher levels of psychological distress. Finally, it was predicted that there would be a positive relationship between the presence of intrusive cognitions and maladaptive adjustment.

3.1.5. Method

I. Patients

Outpatient screening

Of 870 cancer patients approached in outpatient clinics at the Royal Marsden NHS Foundation Trust, 506 (58%) completed and returned the Hospital Anxiety and Depression Scale. Sixteen (2%) patients declined to participate at the screening stage; 1 was recently widowed, 1 had poor English, 2 patients were too distressed and 12 did not specify a reason for their refusal. A further 348 (40%) of patients did not return the HADS. At the screening phase, there were no significant differences between responders and non-responders on time since diagnosis [$t(856) =0.37$, P=.71] or sex [$\chi2(1) = 1.22$, $P = .30$]. However, non-responders were significantly younger than responders [$t(865) =3.19$, P<.01] and were significantly more likely to come from a

different ethnic origin than be White British [$\chi2$ (1) = 16.36, P <.01]. Patients who scored 8 or above on the anxiety sub-scale (28%), were categorised as anxious (Zigmond & Snaith, 1983) and selected for the interview stage of the study. Of these 141 patients, 66 (47%) responded and were interviewed. For the interview stage, responders and non-responders did not differ on time since diagnosis [t(139)=-1.21, P=.23], age [t(139)=0.62, P=.53], ethnic origin [$\chi2$ (1) = 0.32, P=.57] or disease stage [$\chi2$ (2) = 0.49, P=.78]. However, responders were significantly more likely to be female than non-responders [$\chi2$ (1) = 4.53, P <.05].Responders and non-responders did not differ on anxiety [t(139)=-0.89, P=.32], or depression [t(139)=-1.83, P=.07].

Psychological Medicine Invitations

Of 278 cancer patients approached through Psychological Medicine Referrals, 97 (35%) completed and returned the Hospital Anxiety and Depression Scale. Twenty four (8%) were not eligible on the HADS and thus a total of 73 patients from Psychological Medicine were interviewed. Twenty-eight (10%) declined to participate; two felt too ill, two didn't want to talk about their illness, two didn't feel anxious, 1 person did not have enough time and 21 did not give a reason for their refusal. A further 153 patients (55%) did not respond to invitations to interview. There were no significant differences between responders and non-responders on age [t(273) = -0.55, P=.58], time since diagnosis [t(272) = 0.50, P=.62], ethnic origin [$\chi2$ (1) = 3.39, P = .07] or sex [$\chi2$ (1) = 0.36, P = .22].

Final interview sample

A priori power calculations indicated that to detect a medium effect size (r = 0.30, α = .05) with 0.80 power requires a sample size of 64 participants (Cohen, 1988) and therefore at least 64 patients were required to report intrusive cognitions. From outpatient screening and psychological medicine referrals, 139 patients were interviewed and 67 participants reported intrusive cognitions.

II. Measures

Screening

The HADS (Zigmond & Snaith, 1983) is a 14-item self report scale consisting of two subscales; anxiety and depression (see Chapter 2, p 47).

Interview session

Anxiety and depression

Anxiety and depression were assessed in the interview using the Structured Clinical Interview for DSM-IV (SCID; First et al., 2002). At the beginning of the interview, all patients were asked whether their anxiety/concerns were related or unrelated to the cancer diagnosis. Following this, generalised anxiety disorder, major depression, and adjustment disorder were assessed using sub-sections of the SCID. The diagnosis of adjustment disorder was made based on predominant symptoms; adjustment with depressed mood, adjustment with anxiety or adjustment with mixed anxiety and depression.

Intrusive Cognitions

The structured interview (Patel et al., 2007) used in Chapter 2 was employed for the assessment of intrusive cognitions in the present study. The validity check conducted for intrusive thoughts showed that participants reported that the intrusive thoughts were nearly always the same (mean = 98.81, S.D. = 4.53). Visual intrusions were coded as either memories or images, and there was complete agreement between two independent raters ($\kappa = 1.00$).

Impact of Events Scale (IES; Horowitz et al., 1979)

The IES (Horowitz et al, 1979) is a 15-item self report scale which examines subjective distress as a result of a specific event and consists of two subscales, intrusion and avoidance. Further information on the scale is reported in Chapter 2 (p 49).

Appraisal of intrusive cognitions

Six items measuring negative appraisal of intrusive cognitions from the Response to Intrusions Questionnaire (RIQ; Clohessy & Ehlers, 1999) were used including 'Something is wrong with me', 'I am inadequate', 'I cannot cope', 'Some day I will go out of my mind', 'I have a psychological problem' and 'I will not achieve goals that are important to me.' This latter statement replaced 'I will not be able to do

my job well' following Starr & Moulds (2006). Patients were required to rate from 1 (totally disagree) to 7 (totally agree) for each item. In the present study, internal consistency for the scale was high (α =.86).

Coping with intrusive cognitions

Patients were asked to rate on a 100-point scale (0 = *not used at all*, 100 = *used very much*) the extent to which they engaged in three coping strategies- distraction ('I try to distract myself'), suppression ('I try to push the intrusions out of my mind') and rumination ('I dwell on it'). The items were adopted from previous research (Reynolds & Brewin, 1998; Ehlers et al., 1998; Steil & Ehlers, 2000). In line with Reynolds & Brewin (1998), patients were also asked to rate how effective each coping strategy was (0 = *not at all* effective and 100 = *very effective*).

Mini-Mental Adjustment of Cancer Scale (Mini-MAC)

The Mini-MAC (Watson et al, 1994) is a 29-item self report scale used to assess patients coping responses to a cancer diagnosis. Psychometric properties of the scale are reported in Chapter 2 (p 48). In the present study Cronbach's alphas for subscales were; hopelessness/helplessness, α=.87; anxious preoccupation, α=.77, cognitive avoidance, α=.81; fighting spirit, α=.65 and fatalism, α=.20. The low internal consistency for the fatalism subscale can be explained using principal component analysis (Varimax rotation with Kaiser normalization) revealing two principal factors underlying fatalism; the items "*At the moment I take one day at a time*" and "*I've put myself in the hands of God*" comprised one factor and "*I am very optimistic*", "*I've had a good life, what's left is a bonus*" comprised the other. Due to the low reliability of the fatalism subscale, this aspect of coping is not reliably measured and thus will be excluded from further analyses.

The Research Participation Questionnaire (RPQ)

The RPQ (Kassam-Adams & Newman, 2002) is a 12-item scale used to assess reactions to research participation (see Chapter 2, p 50).

III. Procedure

Ethical approval for the study was obtained from the Local Research Ethics Committee. Two groups of patients were approached. A consecutive series of patients attending outpatient clinics were invited to participate. Patients were given the HADS to complete in clinic, or to complete at home and return by mail. Patients subsequently

identified as anxious (=>8) were contacted and invited to participate in an interview, either on the telephone or in person at the Royal Marsden NHS Foundation Trust, Sutton.

At the same time, a second group of patients who had been referred to the Psychological Medicine Service at the hospital were sent an invitation pack inviting them to take part in a study aimed at understanding experiences of worry. The pack included the HADS to send back with the reply form expressing an interest in taking part. Patients identified as anxious (=>8) were contacted by telephone to arrange an interview, either on the telephone or in person. Patients who expressed an interest in taking part, but did not meet criteria for anxiety, were contacted by telephone to inform them that they weren't eligible to take part. For all participants, if a time lapse of more than 21 days had passed, they were asked to repeat the HADS questionnaire, to ensure eligibility.

Patients interviewed also completed the IES, RIQ items and coping scales in response to any reported intrusions (see Reynolds & Brewin, 1998). Participants were asked to complete the Mini-MAC scale and the RPQ.

3.1.6. Results

I. Participant characteristics

The demographic, clinical and psychological characteristics of the total sample are presented in Table 6.

Table 6 Demographic, clinical and psychological characteristics of total sample (*N*=139)

Characteristic	*N (%)*
Age	52.22 (12.18)
Sex	
Male	43 (31)
Female	96 (69)
Ethnic origin	
White British	101 (72.7)
Other	38 (27.3)
Marital status	
Single	20 (14.4)
Married/living with a partner	95 (68.3)
Separated/divorced	20 (14.4)
Widowed	4 (2.9)
Education	
Left school before age of 15 years	7 (5.0)
Secondary Education	38 (27.3)
College or specialised training	35 (25.2)
University or equivalent	37 (26.6)
Unknown	22 (15.8)
Employment	
Employed full time	21 (15.1)
Employed part time	47 (33.8)
Retired	37 (26.6)
Unknown	34 (24.5)
Occupation	
Manual	16 (11.5)
Non manual	79 (56.8)
Unknown	44 (31.7)

Table 6 continued (clinical and psychological variables)

Characteristic	N (%)
Time since diagnosis (months)	38.88 (50.45)
Cancer type	
Testicular	12 (8.6)
Prostate	8 (5.8)
Lymphoma	30 (21.6)
Lung	9 (6.5)
Breast	55 (39.6)
Ovarian	4 (2.9)
Cervical	2 (1.4)
Gastrointestinal	11 (7.9)
Head & Neck	8 (5.8)
Cancer stage	
Early	71 (51.1)
Locally advanced	20 (14.4)
Advanced	35 (25.2)
Unknown	13 (9.3)
Treatment	
On treatment	65 (46.8)
Post-treatment	69 (49.6)
Undecided	5 (3.6)
Interview type	
In person	68 (48.9)
Telephone	71 (51.1)
Time since HADS completion (days)	7.14 (6.70)
HADS anxiety score	11.97 (3.05)
HADS depression score	7.14 (4.03)
Type of distress	
Cancer related	124 (89.2)
Unrelated	15 (10.8)
DSM-IV	
Doesn't meet criteria	89 (64)
Anxiety	5 (3.6)
Depression	5 (3.6)
Adjustment disorder-depression	5 (3.6)
Adjustment disorder- anxiety	24 (17.3)
Adjustment disorder- mixed	11 (7.9)

II. Number and type of intrusive cognitions

Sixty seven patients (48%) reported an intrusive cognition, of whom fourteen patients reported at least one additional intrusion. Of these, three patients reported two intrusive memories, seven patients reported an intrusive memory and an intrusive thought, one patient reported an intrusive image and an intrusive thought and three patients reported an intrusive memory and an intrusive image. Of the 81 intrusions reported in total, 31 were intrusive memories, 8 were intrusive images and 42 were intrusive thoughts.

III. Recruitment, demographic and clinical influence on reporting intrusive cognitions

There was no significant difference in whether patients reported intrusive cognitions according to whether patients were interviewed on the telephone or in person [$\chi2$ (1) = 0.36, P= .55]. However, patients recruited from Psychological Medicine were significantly more likely to report intrusive cognitions than patients recruited from outpatient screening [$\chi2$ (1) = 5.36, P<.05, Cramer's V=.20].

Age, sex, ethnic origin, marital status, education and employment had no affect on whether patients reported intrusive cognitions (P>.05). However, occupation did influence whether patients reported an intrusive cognition [$\chi2$ (2) = 8.06, P<.05, Cramer's V=.24], with the unknown category significantly more likely to report intrusive cognitions than manual and non-manual employees. The unknown category included all patients who were currently unemployed or retired. Manual employees were the least likely to report intrusive cognitions. Independent t-tests revealed that time since diagnosis significantly affected whether patients reported intrusive cognitions [t(137)=-2.46, P<.05, r=.21]. The group of patients reporting intrusive cognitions were significantly longer post diagnosis (mean = 49.60 months, S.D. =58.67) than patients not reporting intrusive cognitions (mean =28.90 months, S.D. =39.22). Finally, the presence of intrusive cognitions was not related to treatment type [$\chi2$ (1) = 0.00 P = .98] or disease stage [$\chi2$ (2) = 3.21 P = .20].

IV. Content and timescale of intrusions

Fifty-eight (72%) of the intrusive cognitions related to the person's own experience of having cancer, and thirteen (16%) of the intrusions related to a relative's

illness, injury or death (three specifically from cancer). In total, 75% of reported intrusions were specifically related to cancer and ten (12%) were unrelated to illness or death. Fisher's Exact Tests showed that intrusive cognitions unrelated to cancer were significantly more likely to be visual intrusions (21/23) than verbal intrusions (2/23) (P<.001) and cancer-related intrusions were equally likely to be visual (19/58) and verbal (21/58). Exploratory analyses investigating potential differences between whether intrusive cognitions were cancer-related or cancer-unrelated and intrusion qualities (e.g. frequency, distress, uncontrollability, interference, vividness, negative appraisal and coping) found no significant relationships (P>.05). For intrusive images, four of eight of the reported images were related to a past event and the four remaining intrusive images were future oriented. For intrusive thoughts, thirty-four (81%) were future oriented, 1 was related to past event, 1 was both future and present oriented and 1 was both future and past oriented. See Table 7 and Table 8 for examples of different types of intrusive cognitions reported in the present study.

Table 7 Content of cancer-related intrusive cognitions

Intrusion type	Timescale	Content
Memory	Past	Having high dose chemotherapy, smell of sweet corn and messing the bed because I am incontinent
Image	Future	Looking down on myself at my own funeral and seeing my friend and family who are crying and hearing music playing
Thought	Future	I am going to die, the cancer is not going to go away

Table 8 Content of unrelated intrusive cognitions

Intrusion type	Timescale	Content
Memory	Past	Boss at work, going to attack me and feeling humiliated
Image	Future	Horrific monster type faces with sharp horrible teeth, snarling and mutating coming towards me
Thought	Future	Fears about flat being destroyed

V. Characteristics of intrusive cognitions

Table 9 shows the mean characteristics of intrusive cognitions. Of the total sample of cognitions (n=81), intrusive cognitions were reported to occur just over half the time in the past week, to interfere moderately with daily life and to be moderately to severely distressing and severely uncontrollable. Intrusions most often lasted for minutes rather than being fleeting or lasting for hours. Analyses exploring the influence of clinical and demographic variables on the impact of intrusive cognitions, including distress, interference and uncontrollability found that there were almost no relationships (P>.05) except that age was significantly negatively correlated with intrusion-specific distress (R=-.28, P<.05); younger patients reported higher levels of intrusion-specific distress. This association remained even when anxiety severity and intrusion frequency were controlled for (R=-.31, P<.01).

To investigate the difference between specific characteristics of visual and verbal intrusions for 67 patients reporting intrusive cognitions, independent t-tests were conducted. For patients reporting more than one intrusion, one intrusion was randomly selected be included in the analysis. Analyses investigating the difference between visual (n=33) and verbal (n=34) intrusions found that visual intrusions were associated with significantly more subjective distress, including intrusion and avoidance, according to the IES. Visual intrusions were also more uncontrollable than verbal intrusions, although this difference did not reach statistical significance. A Fisher exact test showed that visual intrusions were significantly shorter in duration than verbal intrusions, although both visual and verbal intrusions usually lasted for minutes. There was no association between whether intrusions were visual or verbal and each type of reported emotion (P>.05 for all).

Table 9 Characteristics of total sample of intrusive cognitions (*n*=81) and visual (*n*=33) and verbal intrusions (*n*=34)

Characteristic	Total intrusions Mean (SD)	Visual intrusions Mean (SD)	Verbal intrusions Mean (SD)	Difference between visual and verbal intrusions
Frequency	56.30 (24.05)	56.82 (24.17)	59.85 (19.95)	$t(65)=0.56, P=.58$
Interference	49.93 (32.43)	45.45 (34.45)	54.09 (31.40)	$t(65)=0.47, P=.29$
Uncontrollability	81.43 (23.83)	85.00 (24.01)	75.15 (23.69)	$t(65)=-1.70, P=.09$
Distress	69.94 (26.49)	70.00 (27.64)	69.85 (23.60)	$t(65)=-0.2, P=.98$
IES total	39.59 (14.31)	42.33 (12.93)	34.32 (13.28)	$t(65)=-2.50, P<.01, r=.30$
IES avoidance	18.69 (9.15)	19.64 (8.47)	15.68 (8.09)	$t(65)=-1.96, P<.05, r=.24$
IES intrusion	20.90 (7.81)	22.70 (7.37)	18.65 (7.39)	$t(65)=-2.25, P<.05, r=.27$
Duration N (%)				
Seconds	17 (21)	9 (27.3)	1(3)	*Fisher exact test* $<.05$, Cramer's V =0.34
Minutes	52 (64.2)	20 (60.6)	26(78.8)	
Hours	12 (14.8)	4 (12.1)	6 (18.2)	

For the 67 patients reporting intrusive cognitions, it was investigated to what extent emotions were associated with intrusions (Table 10). A repeated measures analysis of variance (ANOVA) was conducted. For patients reporting more than one intrusion, one intrusion was chosen at random to be included in the analysis. One person did not report emotions associated with intrusions and thus the analyses are for $n=66$. There was a significant difference between how strongly various emotions were associated with intrusive cognitions [$F(5,325)=68.87$, $P=.001$, $\eta_p^2 =.51$]. Sadness, anxiety and helplessness were most strongly associated with intrusive cognitions, and least significant difference (LSD) pairwise comparisons revealed there were no significant differences between these three emotions. Shame was the least endorsed emotion and this was reported significantly less than all other emotions ($P<.01$). All other emotion comparisons were significant at $P<.01$. A cautionary note is required when interpreting the ANOVA described, as guilt and shame both had positively skewed distributions and anxiety and helplessness had negatively skewed distributions.

Table 10 Emotions associated with intrusive cognitions ($n=66$)

Emotion	Mean (SD)
Sadness	69.50 (34.81)[a]
Guilt	20.61 (36.71)[d]
Shame	8.64 (26.31)[c]
Anger	40.53 (38.71)[b]
Anxiety	78.56 (25.81)[a]
Helplessness	75.59 (30.50)[a]

Range, 0 = (*not at all associated)* to 100=(*very much so associated)*.

Means followed by different letters differ significantly according to how much they are associated with intrusive cognitions ($P < .01$).

Post-hoc exploration of the emotion data for $n=66$ intrusions found that guilt was most strongly associated with other-focused ($n= 17$) events compared to self-focused ($n=49$) events (R=.27, P=.03) and anxiety was most strongly associated with self-focused events compared to other-focused events (R=-.21, P=.08), although this just failed to reach statistical significance.

VI. Specific characteristics of intrusive memories and images

Intrusive memories and intrusive images were reported to be extremely vivid (mean = 89.26, S.D. = 15.74 and mean = 85.63, S.D. = 21.45 respectively; 0 = *hazy memory*, 100= *clearest and vividest memory*). For intrusive memories, patients reported experiencing emotions the same as, or similar to those experienced during the actual event (mean = 82.10, S.D. = 27.57; 0=*not at all*, 100=*very much so*) and reported moderately reliving the memory (mean = 54.52, S.D. = 41.52; 0=*not at all*, 100=*very much so*), as though it were happening all over again, right now. Re-experiencing physical sensations was reported "a little" (mean = 37.74, S.D. =43.64; 0=*not at all*, 100=*very much so*).

VII. Intrusive cognitions and anxiety

In order to investigate the relationship between number of intrusive cognitions and anxiety level, the total sample was divided into three groups according to Snaith & Zigmond's (1994) criteria; mildly anxious (*n*=53, HADS =8-10), moderately anxious (*n*=55, HADS =11-14) and severely anxious (*n*=31, HADS = 15-21). A one-way ANOVA indicated a significant overall effect of anxiety category on the number of intrusive cognitions reported [F(2,136)=3.40, P<.05] and least significant difference (LSD) pairwise comparisons revealed that severely anxious patients reported significantly more intrusive cognitions, than mildly anxious patients (P<.01, r=.26), and there were no significant differences between moderately anxious and mildly and severely anxious patients (P>.05). A polynomial contrast analysis showed that the mean number of intrusions increases (contrast estimate = 0.27, P<.05) as anxiety level increases. The linear relationship between anxiety and intrusive cognitions may explain why a higher number of patients from Psychological Medicine reported intrusive cognitions than patients screened in outpatient clinics. Patients recruited from Psychological Medicine referrals were significantly more anxious [t(137)=-3.67, P<.01, r=.30] and depressed [t(137)=-3.65, P<.01, r=.30] than patients meeting cut-off for anxiety via outpatient screening. Indeed, the association between recruitment type and presence/absence of intrusions [R=.20, P<.05] disappears when anxiety is statistically controlled [R=.14, P=.14].

VIII. Intrusion appraisal and coping

Means and standard deviations for all measures for participants reporting intrusive cognitions are reported in Table 11. As would be expected, anxiety and depression were higher for those patients reporting intrusive cognitions than in the overall sample. A repeated measures ANOVA was conducted which showed that there were significant differences according to how much three coping strategies were used in response to intrusive cognitions [$F(2,132)=12.44$, $P=.01$, $\eta_p^2 =.16$]. Least significant difference (LSD) pairwise comparisons revealed that rumination was used significantly less frequently than both suppression and distraction ($P<.01$) and these did not differ from each other ($P>.05$). The reported effectiveness of coping strategies was also subjected to a repeated measures ANOVA and showed significant differences according to how effective strategies were [$F(2,62)^1 =16.16$, $P=.01$, $\eta_p^2 =.34$]. Least significant difference (LSD) pairwise comparisons revealed that distraction was considered more effective than suppression and rumination ($P<.01$ for both) and suppression was considered more effective than rumination ($P <.05$).

Table 11 Means and standard deviations for self-report measures ($n=67$)

Measure	Mean	Standard Deviation
Anxiety (HADS)	12.67	3.11
Depression (HADS)	8.07	3.97
IES total	38.27	13.62
IES intrusion	20.64	7.60
IES avoidance	17.63	8.45
RIQ negative appraisal	19.31	10.82
Distraction	72.54	35.42
Suppression	62.31	38.27
Rumination	43.51	37.97
Distraction effectiveness	64.34	31.50
Suppression effectiveness	37.20	33.06
Rumination effectiveness	20.12	24.23

---

[1] Note-due to success only reported for patients endorsing the coping strategy in the first place the total sample for this is $n=32^1$

IX. *Negative intrusion appraisal and anxiety, depression and intrusion related distress.*

Table 12 contains the correlations between negative appraisal of intrusions, anxiety, depression and intrusion-related distress. Negative appraisal was positively correlated with anxiety, depression and intrusion-related distress (0=*not at all*, 100-*severely distressing*), even after controlling for intrusion frequency. Negative appraisal was mildly associated with subjective distress associated with intrusions (IES) and was not correlated with the intrusion sub-scale of the IES. However, negative appraisal was positively correlated with the avoidance sub-scale of the IES. After controlling for intrusion frequency, only the relationship between negative appraisal and IES avoidance remained.

Table 12 Pearson correlations of negative meaning of intrusive cognitions and anxiety, depression, intrusion controllability and distress (*n=67*)

	Negative appraisal (RIQ)	Controlling for frequency
Anxiety	.37**	.29**
Depression	.42**	.31**
Intrusion uncontrollability	.31**	.27**
Intrusion distress	.42**	.34**
Total IES score	.22*	.15
Avoidance (IES)	.28**	.23*
Intrusion (IES)	.08	.01

*P<.05, ** P<.01 (one-tailed)

X. Negative intrusion appraisal and intrusion-specific coping

Table 13 shows the correlations between negative appraisal of intrusions and coping strategies used in response to the intrusions. Rumination was significantly associated with negative appraisal of intrusions and this remained significant after controlling for intrusion frequency. Table 14 shows the correlations between coping strategies used in response to intrusive cognitions and anxiety and depression severity. Although rumination is positively associated with depression severity, this relationship does not hold when intrusion frequency is controlled for. However, avoidance of intrusions as assessed by IES was significantly correlated with depression severity and this remained significant after controlling for intrusion frequency. Overall, subjective distress associated with intrusive cognitions was associated with anxiety and depression, after controlling for intrusion frequency.

Table 13 Pearson correlations of negative meaning of intrusive cognitions and coping (*n*=67)

	Negative appraisal (RIQ)	Controlling for frequency
Distraction	.17	.08
Suppression	.19	.10
Rumination	.41**	.33**

*P<.05, ** P<.01 (one-tailed)

Table 14 Pearson correlations of intrusion specific coping and anxiety and depression (*n*=67)

	Anxiety	Depression
Distraction	.08 (.03)	.06 (-.02)
Suppression	-.02 (-.10)	.02 (-.09)
Rumination	.04 (-.05)	.21* (.10)
Total IES score	.25**(.21*)	.40**(.35**)
Avoidance (IES)	.13 (.09)	.32**(.28**)
Intrusion (IES)	.30**(.27*)	.35**(.32**)

*P<.05 (one-tailed). Partial correlations (controlling for intrusion frequency) in brackets

XI. Intrusive cognitions and adjustment to cancer

Biserial correlations between the presence or absence of intrusive cognitions and the Mini-MAC score for adjustment to cancer showed that when anxiety was statistically controlled for, the presence of intrusive cognitions was significantly correlated with helplessness-hopelessness and anxious preoccupation (Table 15). An unexpected finding was that interview type (telephone vs. in person) was significantly associated with scores on the cognitive avoidance subscale of the Mini-MAC. Patients interviewed in person scored significantly higher on cognitive avoidance than those interviewed on the telephone [$t(137)=-3.16,P<.01, r =.26$]. It may be that patients who find it harder to talk about their illness prefer to be interviewed face to face rather than on the telephone. There were no other significant relationships between interview type and Mini-MAC scores ($P>.05$ for 4 other subscales).

Table 15 Correlations between the presence or absence of intrusive cognitions and adjustment to cancer (*N=139*)

Mini-MAC subscales	Presence or absence of intrusive cognitions	Presence or absence of intrusive cognitions (controlling for anxiety)
Helplessness-hopelessness	.27**	.20**
Anxious preoccupation	.23**	.16*
Fighting spirit	.12	.09
Cognitive avoidance	.02	.03

*$P<.05$, ** $P<.01$ (one-tailed)

In order to start unravelling the intrusion-coping relationship found in cancer patients, exploratory analyses were conducted to investigate whether specific characteristics of intrusive cognitions were related to specific aspects of adjustment to cancer. Table 16 shows that helplessness-hopelessness subscale of the Mini-MAC is significantly associated with several intrusion-specific characteristics, including uncontrollability, frequency, distress, interference and subjective distress associated with intrusions, specifically level of intrusion. Anxious preoccupation was associated with uncontrollability of intrusions. Fighting spirit was negatively associated with level of intrusion, so that the higher levels of intrusion were associated with lower levels of

fighting spirit. Cognitive avoidance was strongly associated with intrusion specific avoidance.

Table 16 Correlations between intrusion characteristics and adjustment to cancer (*n*=67)

Mini-MAC subscales	Uncontrol-lability	Frequency	Distress	Interfer-ence	IES total	IES intrusion	IES avoidance
Helpless-hopeless	.35**	.35**	.35**	.41**	.28*	.28*	.19
Anxious preoccupation	.28**	.18	.17	.06	.23	.18	.21
Fighting spirit	-.08	.04	-.07	.05	-.17	-.27*	-.07
Cognitive avoidance	.12	-.00	-.00	-.12	.26*	-.07	.48**

** *P* <.01, * *P*<.05 (two-tailed)

XII. The RPQ

Of 139 participants, 135 completed the RPQ; feedback was positive with a range of scores from 42 to 60 (mean=56.01, S.D.=3.26), out of a maximum score of 60. There was no significant difference on average RPQ score [$t(133, =1.16, P=.25]$ between those reporting intrusive cognitions (mean=55.68, S.D.=3.24) and those not reporting intrusive cognitions (mean=56.33, S.D.=3.27).

3.1.7. Discussion

The present study replicates and expands findings of Study 1, that anxious cancer patients experience frequent negative intrusive cognitions which are distressing, interfering, uncontrollable and commonly related to future concerns. It was also found that cancer patients appraised intrusive cognitions in a negative way, for example, as a sign that they could not cope or have a psychological problem. Mean negative appraisal of intrusive cognitions was in fact higher in cancer patients compared to ambulance workers and non-clinical populations (Clohessy & Ehlers, 1999; Starr & Moulds, 2006) and equivalent to a depressed sample (Moulds et al, 2008). This contradicts the suggestion that one explanation for lower frequency and impact of intrusions in cancer patients is that they do not perceive intrusions as a sign of mental fragility. Rather, the linear relationship between anxiety and intrusive cognitions remains a robust finding and supports the notion that phenomenological experiences such as intrusive cognitions exist on a continuum from non-clinical (Brewin et al., 1996; Starr & Moulds, 2006) to clinical populations (Hackmann et al., 2004; Patel et al., 2007).

As predicted, negative appraisal of intrusive cognitions was related to general psychological distress including anxiety and depression severity and negative appraisal was also related to intrusion specific characteristics, including distress and uncontrollability. These relationships remained after controlling for intrusion frequency. This follows a pattern of results reported in PTSD samples (ambulance workers, Clohessy & Ehlers, 1999; victims of sexual and physical assault, Dunmore et al, 2001; motor vehicle accident survivors, Ehlers et al, 1998) bereaved (Boelen et al 2003) and student samples (Starr & Moulds, 2006; Williams & Moulds, 2007). Rumination and intrusion avoidance were also associated with negative appraisal, irrespective of intrusion frequency. This is in line with the suggestion that cognitive avoidance and rumination used in response to intrusive cognitions paradoxically prevent the elaboration and integration of intrusive cognitions and help maintain negative appraisals (Michael et al, 2005). Thus, such strategies may serve to exacerbate rather than ameliorate intrusive cognitions which in turn lead to the maintenance of distress (Ehlers & Steil, 1995). In the present study, avoidance of intrusions was associated with depression severity after controlling for intrusion frequency. Overall the results support the notion that negative appraisal of intrusive cognitions plays a role in the development of emotional distress after cancer diagnosis.

In terms of coping with intrusive cognitions, distraction was the most common strategy and was considered the most successful, followed by suppression and rumination. The success of distraction as a technique for coping with intrusions parallels previous research which has found that distraction is associated with a decrease in intrusive cognitions (Salkovskis & Campbell, 1994). Contrary to previous research (e.g. Steil & Ehlers, 2000) suppression and distraction were not associated with negative appraisal of intrusive cognitions. This may be because suppression and distraction were considered more successful than rumination, with distraction rated a successful coping strategy. In previous research which found distraction to be the most common coping strategy in response to intrusive memories (Moulds et al, 2008), it was suggested that distraction encompasses an array of different responses (e.g. use of positive image, listening to music) and thus closer screening of idiosyncratic responses may be required.

A number of further unexpected findings also require explanation. For example, rumination, suppression and distraction were not associated with general distress in the present study. Previous research (Starr & Moulds, 2006) also found no relationship between the item "I dwell on it" and depression severity and suggested that it may reflect a combination of positive and negative types of rumination including experiential self-focus and conceptual-evaluative rumination (Watkins, 2004). Experiential self-focus involves a non-evaluative focusing of attention on direct experience which facilitates emotional processing (e.g. "How did you feel moment-by-moment?), whereas conceptual-evaluative rumination (e.g. "Why did you feel this way?") is more often linked to maladaptive outcomes (Watkins, 2004)). Starr & Moulds (2006) also found suppression to be unrelated to depression severity, whilst Clohessy & Ehlers (1999) did report a relationship. Thus, future experimental research may be required to resolve inconsistencies and elucidate the role of thought suppression on the frequency and impact of intrusive cognitions (Starr & Moulds, 2006). Finally, distraction may have been unrelated to psychological distress because it was often deemed an effective coping strategy for reducing the frequency and impact of intrusive cognitions.

The present study replicated the finding (Study 1) that there is a positive relationship between the presence of intrusive cognitions and maladaptive adjustment to cancer, including anxious preoccupation and helplessness-hopelessness. Closer inspection of this relationship revealed that helplessness-hopelessness was significantly correlated with several key negative characteristics of intrusive cognitions; uncontrollability, frequency, distress, interference and level of intrusion. The link

between individual characteristics of intrusive cognitions and helplessness-hopelessness is important, as this subscale of the Mini-MAC has been associated with 5 year (Watson, Haviland, Greer, Davidson, & Bliss, 1999) and 10 year (Watson, Homewood, Haviland, & Bliss, 2005) disease-free survival as well as psychological outcomes including anxiety, depression and emotional control (Watson et al., 1991). Due to the correlational nature of this finding, it is not clear whether experiencing particularly frequent, uncontrollable, distressing intrusive cognitions leads to individuals feeling more helpless and hopeless about their disease or whether an overall sense of hopelessness makes it more difficult to cope with intrusive cognitions when they arise. Either way, it is important to address the relationship between the presence of intrusive cognitions and feelings of helplessness-hopelessness in psychological therapy.

General cognitive avoidance of cancer was significantly related to avoidance of intrusive cognitions, which suggests that someone who is likely to avoid thinking about the overall implications of a cancer diagnosis, may also be likely to try avoiding specific intrusive cognitions about cancer, illness and death and vice versa. For these patients, cognitive avoidance strategies may prove unsuccessful and paradoxically lead to an increase in intrusions and maladaptive adjustment. As might be expected, fighting spirit was inversely related to level of intrusion so that higher levels fighting spirit (e.g. "I see my illness as a challenge") were related to lower levels of intrusion. An unexpected relationship was the negative correlation between fatalism and level of intrusion, although low internal consistency on this subscale prevents clear interpretation. Although these are preliminary findings, the relationship between intrusive cognitions and maladaptive adjustment is clearly a complex one and merits further research.

The content of intrusive cognitions was similar to content reported in Study 1, where intrusions were most often related to personal or family-related illness injury or death. Previous research with clinical populations (depression and PTSD) has found that the content of intrusions influences accompanying emotions (Reynolds & Brewin, 1999). For example, sadness and guilt were mainly associated with other-focused events such as family deaths or illnesses and fear was mainly associated with self-focussed events such as personal injury. In the present study, guilt was associated with other-focused intrusions and anxiety was associated with self-focused intrusions. Thus, another similarity between intrusive cognitions in cancer patients and those in clinical samples was found and future research could explore this further.

Comparison between cancer-related and cancer-unrelated intrusions revealed that unrelated intrusions were more likely to be visual than verbal. The majority of unrelated intrusions were intrusive memories of a friend or family member's death. Experiencing physical illness including confiding in family and friends, frequent hospital visits and ongoing treatment may provide powerful triggers of these memories which become frequent, intruding and difficult to control. Very few intrusions were completely unrelated to illness, injury or death and these often included negative events where individuals felt humiliated or their life had failed in some way. This echoes the findings of Study 1, where four intrusions unrelated to illness, injury or death represented past or future failures. There were no significant differences between cancer-related intrusions and unrelated intrusions in terms of qualities such as frequency, associated distress, uncontrollability, interference, vividness, accompanying emotions, negative appraisal and coping. The cognitive model of adjustment to cancer (Moorey & Greer, 2002) provides a potential explanation for the finding that intrusive cognitions in cancer patients are not necessarily related to the cancer experience, or illness, injury or death. The model emphasised the extensive nature of concerns which may be disease specific (e.g. prognosis) or related more generally to appraisals of the self, others and the world. Following a cancer diagnosis, changes in personal and social roles may lead to negative beliefs about the self, for example that individuals can no longer work and provide financial support for the family or that they have failed in life and not fulfilled their potential.

The relatively large sample of intrusions in the present study allowed novel comparisons to be made between visual and verbal intrusions in cancer patients. As with previous research (Study 1), intrusive images were relatively uncommon, unlike in some studies of patients with anxiety disorders (e.g. Hackmann et al, 2000). Instead, memories were more prominent, with the majority of patients describing contextualised imagery anchored in the past. Comparisons of visual and verbal intrusions revealed that visual intrusions were associated with significantly more subjective distress (intrusion and avoidance) than verbal intrusions and were more difficult to control. Also, intrusive imagery was more likely to last for seconds compared to intrusive thoughts. These findings support previous work which has emphasised the fleeting nature of intrusive imagery (Holmes, 2004; Speckens, Ehlers, Hackmann, Ruths, & Clark, 2007) and the special relationship between imagery and emotion (Holmes & Mathews, 2005). Previous research found that imagery has a greater impact on emotion than verbal

representations of the same material because i) images are more like actual percepts (Kosslyn, Ganis, & Thompson, 2001) ii) images trigger episodes in autobiographical memory (Conway & Pleydell-Pearce, 2000) and iii) images often include personal involvement in events (Holmes et al., 2008).

Holmes et al (2008) suggested that processing emotional properties and consequences of events happening in the immediate sensory environment is prioritised in the brain and thus mental operations (e.g. intrusive imagery) relying on the same brain regions may be given higher priority. The finding that intrusive imagery is often defined by a sense of "nowness," the feeling that the intrusive memory is happening all over again, right now, is also in concordance with the finding that intrusive imagery is more intruding, less controllable and leads to greater avoidance. The sense of nowness reported in the present study matched levels reported in PTSD samples (Hackmann et al, 2004) and supports the argument that a sense of "nowness" may not be restricted to flashback experiences accompanied by a loss of awareness, but to other types of intrusive memories (Hackmann et al, 2004).

Although these findings are post-hoc and require further investigation, the discovery that images and thoughts are distinguishable in this population supports previous research emphasising their independence (Brewin et al, 1996). For example, thoughts were more likely to be characterised by fear and memories were more likely to be characterised by sadness and happiness (Brewin et al, 1996). Brewin et al (1996) suggested that participants found it easy to distinguish between these two types of cognitions, which is an important point for future research investigating intrusive cognitions in cancer patients. So far, research has focussed almost exclusively on the presence of intrusive thoughts in cancer patients (Kangas et al, 2002), leaving an entire category of intrusions unexplored. Future research investigating intrusive cognitions in cancer patients should consider the distinction between types of intrusions, including visual or verbal intrusions and past or future-oriented intrusions.

Although the present study did not set out to assess risk factors for intrusive cognitions in cancer patients, some exploratory analyses revealed some interesting findings. The finding that disease stage did not influence whether patients reported intrusive cognitions supports the suggestion in Chapter 2, that cancer-specific intrusions may represent general concerns regarding disease-threat rather than prognosis-specific threats. Contrary to previous research (e.g. Hampton & Frombach, 2000) female patients were not more likely to report intrusive cognitions than male patients.

However, occupation had a significant influence on whether patients reported intrusions or not, with patients within the "unknown" category more likely to report intrusions and patients with manual jobs the least likely to report intrusions. A possible explanation for this is that the unknown category included patients who were currently unemployed or retired and thus those less likely to have distraction as a potential tool for coping with intrusive cognitions when they arise. Another explanation could be that these patients have fewer financial resources, which has also been identified as a risk factor for PTSD symptomatology (Cordova et al, 1995). To date, although sociodemographic characteristics have been recognised as significant determinants in the severity of stress response symptoms (Gurevich et al., 2002) occupation has not been highlighted as a potential factor. Future research assessing risk factors for intrusive symptoms in cancer patients should take this into account.

Surprisingly, time since diagnosis was higher in the group of patients reporting intrusive cognitions, than those not reporting intrusive cognitions. This contradicts previous research, where a greater proximity to diagnosis is associated with a higher frequency and severity of stress response symptoms (Gurevich et al, 2002). The finding that patients report intrusive cognitions after a substantial time since diagnosis highlights the prolonged nature of cancer as a stressor that can precipitate intrusive symptomatology throughout the course of the disease. Theories of trauma (Horowitz, 1986; Brewin et al., 1996) recognised that experiencing intrusive symptoms can be an adaptive response aimed at integrating traumatic information into existing memory systems. However when integration fails, individuals can experience ongoing and severe stress response reactions that require psychological therapy (Horowitz, 1986). The adoption of maladaptive coping strategies (e.g. cognitive avoidance) and the severity and length of trauma all increase the likelihood of integration failure and ongoing intrusive symptoms (Brewin et al, 1996).

For those patients reporting intrusive cognitions, younger age was associated with higher levels of intrusion specific distress, irrespective of anxiety severity and intrusions frequency. This is in line with previous research where younger patients reported higher rates of intrusive symptoms (Cordova et al., 1995; Green et al., 1998; Tjemsland et al., 1998).

Limitations of the present study include the inability to draw conclusions about directionality. Prospective research is required to confirm the relationships as the cross-sectional design precludes causal interpretation. Also, the number of correlations

conducted may increase the probability that relationships were encountered, although the consistent pattern found across correlations and concordance with previous research, means it is unlikely the findings were found by chance. Intrusion-specific coping was assessed with single-item measures which may have compromised the reliability of the assessment and underestimated the effect of intrusion-coping on negative appraisal and distress severity. Thus, further research investigating these concepts may benefit from longer scales. Also, dissociation was not included as a coping strategy in the present study and this should be rectified in subsequent research. Another area of potential interest not systematically explored in the present study was whether cancer patients report intrusive cognitions which include other sensory modalities such as hearing, taste, smell and pain (e.g. Hackmann et al, 2004; Whalley, Farmer, & Brewin, 2007). Descriptions given by patients often included a sensory component (e.g. smell of sweet corn, funeral music) which concords with the sensory component of intrusions reported in other samples (e.g. PTSD; Hackmann et al, 2004). Further, Hackmann et al (2004) raised the possibility that people who experience prolonged or repeated traumatic events may have additional or different types of intrusive cognitions, and to investigate these differences remains a question for future research.

Although negative internal appraisals were considered, other appraisals may play a role in the presence and maintenance of intrusive cognitions in cancer patients (Fairbrother & Rachman, 2006; O'Donnell, Elliott, Wolfgang, & Creamer, 2007). For example, internal threat appraisal encompasses individual perceptions of the self as capable, acceptable and in control in general, in addition to how individuals perceive their reaction to intrusive cognitions (O'Donnell et al, 2007). External threat appraisals (e.g. disease-specific threat) are also important and have consistently played a role in psychological models of cancer such as the cognitive model of adjustment (Moorey & Greer, 2002) and found to be related to stress response symptoms (e.g. Hampton & Frombach, 2000). Others have suggested that future research should assess the content of intrusive cognitions to understand why some are more distressing than others and whether individual meaning may influence the content and type of intrusions (Vickberg, Bovbjerg, Duhamel, Currie, & Redd, 2000). Although the meaning of intrusive cognitions in cancer patients has been assessed for the first time, this work could be extended to take other definitions of meaning into account (White, 2004), such as global meaning (e.g. global beliefs and expectations of the world) and situational meaning (e.g. interaction of global beliefs with personal-environment interaction). Also, positive

appraisal of events may play a role in the alleviation of emotional distress in cancer patients and it has been asserted that assigning positive meaning has been related to positive outcomes, including fewer intrusive thoughts (White, 2004).

Overall, the present study adds to our understanding of the phenomenology of intrusive cognitions in cancer patients. The similarity between the types of intrusive cognitions found in cancer patients and patients with psychological disorders supports a transdiagnostic approach (Harvey, Watkins, Mansell, & Shafran, 2004) aimed at identifying experiences which are common across emotional disorders and across non-clinical and clinical populations (Brewin et al, 1996). The finding that the negative appraisal of intrusive cognitions plays a significant role in anxiety and depression severity and intrusion-specific distress strengthens the argument that intrusive cognitions are an important area of research in psychooncology. In particular, if the phenomenology of intrusive cognitions in cancer patients shows similarities to intrusive cognitions found in other clinical populations, psychological therapies developed to reduce the impact of intrusions in these samples may provide a reduction in distress for cancer patients reporting these experiences.

Chapter 4

The use of imagery in psychological therapy

Besides work with PTSD populations (Hackmann, 1998), imagery has recently been neglected in psychological therapy (Hackmann & Holmes, 2004). In Chapter 1, the utility of applying PTSD models to cancer patients was critically appraised. Two important implications for psychological therapy were noted. Firstly, it was recognised that although research has assessed the prevalence of PTSD in cancer populations, therapies developed to treat PTSD (e.g. reliving therapy) have rarely been applied. Secondly, cancer may not truly fit a PTSD model and thus these therapies may be inappropriate. Study 1 and Study 2 found that cancer patients reported negative intrusive imagery and it was associated with anxiety severity. Importantly, in Study 2, intrusive images were as common as intrusive thoughts and were associated with increased intrusiveness and uncontrollability. Images were similar to those reported in other samples, including PTSD, depressed and other anxious groups. For example, imagery was frequent, interfering, associated with significant distress and a sense of nowness. Chapter 3 proposed adopting a transdiagnostic approach, where intrusive symptoms are identified as common experiences across emotional disorders and clinical and non-clinical groups. With this in mind, this chapter discusses the history of imagery in therapy, the application of imagery therapy to PTSD and a renewed interest in the use of imagery in therapy across clinical groups. Research using imagery in therapy for cancer patients is appraised and in line with a transdiagnostic approach, a modular view of therapy is presented. Finally, research supporting the effectiveness of a specific therapy, imagery rescripting, is reviewed in anticipation of its application to cancer patients in Study 3 (Chapter 5).

4.1. An overview and history of the use of imagery in therapy

The potential use of imagery in psychological therapy has been recognised since 1889, where Pierre Janet described examples of imagery substitution, (i.e. replacing one image with another) in hysterical patients (Van Der Kolk & Van Der Hart, 1989). For example, Edwards (2007) described one of Janet's cases of a woman, Marie with severe psychological problems including psychogenic blindness in the left eye (see Edwards, 2007). Marie's problems started following an incident when she was 6 years old and shared a bed with a child disfigured by impetigo on her face. Janet's imagery substitution involved encouraging Marie to re-experience the memory and to imagine the girl as a friendly person and visualise stroking the girls face without fear. Following

therapy, Marie's sight returned and associated psychological symptoms disappeared (Edwards, 2007).

Other early use of imagery in therapy included work by Freud and Jung (see Hackmann, 1998 for a review). They both recognised that bringing memory images and imaginative images into awareness and reflecting on them could be therapeutic. For example, Jung developed a technique called active imagination (Jung, 1960), where under meditation, patients allowed any spontaneous images to emerge and watch them without intervening. These visualisations were discussed with the therapist and their symbolism analysed (Hackmann, 1998). Other more direct imagery techniques included Guided Affective Imagery (Leuner, 1969) where patients were given a scene such as a meadow and prompted to make a journey and deal with symbolic material as it appeared. The theory was that the material would demonstrate areas of conflict in the person's life (Hackmann, 1998). Gestalt therapy developed by Fritz Perls also utilised mental imagery (Hackmann, 1998). An important strategy of Gestalt therapy was to increase the immediacy and completeness of information by bringing it into the here and now by describing the imagery in the present-tense. For example, patients were encouraged to work with imagery including memories and dreams by imagining themselves as each of the other characters in the image to provide alternative perspectives in various situations (Perls, 1971).

Hackmann (1998) discussed the use of imagery in behaviour therapy, including systematic desensitisation (Wolpe, 1958), covert conditioning (Cautela, 1977) and imaginal flooding (Stampfl & Levis, 1967). Systematic desensitisation (Wolpe, 1958) is a technique which involves pairing a feared stimulus (e.g. snake phobia) with a positive stimulus (e.g. relaxation). The feared response is approached in a graded way, via a series of imagined hierarchical scenarios (e.g. imagine being in the same room as a snake, imagine touching the snake). Over a number of trials (i.e. pairings), the fear evoked by the negative stimulus is reduced and there is an increase in the amount of approach behaviour (Hackmann, 1998). Covert conditioning, conceptualised within an operant conditioning model (Cautela, 1977) involved changing behaviour patterns by imagining them to be followed by positive or negative reinforcement or by punishment. The technique has been used to treat maladaptive behaviours and has been applied to smoking, drinking and obesity. For example, a smoker may be asked to imagine smoking without the taste or smell of the cigarette (Cautela, 1971). Imaginal flooding involves imagining a feared stimulus (e.g. snake) without associated punishment (e.g.

snake biting). Imaginal flooding is similar to reliving as imagining the feared item repetitively leads to the extinction of anxiety (Hackmann, 1998).

Beck also recognised the value of imagery when he first developed cognitive therapy (Beck, 1976). Based on the premise that the appraisal of events affects how people feel and can be the cause of psychological disorders, Beck (1976) suggested that underlying meaning could be accessed through imagery, including images, memories and dreams. Cognitive therapy may use imagery by unpacking the meaning of imagery, examining the beliefs associated with imagery and attempting to transform it (Hackmann, 1998). However, despite Beck's early acknowledgement that imagery may be an important component of psychological therapy, there has been an emphasis on verbal thoughts in clinical psychology (Hackmann & Holmes, 2004).

An exception is the therapeutic work conducted with PTSD patients, as intrusive memories are considered a hallmark of the disorder (DSM-IV; APA, 1994). Psychological therapy which has used imagery successfully with PTSD patients includes reliving, eye movement desensitisation (EMDR), and imagery rescripting (Hackmann, 1998; Arntz et al., 2007). Reliving involves asking participants to describe their traumatic experience aloud, in the first person whilst attempting to re-experience what happened (Foa et al., 1991). The method results in the account becoming more organised, complete and contextualised. EMDR is a technique where patients hold in mind negative imagery, associated cognitions and bodily sensations whilst tracking the clinician's finger in front of their visual field (Shapiro, 2001). Theoretically, the success of EMDR is attributed to the role of saccadic eye movements in using visuospatial resources required for intrusive imagery (e.g. Andrade et al., 1997) although the method has remained controversial (Davidson & Parker, 2001). Imagery rescripting involves imagining the traumatic memory and subsequently trying to modify it (e.g. what would you have done differently in the image? Arntz et al, 2007). Imagery rescripting is described in more detail at the end of this chapter.

4.2. Rationale for working with imagery in therapy

Previous research has shown that emotion-laden intrusive imagery can predict and possibly maintain depression (Brewin et al., 1999), anxiety (Hirsch et al., 2003; Hirsch et al., 2004) and posttraumatic stress disorder (Jones et al., 2007). Based on the assumption that negative intrusive imagery may maintain psychological distress by reinforcing avoidant and maladaptive coping strategies (Hackmann & Holmes, 2004)

treatments specifically targeted at these processes could provide an effective and rapid relief from anxiety. It has been argued that, in comparison to intrusive thoughts, images provide an alternative and quick route to accessing generic belief systems and meanings underlying emotional responses (Wells & Hackmann, 1993; Hackmann, 1998). Hackmann (1998) suggested that images condense a large amount of information and reveal layers of idiosyncratic meaning. Hackmann also emphasised that images are flexible because they represent perspectives of any time-scale (past, present, future) and can be literal or symbolic (Hackmann, 1998).

Wells & Hackmann (1993) argued that investigating the existence and content of images experienced by patients with health anxiety provided an effective means of revealing complex individual beliefs and identifying their origins. The themes that emerged were those of misinterpretation of bodily symptoms and overestimation of the likelihood of death. Patients also had superstitious beliefs that just imagining illness or death could make it happen. Holmes et al (2007) made two key proposals regarding the use of imagery in therapy; 1) "Imagery has a more powerful impact on negative emotion than verbal processing of the same material, and therefore imagery should be examined during clinical assessment across disorders" and 2) "Imagery has a more powerful impact on emotion than verbal processing and cognitive behavioural techniques used to promote positive change should also employ positive imagery" (Holmes, Arntz, & Smucker, 2007, p3-4).

Evidence for the suggestion that imagery has a more powerful impact on emotion than verbal processing has been reported using an interpretation training paradigm (Holmes & Mathews, 2005). Participants were required to either imagine unpleasant events while listening to a description of these events, or think about the verbal meaning. Those in the imagery condition reported more anxiety and rated new ambiguous descriptions as more emotional than those in the verbal condition. It was concluded that negative imagery has greater effects on emotion than verbal processing of the same material. Research adopting a between-subjects design and manipulating the use of imagery or verbal thoughts provided causal evidence that negative imagery influences emotion rather than the reverse (Holmes et al, 2008). Working with imagery in therapeutic environments may thus be an effective method of accessing meaning and alleviating emotional distress.

Holmes et al (2007) categorised the use of imagery in therapy as imagery which is direct ('imagery interactive') or indirect (imagery-property') and techniques which focus on alleviating negative imagery or promoting positive imagery (See Figure 1 for examples).

	Direct technique 'imagery-interactive'	Indirect technique 'imagery-property'
Address negative imagery ↓	• Imaginal exposure/systematic desensitisation • Imagery rescripting	• Mindfulness based stress reduction • Attentional training • Imagery competing tasks (e.g. EMDR)
Promote positive imagery	• Building compassionate mind imagery • Positive future self-imagery (e.g. guided imagery)	• Positive interpretation bias training via imagery

Figure 1 Examples of types of imagery technique on two dimensions 1) Addressing intrusive negative imagery to promoting positive imagery 2) working with image directly or indirectly (Holmes et al, 2007, p 6)

In addition to the negative direct techniques that have briefly been described in relation to behaviour therapy (SD) and treatment of PTSD (imaginal exposure/reliving, imagery rescripting), other direct techniques utilise positive imagery. For example, building compassionate mind imagery is a technique based on Buddhist healing practices (Ringu & Mullen, 2005), where individuals are encouraged to practice warm, compassionate images. For example, self-reassuring imagery could involve imagining a self-supporting or compassionate part of yourself and to imagine this as a person with facial expressions and a voice (Gilbert, Baldwin, Irons, Baccus, & Palmer, 2006). Gilbert et al (2006) found that trait self-criticism (e.g. " "I am easily disappointed with myself") was associated with the ease in generating hostile self-critical images, while trait self-assurance (e.g. "I encourage myself about the future") was associated with the ease in generating warm and supportive images of the self. A pilot study assessing the use of compassionate imagery with a depression support group (Gilbert & Irons, 2004)

reported some success with encouraging patients to generate images in order to self-soothe.

Lee (2005) suggested that compassionate imagery can be directed to that of a "perfect nurturer" which has qualities to nurture the individuals personal needs (Lee, 2005). For example, Lee (2005) described a case of a young woman, 'Sylvie' who had developed PTSD and depression following an emergency Caesarean and was informed that she had been 10 minutes from death. Sylvie had intrusive images concerning the birth of her son and also experienced self-critical thoughts and deep feelings of shame and self-loathing. After a series of cognitive therapy sessions the therapist and Sylvie identified that she felt unloved and the traumatic birth of her son was linked to her belief that she was unlovable and nobody cared about her. In subsequent sessions, Sylvie developed an image of a perfect nurturer who was calm, tranquil and warm. The image she developed was of a woman with soft linen clothing, a relaxed face and warm texture. The nurturer reassures Sylvie by providing her comfort and whispering in a soothing voice, "it's OK, everything is going to be fine." After repeated practice of the image, Sylvie developed a short cut where she just imagined a pair of arms outstretched and the smell of her skin. At the end of therapy, Sylvie felt strong and positive and at three month follow-up she no longer met criteria for depression (Lee, 2005).

Indirect techniques that address negative imagery include mindfulness based stress reduction, attentional training and imagery competing tasks. Mindfulness is defined as *"the awareness that emerges though paying attention on purpose, in the present moment, and non-judgementally to the unfolding of experience moment by moment."* (p 145, Kabat-Zinn, 2003). A core element of mindfulness is meditation, where individuals may be encouraged to focus on various experiences including internal experiences such as thoughts, images and bodily sensations and external experiences such as sights and sounds (Baer, 2003). Meditation within mindfulness based therapy emphasises a non-judgemental and detached approach in response to mental experiences. Baer (2003) described the most frequently cited method of mindfulness training, mindfulness based stress reduction which is conducted over 8-10 sessions and involves group courses of mindfulness training. The training is complex, and participants are encouraged to practice skills outside group meetings for at least 45 minutes a day. When participants notice negative images or thoughts, they are taught to note the nature and content of the cognitions and then return attention to the present moment so as to not become absorbed in the content of the cognitions. The premise of

mindfulness based stress reduction is that it is not the presence of phenomena such as intrusive thoughts and images that are stress provoking but the tendency to become emotionally involved with them. Mindfulness based therapy is different from traditional cognitive behavioural techniques because rather than challenging negative cognitions with a specific goal in mind, individuals are taught to observe underlying processes in a dispassionate way (Kabat-Zinn, 2003). Other interventions incorporating mindfulness training include acceptance and commitment therapy (ACT; Hayes, Luoma, Bond, Masuda, & Lillis, 2006). Hayes et al (2006) suggested that rather than focussing on changing psychological events (e.g. intrusive images) approaches such as acceptance and cognitive defusion are used to change the function of those events and the individual's relationships to them. Acceptance involves actively embracing mental events and cognitive defusion involves creating contexts in which unhelpful functions of negative mental events are diminished.

Attentional training is an approach developed by Wells (ATT, Wells, 1990) that is used to learn new ways of responding to negative imagery. The basic premise is that attentional selectivity and intensity govern the nature of individual experience and the control and availability of resources can influence the efficiency of processing and belief change (Wells, 2007). The aim of ATT is to increase flexible cognitive control (e.g. planning for intended actions), disrupt negative styles of thinking (e.g. intrusive images) and enhance metacognitive awareness (Wells, 2007). Metacognitive awareness refers to knowledge about thinking (Wells, 2007) and is involved in controlling thinking and subsequent choice of coping strategies. Wells (2007) suggested that metacognitions include the belief that worry is necessary for coping ("If I worry I'll be prepared") and the belief that controlling negative thoughts is desirable ("I must control my thoughts or I'll go crazy"). ATT consists of three categories; selective attention, attention switching and divided attention. Participants are asked to focus on a fixation point and remain visually focussed throughout. A number of competing sounds are introduced and identified in the environment. These stimuli must load heavily on attentional resources and participants are trained to focus their attention to these stimuli in a flexible way. This flexible approach is also applied to other internal stimuli, such as intrusive imagery. Participants are trained not to avoid negative internal events, but to respond to them in a constructive manner.

Imagery competing tasks refers to research which has started to investigate the effects of visuospatial distracter tasks (e.g. eye movements, tapping tasks) on

desensitization to emotive memories (Andrade et al., 1997; Kavanagh et al., 2001; Holmes et al., 2004). Participants are required to participate in a task (e.g. tapping out a pattern, moulding plasticine) that loads on the same resources required for intrusive imagery, thus reducing vividness, emotional intensity and intrusiveness of imagery.

Finally, indirect imagery techniques focussed on positive imagery include positive interpretation training, which is a method aimed at the experimental modification of negative interpretation biases associated with anxiety and mood disorders (Holmes et al., 2006). Modification can be achieved by encouraging participants to more routinely use positive imagery when confronted with ambiguous situations (Holmes et al, 2007). An example of the potential success of positive interpretation bias training via imagery was presented in two recent studies (Holmes et al., 2006; Holmes, Lang, & Shah, in press). Participants were required to listen to and either a) imagine themselves in numerous ambiguous situations or b) focus on the verbal meaning of ambiguous situations. For positive interpretation training, the task constrained participants to resolve the outcome of a situation in a positive way. For example, "You are at home alone watching TV. You must have been dozing because you suddenly wake up. You have the impression that you heard a frightening noise *and then realise with relief that it is your partner returning home."* The initial part of the sentence is ambiguous because it implies a negative outcome (e.g. intruder) and the positive resolution is in italics. Over 100 positive training scenarios were presented to participants in the imagery and verbal conditions. Participants in the imagery condition showed greater increases in positive affect and greater reductions in anxiety compared to those in the verbal condition. As well as providing evidence for the success of positive interpretation training via imagery, this work extended that of Holmes & Mathews (2005) to show that positive imagery, as well as negative imagery is associated with more emotion than verbal processing of the same material.

Holmes et al (2007) demonstrated how in recent years there has been a rejuvenation of interest in the use of imagery in psychological therapy. Based on the finding that mental imagery has a special relationship with emotion (Holmes & Mathews, 2005), imagery may be a powerful tool for alleviating emotional distress (Holmes et al, 2007). The discussion will now turn to the use of imagery techniques with cancer patients.

4.3. Imagery in therapy and cancer

4.3.1. Direct techniques

Both direct techniques working on positive imagery (guided imagery) and negative imagery (systematic desensitisation) have been applied to cancer patients experiencing psychological distress. The most prevalent therapeutic technique that uses imagery in cancer patients is guided imagery. Guided imagery refers to the use of imagination to invoke one or more of the senses in order to 'guide' the individual through experiences in the mind. Individuals are encouraged to form positive mental representations of objects, places or situations (Roffe, Schmidt, & Ernst, 2005). Techniques vary but can include non-specific calming themes, such as imagining a bright healing light, and more specific disease-related themes such as the use of metaphor to visualise the body's natural defences (Simonton et al., 2000). For example, patients may imagine a soldier with a bayonet attacking a cluster of cancer cells or visualising fish-like creatures swimming in blood and lymph looking for a primary tumour or hidden metastases (Walker, Sharp, Walker, & Walker, 2007). Patients have also used images such as PAC-men, an animated computer game where a small yellow shape follows and eats "bad monster" characters to represent the cancer being attacked by the immune system (Moore & Spiegel, 1999). Guided imagery techniques are used to enhance an individual's ability to cope with stress and sense of control (Walker et al, 1999) and encourage the general process of recovery (Simonton, Matthews-Simonton, & Creighton, 1978). Guided imagery may also encourage patients to distance themselves from inflexible or negative thought patterns (Post-White, 2002).

One study investigated the psychological, clinical and pathological effects of relaxation training and guided imagery during primary chemotherapy (Walker et al., 1999). Ninety-six women with newly diagnosed locally advanced breast cancer were randomly allocated to standard care (control group) or standard care plus relaxation training and guided imagery (experimental group). The intervention was aimed to reduce levels of stress and increase feeling of control (Walker, 2004). Relaxation was taught via audiotape and imagery was encouraged using a portfolio of ten coloured cartoons to help visualise host defences killing cancer cells. Participants were asked to practice at least daily and document difficulties and vividness of imagery. Clinical, pathological and psychological responses to chemotherapy were assessed using standard measures (e.g. size of tumour, histology of breast tissue, mood, coping and quality of

life). Beneficial psychological effects of the intervention were reported; women in the experimental group were more relaxed, had fewer psychological symptoms and had higher self-rated quality of life. There were no significant differences between the experimental and control group on measures of clinical and pathological response, although, there was a significant correlation between ratings of imagery vividness and clinical response, in terms of host defences. Specifically, the more vivid the imagery reported, the higher the natural killer (NK) cell and lymphokine activated killer (LAK) cell activity after chemotherapy and 12 weeks after radiotherapy (Walker, 2004). Although Walker et al (1999) found no significant effect of intervention on pathological and clinical response, follow-up over 68 months did show a trend for prolonged survival in the intervention compared to control group and this was statistically significant for tumour size (Walker et al., 2000). The question remains how psychological intervention may lead to survival in cancer patients, although it has been suggested that intervention may offset stress-induced immunosuppression (Walker, 2004). Walker et al (2000) suggested that it may be premature to evaluate the effect of intervention at 68 months and longer-term follow-up is necessary.

Others have supported the potential positive effects of guided imagery on the immune system. For example, a clinical study of visualisation on depressed white blood cell count in medical patients, including cancer patients found a significant effect of mental imagery on immune response. Specifically, white blood cell count increased over a 90 day period, indicating a "strengthening of the immune system" (Donaldson, 2000, p124). Others also reported a significant increase in NK cell activity in early stage breast cancer patients following guided imagery (Bakke, Purtzer, & Newton, 2002).

Another recent study with 28 early stage breast cancer patients (Lengacher et al., 2008) found that visualisation of immune cells destroying cancer cells over a 4 week period had beneficial immunological effects on NK cell activity. However, these studies were not randomised controlled trials, as they utilised repeated-measures designs and thus other important variables were not controlled. For example, Bakke et al (2002) admitted that their design did not allow the conclusion that imagery enhances immune function because psychological benefit of personal support was not controlled. Further, they reported that although guided imagery remained successful for reducing depression at 3 month, the increased NK activity was not maintained (Bakke et al., 2002). Another recent study testing the efficacy of guided imagery in breast cancer patients found that

although there were significant effects on depression and anxiety there were no effects on immunosuppression (Nunes et al., 2007).

The effect of guided imagery and relaxation on pain in cancer patients has also been studied (Wallace, 1997). A systematic review of the literature analysed the efficacy of guided imagery and relaxation on pain relief in nine studies from 1982 to 1995 (Wallace, 1997). Although there were mixed findings for the usefulness of guided imagery for cancer pain (e.g. Arathuzik, 1994; Ferrell, Ferrell, Ahn, & Tran, 1994), it was concluded that there was significant evidence that imagery reduces the physiological experience of pain in cancer patients, as measured by self-report. However, it was argued that there is little evidence that relaxation and imagery interventions are able to change affective states, feelings of control and quality of life. Wallace (1997) suggested that research focussing on the effect of guided imagery on pain in cancer patients should make explicit the description of pain experience being studied, to study single interventions rather than mixed interventions, take measures of patient compliance with the treatment and conduct longitudinal studies where possible.

One study that wasn't included in the systematic review (Syrjala, Donaldson, Davis, Kippes, & Carr, 1995) investigated the effect of relaxation and guided imagery compared to training in a package of cognitive behavioural coping skills (which included relaxation and guided imagery) on self-reported pain. Ninety-four patients receiving bone marrow transplants were randomised to one of four conditions: therapist-control, no-treatment control, relaxation and guided imagery and cognitive behavioural coping skills package. Relaxation was induced using progressive muscle relaxation (PMRT) and imagery involved imagining descending a staircase and visualising a pleasant place. The cognitive behavioural package included imagery and relaxation training, the use of self-statements (re-training self-defeating thoughts), distraction (focussing attention away from noxious physical sensations) and setting and attaining of short-term goals (e.g. playing a game). Patients in the two treatment groups reported significantly less pain than patients in the control groups, although the cognitive behavioural group did not provide any additive beneficial effects compared to the relaxation and guided imagery group. Syrjala et al (1995) concluded that relaxation and imagery have a positive impact on pain coping in cancer patients. Although they did specify the type of pain experience being studied (oral mucositis pain), they suggested that more research is required to ascertain which patient groups benefit and which groups don't benefit from imagery interventions. Also, although it was shown that

cognitive behavioural coping skills training did not provide any additive effects beyond imagery and relaxation, it is not clear whether using guided imagery alone would be as beneficial as using imagery in combination with relaxation.

Others have examined the long-term effects of relaxation and guided imagery on psychological distress in cancer patients (e.g. Baider, Peretz, Hadani, & Koch, 2001). One hundred and sixteen patients were randomly allocated to an intervention (PMRT and guided imagery) or control group (same standard of care but no specific intervention). Dependent measures to assess psychological distress (at 1 month, 3 months-just before intervention and 6 months after intervention) included the Brief Symptom Inventory (BSI) and the Impact of Events Scale (IES). Baider et al (2001) reported a small but significant positive effect of the behavioural intervention on psychological distress. In addition to the small effect size, there were several limitations, such as high drop out rates, use of mixed interventions, failure to include low distress patients in the experimental group and failure to measure effectiveness of behavioural treatment directly. In a subsequent study, Sloman (2002) investigated the effect of single interventions on psychological distress in cancer patients. Twenty-six women and thirty men with advanced cancer, who were experiencing depression and anxiety, were randomly assigned to one of four treatment conditions: PMRT, guided imagery training, both of these treatments and therapist control. The Hospital and Anxiety Depression Scale and the Functional Living Index Cancer scales were administered to all patients pre and post test phase. All three treatment conditions failed to produce significant improvements for anxiety but they all produced significant improvements for depression and quality of life. However, no one treatment proved to be superior and due to the small sample sizes used in the study, firm conclusions could not be drawn (Sloman, 2002).

A systematic review of the literature assessing the efficacy of guided imagery on outcome measures including pain, treatment side effects, psychological well being and immunodeficiency (Roffe et al., 2005) concluded that although there was no compelling evidence for the positive effect of guided imagery on physical symptoms such as nausea and vomiting, studies showed significant effects for emotional response during chemotherapy (Troesch, Rodehaver, Delaney, & Yanes, 1993) comfort during radiotherapy (Kolcaba & Fox, 1999) and depression and quality of life (e.g. Sloman, 2002). A recent study has also concluded that guided imagery and relaxation was

successful for alleviating anxiety, depression and body discomfort in cancer patients receiving brachytherapy treatment (Leon-Pizarro et al., 2007).

Possible reasons given for the beneficial effects of guided imagery include increases in patient's feelings of control and 'self-efficacy' (Walker et al, 2007) and diversion of attention from the adverse cancer-related experience (Lyles, Burish, Krozely, & Oldham, 1982). However, research has often failed to assess the differences between guided imagery as a sole intervention and guided imagery used in combination with progressive relaxation (Roffe et al, 2005). Also research has not provided evidence-based explanations of the success of guided imagery treatments. For example, perhaps visualisation is an effective relief from psychological distress and other adverse effects of the cancer experience because it replaces negative intrusive imagery that cause the distress in the first place. As described in Chapter 1, Brewin (2001) suggested that one way to remove the impact of situationally accessible memories (SAMs) is to replace them with competing verbally accessible memories (VAMs). This view is also supported in relation to future oriented intrusive images, as information may require updating and integration in order for images to be resolved, or at least reduced in terms of their impact on psychological distress (Hackmann & Holmes, 2004). Although guided imagery therapy has shown to be generally beneficial, it is not known to what extent this was due to the imagery component or whether the treatment could be improved by replacing standard imagery instructions (e.g. visualising host cells destroying cancer cells) with procedures targeted at patients own idiosyncratic images.

Moreover, other important factors in the efficacy of guided imagery are often omitted. For example, it has been suggested that imaging ability should be considered when guided imagery is used (Kwekkeboom, Huseby-Moore, & Ward, 1998; Kwekkeboom, 2000). A pilot study to predict success with guided imagery for cancer pain (Kwekkeboom, Kneip, & Pearson, 2003) found that imaging ability predicted mean pain intensity, positive affect and perceived control over pain. The importance of imagery vividness should not be underestimated as Walker et al (1999) showed that self-reported vividness of imagery significantly correlated with clinical response. In relation to this, it has been suggested that very little research has focussed on the subjective experience of imagery itself, which is important for the effective use of imagery in therapy (Bywaters, Andrade, & Turpin, 2004).

Direct imagery techniques focussed on negative imagery, rather than positive imagery have also been utilised in cancer patients. Systematic desensitisation (SD) is a

standardised behavioural therapy used to alter maladaptive learned responses (Morrow & Dobkin, 1988). Morrow and colleagues adopted a modified version of progressive muscle relaxation therapy as a competing response to maladaptive anticipatory nausea and vomiting (ANV) in cancer patients currently undergoing chemotherapy (e.g. Morrow & Morrell, 1982). During systematic desensitisation, the patient imagines scenes from a hierarchy of events related to chemotherapy treatment. For example, the patient imagines the evening before treatment, breakfast the morning of the treatment, driving to the hospital and entering the waiting room and seeing the clinic nurse. Whilst imagining these scenarios, patients are taught relaxation techniques such as tensing a particular muscle group, saying the word "relax" to themselves and focussing on releasing the tension from the muscle group (Morrow, 1986). Thus the treatment stimuli become associated with relaxation so that when the patient encounters each scenario they respond with relaxation rather than nausea and vomiting. Several studies have supported the effectiveness of SD on ANV in cancer patients. For example, Morrow & Morrell (1982) randomly assigned 60 cancer patients to SD, counselling or a no treatment group and found that only patients in the SD group reported significant reductions in frequency, severity and duration of ANV. Morrow (1986) assigned 92 cancer patients to one of four conditions, i) SD, ii) relaxation only iii) counselling iv) no treatment control and found that relative to the other 3 groups, SD patients reported a significant decrease in the severity and duration of anticipatory nausea from baseline to follow-up. Thus, the positive effects on ANV could not be attributed to relaxation alone although relaxation and SD were found to produce significant reductions in ANV relative to the other groups.

Morrow & Dobkin (1988) discussed explanations for the success of SD for the treatment of ANV. Several hypotheses have been proposed, which have included explaining ANV as a classically conditioned response (Watson, 1993). The conditioning model suggests that ANV results because an unconditioned response (nausea and vomiting) follows an unconditioned stimulus (chemotherapy). Potentially conditioned stimuli (e.g. sensations, images, clinic nurse) alter after a number of trials (i.e. chemotherapy treatments) to give rise to a conditioned stimuli (e.g. clinic nurse) eliciting a conditioned response (ANV). In this context, SD works by breaking the associative bonds between conditioned stimuli and conditioned response and allow patients to learn an adaptive response (relaxation). Other suggestions include the notion that pairing scenarios with relaxation comprises a form of distraction so that

conditioning no longer occurs (Morrow & Dobkin, 1988). Another hypothesis is that pairing relaxation with a hierarchy of feared events leading up to chemotherapy treatment increases patient's perceived sense of control so that the subjective feeling of helplessness is alleviated. However, Morrow & Dobkins (1988) concluded that although these latter explanations are appealing, there are no empirical data to support them.

Although a series of studies have supported the effectiveness of SD in alleviating chemotherapy side-effects such as nausea and vomiting, the recognition of higher mental processes and the development of therapies encompassing cognitive as well as behavioural components (Watson, 1993; Moorey, 1991) means there is no recent research assessing the effectiveness of SD in cancer patients. Also, it has been suggested that the important elements of desensitisation remain uncertain (Hackmann, 1998). Some suggested that the use of a hierarchy and progressive muscle relaxation was not essential (e.g. Dawson & McMurray, 1978) and others emphasised the importance of the use of imagery by the patient (Wilkins, 1971). For example, imagery is not necessarily static according to each hierarchical stage, the image may evolve throughout therapy and other associations may come to the fore.

Psychological therapies currently prevalent for alleviating distress in cancer patients include Cognitive Behavioural Therapy (CBT) for cancer patients (e.g. Moorey & Greer, 2002) and Mindfulness Based Stress Reduction (MBSR; Kabat-Zinn, 2003). These will now be discussed in relation to how they approach imagery in therapy.

4.3.2. Psychological therapies for cancer patients with imagery components.

CBT is an approach which was developed by Beck (1976) and is a structured, collaborative short-term therapy which involves both behavioural (e.g. activity scheduling) and cognitive (e.g. monitoring automatic negative thoughts) techniques. CBT is focussed on addressing and managing specific problems rather than global issues (Hawton, Salkovskis, Kirk, & Clark, 2002). In 1989 the first text describing a CBT intervention programme for cancer patients was published (Moorey & Greer, 1989) which described the cognitive model of adjustment to cancer. The model, which is derived from Lazarus & Folkman's conceptualisation of stress, appraisal and coping (Lazarus & Folkman, 1984) described a series of negative consequences in relation to the diagnosis of cancer, where the experience of symptoms and treatment side-effects leads to changes in mental and physical abilities, changes in personal and social roles

and change in appearance which may lead to negative beliefs about the self, others and the world. Threats to the self vary according to the meaning associated with consequences of cancer. For example, a man to whom work is the most important thing in life, will appraise 3 months sick-leave as catastrophic, even if he is assured that the cancer is curable. Moorey & Greer (2002) explained that threats to the self can also be defined more generally as threats to the personal domain, which was defined by Beck (1976) as aspects of life such as friends, relatives, goals, possessions and values. Emotional responses to cancer can be conceived as interpretations of particular threats to the personal domain (Moorey & Greer, 2002). If an individual perceives danger or vulnerability, by appraising a situation as threatening to personal and social well being or feeling vulnerable based on the appraisal that the patient cannot deal with the threat, then anxiety will be the key emotional response. If an individual perceives that their personal domain has been unjustifiably attacked, then anger will be the key emotional response. Guilt arises from self-blame, where an individual is searching for meaning to explain their experience. Finally, sadness and depression result from a sense of loss from the personal domain, where loss covers a wide range of potential factors, including physical factors, such as loss of strength, mental factors, such as loss of concentration, or social factors such as loss of a valued role (e.g. mother, employee).

The cognitive model of adjustment to cancer combines emotional responses resulting from differential appraisals of cancer into a model which includes a person's pre-existing self-schema, their subsequent survival schema, cognitions, emotions and behavioural responses (see Figure 2).
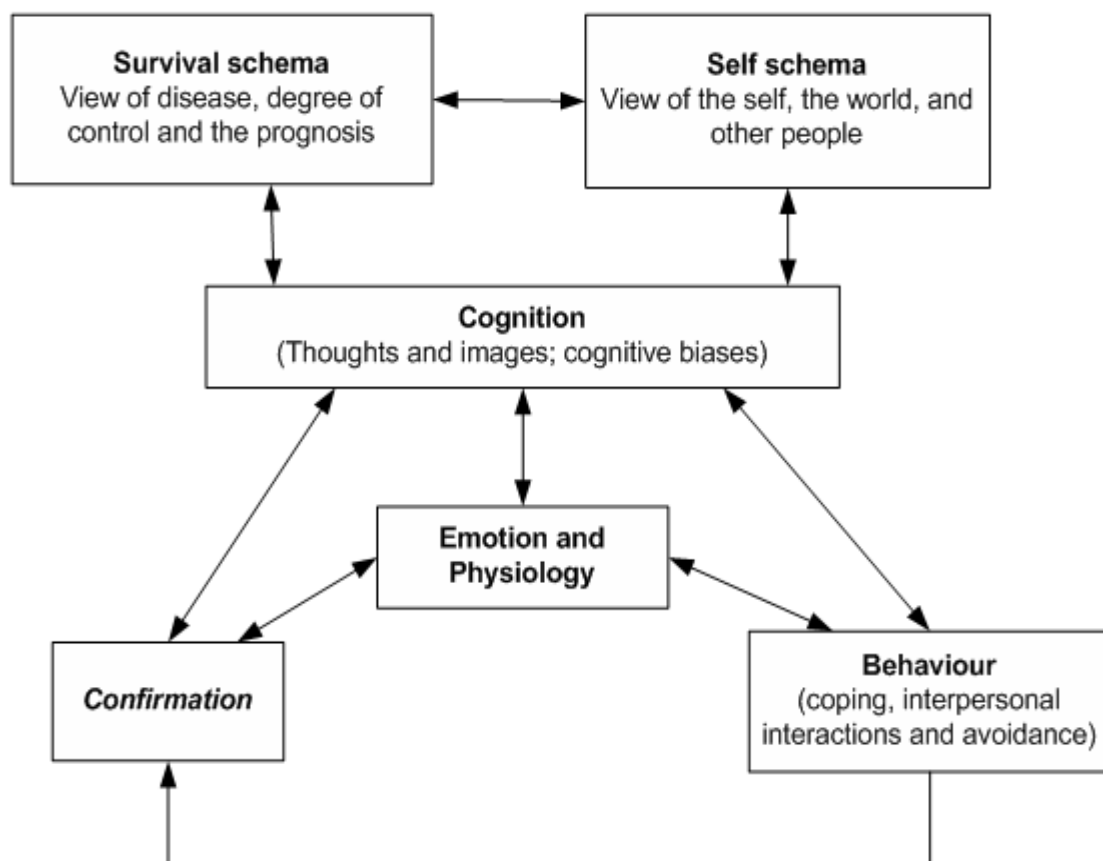
Figure 2 Cognitive model of adjustment to cancer. Reproduced from Moorey & Greer (2002, p 20)

In summary, following the acceptance of cancer as a precipitator of significant psychological distress, the cognitive model of adjustment to cancer (Moorey & Greer, 2002) proposed that negative appraisals and meanings that individuals assign to the cancer experience determines individual emotional and behavioural responses and subsequent adjustment.

Within CBT for cancer patients, imagery has been described as part of an overall treatment package including exposure in imagination, image modification and guided imagery for cancer patients (see Moorey & Greer, 2002). As previously described, imaginal exposure is a direct technique focussed on negative imagery. Patients with aversions to treatment are asked to imagine, rather than experience "in vivo" the feared stimulus while relaxed so that they learn to control their anxiety. This is different from SD because the patient is required to imagine the feared scene in its entirety and not graded images of a feared scenario. Image modification was described by Moorey & Greer (2002) in the case of a woman with successfully treated sarcoma, who reported anxiety which was associated with images of herself as a child. At age 11, she had been seriously ill and felt helpless and dependent. Cancer had re-activated the memories of

herself as a helpless invalid. In order to remind her that these were images from the past, and not facts about the present and future, the woman altered the image of herself as a child. Specifically, she imagined herself in hospital, putting on her clothes and leaving. This modification also represents a direct imagery technique focussed on negative imagery. Moorey & Greer (2002) suggested that images that are vivid and seem real can be modified by imagining them on a television screen and visualising the self watching them with friends or relatives. This helps reinforce the idea that they are mental constructs and not perceptions. Guided imagery has also been previously described within the context of CBT for cancer patients and involves creating an image in the mind's eyes, for example, of the cancer being destroyed by the treatment and body's defences (Simonton et al., 2000). Although research has supported the effectiveness of cognitive-behavioural based therapies in cancer patients (e.g. Edelman, Bell, & Kidman, 1999; Osborn, Demoncada, & Feuerstein, 2006; Tatrow & Montgomery, 2006; Andrykowski & Manne, 2006) these studies do not assess the relative effectiveness of components of this therapy, including imagery components.

In line with the framework described by Holmes et al (2007), other imagery-related therapeutic techniques used with cancer patients include mindfulness based cognitive therapy which is an indirect technique addressing negative imagery. Individuals are taught to experience mental events (e.g. intrusive images) in a dispassionate way instead of reacting emotionally to them. A systematic review of the literature applying mindfulness based stress reduction in cancer care (Smith, Richardson, Hoffman, & Pilkington, 2005) described 11 clinical trials of mindfulness therapy with cancer patients (both controlled and uncontrolled studies) and concluded that mindfulness based stress reduction has the potential to be a clinically valuable intervention for cancer patients to improve mood, sleep quality and reduction in stress.

The main application of imagery techniques in therapy for cancer patients includes guided imagery and systematic desensitisation. The use of cognitive behavioural therapy and mindfulness based stress reduction also comprise components which target intrusive images. However, research investigating imagery in cancer patients has mainly focussed on the use of positive imagery with minor emphasis on negative imagery in the systematic desensitisation work of Morrow and colleagues (e.g. Morrow, 1986). So far, aside from work conducted by Brewin et al (1998a, 1998b) and the present thesis, the presence of negative imagery in cancer patients has remained

largely unexplored. As a consequence, there is no recent research systematically exploring the use of direct imagery techniques on negative imagery in cancer patients.

4.4. Modular approaches to therapy

A modular view of therapy suggests that having treatment components tailored to individual presentation rather than giving everyone the same overall treatment package may be beneficial (Brewin, 2006). Further, it has been argued that there is a lack of systematic research investigating mechanisms of change behind therapy for cancer (Gurevich et al., 2002). Awareness of specific risk and distress symptoms can provide a platform to explore personal meaning for cancer patients and decide which psychological processes are most challenging (White, 2004). For example, mental imagery has been identified as a key component of anxiety that needs to be addressed in psychological therapy (Hirsch & Holmes, 2007), but studies of psychological intervention for cancer patients often fail to identify such components. Indeed, although stress response symptoms such as intrusive thoughts and images have been identified and linked to psychological distress in cancer patients, there is little systematic evidence for the benefit of interventions to treat stress response syndromes in cancer (Gurveich et al, 2002). There are some exceptions, for example a single-case study showed that a trauma focussed intervention successfully reduced PTSD symptoms in a 40-year old man, 3 years post-bone marrow transplantation for leukaemia (Duhamel et al., 2000). With research identifying cognitive processes associated with psychological distress in cancer patients (e.g. intrusive memories, White, 2004) research should take these into account when evaluating the effectiveness and applicability of psychological therapy for cancer patients.

A recent meta-analysis of psychological treatments for PTSD (Bisson et al., 2007) found that of five therapies assessed in randomised controlled designs, therapies targeted at specific traumatic memories and their meaning, rather than treatments which were not trauma-focussed had the most significant impact on PTSD symptoms, anxiety and depression. Other research specifically with cancer patients has also supported the specificity of therapy. In evaluating the effectiveness of expressing writing on intrusive thoughts in women with breast cancer (Zakowski, Ramati, Morton, Johnson, & Flanigan, 2004), it was concluded that psychological therapy for cancer patients should be tailor-made to individual needs. Further, a meta-analysis of psychosocial intervention components (Graves, 2003) suggested that interventions designed to include social

cognitive theory components (e.g. self-efficacy, outcome expectations and self-regulation) produced larger effect sizes than interventions lacking those components. Little is known about the therapeutic processes contributing to the effectiveness of psychological interventions for cancer patients (Andersen, Shelby, & Golden-Kreutz, 2007) and evaluating mechanisms of change is important for a number of reasons. Information can help in choosing appropriate interventions, providing explanations for the success or failure of therapy, identifying treatment moderators and enhancing the translation of tested therapies to clinical practice (Kazdin, 2006). By choosing strategies that are most responsible for change, there will be increased efficiency, effect sizes and maintenance of intervention effects for patients (Andersen et al, 2007).

A model that may be useful in conceptualising mechanisms of change in therapy is the retrieval competition account of CBT (Brewin, 2006). This account suggests that different therapies may work on the same principle, and that discipline-specific strategies such as logical reasoning (cognitive therapy) and associative learning (behaviour therapy), result in the same process, where an alternative and positive representation is created which is potent enough to compete with negative representations for attention at the crucial time of retrieval. Using behaviour therapy as an example, and specifically the extinction of fear, Brewin (2006) cited evidence that fear is not unlearned through exposure but rather extinction involves learning a lack of association in a new context. There are several implications of this account in terms of the success of psychological therapy, including the possibility that simply teaching individuals methods of personally disengaging attention from negative representations has the same effect on reducing negative symptoms as more elaborate and indirect techniques (Brewin, 2006, p 778).

Specifically, it was suggested that in order for modular therapy to be successful, processes meeting the following criteria should be focus; a) they are a common feature of the disorder, b) they have been shown empirically to be critical in mediating or maintaining the disorder and c) they are amenable to direct modification (Brewin, 2006). Modular therapy fits with the law of parsimony (Ockham's razor) which argues that if you explain something adequately without introducing further complexity, then the simple explanation is the best explanation (Warburton, 2000). Modular therapy also fits with the principles of a transdiagnostic approach to clinical disorders, by identifying modifiable, common processes underlying emotional distress. The key question when assessing the applicability of therapy to emotional distress may thus focus on which

processes meet the three criteria described above. Once processes have been identified, specific therapeutic techniques can be applied.

Intrusive imagery was identified in Study 1 and Study 2 as a cognitive process associated with psychological distress and maladaptive adjustment in cancer patients. Intrusive images meet the criteria proposed above because they are a common feature of anxiety and depression (Holmes et al, 2007), have a causal role in the maintenance of anxiety and PTSD (Hirsch et al, 2004; Jones et al, 2007) and are amenable to direct modification. Of the above techniques utilising imagery in therapy, imagery rescripting has recently received considerable attention (see Holmes et al, 2007 for a review). Imagery rescripting will now be described and recent empirical evidence supporting its effectiveness will be presented.

4.5. Imagery rescripting therapy

Although the earliest form of imagery rescripting was described in 1889 as imagery substitution by Janet (Van Der Kolk & Van Der Hart, 1989), imagery rescripting was more recently presented as a treatment of PTSD for survivors of childhood sexual abuse (Smucker, Dancu, Foa, & Niederee, 1995; Arntz & Weertman, 1999). The technique involves a combination of imaginal exposure (deliberately recalling the intrusive imagery) followed by imagery rescripting (modifying the negative imagery to produce a positive outcome). For survivors of childhood sexual abuse, patients are required to evoke the negative image and whilst visualising the intrusive imagery, the patient is encouraged to develop a new scenario to replace the negative scene, where the patient as an adult interrupts the abuse, "rescues" the child, and provides protection and nurturance. Smucker et al (1995) found the treatment to be extremely effective; at 3 month and 6 month follow-up, no patients met criteria for PTSD and patients reported enhanced feelings of control, less self-blame and a greater capacity to assign responsibility to the perpetrator.

In addition to the treatment of traumatic childhood memories, imagery rescripting has been described in other populations of patients including patients experiencing posttraumatic symptoms as a result of motor vehicle accidents, epileptic seizures and industrial accidents (Rusch, Grunert, Mendelsohn, & Smucker, 2000), bulimia (Ohanian, 2002) and patients suffering from PTSD as a result of industrial accidents (Grunert, Smucker, Weis, & Rusch, 2003). The above studies reported a positive and rapid improvement in patients distress associated with intrusive imagery

(Rusch et al., 2000), maladaptive behaviour (Ohanian, 2002), depression, anxiety, intrusion and avoidance on the Impact of Events Scale (IES) and subjective distress (Grunert et al, 2003). One study found that imagery rescripting therapy was so powerful, that it was effective in only one session (Rusch et al, 2000).

Significant progress in the use of imagery rescripting in therapy has been made and the special issue "Imagery Rescripting in Cognitive Behaviour Therapy: Images, Treatment, Techniques and Outcomes" presented a series of papers reporting intrusive imagery in a range of disorders including social phobia (Stopa & Jenkins, 2007), OCD (Rachman, 2007; Speckens et al., 2007), suicidality (Holmes, Crane, Fennell, & Williams, 2007) and bulimia (Somerville, Cooper, & Hackmann, 2007). Beyond studies exploring the frequency and nature of intrusive imagery in various patient groups, the special issue extends the literature on the clinical application of using imagery in therapy for patients with social phobia (Wild, Hackmann, & Clark, 2007), PTSD (Arntz et al., 2007; Grunert, Weis, Smucker, & Christianson, 2007) snake phobia (Hunt & Fenton, 2007) and depression (Wheatley et al, 2007).

Wild et al (2007) described the use of imagery rescripting for 14 patients with social phobia. After assessing the content and meaning (including associated memories) of negative intrusive images, cognitive restructuring was employed to verbally challenge beliefs associated with the image (e.g. "I am ugly") and rescripting was subsequently used to help view the negative imagery from different perspectives in order to update the patient's understanding of the image. Rescripting was conducted in three phases; the first stage involved reliving the memory at the age it happened, in the second stage the patient relived the memory at their current age, watching what happened to their younger self and in the third phase, the patient relived the memory again from the perspective of their younger self with their adult self in the room intervening (Wild et al., 2007). At this point the younger self is asked what they need to happen in the image in order to feel better and then imagine this happening. One case study was of a patient who had a recurrent image of himself looking extremely self-conscious, with a red face and big ears. The image was related to a memory of being humiliated by a friend at a party. In the imaginal rescripting, the patient intervened in the party scene, telling his friend to leave his younger self alone. He also chose to introduce friends and family into the image and confronted the bullies with their support. Wild et al (2007) found that within a single imagery rescripting session, patients rated their beliefs associated with the image as significantly weaker and the

images were significantly less distressing and vivid. One week later, patients still rated their images as less distressing (although not less vivid) and patients reported significantly fewer negative social concerns in the previous week (e.g. "I am weird"). Following imagery rescripting patients also showed significantly lower scores on a measure assessing the severity of components of social phobia, including anxious affect. Further evidence for the success of imagery rescripting in social phobia was provided in a controlled study, where the control group showed no significant changes and the experimental group showed significant improvements in negative beliefs, image and memory distress and vividness, fear of negative evaluation and anxiety in feared social situations (Wild, Hackmann, & Clark, 2008).

Arntz et al (2007) compared the use of imaginal exposure with and without imagery rescripting in a sample of 67 patients with posttraumatic stress disorder (PTSD). Imaginal exposure alone involves recalling the details of a traumatic event in the present tense while focussing on accompanying emotions, thoughts and behaviours. At toxic moments during the trauma, patients are required to 'rewind or hold' an image to focus on the most anxiety provoking aspects of the trauma. Imaginal exposure with imagery rescripting introduces a new component to exposure in the 5th-10th session, where patients are asked to imagine how they wish they had reacted (Arntz et al, 2007). Although the combination group did not show higher reductions in PTSD severity compared to the imaginal exposure alone, patients in the combination group were significantly less likely to drop out of therapy and also showed greater reduction in variables such as anger, guilt and shame. After the trial Arntz et al (2007) asked therapists to complete an anonymous questionnaire about their preference for imaginal exposure alone or in combination with rescripting and it was found that therapists also found the combination therapy more acceptable. In conclusion, Arntz et al (2007) argued that adding rescripting to imaginal exposure may be more acceptable to patients and therapists whilst also leading to greater effects on non-fear problems such as anger and guilt.

Others have suggested that imagery rescripting may not only be beneficial as an adjunct therapy to exposure but as a stand-alone therapy for PTSD patients for whom prolonged exposure (PE) is unsuccessful (Grunert et al, 2007). Twenty-three participants with PTSD as a result of industrial accidents and for whom PE had failed participated in Imagery Rescripting and Reprocessing Therapy (IRRT). There were three stages of therapy; re-experiencing, mastery and consolidation. In the first stage,

patients were required to experience the trauma, including associated emotional and physical sensations. In the second stage, patients were encouraged to use mastery and adaptive imagery to develop an alternative visual representation of oneself as a competent survivor helping the "today-self" help the "traumatised-self" to cope with the trauma more effectively. The final stage, named "post-imagery re-processing" enabled further linguistic processing of the imagery session and consolidation of the alternative positive representation. Over the course of treatment, mean levels of avoidance, intrusions (measured by IES), depression and anxiety decreased following treatment and concentration levels (WAIS) improved. At the end of IRRT 18/23 (79%) of patients made a complete and sustained recovery.

Imagery rescripting has also been investigated in the treatment of snake phobia by comparing 4 treatment groups; imaginal exposure, imagery rescripting, a combination of these or a relaxation control (Hunt & Fenton, 2007). Fifty-two individuals with snake phobia were allocated to the four treatment groups. The relaxation control group received minimal exposure (e.g. therapist approaching snake video) and relaxation technique training such as controlled breathing. The in vivo group were required to produce a hierarchy of fear and gradually be exposed to each level of fear by getting closer to the feared stimuli (a mature male bull python and a mature female corn snake). The imagery rescripting component required individuals to modify distorted beliefs about the snake through imagery (e.g. "imagine the snake with no teeth like an old man").Hunt & Fenton (2007) found that imagery rescripting was as effective as in vivo exposure in reducing behavioural avoidance and fear of snakes.

Finally, two single-case studies were presented of two clinically depressed patients receiving imagery rescripting therapy (Wheatley et al, 2007). Imagery rescripting was associated with a significant reduction in distress and it was suggested that imagery rescripting in depression may be a viable approach when patients report distressing intrusive memories. Imagery rescripting was a relatively short intervention, with improvements maintained at 1 year follow-up.

One possible explanation for the success of imagery rescripting in reducing intrusion frequency and intrusion associated distress can be gleaned from the retrieval competition account of CBT (Brewin, 2006). Rather than imagery modification leading to direct changes to information represented in memory, Brewin (2006) proposed that imagery rescripting functions to increase the activation of positive rather than negative images. In therapy, this process involves creating a new but related memory or image to

have a positive outcome, and helping this representation to win the retrieval competition. According to this account, for the target representation to win over existing negative representations, it must be "positive, highly memorable and attention-grabbing in the presence of negative cues" (p777). In addition to the immediate positive effects on mood, Brewin (2006) argued that altering intrusive images and thoughts can reduce the troublesome representations being activated in the future.

Holmes et al (2007) emphasised that imagery rescripting does not simply function by changing a negative image into a positive image. Modification of distressing imagery offers patients new perspectives on past events which elicit new feelings, identify unmet needs and encourage constructive processing of emotional material. Hackmann (1998) also emphasised that modifying intrusive imagery may operate on two levels, one encouraging cognitive change (i.e. changing the meaning of the content of the image) and one encouraging metacognitive change (i.e. change the meaning of having the image). For example, Hackmann (1998) described a case of a woman who had a repetitive image of her own gravestone and the happy faces of her husband and child when they visited it. During therapy, the woman pictured the negative image on a television screen and imagined herself alive and well. She then imagined turning off the television and driving away from the house. This changed her beliefs about the meaning of having the image, as she no longer felt it reflected her future but was only a product of her fearful imagination (Hackmann, 1998).

Study 1 and Study 2 reported that anxious cancer patients experienced negative intrusive images which were associated with psychological distress and maladaptive adjustment. Intrusive imagery has been identified as a cognitive process that is amenable to direct modification, may have a causal role in psychological distress and is prevalent across anxiety and mood disorders. Imagery rescripting has proved an effective technique for alleviating distress across clinical groups (PTSD, depression, bulimia, snake phobia, social phobia). Therefore imagery rescripting targeted at reducing the frequency and negative properties of intrusive images may be an effective therapy for anxiety in cancer patients.

Chapter 5

Imagery rescripting for cancer patients

In Chapter 4, the use of imagery in psychological therapy was discussed and the possibility of using imagery rescripting for cancer patients reporting intrusive imagery was raised. The following chapter describes a series of single-case studies aimed at piloting the use of this short therapy for anxiety in a new patient group. Before describing the case studies, the utility of using single-case studies for assessing psychological interventions is addressed.

5.1. Single-case studies

5.1.1. Single-case design

Single-case experimental design provides a methodology for studying behaviour change in individuals (Hersen & Barlow, 1978). Following an initial period of baseline observation (A phase) the treatment approach is introduced (B phase) and the selected target behaviour is continually monitored via behavioural, subjective (e.g. self-report) or physiological indices of improvement. The baseline phase of single-case design serves two fundamental purposes, to describe the current level of behaviour and to predict what the behaviour would be like in the future if no intervention was introduced (Kazdin, 1982). Once the initial baseline has been established and the specific treatment is introduced, a multitude of variations on the AB design can be implemented (Hersen & Barlow, 1978).

Aldridge (1991) argued that the prime feature of the single-case design is that they are feasible. The approach is cost-effective and practical as the problems of finding large groups of patients are avoided. Further, the design approach is flexible and allows for varying levels of scientific rigour (Aldridge, 1991). Single-case designs are also noted for providing clinical rather than statistical significance (Hersen & Barlow, 1978; Kazdin, 1982) which is important in therapeutic research as statistical significance can lead to overestimation of treatment success (e.g. patients are less depressed but are still suicidal) and underestimation (e.g. some individuals in experimental group improved drastically but some do not improve or get worse and thus any effect is cancelled out in comparison to a control group). Single-case studies thus have the benefit of focussing on individuals and obtaining more detailed information to help identify those for whom treatment is not working (Hersen & Barlow, 1978). Further, focussing on the individual removes problems with inter-participant variability (Hersen & Barlow, 1978). For example, although methodologically sound randomised controlled trials (RCTs) aim to

control for possible confounding factors such as age, there are several inter-individual factors which still vary and are beyond control, such as compliance with treatment and comorbidity (Kazdin, 2001). Kazdin (2001) also suggested that the continual assessment of outcome measures of the targeted behaviour throughout treatment and follow-up provides important feedback about the success of the treatment that pre-post treatment assessment of group designs does not allow.

Some suggest that single-case studies are a useful pre-cursor to costly RCTs, for example, Gedo (1999) concluded that *"perhaps in order to understand the general case, we first need a more thorough and subtle understanding of the single-case"* (p 278). Single-case studies also suit a cyclical approach to research (Barkham & Mellor-Clark, 2003), as it has been recognised that single-case design can be implemented following large scale studies identifying a particular area requiring more in depth investigation (Gedo, 1999). Following queries and amendments arising from single-case design, the treatment approach could once again be subjected to large-scale research designs such as RCTs.

One of the major criticisms levelled at single-case design is the inability to generalise findings from individuals to other populations. In answer to this criticism single-case research designs do not claim to be generalisable to populations outside the study domain. Also, the use of multiple baseline designs can overcome the problem of applying general validity to a treatment (Aldridge, 1991). As long as clinicians follow a shared protocol, by targeting a specific behaviour, individual case studies can be analysed as a group and more information regarding the efficacy of treatment can be gleaned.

Another issue that is central to the usefulness of single-case design is that measurement of change must be carefully considered For example, self-report measures of the experience of imagery rely on self-monitoring which can be unreliable (Hersen & Barlow, 1978) and the manner in which the outcome measure is assessed should be replicable.

5.1.2. Clinical significance
The clinical significance of a treatment refers to whether the change in a specific outcome measure makes any real difference in the everyday life of the client (Kazdin, 1999), and whether the treatment has met standards of usefulness set by clinicians, researchers and consumers (Jacobson & Truax, 1991). Although it is unclear what the

standards should be, various suggestions have been made, including a) a high percentage of clients improving, b) a level of change recognisable by family or friends/the individual/the therapist, c) an elimination of the presenting difficulty and d) normative levels of functioning by the end of treatment (Jacobson & Truax, 1991). Clinical significance has been broadly defined as *"returning to normal functioning"* (Jacobson, Roberts, Berns, & McGlinchey, 1999, p 300). Statistical indices have been developed in order to ascertain whether the amount of change from outside the normal range towards the normal range for individuals is large enough to be considered meaningful (Jacobson & Truax, 1991). Clinically significant change can be calculated in three ways (Jacobson & Truax, 1991); a) the level of functioning post-treatment falls outside the range of the dysfunctional population, where range is considered within 2 standard deviations (in direction of functionality) of the mean of that population, *a=M of dysfunctional population- 2SD of dysfunctional population* b) the level of functioning post-treatment falls within the range of the functional population, where range is considered within 2 standard deviations of the mean of that population, *b=M of functional population + 2SD of functional population* and c) the level of functioning post-treatment is closer to the mean of the functional population compared to the mean of the dysfunctional population. This cut off score is calculated using the following equation (Jacobson & Truax, 1991):

$$c = \frac{(SD\ of\ functional\ pop\ x\ M\ of\ dysfunctional\ pop) + (SD\ of\ dysfunctional\ pop\ x\ M\ of\ functional\ pop)}{SD\ of\ functional\ pop + SD\ of\ dysfunctional\ pop}$$

Knowledge of the functional and non-functional norms is required, which may be problematic because this information is not always available. The preferable method of establishing clinical significance via the cut-offs stipulated above varies according to individual studies and the availability of normative data for outcome measures in functional and dysfunctional populations (Jacobson et al, 1999).

5.1.3. Reliable change

Jacobson and colleagues recognised that although clinical significance is a useful assessment of whether patients are returning to normal functioning, a second criterion is required to establish a *reliable* clinically significant effect of treatment. To determine whether the amount of change observed between pre and post-treatment is statistically reliable, Jacobson and colleagues developed the reliable change index (RCI; Jacobson, Folette, & Revenstorf, 1984). The formula (see Table 17) ascertains not only whether specific outcome measures have changed post-therapy but precisely how much change has occurred and whether this is greater than the change that would be expected to occur due to unreliability in the outcome measure (Jacobson & Truax, 1991). The RCI is a z score, with a score greater than 1.96 indicating reliable change (Jacobson & Truax, 1991).

Table 17 Calculating Reliable Change Index

Statistical measure	Calculation
Standard error (SE)	SD of functional population$\sqrt{}$ 1- Reliability
Standard difference (Sdiff)	$\sqrt{2(SE)^2}$
Reliable change (RC)	$\dfrac{\text{Post intervention score} - \text{Pre-intervention score}}{\text{Sdiff}}$

The RCI allows more precise evaluation of the efficacy of treatment than clinical significance alone (Jacobson et al, 1999) and should not be confused as simply another method for determining clinical significance (Jacobson et al, 1999). This is because if a client's change post-treatment is reliable but the patient remains within the range of the dysfunctional population the patient is deemed to have "improved but not recovered", whilst if the patient's change on a specific outcome measure is reliable and within the range of the functional population, the patient is considered to have "recovered."

In summary, based on the finding that anxious cancer patients experienced vivid and uncontrollable intrusive imagery, it is important to investigate whether imagery rescripting therapy can be applied to cancer patients. This is the first time imagery rescripting has been investigated in this sample.

5.2. Study 3

Key research questions included:

1. Can the frequency, interference, vividness, uncontrollability and distress associated with intrusive images be reduced by individual rescripting of the image?

2. Does imagery rescripting lead to a decrease in anxiety and depression?

5.2.1. Aims and hypotheses

It was predicted that imagery rescripting would reduce the frequency, interference, vividness and distress associated with intrusive imagery and increase the controllability of intrusive imagery and it was predicted that imagery rescripting would lead to a reduction in anxiety and depression levels. It was also expected that the positive outcomes associated with imagery rescripting would remain at 3 month and 6 month follow-up.

5.2.2. Method

I. Participants

A series of single-case studies were conducted from people reporting intrusive imagery in the interview study discussed in Chapter 3. To be invited to take part in imagery rescripting, patients had to score above cut-off for anxiety on the HADS (=>8) and report frequent (defined as occurring more than half the time in the past week) distressing images or memories. They were also required not to be receiving any other one-to-one support. Eleven patients met the above criteria and were invited to take part in imagery rescripting therapy. The uptake rate was 18%, with 2 patients consenting to and completing therapy.

Of the nine patients who did not take up imagery rescripting therapy, one patient withdrew due to work commitments, two patients did not reply to the invitation, two wanted to stay with their current counsellor and four expressed that they did not want to remove the intrusions. For example, one patient described how she would prefer to continue trying to ignore the intrusions and another patient expressed concern that if he were to face his intrusions, they would get worse, not better. The two patients who participated in imagery rescripting therapy did not meet diagnostic criteria for PTSD measured by the Posttraumatic Stress Disorder Symptom Scale (PSS-I; Foa et al.,

1993). The names of the patients have been changed in order to protect patient confidentiality.

II. Materials

Patients were selected based on their involvement in Study 2 and thus information on the initial intrusive cognitions interview and related materials can be found in Chapter 3. This section will include detail of materials used during the imagery rescripting sessions.

Posttraumatic Stress Disorder (PTSD)

PTSD was assessed with the PTSD Symptom Scale-Interview Version (PSS-I; Foa et al., 1993), a 17-item scale corresponding to symptoms of PTSD including re-experiencing, avoidance and arousal. Each item is rated for severity on a 4 point scale (0 = not at all, 1 = once per week or less, 2 = 2-4 times per week and 3 = 5 or more times per week. The PSS-I shows good internal consistency, test re-test reliability, inter-rater reliability and high sensitivity (Foa et al, 1993).

Anxiety & Depression

Anxiety and depression were assessed using the Structured Clinical Interview for DSM-IV (SCID: First et al., 2002) and the *Hospital Anxiety and Depression Scale* (HADS; Zigmond & Snaith, 1983). The HADS scale has been described in detail elsewhere (p 47).

Frequency and nature of intrusive cognitions

Five Likert scales were used to assess the frequency (0 = *none of the time*, 100 = *all the time*), interference (0 =*not at all*, 100 = *severely*), uncontrollability (0 = *not at all*, 100 = *completely*), distress (0 = *not at all*, 100 = *severely*) and vividness (0 = *hazy memory*, 100 = *clearest and vividest memory*) associated with intrusive imagery. The scales were based on questions from the interview schedule described in Chapter 2, which asked about the frequency and nature of intrusive cognitions.

Distress associated with intrusive cognitions

The IES (Horowitz et al., 1979) is a 15-item self-report scale which examines subjective distress as a result of a specific event. The IES is made up of two sub-scales of intrusion and avoidance. The IES was used to measure intrusion and avoidance associated with intrusive imagery.

III. Procedure

Patients were initially monitored over a baseline period of 3 weeks to ensure that symptoms were stable, and treatment progress was assessed with weekly administration of the HADS and weekly ratings of intrusive memories. Following Wheatley et al (2007) and due to high inter-correlations between the five scales, ratings were summed to provide a single measure of intrusive memories. Emotion ratings associated with the intrusive memories were collected at various points throughout the imagery rescripting sessions.

The treatment protocol was based on previous work of Wheatley et al (2007) and following the imagery rescripting treatment manual (Wheatley & Brewin, 2005). The intervention took between 3 and 7 hour-long sessions and intrusion and affect were measured continuously throughout this period. The main aim of imagery rescripting was to encourage cognitive (changing the meaning of the imagery) and metacognitive (changing beliefs about the image) change by intervening with mental phenomena that maintain distress (Wheatley & Brewin, 2005). This was attained by encouraging the patient to construct a competing image which has strong associations with the negative image, is easier to remember and retrieve and involves positive rather than negative affect. In session 1, patients were given a rationale for working with negative imagery.

Table 18 Rationale for imagery rescripting therapy (from Wheatley & Brewin, 2005).

"Intrusive visual memories are very common. Sometimes these can be very pleasant, such as images of a special day we remember well. When we recall that day we might recall smells and sensations as well as mental pictures. However when bad things happen we may be left with distressing images and memories that haunt us and colour our present. Sometimes these distressing memories reflect negative, self-defining moments that are stored with the meanings they had at the time of the event and without a time code. It can feel almost as if the past event is happening all over again, and it is not unusual for people to feel emotions or even physical sensations that they had at the time. These memories need to be updated, and need to find their proper place amongst your other memories. The best way to do this is to access and reflect on the contents of these distressing fragments of memory. The meanings of the memory can then be carefully thought about, and it may be that some of them are distorted or out of date. If we decide that this is the case we can then change the images/memories in various ways using creative imagery.

A common response to distressing visual images is to avoid them or to block them out in some way. This is understandable, especially if you experience similar emotions or sensations to those you experienced at the time of the original event. Some common ways to try and block things out are cleaning excessively, drinking alcohol or avoiding people or places that remind us of past events. Rather than try to avoid the memory you need to bring it into awareness and learn how to respond to it. Instead of having the memory lurking in the shadows, we need to bring it into the light where we can see it. Its important to note that we are not trying to get rid of these distressing memories or erase them from your mind, we are trying to learn new ways of responding to them so that they don't cause you so much distress."

Patients were also given personalised case formulations, devised to aid understanding of the mechanisms behind intrusive imagery (e.g. how images may lead anxiety). See Figure 3 for a generic example of case formulation.

TRIGGER (a)

Activation of visual memory network (b)

Negative beliefs about self, others and world (c)

Experiences of images as uncontrollable (d)

DEPRESSION/ANXIETY
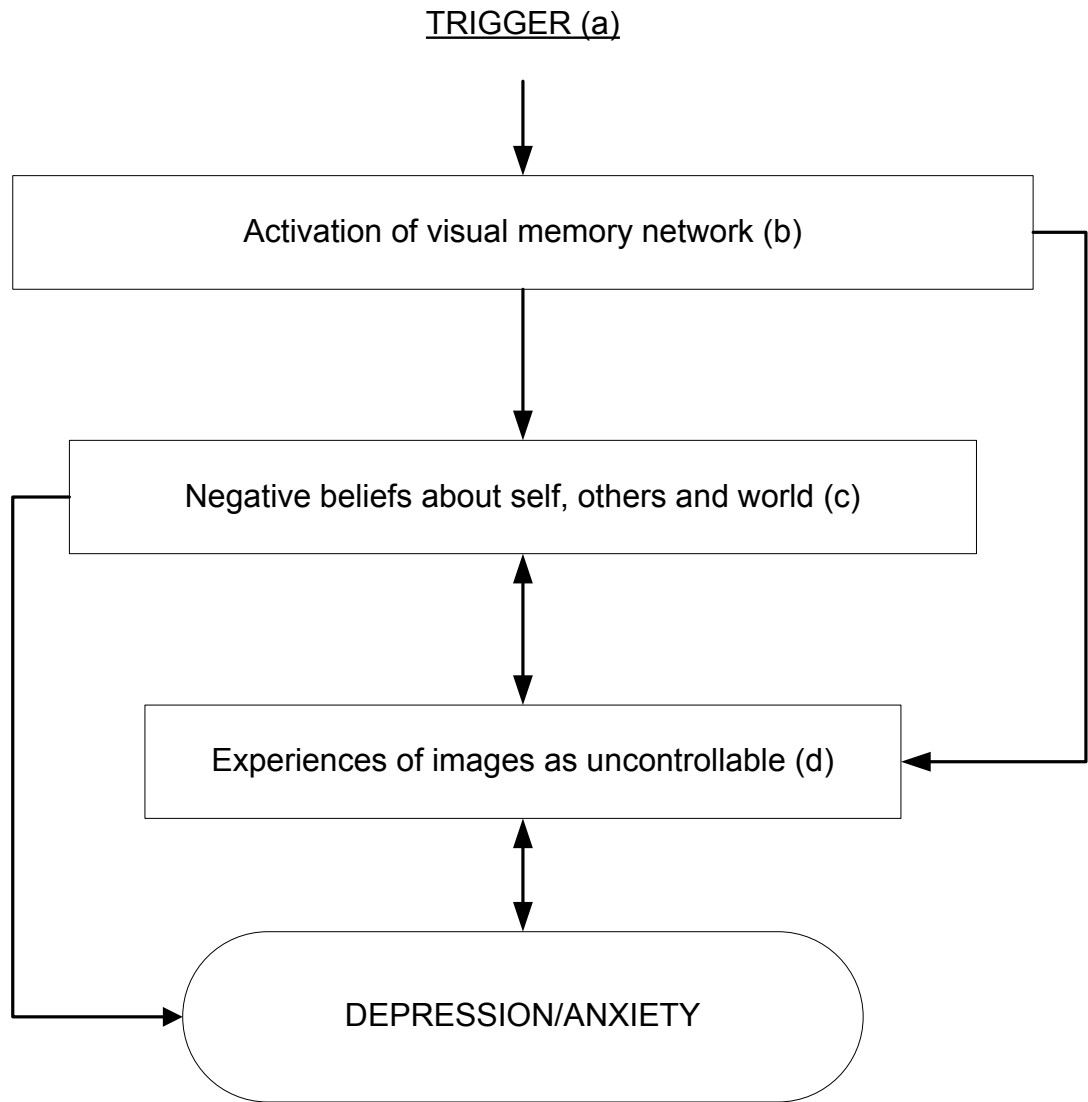
a) Trigger: Negative thoughts, emotions, rumination, environmental cues such as row with partner, TV shows, places associated with a lost loved one

b) Activation: Visual, verbal, emotional, kinaesthetic, olfactory images 'Ghosts from the past'

c) Enduring beliefs of worthlessness, hopelessness, etc

d) Experience of intrusive memories as uncontrollable, and a sign of madness or weakness

Figure 3 Case formulation given to participants in Session 1.

Following rationale and case formulation, patients were encouraged to develop a positive image of a 'safe place' (e.g. a beach), in case they felt overwhelmed by the negative imagery. Patients were then required to describe intrusive images in detail. The therapist helped cue the intrusive imagery using specific trigger questions. Patients were also helped to identify potential triggers, associated emotions, meaning and possible avoidant behaviours. At the end of the first session patients were encouraged to think of the possibility of modifying the negative images. Examples of trigger questions used in therapy are presented in Table 19.

Table 19 Imagery Rescripting trigger questions

To bring image online	• Can you describe what you see in your mind's eye? • Where are you in the image? What do you look like? • What/who else is there?
Other sensory modalities	• Can you hear anything? Apart from your own voice? • Breathe in and tell me what you smell in the image. • Can you taste anything in the image?
Perspective	• Can you see yourself in the image? • Are you on the outside looking in or are you looking out from behind your own eyes?
Associated emotions/triggers	• What types of emotions are brought up by this image? • How intense are these feelings from 0-100? • What were you doing, thinking or feeling immediately before you had the intrusive image?
Meaning	• What does the image say about you/others/the world? • What is the worst thing in the image? (e.g. its intrusiveness, content, the way it makes you feel)
Avoidance	• Are you aware of actively suppressing or avoiding images when they occur? • What are you afraid might happen if you do not push it away?
Considering transformation	• How do you need to feel when you have this intrusive image? In control? Protected?

In session 2, patients were required to bring intrusive imagery into awareness in the same way as in Session 1. Following imagery exposure, the possibility of image modification was approached and the following sessions involved coming up with a detailed alternative to the negative image. Transformation of negative imagery was encouraged by asking patients to change the perspective of the image (e.g. "Imagine yourself looking at the image as though it is on a television, then switching it off or making it smaller or dimmer."), change its physical features (e.g. "Can you make things bigger/smaller?") or prevent the image from freezing at the worst point (e.g. "What would happen if you allowed the image to continue?") Other options included changing personal characteristics (e.g. making self stronger), or making themselves feel safe. Patients were also encouraged to introduce new information into the image, for example, themselves or someone else entering the image. At the end of transformation sessions, patients were debriefed by asking what it was like for them to transform the image. Once one image had been dealt with, new images were addressed in an identical way. For case 1, Sessions 4-7 involved fine tuning alternative images via rehearsal until the patient was happy with them. Consolidation was the final step in imagery rescripting and required patients to consider how new images were beneficial and what they meant about the self/others the world and the future.

IV. Supervision

All sessions were conducted at the Royal Marsden NHS Foundation Trust by Katriina Whitaker (doctoral student). On site clinical supervision was provided by Dr Maggie Watson. Before commencing therapy, Katriina attended an imagery workshop conducted by Professor Chris Brewin and Dr Jon Wheatley. Katriina also attended several sessions of supervision at University College London (UCL) in preparation for conducting imagery rescripting therapy. These included listening to taped sessions of imagery rescripting with depressed patients (Wheatley et al, 2007) and discussing the treatment manual with Chris Brewin and Jon Wheatley. All therapeutic sessions were audiotaped to ensure adherence to the treatment manual. Weekly supervision was provided at UCL with Chris Brewin.

5.2.3. Case 1- John

I. Background information

John was 52, a former brick layer and had been diagnosed with multiple myeloma on 18th July 2006. Multiple myeloma is an incurable cancer of plasma cells which is associated with back pain as it affects the bones of the spine. John had experienced loss of height due to his myeloma. Other symptoms include excessive tiredness and lethargy, repeated colds, coughs and infections due to a shortage of normal antibodies, loss of appetite and unexplained bruising. John presented with high depression and anxiety scores on the Hospital Anxiety and Depression Scale (11 and 16 respectively) and he met full criteria for current major depressive episode, with numerous previous episodes, and also met criteria for current Generalised Anxiety Disorder. When asked whether his cancer diagnosis was involved in the reported symptoms, John reported that he had a history of anxiety and depression and a combination of factors were contributing to him feeling this way, including the cancer diagnosis.

For John, feelings evoked since being diagnosed with cancer had triggered off memories from the past including distressing flashbacks where he felt frightened or vulnerable and also where he had acted like a bully. Moorey & Greer (2002) suggested that the personal meaning attached to illness and its consequences determines the adjustment to cancer and these personal meanings are shaped by an individual's core beliefs and cognitive rules and assumptions about the self, the world and others as well as their beliefs and assumptions about illness and death. Figure 4 demonstrates John's schema, appraisals, cognitions, emotions and behaviour associated with the cancer diagnosis.

Survival schema
-View of cancer as debilitating.
-View of cancer as destroying physical strength (lost several inches in height due to spinal cord compression).
-Hopeless about the future.

Self schema
-View of the self as weak & worthless.
-View of the world as an extremely negative and dangerous place.
-View of other people as threatening.

Cognitions
-I feel vulnerable in social situations
-I'm weak
-I'm worthless
-Images of self in humiliating situations were being bullied/bullying others

Emotion and Physiology
-Frightened/panicked   -Muscular tension
-Angry   -Breathlessness
-Humiliated   -Heart racing
-Worthless   -Unsteady/shaky
-Low mood   -Hot/cold sweats
-Anxious   -Flushed
                                          -Dizzy

Confirmation
-Avoiding contact with people and thus confirm feelings of worthlessness/ helplessness.
-Constant reliving of emotional and physical feelings felt during specific negative events in the past, experienced as intrusive memories in the present.

Behaviour
-Avoiding social situations
-Avoiding people
-Avoiding places that are associated with intrusive memories

Figure 4 The cognitive model of adjustment to cancer applied to John (from Moorey & Greer, 2002).

5.2.4. Case 1- Treatment overview

I. Session 1

The first intrusive memory that John reported was of an incident that had happened 3 years previously, when he was working as a bricklayer for a small firm. The memory that kept coming back involved his boss coming over to the area where he was working and criticising his work, getting more and more aggressive, belittling his work and saying he didn't want him there. John was finishing the job that day and asked for the money he was owed for 3 days work but his boss refused to pay him. John kept reliving the memory, wishing that rather than walk away from the situation he had stood up for himself and confronted his boss, by using violence and not being such a coward. John reported feeling 100% anger, 100% worthlessness, 100% humiliation and the memory was associated with physical feelings of panic, for example, heart beating faster, difficulty breathing and tenseness in forehead and chest. John was trying to avoid thinking about the intrusive memory, or would try to pinch himself to stop himself from thinking about it.

At the end of session 1, the notion of rescripting the image was introduced and some possible ideas were discussed. John felt that he wanted his boss to be humiliated in the image, rather than him. The session ended with John thinking about how he could create an alternative image, which would make him feel less angry, humiliated and worthless. By the end of the first session, John reported that he already felt less foolish, as it was the first time he had spoken about the memory. He said that the memory was not as intense as it initially was and two emotion ratings had reduced slightly; 65% worthlessness, 80% humiliation. Anger remained at 100%.

II. Session 2

At the beginning of session 2, emotion ratings were 70% anger, 50% humiliation and 50% worthlessness in relation to the intrusive memory at work. John realised that he didn't want to hurt his boss in the image and he had conflicting emotions about being a coward and being a bully. When asked what needed to change in the image for him to feel better, John described how he would like to be in control by being more laid back and finding the situation amusing rather than humiliating. John began rescripting the image by imagining his boss as an exaggerated character, breathing heavily and puffing out, with steam coming out of his ears. John decided that his boss seemed as though he was going to explode and he could imagine him like a balloon, becoming bigger and

bigger until he burst. John felt that an image of his boss bursting with air was amusing and made him feel better about the situation. John also spontaneously imagined his boss spinning out of control, so that he was drilling down into the ground. Then, as his boss approached him, he would start filling with air, his eyes very large and his cheeks blown out and John said "it made me realise, he was just as desperate as I was." By the end of session 2, John felt less than 50% anger, 50% humiliation and 50% worthlessness in relation to the memory.

III. Session 3

At the beginning of session 3, emotion ratings were 30% anger, 30% humiliated and 30% worthlessness. John also reported feeling 30% happiness in response to the alternative image. John reported that the frequency of intrusive memories in general (i.e. not just the intrusive memory described so far) was greatly reduced and he felt more relaxed and fewer physical sensations in relation to the intrusive memory. John had developed the intrusive memory further so that he imagined his boss as a toy soldier, in a marching pose, marching towards him. Instead of blowing up like a balloon, his boss's head starts spinning round and round, with steam coming out of his ears. He is wearing a military uniform and his face is painted like a puppet with red rouge on his cheeks, a jutting chin and painted red lips. Whilst describing the uniform, John experimented with the uniform his boss was wearing, changing it to a pink colour and then changing it to a floral dress with builder's boots and a grey jumper. John pictured himself laughing at his boss, who moved towards him with a powerful jet of stream coming out of his nose and ears, spinning out of control. By the end of the session, John reported that he felt happier with the image, less tense in his chest and amused by the memory rather than afraid of it.

IV. Session 4

In Session 4, John reported that he was having a number of different memories and therefore in order to deal with them he was using a calming image of a waterfall. It was explained that although using a general positive image such as a waterfall may be useful as a distraction technique, it does not have the same impact as transforming individual images. The rationale for rescripting was discussed again. In addition to using the calming theme, John reported that he was still using an alternative image of the scene with his boss and now his boss was a clown figure, still with large boots and

red rouge on his cheeks. Emotion ratings in relation to the first memory were 50% anger, 40% worthlessness and 30% helplessness.

John reported another intrusive memory of a scene in a shopping centre, where he had punched a man in the face and knocked him to the ground because he felt threatened by him. John had a clear image of people standing around looking at him following the attack, with accusing faces. He talked about how the image encapsulated how he feels about his life, that he is a bully but feels bullied, that he feels complete frustration because people do not understand him and do not know the whole story before making a judgement. John felt frightened by the man in this second image, and felt that he hit him in self-defence. The emotions he associated with the shopping centre image were guilt (80%), sadness (80%) and frustration (80%). John suggested that he wanted to feel less guilty in the image and to feel that the man wasn't hurt and would be ok.

When initially trying to rescript the image, John decided he didn't want to hit the man in the image, and following his provocation, he apologises and smiles and the man smiles back and John sees the man walking away, smiling. John described how it wanted to become more of a "middle man" in the images, and to react better than he did at the time. He talked again about how he switches from being a frightened, bullied boy or a huge powerful bully. He touched on the fact he has other memories from childhood of his father beating him, but they were too disturbing to talk about. John left the session with the second transformation in mind, with homework to use the alternative images when either of the two distressing memories arose.

(Note: In session 4, overall intrusion score reaches highest point (42/100, compared to 82/100 originally). This also corresponds to an increase in anxiety and depression. (see peaks on figures 1 & 2).

V. Session 5

At the beginning of session 5, John reported that the images were even less frequent. He also reported a third image, which involved another incident where he had been violent towards another man. In terms of the second image of the shopping centre, John reported that his guilt, sadness, rejection and frustration associated with the image had dropped to 10%. For the first image at work, the clown transformation was vivid and he had elaborated the image so that his boss was wearing a one piece clown suit, with yellow dots and red shoes. He described the clown as a "harmless figure".

In session 5, John started to talk about transforming his third most prominent intrusive memory, which was where he had been drunk in a pub and attacked a man for making racist comments about English people. He regretted hitting the man, and wanted to feel less guilty in the image. John talked about wanting to shake the man's hand in the image, instead of fighting.

Although John had grasped the idea of imagery rescripting, he was creating rescripts which tried to prevent the negative event from happening at all. When probed whether this was completely successful, John admitted that he was finding it difficult to wipe away the memories. The therapist considered that John was reverting back to an avoidance strategy. In addition to this, John was also not willing to talk about other intrusive distressing memories because he had never talked to anyone about them before and he was worried about "opening a can of worms". John was reassured that he would only be asked to talk about memories that he was happy to discuss and there was another possibility for rescripting that we had not yet discussed.

Based on previous work conducted by Lee (2005) and described in Compassion by Paul Gilbert (Lee, 2005), the therapist introduced the idea of a Perfect Nurturer to John, someone that could enter the various images and change the meaning of the image. When asked what his perfect nurturer would be like, John found it easy to conjure up an image of a religious figure, an angel which was devoid of aggression and nastiness and full of understanding and forgiveness. The rest of session 5 was used to develop a full image of a perfect nurturer figure and John's homework was to consolidate the image and to consider how he would apply it to the current intrusive memories he was willing to discuss.

VI. Session 6

At the beginning of session 6, John described the image he had come up with of his Perfect Nurturer (see Table 20).

141

Table 20 Description of Perfect Nurturer (John)

Compassionate image: Perfect nurturer. Description of attributes, physical appearance, qualities.   "It's an angel, it hasn't even got features, I just know its there, it's a human form, with very bright white light. I have a very strong sense of what is it, I can't describe it but I know what it is….its a protector, its very kind, *devoid of aggression, nastiness*……but very strong, a destructor of evil forces. I know it can do things, I get a sense when it arrives, it envelops me, protects me, I have total trust in it, it has the power to take away my anxiety and suffering…virtually nothing can destroy it."   *As the patient was coming up with the image, he used an image of his Grandfather to help decide the characteristics he wanted the angel to have. His Grandfather was always firm but fair, warm and consistent. Patient wanted the PN to have these qualities too.*
Description of physical response associated with image   "I'm aware I am carrying a lot of tension in my head and tightness in my chest, and it removes that accumulated stress over many years. The angel touches me on the head and I feel physical warmth go through my chest…….just a touch can take out this terrible anxiety, suffering, fear."
Description of emotional response associated with image   "The image makes me feel as though I count, as though a lot of bad things aren't necessarily my fault."   "Not nasty, somebody cares for me, protected. It knows every atom about me; it takes away my guilt, and offers me forgiveness."
Examples of what PN says   The angel enters the images at stressful points and says "John, I understand, don't worry". The angel is kind and firm, "don't be frightened, don't worry, you are protected". The angel is very powerful, a power beyond our understanding.   "I understand, don't hate yourself, this man will be ok. I'm here to protect you and this man. He won't be damaged long-term."   "You're not bad, you're not a bad person, it's not your fault"

In the session, John demonstrated that he had applied the PN to the three intrusive memories discussed in previous sessions. For the memory of his boss humiliating him at work, in addition to transforming the image so the boss is less threatening (by making him a clown with ridiculous features etc), the PN comes in at the end of the image and reassures John that he has done the right thing. The PN touches him on the forehead and takes away the residual fear and pain. For the shopping centre image, the PN comes in after John has punched the man and says "Don't worry, I saw everything and I understand". He also approaches the man on the floor and says "you are going to be ok". For the people looking at John accusingly, the PN turns to them and says "you don't understand the whole situation; this man was frightened and acted in self-defence". The crowd then lose the look of accusation and the scene calms down. For the pub scene, following the dispute with the man at the bar, when the scene is at its most chaotic (i.e. 6 men have jumped on John to restrain him), the PN appears and everything stops, the image freezes. John was still working on this third image by the end of Session 6 so it was decided that Session 7 would be the consolidation and final session.

VII. Session 7

John reported that he had learnt to control his intrusive memories and was finding the PN image very helpful. He reported that he felt a lot less angry and less tormented by feelings of worthlessness and hopelessness. John reported that physical sensations had also reduced (e.g. heart racing, tenseness in forehead and chest) and he was more accepting of himself. John realised that he perhaps was a more placid and quiet person than he had believed and that his true personality was not of someone who liked conflict.

John talked about how the PN accepted him totally and reassured him that he was not worthless but was in fact, valuable. His beliefs about himself had shifted so that he felt less worthless and his view of other people was that perhaps they are less judgemental than he had believed. John asserted that he realised that you can't change people but you can change your reaction to other people.

5.2.5. Case 1- Outcome and Experience of Treatment

The client's raw data for anxiety, depression and intrusions are presented graphically in Figures 5 and 6. John's scores on the anxiety subscale of the HADS showed a decreasing trend, moving from the severely anxious to the mildly anxious range. As normative data for the dysfunctional population was not available, Jacobson & Truax's (1991) method for establishing clinical significance using normative data from the functional population was utilised (see Table 21). Cut-off b is operationalised as the level of functioning subsequent to therapy falling within the range of the functional population, where range is defined as within two standard deviations of the mean of that population (Jacobson & Truax, 1991). Once the cut-off has been calculated, it can be compared to the post treatment and follow-up scores to establish whether the change has reached clinical significance. Cut-off b for establishing clinical significance is sometimes considered too lenient when functional and dysfunctional populations overlap (Jacobson & Truax, 1991; Jacobson et al., 1999) and thus the scales own cut-offs were also utilised (see Table 21) in order to avoid overestimation of recovery.

Table 21 Functional population means, standard deviations, scale reliability and scale cut-offs

Scale	Mean (S.D.)	Cronbach's alpha	Scale cut-offs	References
HADS-anxiety	6.14 (3.76)	.82	0-7 = not anxious 8-10 = mild anxiety 11-14 = moderate anxiety 15-21 = severe anxiety	(Snaith & Zigmond, 1994; Crawford, Henry, Crombie, & Taylor, 2001)
HADS-depression	3.68 (3.07)	.77	0-7 = not depressed 8-10 = mild depression 11-14 = moderate depression 15-21 = severe depression	(Snaith & Zigmond, 1994; Crawford et al, 2001)

For HADS-anxiety cut-off b was calculated [b= 6.14 + (2 x 3.76) =13.66], showing that the patient had recovered by moving from the severely anxious (HADS anxiety =16) into the normative range (HADS anxiety = 9, < 13.66). The Reliable Change Index (RCI = 3.10, > 1.96), showed that the client had reliably improved on anxiety measured by the HADS. According to HADS cut-offs the patient had moved

from severely anxious to mildly anxious range. The client's scores on the depression subscale of the HADS also showed a decreasing trend, moving from the moderately depressed (HADS depression = 11) to not depressed range (HADS depression = 6).The RCI (RCI = 2.40, > 1.96) and cut-off b [b = 3.68 + (2 x 3.07) = 9.82] calculations showed the client had recovered on the depression subscale. The increase in anxious and depressive symptoms at session 4 can be attributed to the reports of further intrusive memories and the subsequent misuse of imagery rescripting described above (p 139). At 3 month and 6 month follow-up John no longer met criteria for anxiety on the HADS (a score of 7 (RCI=3.98) and 5 (RCI= 4.87) respectively) and he also remained in the not depressed range (score of 2 at both follow ups RCI= 4.33).
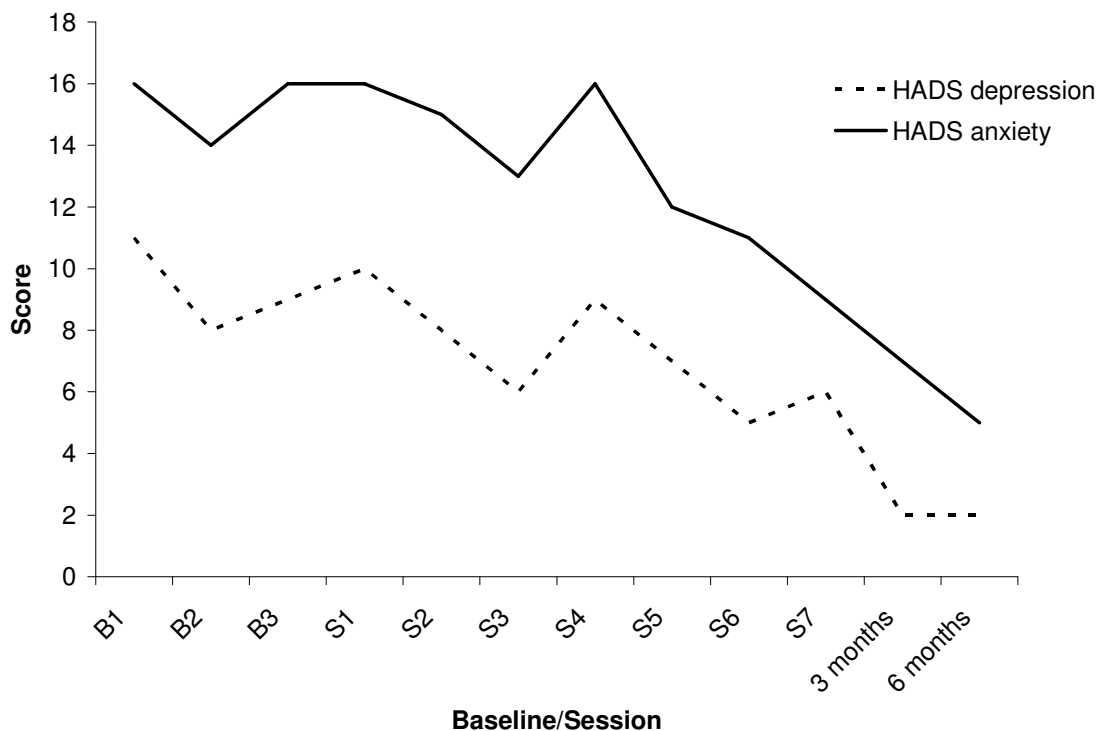
Figure 5 HADS anxiety and depression for baseline, during therapy and 3-month and 6-month follow-up (B = baseline, S = Therapy session, HADS = Hospital Anxiety and Depression Scale)

For parsimony, the measure of intrusive symptoms is presented as an aggregate of scores for frequency, distress, vividness, interference with daily life and uncontrollability (Wheatley et al, 2007). When more than one memory was reported a single rating of the frequency, distress, vividness, interference with daily life and controllability of intrusive memories was taken each week. The particular memory

referred to in the scale therefore changes as the therapist shifts to work on a new memory. Intrusive symptoms also showed a decreasing trend across sessions, with an average 68 point drop in intrusive symptoms from baseline to end of treatment. In correspondence with an increase in anxiety and depression in Figure 5 and session 4, there was an increase in intrusive symptoms to 42/100. This can also be attributed to the reports of further intrusive memories and the misuse of imagery rescripting in session 4. At 3 month and 6 month follow-up, the average point drop in intrusive symptoms stabilised at 50.
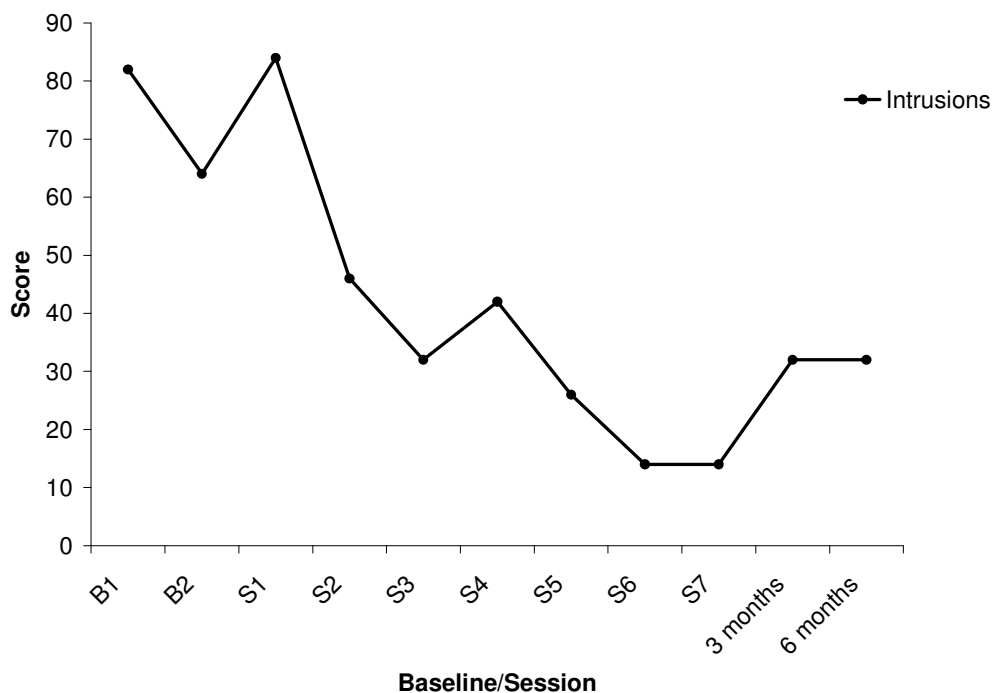
Figure 6 Aggregate intrusive symptoms score (including frequency, interference, uncontrollability, distress, and vividness) at baseline, during therapy and 3-month and 6-month follow-up (B = baseline, S = Therapy session)

Pre-treatment and post-treatment measures also included the IES. The client's subjective distress associated with intrusive memories (IES) fell 10 points, from a total of 53 (24 avoidance, 29 intrusion) to a total of 43 (26 avoidance and 17 intrusion). As there are no functional population means for using the IES as a measure of subjective distress associated with intrusive cognitions, a statistical approach to clinical significance could not be utilised, although the reduction in subjective distress associated with intrusive memories is in concordance with the reduction in overall intrusion rating in Figure 6. There was a further reduction in subjective distress

associated with intrusive memories at 3 month follow-up, with a total score of 20 on the IES (12 avoidance and 8 intrusion). However, at 6 month follow-up, this had levelled out to match the post-treatment drop of 10 points, with a total of 42 (27 avoidance and 15 intrusion).

By the end of treatment, John also showed changes in his desire for behavioural change, by volunteering that he would be keen to go back to work and this would be a new short-term goal for him. By the end of treatment the patient reported that the original distressing intrusive memories had become extremely rare, although he did sometimes picture the transformed images in his mind's eye at times of stress. The patient also expressed an interest in using the perfect nurturer image for other intrusive memories that he was not willing to discuss during treatment.

5.2.6. Case 2- Sarah

I. Background information

Sarah was 43 years old and had been diagnosed with early stage breast cancer on 27th October 2005. She was currently on hormone therapy (Zoladex) after completing other treatments including chemotherapy, a mastectomy and radiotherapy by September 2006. Following her breast cancer diagnosis, Sarah left her job as an operations manager and subsequently took her employer to an employment tribunal for unfair dismissal and sexual discrimination. Sarah felt that she had been pushed out of her job due to her diagnosis and people's mistaken assumption that she was no longer able to fulfil her role at work.

Sarah presented with high depression and anxiety scores on the Hospital Anxiety and Depression Scale (15 and 12 respectively) and she met full criteria for current adjustment disorder with anxiety. Sarah reported that her anxiety had started since the cancer diagnosis and thus the symptoms reported were a direct result of cancer-related concerns. For example, post-surgery Sarah experienced hyperventilation and panic attacks whenever confronted with crowded places. The cancer diagnosis also affected how Sarah felt about herself, as it challenged core beliefs about herself (e.g. confident, successful) other people and the world (e.g. people/the world is unfair as I have been pushed out of the job I love). Figure 7 demonstrates Sarah's schema, appraisals, cognitions, emotions and behaviour associated with the cancer diagnosis, in line with Moorey & Greer's cognitive model of adjustment (Moorey & Greer, 2002).

```
┌─────────────────────────────────┐        ┌─────────────────────────────────┐
│          Survival schema        │        │           Self schema           │
│ -View of cancer as physically   │◄──────►│ -View of the self as awful/     │
│ debilitating (e.g. breast       │        │ useless and not the person used │
│ implants gone wrong, image of   │        │ to be                           │
│ self as distorted)              │        │ -View of the world as against   │
│ -View of cancer as destroying   │        │ her                             │
│ career                          │        │ -View of other people as        │
│ -Fearful of the future (e.g.    │        │ unsupportive/untrustworthy      │
│ financial concerns)             │        │                                 │
└─────────────────────────────────┘        └─────────────────────────────────┘
```

Cognitions
-I am useless
-I am not the person I used to be
-I lack confidence
-I am unemployable
-Images of self being suffocated and humiliated by ex-colleagues

Emotion and Physiology

-Frightened/panicked   -Muscular tension
-Worthless   -Stomach churning
-Helpless   -Pins and needles
-Anxious   -Hyperventilation

Confirmation

-Constant reliving of emotional and physical feelings felt during specific negative events in the past, experienced as intrusive memories in the present.

Behaviour
-Avoiding people associated with previous job
-Avoiding places that are associated with intrusive memories
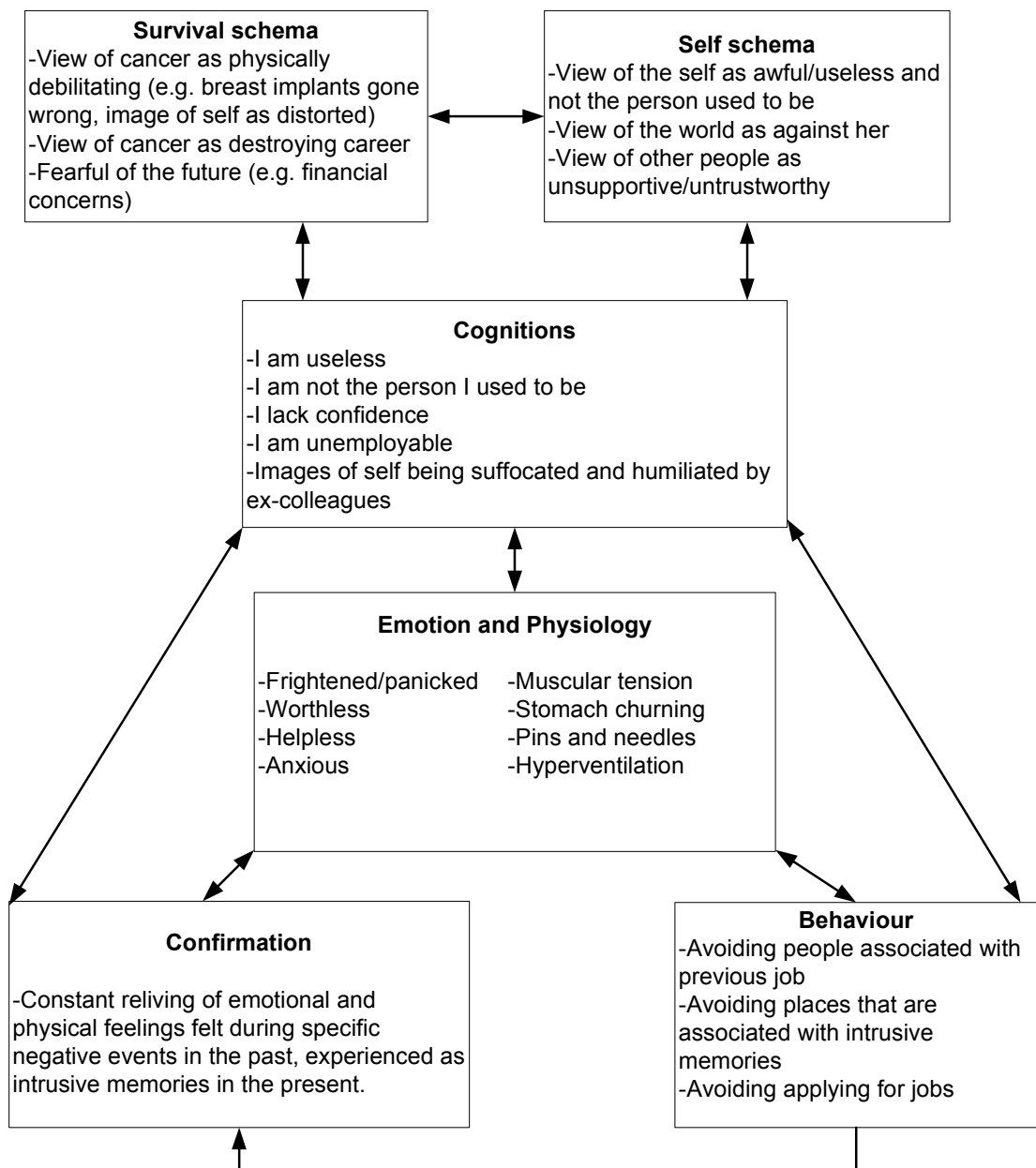-Avoiding applying for jobs

Figure 7 The cognitive model of adjustment to cancer applied to Sarah (from Moorey & Greer, 2002).

5.2.7. Case 2-Treatment overview

I. Session 1

The first intrusive memory that Sarah reported was of an incident that had happened following her breast cancer surgery. The most frequent intrusive memory was Sarah's first day back after surgery- she felt so happy to be returning to work and people were very pleased to see her. But as she got to her desk, all her belongings had been put in a cloakroom and a male colleague came over to her and was shouting and *swearing "If you can't do your job I'll f****** do it for you"*. A female colleague joined him and started whispering in his ear, *"Sarah's done this wrong, Sarah's done that wrong"*. Sarah felt as though it was unjust and wanted a chance to explain but they wouldn't let her speak.

At this point in the description of the image, Sarah started to hyperventilate in the session and therefore we spent some time using a safe image she had created of a sandy beach and her friends and family to try and help her relax. Sarah found it challenging to do this and reported difficulty in getting to the beach. She could see her nieces playing there but was unable to get to them. When asked about what emotions she associated with the intrusive memory she reported feeling 100% panic, 100% worthlessness, 100% helplessness. In addition to hyperventilation, the memory was associated with other physical sensations including, stomach churning and pins and needles in hands and feet. Sarah reported that the worst thing about the mental picture at work was feeling out of control. On experiencing the intrusive memory, Sarah avoided it by reading books, listening to music or phoning a friend. At the end of the session, the emotion ratings were still extremely high (100% for all). The notion of rescripting the image was introduced and some possible ideas were discussed. Sarah felt that she wanted to feel in control, to speak up for herself and make them listen. The session ended with Sarah thinking about how she could create an alternative image, which would make her feel less panicked, worthless and helpless. For example, she imagined a real scenario where her male colleague had fallen off his chair in a bar and was humiliated. This helped the session to end on a more positive note, and gave Sarah some content to work with over the following week.

II. *Session 2*

At the beginning of session 2, emotion ratings remained at 100% panic, 100% worthlessness, 100% helplessness in relation to the intrusive memory at work. Sarah reported that she had also found the safe image distressing, because it triggered fears that something was wrong with her nieces. During the past week, Sarah had spontaneously used an image of one of her nieces coming out of school with a smile on her face to counteract the negative beach scene. This was encouraged as an example of imagery rescripting-challenging a negative image with a more positive one. At this point, some time was spent elaborating the safe image on the beach so it was no longer frightening. Sarah imagined herself being buried in the sand by her nieces, which meant she wouldn't be outside the image, looking in, but a strong part of the image. Once Sarah was satisfied with the safe image, the distressing negative memory from session 1 was discussed.

As Sarah had hyperventilated while describing the image for the first time, it was decided that before we would start reliving the image, we would have some ideas in mind to use as we went along. When asked, what would need to happen in the image for it to be less distressing, Sarah suggested that she would like to go back in time and defend herself- she recalled something she had said in court-*"I lost my boob, not my brain."* To start with, Sarah struggled to come up with an alternative image and we discussed changing the main characters in the image. After the use of prompts (e.g. "what would you like to happen next?") and suggested transformation options (e.g. "imagine the key character one foot high. Shrink the shouting face that you see and make the voice squeaky"), Sarah decided she wanted to turn the male colleague into a snake and the female colleague into a rat which then shrank and scurried away.

The negative image was brought online and the alternative images were conjured up when required. Sarah started rescripting the image by imagining the scene and using a purple wand to change the characters into a snake and rat respectively. Sarah imagined the snake slithering down a little hole and the rat scurrying off to nowhere. Once they have gone, other members of staff become central in the image, including two receptionists. The two receptionists begin to cheer shouting *"Well done Sarah"*. Sarah asks them *"Where were you when I needed you?"* At this point, Sarah realised that the receptionists had not betrayed her; they were just scared themselves, and scared for their own jobs. Unfortunately, Sarah then imagined that the snake had come back out of the hole. Although this was distressing, Sarah recognised that this

may be necessary as it is symbolic of the way she wanted to protect her staff from her bullying colleagues. She chased the snake away and concreted over the hole. The end of the image involved her hugging the two receptionists. Sarah felt very relieved at this point, in realising that not everyone was against her and reported emotion ratings were as follows; 100% relieved, 100% exhausted, 0% helpless, 80% worthless and 20% panicked.

Following the success of transforming the first intrusive memory, Sarah reported a second intrusive memory which had not been discussed previously but which was triggered from thinking about who betrayed her when she returned to work following breast cancer surgery. The image was of other work colleagues taunting her when she was out having a meal in a restaurant. Sarah said this image was also associated with extreme feelings of worthlessness (100%) and helplessness (100%) and she couldn't believe people could make her feel so bad. As we were coming towards the end of the session, we discussed thinking about transformations for the second image, to review in Session 3. Sarah was also given an intrusive image record form in order to write down specific images that came up over the next week and the use of the alternative image. When asked how it felt to try and transform the first image, Sarah said she felt good trying to change it although she wasn't sure what the current emotion ratings were- it depended on whether she could *"keep the snake bolted down"*.

III. Session 3

At the beginning of session 3, Sarah reported experiencing no intrusive memories in the past week- in fact, all scores on the intrusion rating scale fell to 0 and Sarah no longer met criteria for anxiety or depression on the HADS. Sarah had been on holiday for the previous week which she found relaxing. Emotion ratings for the first intrusive memory were 100% in control, 50% confidence, 0% helplessness, 0% worthlessness and 0% panic. A recap of the alternative image revealed that it was the same as before, and blocking up the hole after the snake went down it was successful. The image had been elaborated somewhat, so that the rat scurried away and ends up in a garden being eaten by a one-legged fox. When the snake tried to return, Sarah slammed it down the hole and it doesn't come back. After the scene where the receptionists were cheering, Sarah walked away with her head held high.

Due to the success of the transformation of the first image, Session 3 was spent mainly working on the second image. The image was explored in more detail and it

transpired that it was of five (female) ex-colleagues sitting at a table in a restaurant. The women are laughing at her, getting closer and closer, surrounding Sarah so she feels claustrophobic. Sarah recognised that although the image is based on an event that actually happened, the intrusive image that keeps coming back is an abstracted version of the memory. Emotion ratings for the second image were 100% fear/anxiety, 100% panic. Sarah could hear laughter in the image and the restaurant slips away and Sarah can just see her colleagues crowding in on her, taunting her. When asked what meaning the image had for her, Sarah reported that it made her feel like a complete failure and that she wanted revenge for the way they had treated her following her breast cancer diagnosis. The worst thing about the image was the women cackling at her. When asked to consider some alternative images, Sarah found it very difficult to imagine how the image could be changed. Using the cackling element as key to the image, it was suggested that the women could be imagined as witches. With the mention of this theme, Sarah instantly began thinking about a transformation. Sarah imagined the women as witches, with big pointed noses, bad teeth and bad hair. Sarah imagined that in the middle of the table was a cauldron, with frogs, eyeballs, a snake and a rat. The snake and rat were symbolic of the other ex- colleagues that had been tackled in the previous image. Sarah introduced the purple wand which was used to make the witches shrivel into nothing; they melt away (Sarah likens this melting to a scene in the Wizard of Oz where the witch melts away). The nasty scene fades away and Sarah is left with a friend who was there in real life, who hands her a long island iced tea.

At the end of session 3, we agreed that Sarah would practice the second image and we would recap the image in session 4 and continue with any other prominent intrusive memories.

IV. Session 4

Sarah did not attend for session 4 as she went on a last minute holiday. She telephoned on her return to say she had not been experiencing intrusive memories and felt she did not need to continue with the therapy for now. It was explained that although we can learn new ways of responding to negative images, they will not necessarily disappear completely. Sarah reported that she felt she had learnt a new skill which could be used in the future if the imagery re-emerged. Sarah was reassured that she could telephone at any time if she wanted to consolidate the imagery rescripting sessions. Due to Sarah's non-attendance at the final session, end of study questionnaires

were sent in the post to Sarah. However, these were not returned for 3 months and therefore although there is not a full set of end of study data, there is full data for 3 month follow-up.

5.2.8. Case 2- Outcome and Experience of Treatment

The client's raw data for anxiety, depression and intrusions are presented graphically in Figures 8 and 9. Sarah's scores on the anxiety subscale of the HADS showed a decreasing trend and she moved from the severely anxious (HADS anxiety = 15) to the not anxious range (HADS anxiety = 4). The RCI (RCI = 4.87, > 1.96) and cut-off b (b = 13.66) showed that the client had recovered according to the anxiety subscale of the HADS. At 3 month follow-up, the patient had still recovered (RCI=3.54, >1.96, HADS anxiety =7). The client's scores on the depression subscale of the HADS also showed a decreasing trend, moving from the moderately depressed (HADS depression = 12) to not depressed range (HADS depression =1). The RCI (RCI = 5.29, > 1.96) and cut-off b (b = 9.82) showed that the client had recovered on the depression subscale. This achievement remained at 3 month follow-up (RCI= 5.29, >1.96), with the patient no longer meeting criteria for depression on the HADS (HADS depression = 1).

As before, the measure of intrusive symptoms is presented as an aggregate of scores for frequency, distress, vividness, interference with daily life and uncontrollability (Wheatley et al, 2007). The intrusive symptoms also showed a decreasing trend across sessions, with an average 56 point drop in intrusive symptoms from baseline to 3 months follow-up.

The client's subjective distress associated with intrusive memories (IES) fell 25 points, from a total of 63 (32 avoidance, 31 intrusion) at pre-treatment to a total of 38 (20 avoidance and 18 intrusion) at 3 month follow-up. Again, a statistical approach to clinical significance could not be utilised for the IES, although the reduction in subjective distress associated with intrusive memories was in concordance with the reduction in overall intrusion rating in Figure 9.

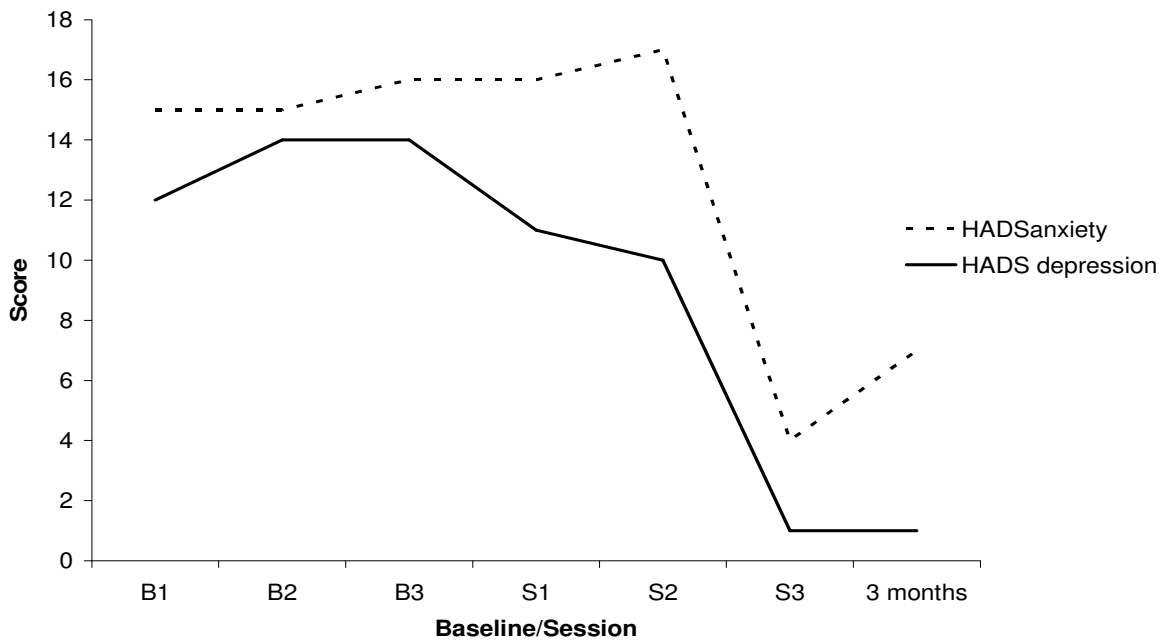**Figure 8 HADS anxiety and depression at baseline, during therapy and at 3 month follow-up (B = baseline, S = Therapy session, HADS = Hospital Anxiety and Depression Scale).**
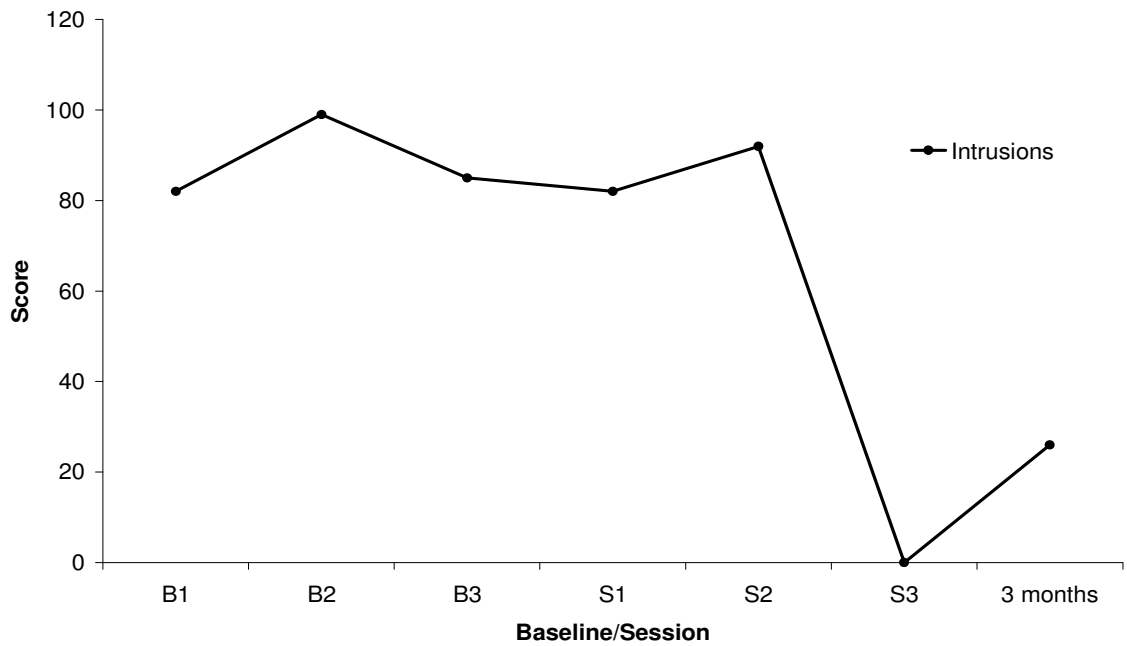

Figure 9 Aggregate intrusive symptoms score (including frequency, interference, uncontrollability, distress, and vividness) at baseline, during therapy and at 3 month follow-up (B = baseline, S = Therapy session).

5.2.9. Discussion

The two cases illustrated that imagery rescripting was associated with a clinically significant reduction in distress and a significant reduction in negative characteristics of intrusive images and supports the notion that it may be a viable therapy for cancer patients reporting negative intrusive imagery. The effects were relatively long-lasting with Sarah and John remaining in the not depressed and not anxious range at 3 month follow-up and John remaining in this range at 6 month follow-up. Wheatley et al (2007) reported similar success in using imagery rescripting in patients with severe and recurrent depression and also reported long-lasting effects after 1 year follow-up.

Throughout the therapy sessions, the negative imagery that was addressed directly accessed feelings about themselves (worthless, hopeless), others (threatening, unsupportive) and the world (dangerous/adverse). According to Moorey & Greer's (2002) cognitive model of adjustment to cancer, viewing the world and other people as threatening leads to feelings of anxiety and feeling as though one is being attacked leads to anger. Both John and Sarah felt anxious and angry with respect to their intrusive images. Also, the model predicted that the belief that cancer has led to a personal loss, in John's case, of physical strength can lead to feelings of depression. In line with this, different types of imagery rescripting were utilised and seemed to have varying effects on reported emotions. For example, for John's first imagery rescript we used mastery imagery where he regained control of the situation of the image by reducing his boss to a comical character. This led to decreased feelings of helplessness and anger and increased reports of self-efficacy. The success of mastery imagery with John is exemplified by his own recognition in session 7 that *"you can't change people but you can change your reaction to other people."* In the later images, where John felt to blame for various situations, compassionate imagery (Lee, 2005) was used to help reduce feelings of guilt, worthlessness and hopelessness.

Sarah had reported that the worst component of her intrusive images was being out of control and thus for Sarah, mastery imagery was used to help regain her self-efficacy and reduce feelings of helplessness and worthlessness. In addition to changing the meaning of the imagery for John and Sarah, rescripting also encouraged meta-cognitive change. For example, in session 1, John mentioned that he already felt less foolish by talking about the imagery. This may be because previously John appraised negative imagery as meaning that he was losing control, or couldn't cope (assessed

using Response to Intrusions Questionnaire when participating in Study 2) and talking about the imagery for the first time allowed him to feel that he wasn't going mad. Accessing the meaning of imagery content and the meaning of the presence of imagery are both important (Hackmann, 1998; Wheatley & Brewin, 2005).

In accordance with previous research (Wells & Hackmann, 1993, Hackmann, 1998) accessing intrusive imagery provided an alternative and quick route to accessing generic belief systems and meanings underlying emotional responses. The special relationship between imagery and emotion (Holmes & Mathews, 2005) has been explained by suggesting that imagery provides direct access to emotional representations because imagery may mimic real-life perceptual events and therefore provide privileged access to related representations in autobiographical memory (Conway, 2001). This explanation was supported by research which showed that imagery was associated with greater self-involvement and stronger associations with autobiographical memory than verbal thoughts (Holmes et al, 2008) and intrusive imagery is often accompanied by a sensation of reliving and accompanying emotional sensations felt at the time of the original memory (e.g. Study 1).

The success of alternative imagery in reducing the toxic nature of intrusive memories can be explained using the retrieval competition account of CBT (Brewin, 2006). This account suggests that by using an alternative positive image and providing elaboration of the image, therapy provides a representation in memory which will win the retrieval competition when pitched against the original negative memory. In line with the notion that imagery may mimic earlier perceptual encoding (Conway, 2001), evidence has suggested (Smith, Henson, Dolan, & Rugg, 2004) that encoding and retrieval of emotional material activates common areas of the brain, including the left amygdala and left angular gyrus. Thus, when a negative memory is triggered and recalled, there is recapitulation of brain activity involved in the original experience of an emotional state (Buchanan, 2007). Transforming intrusive memories by creating a strong alternative image may thus alleviate this reactivation, and lead to a reduction in the intensity of accompanying emotional sensations. Brewin (2006) emphasised that imagery rescripting works on associative principles rather than logical reasoning so that there are direct and automatic changes in the accessibility of representations in memory rather indirect manipulation of belief through standard verbal challenging.

The dual role of imagery in maintaining dysfunctional states (e.g. Hirsch et al., 2004) and resolving such states (Conway et al., 2004) can also be explained by

conceptualising images as goals (see also Chapter 2). Conway et al (2004) argued that images are a type of mental representation which holds information about our personal goals. Intrusive images often arise at moments when our personal goals are challenged. For example, John experienced feeling helpless, worthless and humiliated when he was unable to stand up to his boss. The image represented a self-defining moment when John's goals (to be strong and protect himself) were challenged. Sarah reported feeling helpless, worthless and panicked when she was forced out of the job she loved following her breast cancer diagnosis. Sarah's imagery also reflected self-defining moments where the goal, to move on from her cancer diagnosis and be back at work, was challenged.

According to Carver & Scheier (1998), behaviour can be explained in the context of self-regulating feedback systems. These systems are based on an individuals concrete (e.g. successful research career) and abstract (e.g. wants to be respected) goals. Goal pursuit involves having a goal (referent), assessing where one is in relation to the goal (input) and taking steps to reduce the discrepancy between input and referent (behaviour). If goals are desirable, individuals take measures to reduce the discrepancy between the input and referent (negative feedback loop) and if goals are undesirable, individuals take measures to enlarge the discrepancy between input and referent (positive feedback loop). The latter type of feedback loop thus leads to avoidance and has no endpoint, because there is no target to be reached. Thus negative feedback loops are required to constrain the unlimited task of enlarging the discrepancy between input and referent. Feedback loops also have comparators which monitor rate of progress by comparing the distance between input and referent. If the comparator reveals that positive or negative feedback loops are unsuccessful, it leads to negative affect. If the comparator reveals that positive or negative feedback loops are successful, it leads to positive affect (Carver, 2006). In terms of the single-case studies described in this chapter, avoiding undesirable referents (intrusive imagery) is unsuccessful because 1) there is no specified end point and 2) avoidance paradoxically leads to increased intrusive symptoms (Ehlers & Steil, 1995). Thus, another explanation for distress associated with intrusive images is that due to failure to avoid intrusive images and thus reduce the discrepancy between input and referent, John and Sarah experienced negative affect. Applying imagery rescripting to help create positive alternative imagery allowed for new desirable goals to be associated with negative intrusive imagery. In this respect, a negative feedback loop was created which constrained the positive feedback loop

because although the positive feedback loop remained (with goal to avoid feeling humiliated/like a failure), a strategy of avoidance was replaced with a strategy of creating new goals. Creating new goals which can then be targeted within a negative feedback loop can thus lead to feelings of positive affect in accordance with the affect-generating systems described above and in Chapter 2.

To expand on the case studies described above, using imagery rescripting, negative feedback loops were introduced with new referents- John as the stronger character and Sarah as the person in control/respected at work. Both John and Sarah realised through rescripting the image that it was other people in the image who were out of control, not them. John's goal "to be strong/in control" was reinstated because he realised that in the first image he had behaved in a desirable way and overall he was a calmer, more passive person than he realised. Sarah realised that she was still respected by important work colleagues and had been pushed out of her role unfairly. For both patients, the use of positive imagery introduced a negative feedback loop with desirable goals (e.g. to feel in control) and continued practice of positive imagery and consolidation of the rescripted images led to discrepancy-reduction between the loop's input and referent.

There were specific limitations for both case examples. For example, although John rescripted several images during therapy, some memories were not discussed or worked on. Despite this, John no longer met criteria for anxiety or depression on the HADS and thus the results provide powerful evidence that accessing imagery affords significant emotional shifts in therapy. For Sarah, there were only 3 sessions, with no consolidation of the imagery rescripting from session 3. However, previous research has shown that imagery rescripting may be effective in as little as one session (Rusch et al., 2000) and the suggested number of sessions is between 3 and 6 (Wheatley & Brewin, 2005). Based on the notion that imagery provides direct access to meaning and emotion associated with previous events, it may be that 3 sessions was enough to provide alternative coping strategies in response to intrusive memories. The finding that Sarah reported a reduction in the frequency and negative properties associated with intrusive cognitions and a reduction in anxiety and depression and this was maintained at 3 month follow-up supports the suggestion that imagery rescripting was successful.

Despite these case-specific limitations, both single-case studies illuminate the potential role of imagery rescripting in cancer patients reporting a wide variety of concerns, leading to intrusive imagery. Rescripting was successful for a patient with a

history of depression, an incurable type of cancer and a sense of loss associated with changes in physical strength. The therapy was equally as successful for a patient with adjustment disorder with anxiety, a curable type of cancer and a sense of future-related anxiety due to changes in a valued work role.

Overall limitations of the case examples include the use of cut-off b to assess clinically significant change. When dysfunctional and functional populations are overlapping, cut-off b can be considered too lenient (Jacobson & Truax, 1991; Jacobson et al., 1999). However, in order to avoid overestimating recovery, other methods of establishing clinical significance were utilised such as using scale cut-offs. As can be seen from the follow-up data, the patients moved into the not anxious and not depressed range on the HADS. As clinical significance is broadly defined as "returning to normal functioning" (Jacobson et al., 1999) the present findings suggest that the patients recovered.

Other limitations include the reliance on self-report measures and the possibility that patients would have over-estimated improvements. However, behavioural changes were also noted. For John, he decided he wanted to go back to work and for Sarah, the reason she stopped therapy was that she went away on holiday and seemed to be embracing life more readily. In fact, the explanation for the 3 month delay in sending back the follow-up questionnaires was that Sarah had been on a number of holidays and was extremely busy. The follow-up data sent by mail also suggests that demand characteristics are unlikely to explain the findings. Longer term follow-up would help to clarify this further and also allow assessment of longer-term improvements of intrusive symptoms and psychological distress. The use of simple non-validated measures of intrusion characteristics is also a limitation, although currently no validated measures exist to rectify this. Other important factors to the success of imagery rescripting, such as the extent to which imagery is brought online are difficult to measure and require further consideration in imagery rescripting research. In general, adherence to the imagery rescripting manual and competence in therapy were closely monitored in weekly sessions with Professor Chris Brewin.

An important limitation of the present study concerns the low uptake for imagery rescripting by cancer patients reporting intrusive cognitions. Specific reasons for refusal included the desire to avoid facing distressing intrusive cognitions. This suggests that imagery rescripting and the possibility of intense focus on intrusive images may seem like a daunting prospect for some patients. Previous research has

suggested that tasks aimed at desensitising individuals to intrusive imagery by reducing vividness and emotional distress (e.g. EMDR, visuospatial tapping tasks) may prove a useful precursor to therapies aimed at reducing intrusive imagery and alleviating distress (Andrade et al, 1997; Kavanagh et al, 2001). Kavanagh et al (2001) proposed that if tasks aimed at competing for resources required for imagery blunt the emotional impact of negative intrusions, without affecting the course of treatment, they could operate as a treatment aid in early stages of therapy.

Broadening outcome measures in the present study would help elucidate the success of imagery rescripting for cancer patients as assessment of other types of distress may also prove beneficial. For example, the meaning cancer has for an individual is a core component of the cognitive model of adjustment to cancer (Moorey & Greer, 2002) and others have recognised the important of assessing global meaning as well as situational meaning in cancer patients (White, 2004). In the present study, although meaning was not formally assessed, transformation of imagery had a direct impact on changing the meaning of intrusive imagery as documented in both cases. Another potential outcome measure is the Mini-MAC (Watson et al, 1994), a measure of maladaptive adjustment linked to the presence of intrusive cognitions in cancer patients (e.g. Brewin et al, 1998a; Study 1 & 2). It would be interesting to investigate whether a reduction in intrusive imagery led to improved adjustment such as less hopelessness/hopelessness and anxious preoccupation in cancer patients completing imagery rescripting therapy.

Others have suggested that a difficulty with assessing the benefits of imagery rescripting therapy lies in distinguishing separate components of therapy, including reliving and rescripting components (Hunt & Fenton, 2007; Wild et al., 2007). In the present study, patients were asked to vividly evoke the memories, describing them in the present tense. This is considered a reliving component of therapy (Wild et al, 2007) which is successful because it allows for habituation, reflection and spontaneous cognitive change (Hackmann, 2005). Future research with cancer patients could compare reliving and rescripting components, following work with PTSD (Arntz et al., 2007) and snake phobia (Hunt & Fenton, 2007) samples. Combination therapy emphasising these components supports the approach of cognitive behaviour therapy in cancer patients (Moorey & Greer, 2002) which uses a variety of approaches in treatment, including those with imagery components. Typically when CBT for cancer patients is described the emphasis is on challenging verbal thoughts, and the recognition

of imagery in therapy may require rejuvenation. Wild et al (2007) also suggested that future research could investigate whether belief change is compulsory to the success of imagery rescripting therapy, or whether creating a competing image with positive affect is sufficient for a shift in symptomatology (Brewin, 2006).

In summary, the case examples presented here showed a clinically significant reduction in anxiety and depression and substantial reductions in the negative properties of intrusive imagery, including frequency, distress, interference, uncontrollability and vividness. Further empirical work is required to assess whether imagery rescripting is beneficial more widely, and inclusion of a control group would be necessary to make more robust conclusions. However, these preliminary findings at least support the suggestion that mental imagery manipulation be considered a core cognitive therapy skill (Wheatley et al, 2007) and intrusive imagery should be assessed, and where appropriate, targeted in cancer patients receiving psychological therapy.

Chapter 6

Discussion & Conclusions

The present thesis began by discussing the application of a PTSD framework for understanding psychological distress in cancer patients. This chapter revisits the central assumptions and criticisms of this approach and reflects on how the thesis has addressed these issues by utilising a wider literature to approach the phenomenon of intrusive cognitions in cancer patients. The hypotheses and findings of the present research are summarised and an overall comparison of the findings with previous research is provided. The clinical implications of the findings and research limitations are discussed with suggestions for future research.

6.1. PTSD and cancer: An alternative approach

Cancer is a life-threatening illness which is considered traumatic because it threatens core assumptions about the self, others and the world (Janoff-Bulman, 1992) and is unpredictable and uncontrollable (Ehlers & Steil, 1995). Following the introduction of life- threatening illness as a stressor that could precipitate PTSD, several studies assessed the prevalence of PTSD in cancer patients. Low prevalence rates (e.g. Mundy et al, 2000) led some to suggest that PTSD may be an inappropriate model for understanding psychological distress in cancer patients (e.g. Green et al, 1997; Gurevich et al, 2002 and Kangas et al, 2002). For example, cancer is a qualitatively different type of stressor and reflects an ongoing sense of threat. Traumatic stress for cancer patients may manifest in different ways (Baum & Posluszny, 2001) where major stressors (e.g. diagnosis of life-threatening disease) are quickly superimposed with other stressors (e.g. treatment). Stressors do not necessarily reflect life threatening events but reflect more widespread concerns triggered by the cancer experience in general, for example, future concerns relating to financial or work commitments (Moorey & Greer, 2002). These latter problems are defined as critical life events which are normative and expected to happen to individuals (Birrer et al, 2007). Traumatic events are non-normative (Birrer et al, 2007) and entail actual or threatened death, serious injury or a threat to physical integrity to the self or others (DSM-IV, APA, 1994). Although some aspects of the experience of cancer meet this criterion, other aspects such as relationship breakdown, job loss or financial concerns do not. Research has found that patients themselves don't always perceive their cancer as a threat to life or as a traumatic stressor precipitating fear, helplessness and horror (Cordova et al., 2007).

In addition to the problems with identifying the specific stressor precipitating PTSD symptoms in cancer patients, another major limitation of the approach is the

considerable overlap of arousal symptom clusters with symptoms associated with PTSD. For example, insomnia, irritability and poor concentration are also side effects of cancer treatments such as chemotherapy and thus difficult to separate from arousal symptoms. Avoidance symptoms (e.g. forgetting aspects of the trauma, avoiding places/people), are not always applicable to cancer patients due to constant follow-up hospital appointments and the internal and thus inseparable nature of cancer as a stressor (Green et al, 1997).

Several studies recognised that although cancer patients often failed to meet all symptom clusters of PTSD, intrusive recollections were relatively common (e.g. Palmer et al 2004; Matsuoka et al, 2005). A new surge of research assessed the incidence of intrusive thoughts in cancer patients (Kangas et al, 2002), using the IES, a scale developed to assess intrusiveness and avoidance in response to a traumatic event. However, limitations of the IES include its failure to assess the type of intrusive cognitions (e.g. visual/verbal), valence (e.g. positive/negative), content and characteristics of intrusive cognitions. The items of the IES also allude to the traumatic event being in the past, but cancer as a traumatic stressor is experienced in the present and also involves a number of potentially stressful future events (e.g. recurrence, treatment side-effects). A few studies asked cancer patients about intrusive cognitions without using the IES, but were still restrictive in their definitions of what was considered traumatic. For example, Matsuoka et al (2002) defined cancer related intrusive thoughts as uncontrollable thoughts about the disclosure of the cancer diagnosis coming to mind at any time since diagnosis or over a period of more than 4 weeks.

At the same time as psycho-oncology was focussing on assessing the incidence of intrusive thoughts in cancer patients, clinical psychology was revisiting the area of intrusive cognitions in various clinical samples, including PTSD, depressed and anxious groups. Strikingly, different types of visual intrusions considered a hallmark of PTSD patients were found to be experienced in these groups and demonstrate similar characteristics (Brewin, 1998; Hackmann & Holmes, 2004). For example, although intrusive imagery was reported less frequently in a depressed sample compared to a PTSD sample, when depressed patients did experience intrusive memories, they were similar to intrusive memories reported by PTSD patients (Reynolds & Brewin, 1999). Both groups experienced vivid, distressing memories that occurred several times a week and lasted between several minutes and hours. Hackmann & Holmes (2004) suggested

that reports of intrusive imagery in anxious samples were also showing patterns similar to those found in PTSD samples. For example, frequent uncontrollable intrusive images were reported in social phobia (Hackmann et al, 2000), agoraphobia (Day et al, 2004) and OCD (Speckens et al, 2007). Images were distressing, vivid and often related to actual memories of traumatic events.

In the context of PTSD and as discussed in Chapter 1, cognitive models have included processes linked to the maintenance of intrusive memories and PTSD (Ehlers & Steil, 1995). However, research had not clarified which processes linked to the maintenance of intrusive cognitions in other clinical samples. Recent research with bereaved, non-clinical and depressed samples has applied the cognitive model to the maintenance of intrusive symptoms in other populations (Boelen et al, 2003; Starr & Moulds, 2006, Moulds et al, 2008) and found that similar processes, such as the meaning individuals give to intrusive cognitions, rather than the intrusions themselves, is associated with psychological distress (Starr & Moulds, 2006).

Based on the finding that intrusive symptoms are the predominant symptom of PTSD reported by cancer patients and intrusive cognitions are ubiquitous and similar across clinical groups, the present thesis took an alternative, transdiagnostic approach and moved beyond the PTSD model to incorporate literature assessing intrusive cognitions across clinical groups. Following from previous research (e.g. Patel et al, 2007) intrusive cognitions were operationalised into three categories. Intrusive thoughts were defined as verbal intrusions that could relate to any time scale (past, present, future), intrusive memories were defined as memories of a specific event that occurred in the past and intrusive images were defined as images referring to any time-scale. Past-oriented intrusive images were distinguished from intrusive memories, because they lacked autobiographical context and were more like "snapshots." In later analyses, images and memories were combined and considered visual intrusions, as both are pictorial, rather than verbal representations.

Indeed, although psycho-oncology research adopted a PTSD framework to understand psychological distress in cancer patients, visual imagery, a hallmark symptom of PTSD, was rarely considered. The most recent literature investigating imagery in cancer patients was in the context of using guided imagery to alleviate psychological distress, treatment side-effects, pain and enhance the immune system (Roffe et al, 2005). For example, Walker and colleagues (e.g., Walker et al, 1999) found that the use of cancer-related images (e.g. immune system attacking cancer cells) was

successful in alleviating psychological distress. However, the mechanism by which guided imagery alleviated distress was unclear and guided imagery was mainly used alongside progressive muscle relaxation and thus the specific role of imagery was difficult to identify.

Based on the rejuvenation of interest in imagery within the field of clinical psychology (Hackmann & Holmes, 2004) and the relative lack of interest in imagery in cancer patients, the starting point of my thesis was developed during my MSc based on work conducted by Baddeley & Andrade (2000), which emphasised the importance of memory in the vividness of imagery by focussing on the detrimental effects of various concurrent memory tasks on imagery vividness. The work tested further hypotheses about the determinants of imagery vividness, for example, valence (positive, negative, neutral) and motion (static, dynamic) in non-clinical populations. It was found that negative and positive imagery were significantly more vivid than neutral imagery and dynamic imagery was significantly more vivid than static imagery. This work led me to become familiar with the potential application of understanding imagery for clinical practice. Determining the factors that influence imagery is an important task, because imagery is useful in therapy (see Chapter 4) and has a significant impact on emotion (Holmes & Mathews, 2005).

With this recognition of the 'special' relationship between imagery and emotion, it soon became clear that investigating intrusive imagery as well as intrusive thoughts in cancer patients would be an important next step in research. The present thesis began by acknowledging that although there was cause for considering intrusive symptoms in cancer patents, intrusions were not sufficiently assessed and important models used to understand how intrusions lead to psychological distress were not utilised.

In summary, starting from a PTSD framework, it became clear that identifying common experiences and processes associated with psychological distress in cancer patients is a viable alternative to classifying individuals according to diagnostic categories (Birrer et al, 2007). In Chapter 3, this was likened to a transdiagnostic approach to psychological disorders (Harvey et al, 2004), which assumes that experiences such as intrusive thoughts and images exist on a continuum from clinical to non-clinical populations.

The thesis addressed the limitations of previous research assessing intrusive cognitions by asking generally about individuals intrusive experiences in the last week (i.e. there were no assumptions about what the content of the intrusions would be).

From the broad literature of intrusive symptoms in clinical disorders, research questions included whether cancer patients experienced different types (e.g. visual/verbal, future/past) of intrusive cognitions, how similar in quality these were to clinical samples and whether they were associated with anxiety and maladaptive adjustment. The thesis also set out to investigate how patients appraised and coped with intrusive cognitions and whether therapeutic interventions could be used to alleviate their frequency and impact. Interview methods were utilised throughout in order to provide detail so far denied by work assessing intrusive thoughts in cancer patients.

Before discussing the specific hypotheses and findings of the present research in more detail, a note on outpatient recruitment is warranted. In Study 1 and in order to determine whether intrusive cognitions were related to anxiety in cancer patients, a series of outpatients were screened for anxiety using the HADS. The rationale was to compare matched anxious and non-anxious samples to delineate whether the experience of intrusive cognitions was related to psychological distress. During this screening process with prostate cancer patients, I worked with urology consultants on analyses which are not reported in this thesis (see Burnet, Parker, Dearnaley, Brewin, & Watson, 2007)[2]. We were interested in whether there were implications for different medical treatments in terms of psychological distress. Specifically, we wanted to assess whether a relatively new approach to the management of prostate cancer (Active Surveillance), which involves actively monitoring, rather than radically treating early stage prostate cancer patient was associated with increased distress. Our study (Burnet et al, 2007) reported that there were no significant differences in anxiety and depression for prostate cancer patients left untreated and those who received radical treatment (radiotherapy, hormone therapy). From a treatment perspective, it was important for the consultants to consider whether living with untreated prostate cancer was associated with increased psychological morbidity. From a psychological perspective, one potential avenue would be to investigate whether the differences in psychological distress across the treatment groups was mediated by experiences such as intrusive cognitions. Although the lack of differences between the treatment groups precluded an exploration of this question, the extra analyses showed that in addition to investigating mechanisms underlying anxiety in cancer patients, screening for anxiety was a useful practice. Later exploratory analyses in Study 2 found, as would be expected if intrusions were a mediating variable

---

[2] Note, name changed from Burnet to Whitaker in 2007 due to marriage

in anxiety, that there was no effect of treatment type on whether patients reported intrusive cognitions.

6.2. Overview of hypotheses and findings

6.2.1. Study 1

The thesis includes three studies. Study 1 was a cross-sectional controlled study comparing anxious and non-anxious cancer patients (see Chapter 2), where it was hypothesised that:

1) There would be a higher number of intrusive thoughts, memories and images in anxious patients compared to non-anxious matched controls.

2) The presence of intrusions cognitions would be associated with maladaptive adjustment.

3) Asking participants about intrusive thoughts, memories and images would not be associated with elevated levels of distress.

The findings of Study 1 supported these hypotheses. Anxious prostate cancer patients were significantly more likely to report intrusive thoughts, images and memories compared to non-anxious prostate cancer patients and there was a linear relationship between anxiety and the number of intrusive cognitions. Anxious cancer patients experienced distressing, negative intrusive cognitions which were interfering and difficult to control. The content of intrusive cognitions reported was similar to the content of intrusive memories reported by depressed cancer patients regarding illness, injury or death and specifically about the experience of cancer (Brewin et al, 1998a). However, there were a number of intrusive cognitions that were not specifically related to illness, injury or death. Unrelated intrusions often reflected individuals feeling of failure in life, for example, of negative personal experiences (e.g. work, relationships). Also, the majority of intrusive cognitions were future-oriented and thus in order to encompass the broad array of concerns precipitated by a cancer diagnosis, asking patients about the experience of intrusive cognitions more generally, rather than in the context of PTSD would prove beneficial. This would also help divert from the problem labelled 'conceptual bracket creeping' where an increasingly number of events are considered traumatic and can precipitate a PTSD diagnosis (McNally, 2003).

In line with intrusions reported in PTSD samples, intrusive memories were associated with a sense that the event was happening all over again. This reflects the

maladaptive processing associated with intrusive memories, where failure to integrate traumatic experience into autobiographical memory leads to a lack of information updating and subsequent feelings of 'nowness'. The intrusions were most often associated with feelings of sadness and helplessness and were also related to maladaptive adjustment including anxious preoccupation and helplessness-hopelessness, after controlling for anxiety severity. Patients did not find being asked about their intrusive experiences distressing, rather they often perceived the experience as beneficial.

Overall, cancer patients with anxiety reported intrusive cognitions with several similarities to those found in PTSD, depressed and anxious groups. However, there were several differences between the intrusions reported by cancer patients and other clinical groups. For example, anxious patients reported fewer intrusions than found in other populations and reported less overall impact of intrusions (Reynolds & Brewin, 1998). Also, intrusive imagery was less frequent than imagery reported in anxiety disorders (e.g. Hackmann et al, 2000). Overall, intrusive thoughts were significantly more common than intrusive imagery, which contrasts with previous research reporting that intrusive images are more common in PTSD samples (Ehlers & Steil, 1995). Intrusive memories reported in Study 1 were more similar to those reported in non-clinical populations than PTSD samples. For example, intrusive memories reported by anxious cancer patients were mainly contextualised autobiographical imagery which could be retrieved during an interview without accompanying physical sensations (e.g. memory of mother dying of breast cancer), whereas, intrusive memories in PTSD samples are often fragmented, accompanied by high levels of arousal and cannot be deliberately retrieved (Brewin, 1998).

Two possible reasons for the lower frequency and impact of intrusive cognitions were that 1) the anxious group was significantly less anxious than clinical groups and there is a linear relationship between anxiety and intrusions and 2) cancer patients may appraise intrusive cognitions as a normal stress response to the concrete stressor of a life-threatening illness. In Chapter 3, the cognitive approach to PTSD (Ehlers & Steil, 1995) was utilised in order to elucidate the processes linked to the maintenance of intrusive cognitions in cancer patients.

6.2.2. Study 2

Study 2 was a cross-sectional study of a mixed sample of anxious cancer patients (see Chapter 3). The following hypotheses were tested:

1) The positive linear relationship between anxiety severity and the number of intrusions reported in Study 1 would be replicated.

2) There would be a significant positive association between i) negative appraisal of intrusive cognitions (e.g. "Some day I will go out of my mind") and anxiety severity and ii) negative appraisal of intrusive cognitions and intrusion associated distress; after controlling for intrusion frequency.

3) Negative appraisal of intrusive cognitions would be associated with the extent to which patients engaged in coping strategies. Engaging in cognitive avoidance mechanisms would be associated with higher levels of psychological distress.

4) The positive relationship reported in Study 1 between the presence of intrusive cognitions and maladaptive adjustment would be replicated.

Contrary to one explanation for the lower frequency and impact of intrusive cognitions in cancer patients, it was found that cancer patients appraised intrusive cognitions in a negative way, as a sign that they couldn't cope and had a psychological problem. The level of negative appraisal of intrusive cognitions was higher in cancer patients than in ambulance workers assessed for PTSD (Clohessy & Ehlers, 1999) and student samples (Starr & Moulds, 2006) and matched levels reported in a depressed sample (Moulds et al, 2008). Negative appraisal of intrusive cognitions was associated with increased intrusion-related distress and psychological distress severity, after controlling for intrusion frequency, which corresponds to the considerable number of findings presented in Chapter 3 (e.g. Clohessy & Ehlers, 1999; Boelen et al, 2003; Williams & Moulds, 2007). As predicted, negative appraisal was associated with the extent to which patients engaged in strategies to control the intrusions (e.g. cognitive avoidance). These strategies in turn were associated with increased psychological distress. The study also replicated the positive linear relationship between number of intrusive cognitions and anxiety and the positive relationship between the presence of intrusive cognitions and maladaptive adjustment.

New findings emerged from Study 2, including the greater impact of visual compared to verbal intrusions. Visual intrusions were associated with higher levels of intrusion and avoidance, greater uncontrollability and were more likely to last for seconds than minutes or hours. The fleeting nature of intrusive imagery paralleled work

with PTSD populations (e.g. Speckens et al, 2007). Although the differences reported between visual and verbal intrusions were post-hoc and require further investigation, they are important for two reasons. Firstly, although intrusive imagery is sometimes reported less often than intrusive thoughts, it is associated with higher subjective distress and feelings of reliving and thus may require targeted intervention. Secondly, the finding provides further evidence for the distinction between types of intrusive cognitions (e.g. Brewin et al, 1996) which should be considered in future research with cancer patients.

After identifying that intrusive cognitions were associated with anxiety and maladaptive adjustment in prostate cancer patients, intrusive cognitions were explored in more detail in a mixed sample of anxious cancer patients. Study 2 confirmed the findings of Study 1 and extended them by showing that the meaning individuals assign to intrusive cognitions and intrusion-specific coping are associated with increased psychological distress. Based on the identification of intrusive cognitions as a common feature of distress in cancer patients in Study 1 and Study 2, the knowledge that intrusive cognitions mediate and maintain psychological distress (e.g. Hirsch et al, 2004) and the suggestion that intrusive cognitions are amenable to direct modification (e.g. Holmes et al, 2007), a modular approach to therapy was utilised in Study 3.

6.2.3. Study 3

Study 3 (Chapter 5) used single-case design to assess whether a psychological intervention, imagery rescripting, would be successful in reducing the frequency and impact of intrusive imagery and associated psychological distress. Imagery rescripting was chosen based on the considerable number of studies across PTSD, anxious and depressed samples demonstrating its success for patients reporting frequent, distressing intrusive imagery. The hypotheses were as follows:

1) Imagery rescripting would reduce the frequency, interference, vividness and distress associated with intrusive imagery and increase the controllability of intrusive imagery.

2) Imagery rescripting would lead to a reduction in anxiety and depression levels.

3) Positive outcomes, in terms of reduced frequency, impact and psychological distress, associated with imagery rescripting would remain at 3 month and 6 month follow-up.

Following previous research (e.g. Wheatley et al, 2007), imagery rescripting was found to provide effective and rapid relief from anxiety and depression, with reductions in negative intrusion characteristics such as frequency, distress,

uncontrollability, interference and vividness. These positive outcomes remained at 3 month and 6 month follow-up. The success of imagery rescripting was explained using a competition retrieval account (Brewin, 2006) and the self-regulation model (Scheier & Carver, 2003) following Conway et al's (2004) work conceptualising images as goals.

6.2.4. Proposed model of cancer as a traumatic stressor.

Based on the findings of the present research an overall model of how cancer as a traumatic stressor leads to anxiety and depression through experiences of intrusive cognitions is outlined (Figure 10). The flowchart represents a re-formulation of the rationale for imagery rescripting therapy (see Figure 3, Chapter 5; Wheatley & Brewin, 2005) in order to incorporate verbal as well as visual intrusive cognitions, negative appraisal and intrusion-specific coping. The figure is marked to indicate where supporting findings can be found in the present thesis (e.g. Study 1).

Evidence suggested that cancer is a traumatic stressor that precipitates uncontrollable intrusive thoughts and images (e.g. Bleiker et al, 2000). This was confirmed in Study 1 and Study 2 of the thesis. Although these intrusions share some similarities with clinical samples, both studies showed that there were marked differences. In previous research, although differences were reported in intrusive cognitions between psychological disorders (e.g. depression, PTSD), the cognitive approach to the maintenance of intrusive memories in PTSD (Ehlers & Steil, 1995) was successfully applied to the maintenance of intrusive memories in other samples (e.g. Starr & Moulds, 2006). The same approach was thus applied to the experience of intrusive cognitions in cancer patients.

The findings of Study 2 supported the suggestion that the experience of intrusive cognitions in cancer patients leads to psychological distress in the same way as proposed in the cognitive approach (Ehlers & Steil, 1995). The experience of intrusive cognitions as uncontrollable leads individuals with cancer to think that they are unable to cope or have a psychological problem. The relationship is bidirectional because having intrusive cognitions which are considered a sign of mental fragility also means they are experienced as less controllable. The positive association between negative appraisal and intrusion uncontrollability reported in Study 2 supports this suggestion. Following negative appraisal, individuals subsequently engage in coping strategies (e.g. avoidance) aimed at reducing intrusive cognitions. Study 2 reported a significant correlation between negative appraisal and coping with intrusions (e.g. rumination,

avoidance). This relationship is also bidirectional because adopting ineffective coping strategies enhances the negative meaning of the intrusive cognitions (e.g. "I cannot cope"). Coping strategies such as avoidance prevent adequate processing of the distressing intrusions and paradoxically exacerbate rather than alleviate intrusive cognitions, which in turn lead to maintenance of anxiety and depression (Michaels et al, 2005). It is suggested that the failure of coping strategies exacerbates intrusive cognitions in two ways identified in Figure 10; i) increased frequency of intrusions and ii) experience of intrusions as uncontrollable. The relationship between avoidance of intrusive cognitions and depression severity reported in Study 2 supports the final relationship in the flowchart. This is a preliminary model adopted in the present research and requires further empirical testing in order to elucidate the nature of relationships. For example, suggested causal relationships need to be empirically tested in future research.

Interventions specifically targeted at the processes described below, are likely to be most useful for cancer patients experiencing intrusive cognitions. This is further discussed in the section "Clinical Implications" (p 175).

**Cancer as a
traumatic stressor**

↓

Intrusive thoughts and images
with following characteristics (Study 1 and Study 2):
Frequent
Past/Present/Future oriented
Interfering
Distressing
Vivid imagery
Intrusive memories associated with sense of "nowness"
Last for seconds or minutes

↓

Experiences of thoughts and images as uncontrollable
(Study 1 and Study 2)

↕

Negative intrusion-appraisal (Study 2)
(e.g. "These thoughts mean that I am going out of my mind", "Something is
wrong with me")

↕

Intrusion-specific coping strategies (Study 2)
e.g. avoidance, rumination

↓

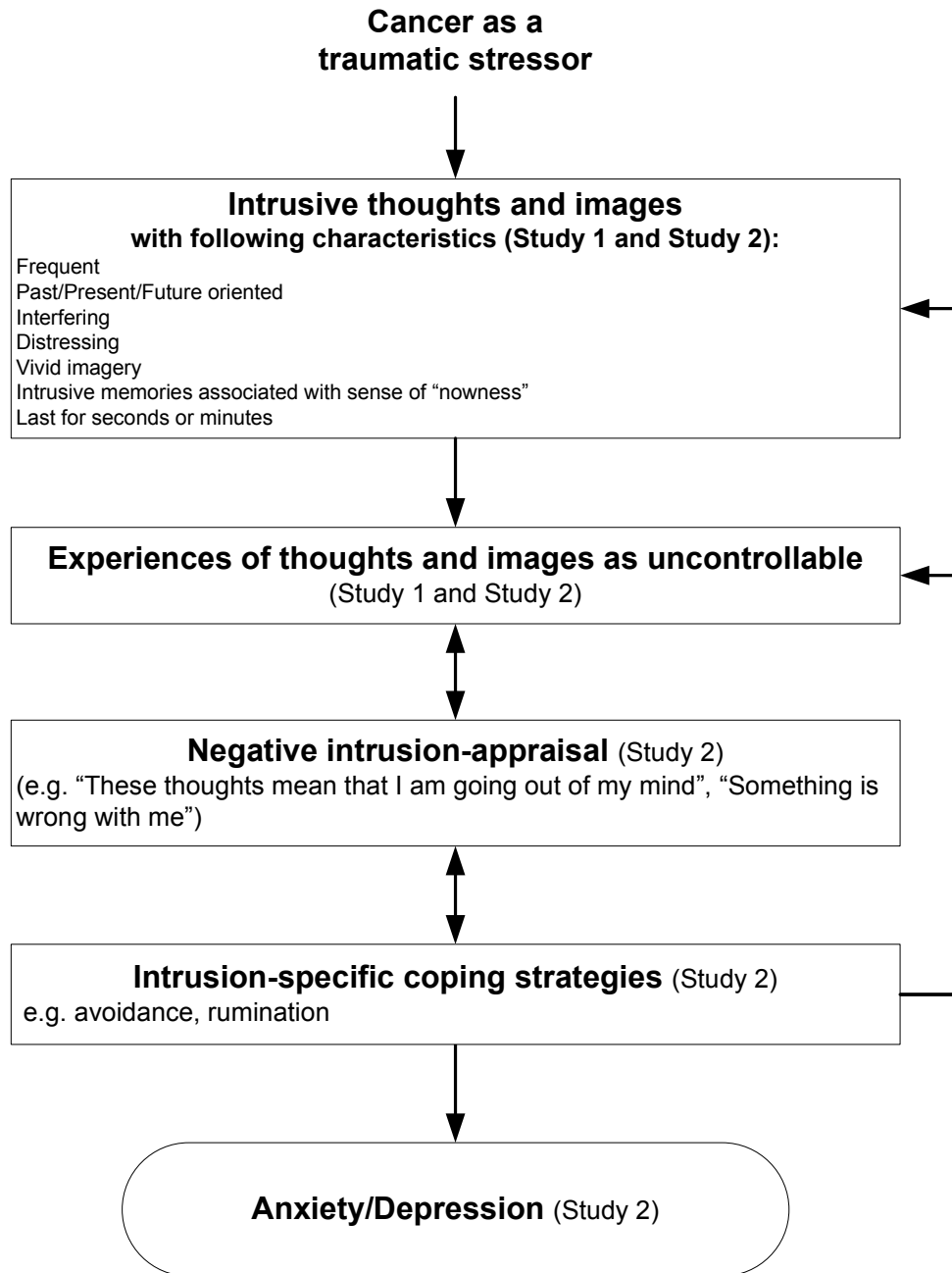**Anxiety/Depression** (Study 2)

**Figure 10 Formulation representing how intrusive cognitions experienced by
cancer patients can lead to anxiety and depression.**

6.3. Clinical implications

There are several clinical implications of the present research. Based on the finding that intrusive cognitions play a role in psychological distress and maladaptive adjustment in cancer patients, identifying them in individuals requiring psychological intervention would be helpful in therapy. Clinicians providing psychological therapy could be encouraged to routinely assess whether cancer patients experience intrusive thoughts or images. Avoidance of intrusive cognitions in Study 2 was associated with increased negative intrusion-appraisal and depression severity, after controlling for intrusion frequency. Identifying intrusive cognitions would also have implications for maladaptive avoidance responses because patients are automatically encouraged to confront rather than avoid their intrusions. This has practical application in enhancing treatment compliance, as avoidance includes avoiding places or individuals that trigger intrusive cognitions, for example, follow-up hospital appointments.

Based on the finding that the appraisal of intrusive cognitions is associated with rumination and cognitive avoidance and both negative appraisal and maladaptive coping are associated with increased distress in cancer patients, brief psychological interventions may be useful for alleviating distress. For example, simply asking cancer patients about whether they experience intrusive cognitions would help normalise the experience by showing that they are a common experience following a traumatic or critical life event. Therapies aimed at identifying and modifying negative appraisal of intrusive cognitions (Steil & Ehlers, 2000) would prove beneficial for cancer patients reporting these experiences. Further, using case formulations such as those presented in Chapter 5 could enhance metacognitive awareness by showing patients how the experience of intrusive cognitions leads to psychological distress.

Study 3 explored the use of imagery in psychological therapy and provided a rationale for targeting visual intrusions in cancer patients using imagery rescripting. Imagery rescripting is a technique which was applied to the treatment of childhood abuse memories (e.g. Smucker et al, 1995; Arntz & Weertman, 1999) and more recently developed for use in a number of different clinical groups (Holmes et al, 2007). Evidence from Study 3 showed that modifying intrusive images by encouraging patients to create alternative, more positive images led to decreased frequency and impact of intrusive cognitions and clinically significant decreases in anxiety and depression. These improvements remained at 3 month and 6 month follow-up. Although single-case

design limits generalisability of the use of this therapy in cancer patients, the success reported in Study 3 is promising. For patients experiencing negative intrusive images, rescripting is a rapid and effective therapy for relieving psychological distress.

Another insight gained from imagery rescripting therapy was how a number of different types of intrusive images are amenable to modification. For example John experienced a series of intrusive images where he had been bullied or acted like a bully. Cancer had triggered feelings of loss (in physical strength) and led to depressive episodes. John was frightened to leave the house and interact with other people because he felt he was no longer able to defend himself based on his illness. By addressing imagery he realised that he was not the aggressive person he thought he was, nor did he need to resolve situations using violence. It could be hypothesised that the change in meaning of these intrusive images meant that the loss of physical strength was no longer central to John's appraisal of cancer. Although John reported seemingly unrelated intrusive imagery, the finding that the images had implications for disease-appraisal strengthens the argument that assessing intrusive cognitions more broadly, rather than within narrow definitions will encompass the rich experience of coping with cancer.

Imagery rescripting is one of several therapies that would prove beneficial for cancer patients reporting intrusive cognitions. Recent therapeutic techniques have been developed to address intrusive thoughts as well as intrusive images by pairing these negative processes with positive emotions or mental states (Brewin, 2006). For example, techniques such as mindfulness based stress reduction (e.g. MBSR; Smith et al, 2005) and Acceptance and Commitment Therapy (ACT; Hayes et al, 2004) differ from traditional cognitive behavioural techniques which involve challenging the validity of negative thoughts. Instead, MBSR and ACT assume that it is not the presence of intrusive thoughts that causes distress, but the tendency of the patient to become emotionally involved in them. Participants are trained to distance themselves from their intrusive thoughts and acknowledge them in a dispassionate way, without emotional involvement. Thus intrusive thoughts are paired with positive mental states such as self-acceptance in ACT. In Study 3, imagery rescripting of negative memories involved pairing negative imagery with positive imagery. These techniques are constructive because they help patients distance themselves from extremely negative processes, without suggesting that these processes will disappear altogether. Thus, adaptive coping strategies are introduced and ultimately replace maladaptive coping strategies such as cognitive avoidance. The effectiveness of these approaches on the frequency and impact

of intrusive thoughts as well as intrusive images in cancer patients remain a question for future research.

6.4. Limitations

The cross-sectional nature of the present research limits the conclusions in terms of causality. Prospective studies have reported that intrusive thoughts predicted anxiety (Brewin et al, 1998b), psychological distress (Bleiker et al, 2000), anxiety and depression (Epping-Jordan et al, 1999) and anxiety (Hipkins et al, 2004) in cancer patients. Future research taking different types of intrusive cognitions into account, should investigate prospectively the course of intrusions and their relationship to psychological morbidity.

The present research adopted a cross-sectional design in order to first identify whether different types of intrusive cognitions are reported by cancer patients and whether intrusive cognitions are similar to and behave in the same way as reported in other research. Now that the importance of intrusive cognitions in cancer patients has been established, prospective design would be a natural next step in research. Other types of study design, such as experimental manipulation used in other anxious samples (e.g. Hirsch et al, 2003; Hirsch et al, 2004) also has potential for elucidating causal relationships. For example, patients with social phobia holding a negative image in mind felt more anxious, used more safety behaviours and believed that they had performed poorly compared to when they held a control image in mind. Although manipulating intrusive cognitions in cancer patients would require careful ethical consideration, establishing causal relationships in cancer patients is important.

The present study did not assess past psychiatric history or prior traumatic events. There is evidence that greater exposure to traumatic events is associated with clinically significant stress response symptoms in both early stage and metastatic breast cancer patients (Andrykowski & Cordova, 1998; Butler et al, 1999). Although in Study 3, anxiety and depression were assessed with the SCID (First et al, 2002), other psychological disorders were not assessed such as PTSD. The decision not to make an exhaustive assessment of past and present psychiatric history was based on the goal to keep the time patients were required to spend in the interview to a minimum. In addition to potential psychological distress, patients were dealing with a life threatening physical illness and this had to be considered when designing interviews and completing NHS ethics. In Study 1 and Study 2, assessment of research participation supported previous

trauma-related research (e.g. Newman et al, 1999), where participation was perceived as beneficial and associated with lack of regret in participating. Furthermore, there were no differences according to whether individuals reported intrusive cognitions or not. This is encouraging for future research assessing intrusive symptoms in cancer patients.

In Chapter 3 it was suggested that simple rating scales for intrusion-specific coping may have compromised the reliability of assessment and future research could introduce more complex measures. Williams & Moulds (2007) addressed this limitation by introducing coping measures including the Ruminative Response Scale of the Response Styles Questionnaire (Nolen-Hoeksema & Morrow, 1991) and the White Bear Suppression Inventory (Wegner & Zanakos, 1984). They also introduced additional measures of negative appraisal, including the Interpretation of Intrusions Inventory (Obsessive Compulsive Cognitions Working Group, 2001). Future research with cancer patients could use a broader array of self-report instruments, such as those mentioned above, in order to further elucidate the applicability of Ehlers and Steil's (1995) model. In addition to different self-report measures the use of open-ended questions and qualitative analyses would prove useful. Based on the complex aetiology of intrusive phenomena, qualitative methodology would also be useful for assessing other aspects of intrusive cognitions in cancer patients.

Participants in the present research were mainly White British and married. In particular, at the screening stage of Study 1 and Study 2, non-responders were significantly more likely to come from a different ethnic origin than be White British. In a review of the literature discussing why ethnic minorities are under-represented in research within the UK, it was suggested that key barriers were language, socio-cultural differences, shortage of resources for translation and fear and mistrust of the healthcare system (Hussain-Gambles, Atkin, & Leese, 2004). Future research would benefit from sampling more diverse populations of cancer patients. This could include further investigate the types of intrusive cognitions reported by children with cancer (e.g. Stuber et al, 1994) and also children of parents with cancer (e.g. Huizinga et al, 2007).

Another limitation of the present research is that all studies included a self-selected sample (i.e. people who agreed to be interviewed) and so people with severe symptoms could be over-represented. Conversely, avoidance is a strong characteristic of intrusive cognitions and therefore people may not take up invitation to interview (Birrer et al, 2007). Although in Study 1, responders were significantly more anxious than non-responders and thus this supports the first possibility, there were no significant

differences in anxiety between responders and non-responders in Study 2. However, there was an extremely low uptake rate for imagery rescripting therapy, which may have been as a result of an overall reluctance to focus on distressing intrusions. This is a key problem because a therapeutic intervention is only helpful if people agree to participate. Perhaps if intrusive imagery is assessed more routinely in clinical practice, the idea of using therapies such as imagery rescripting could be introduced more gently over a number of sessions rather than in an interview where patients may have acknowledged the presence of distressing intrusions for the first time. Another possibility for the future use of direct imagery techniques in therapy would be to introduce tasks aimed at reducing the vividness and emotional impact of intrusive cognitions (e.g. EMDR; Kavanagh et al, 2001). These tasks help introduce challenging therapy by allowing patients to initially focus on imagery in a controlled way.

There was a marked difference in uptake rates between prostate cancer patients in Study 1 and the mixed sample of cancer patients in Study 2. For screening, the overall response rate was 75% in the former and 58% in the latter. This is despite identical methods of outpatient screening. For interview take up rate, this was 65% in Study 1 and 47% for outpatient invitations in Study 2. Although rates as low as 44% are not uncommon for survey research (Laposa & Alden, 2003), the discrepancy between the two studies require some explanation. One factor that could potentially explain the discrepancy is age, as in Study 2 screening, responders were significantly older than non-responders and prostate cancer patients are a typically older sample. Prostate cancer patients were also more likely to be retired than the mixed sample of cancer patients and thus have more time for participation. In Study 2 there was an extremely low response rate from Psychological Medicine Referrals (35%). Although purely speculative because patients did not complete the HADS, this may be because patients referred to Psychological Medicine were at the peak of their anxiety and therefore less likely to participate. Another reason is that for Psychological Medicine screening, patients were sent an invitation pack consisting of an invitation letter, information sheet, consent form, reply form and the HADS. This amount of information in one pack may have deterred patients. Future research investigating intrusive cognitions in cancer patients should take these findings into account and adopt methods to maximise participation. For example, Psychological Medicine patients could have been sent a letter with an expression of interest form as the first stage, or therapists could have approached the patients face to face.

The present thesis started from a PTSD framework and one potential criticism is that the symptom clusters of arousal and avoidance were not considered. Although prevalence rates are low, some cancer patients do meet full criteria for PTSD. However, it is argued that the alternative transdiagnostic approach adopted in this thesis, which doesn't classify individuals according to diagnostic categories, would still identify these cancer patients requiring psychological intervention. In fact, the majority of interventions for PTSD target intrusive symptoms (e.g. reliving therapy; Foa et al, 1991; imagery rescripting; Arntz et al, 2007). Although some may consider it important to identify patients meeting full criteria PTSD, the present thesis suggests that identifying intrusive cognitions is a more fruitful starting point because this approach includes people with PTSD and also includes those who experience significant psychological distress as a result of intrusive symptoms but who do not meet full criteria for PTSD. This was described as a modular approach to therapy in Chapter 4, where treatment approaches are tailor-made to individual presentation.

Although imagery-based interventions were used in Study 3 and were tailor-made to individuals reporting intrusive images, participants reporting intrusive thoughts were not provided with a specific intervention as this was beyond the scope of the present research. Imagery rescripting was used for several reasons. Firstly, it is a short, manualised therapy that could be learnt within the available time-scale, it targeted intrusive imagery identified in cancer patients in Study 1 and Study 2 and several recent studies showed that is can be successful across samples to address negative imagery (Holmes et al, 2007). As discussed in terms of clinical implications of the present thesis, other psychological therapies aimed at intrusive thoughts as well as intrusive images should be assessed in future research.

In summary, key limitations of the present thesis include the cross-sectional design of Study 1 and Study 2 and the inability to generalise from the single-case design of Study 3. The research did not assess the psychiatric history of cancer patients, relied on self-report measures and the use of simple-rating scales. The findings so far apply to a relatively homogenous sample of cancer patients and more diverse populations and other hospitals need to be sampled in order to further understand intrusive cognitions in cancer patients. The intervention component only targeted a specific type of intrusive cognition and interventions targeted at intrusive thoughts are equally important. In order to further understand the utility of applying a PTSD framework to cancer patients, other symptoms including arousal and avoidance need to be considered.

6.5. Future research

6.5.1. Prospective research

Although intrusive cognitions have been identified in cancer patients and linked to psychological distress, few studies have studied the temporal course of stress response (Gurevich et al, 2002) after cancer diagnosis. Andrykowski et al (2000) assessed the temporal stability of PTSD symptoms in breast cancer survivors and found that symptoms did not significantly decrease between baseline and 1 year follow-up. Bleiker et al (2000) in a prospective study of early stage breast cancer survivors found that 60% of patients assessed (IES) at baseline (2 months post-surgery) continued to report high levels of intrusive thoughts at 2 year follow-up and Brewin et al (1998b) found that 68% of patients who had experienced intrusive memories at initial assessment continued to experience them six months later. Therefore evidence suggests that intrusive cognitions are not a transient phenomenon. In Study 2, it was unexpectedly found that a longer time since diagnosis was associated with the presence of intrusive cognitions. Although an explanation for this direction is unclear and the finding needs to be clarified with future research, this implies that intrusive cognitions are not necessarily a result of the cancer diagnosis as a single event but reflects the ongoing nature of cancer as a life-threatening stressor. Future work investigating the temporal stability of different types of intrusive cognitions is required in order to establish the long-term effects of intrusive cognitions on psychological distress. This would also help identify the appropriate time for psychological interventions. This work could also investigate the possibility that the content of intrusive cognitions changes as the immediate stressor changes (Baum & Posluszny, 2001).

6.5.2. Experimental design

Drawing on other experimental paradigms in future research would prove useful. For example, theoretically the maintenance of imagery depends considerably on working memory resources (Baddeley & Andrade, 2000). Research investigating the effects of distracter tasks on desensitising to emotive memories has found that visuospatial tasks (e.g. rapid eye movement) reduced the vividness and emotion associated with visual images (Andrade et al, 1997; Kavanagh et al, 2001; Kemps & Tiggemann, 2007). Other research has focussed on reactions to traumatic film consisting of numerous distressing images. Competition from one specific kind of

distraction task while watching the film can significantly reduce the extent to which distressing images from the film intrude in the following week but other kinds of distraction task actually increases the intrusions (e.g. Holmes et al, 2004; Stuart et al, 2006). A review of the trauma film paradigm for inducing and modulating intrusive memories (Holmes & Bourne, 2008) concluded that it provides an invaluable tool for insight into the formation and maintenance of intrusive memories. They suggested that the paradigm could be adapted for concerns of other clinical disorders (e.g. social phobia, agoraphobia) and this may also prove useful for cancer patients reporting intrusive imagery. For example, research could investigate whether the intrusiveness and vividness of imagery was reduced by training patients in a visuospatial tapping task in response to intrusions.

Also, further research assessing the utility of imagery rescripting as a psychological intervention in cancer patients should include a control group within a larger scale study. This might establish the causal relevance of imagery by providing evidence that a reduction in negative imagery precedes decreases in anxiety rather than the reverse.

As imagery depends considerably on working memory resources and imagery rescripting can be a successful therapy, other factors that influence the vividness of imagery in both intrusive images and imagery interventions may be important for the successful reduction of distress in cancer patients. In particular, it has been argued that imagery treatments for cancer patients such as guided imagery make assumptions about people's imaging ability and specifically about the vividness of individual imagery (Kwekkeboom et al, 1998). Interestingly, this was the starting point of the present thesis as I studied the determinants of imagery vividness during my MSc in recognition of the potential use of imagery in therapy. In this sense, the thesis has been cyclical, as it began with the identification of imagery as an important factor to investigate in cancer patients and finishes with the suggestion that because imagery does have a role in anxiety, imagery vividness remains a significant issue. In addition to the finding that imagery vividness is associated with increased positive outcomes (e.g. increased pain control) for cancer patients using guided imagery (Kwekkeboom et al, 2003) the imagery vividness in imagery rescripting therapy is also important. For example, the aim of imagery rescripting is to construct a competing image that has strong associative links to the negative image, will effectively compete with the distressing image (i.e. it will be easy to remember and retrieve) and involves positive affect. By increasing the

vividness of the alternative imagery and decreasing the vividness of intrusive imagery, imagery rescripting is more likely to be successful.

6.5.3. Beyond self-report

Self-report and interview measures may be the most appropriate methods for assessing phenomena such as intrusive cognitions in cancer patients. However, there are problems with the method such as the retrospective nature of assessment and their vulnerability to demand characteristics (e.g. patients answer in the way they think they should). Beyond the use of self-report scales, alternative assessment methods could be considered in future research. For example, in Study 2 patients were explicitly asked how they appraised their intrusive cognitions and it was found that negative appraisal was associated with intrusion-specific distress/coping and psychological distress. However, other measures of negative appraisal such as the Implicit Association Test (IAT; Greenwald, Mcghee, & Schwartz, 1998) could be used to gain insights impenetrable by self-report measures alone. The IAT is an experimental method which measures the association between two concepts (e.g. intrusive thoughts and personally significant). Participants are required to categorise stimuli where faster responses indicate easier pairings and slower responses indicate more difficult pairings. For example, one study experimentally manipulated appraisals of the importance of intrusive thoughts in order to test cognitive theories of obsessions (Teachman, Woody, & Magee, 2006). Teachman et al (2006) found that the manipulation shifted implicit appraisals of intrusive thoughts in the expected direction. Participants who received information indicating that their intrusive thoughts were meaningful indicators of their values implicitly evaluated themselves as more immoral and dangerous and their intrusive thoughts as more important compared to participants who were not given this information. However, explicit measures of intrusive thoughts, such as the Interpretations of Intrusions Inventory (III; Obsessive Compulsive Cognitions Working Group, 2001) were unaffected by the manipulation. This showed that providing information about negative thoughts can change the appraisal of those thoughts but implicit and explicit appraisals may be distinct. Future work investigating the role of negative appraisal of intrusive cognitions in cancer patients could use implicit as well as explicit measures of intrusive cognitions and determine whether such appraisals are open to manipulation.

As well as using experimental manipulation and finding alternative methods for assessing aspects of intrusive cognitions, future research elucidating the similarities and differences of intrusive cognitions in cancer patients compared to other clinical groups may benefit from using functional imaging methods to assess the presence of intrusive symptomatology. Research has started to consider the neural correlates of intrusive symptoms in breast cancer patients (e.g. Matsuoka et al, 2003). However, future research with cancer patients may benefit from using tasks analogous to previous PTSD research such as script-driven imagery (Francati et al, 2007). Also, the emotional stroop has been used to assess the presence of intrusive cognitions in cancer patients (Naidich & Motta, 2000) and future research could extend this to use the emotional stroop within neuroimaging studies. In addition to script-driven imagery and the emotional stroop, new tasks such as the trauma-film paradigm may be a useful tool for investigating neural correlates of PTSD symptomatology (Holmes & Bourne, 2008).

The appropriateness of using these experimental techniques for understanding intrusive cognitions in cancer patients is yet to be assessed but the central message is that other methods exist and future research with cancer patients should continue to use the wider literature, beyond psycho-oncology, to guide future research.

6.5.4. Potential from cancer and PTSD literature

A potential area for future research is to identify the risk factors associated with different types of intrusive cognitions reported in the present research. Risk factors for PTSD symptomatology were discussed in Chapter 1 and explored in relation to intrusive cognitions in Study 2. The presence of intrusive cognitions was associated with longer time since diagnosis and occupation, with retired and unemployed patients more likely to report intrusive cognitions. Younger age was identified as a risk factor for more severe intrusive cognitions, according to levels of intrusion measured by the IES, although sex was not found to be related to intrusive cognitions. Disease stage was also unrelated to intrusive cognitions in Study 1 or Study 2 which contradicts some research (e.g. Hampton & Frombach, 2000) but corroborates others (e.g. Alter et al, 1996). Now that the definition of intrusive cognitions has been broadened in cancer patients to include different forms (visual/verbal) and timescales (future/past), risk factors should be re-explored in prospective research to determine predictors of intrusive symptoms in cancer patients and identify patients most likely to experience intrusive cognitions and require psychological intervention.

Other factors that are important include social support. Women with metastatic breast cancer reporting higher levels of stressful life events and poor social support had the most severe intrusive symptoms (Butler et al, 1999). Social constraints have been positively related to intrusive cognitions, avoidance and higher levels of depression (Cordova et al, 2001; Lepore & Helgeson, 1998). One suggestion is that social support and interpersonal relationships buffer the negative emotional effects of intrusive thoughts (Lepore, 2001). Although the exact mechanisms are unclear, there are several possible explanations. Based on information processing theories, one explanation is that social constraints inhibit cognitive processing of traumatic events, leading to poorer adjustment whereas good social support facilitates processing and integration of traumatic experiences (Horowitz, 1979). Alternatively, Lepore (2001) suggests that talking with supportive others may help restore basic beliefs about the self and the world that have been shattered following cancer (Janoff-Bulman, 1992). Other potential explanations include the idea that talking may lead to habituation to the trauma. Also, social support may prevent negative appraisal of intrusive cognitions (Ehlers & Steil, 1995). This latter suggestion is supported by the current findings, where cancer patients were found to appraise intrusive cognitions in a negative way. Future research assessing the relationship between social support and intrusive cognitions in cancer patients could assess whether good social support is associated with lower negative appraisal of intrusive symptoms.

Pennebaker's work (e.g. Pennebaker, 1997 for a review) has shown that talking and writing about trauma or distressing events leads to decreases in distress. Written emotional disclosure can buffer the adverse effects of social constraints in cancer patients and may be a beneficial tool in aiding psychological adjustment for those unable to express concerns to others (Zakowski et al, 2004).

6.5.5. Potential from general PTSD literature

Following the cognitive approach to the maintenance of intrusive memories in PTSD (Ehlers & Steil, 1995; Ehlers & Clark, 2000) there may be several other predictions about factors important in the maintenance of PTSD which are relevant to cancer patients. In addition to negative appraisal of intrusive cognitions, Ehlers & Clark (2000) suggested that a sense of current threat was important for the development of PTSD. Current threat can be an external threat to safety or an internal threat to self and the future. A sense of current threat may result from negative appraisal of the trauma

and its sequelae. Various types of appraisal are important, such as appraisal of trauma, self-appraisal (e.g. "I am someone that bad things happen to") and appraisal of other people's reactions (e.g. "They think I am too weak to cope on my own"). Future research with cancer patients could further utilise the cognitive model of PTSD in order to guide research questions and facilitate hypotheses testing. For example, is a sense of current threat associated with intrusive cognitions in cancer patients? What other types of negative appraisal are important in cancer patients? Are other types of negative appraisal associated with intrusive cognitions, maladaptive coping or psychological distress?

The present study provides novel findings by assessing the content of several different types of intrusive cognitions reported by cancer patients. Future research could also ascertain the source of the unwanted memory in line with previous PTSD research (see Birrer et al, 2007) by providing a list of options (e.g. "loss of job", "your own life threatening illness"). This might help distinguish between traumatic stressors and critical life events (Birrer et al, 2007) whilst providing more detailed information about the source of intrusive cognitions in cancer patients. It would also be interesting to investigate potential triggers (e.g. places, people, feelings) of intrusive cognitions in cancer patients and compare these to PTSD and depressed samples (Birrer et al, 2007).

One difference noted between intrusive memories reported by depressed and PTSD samples is that the latter group reported significantly more out-of body experiences associated with their intrusions (Reynolds & Brewin, 1999). Out-of body experiences were described as those where the patient saw themselves and the event from an external perspective. Brewin (1998) suggested that this may represent a dissociative response to traumatic events in PTSD patients. This phenomenon could be investigated in cancer patients by asking patients whether their intrusive memories were 'observer' or 'field' memories. Observer memories may be reported by an individual if they dissociate from the experience based on extreme fear or risk of imminent death (Brewin, 1998). It might be hypothesised that due to the ongoing and chronic nature of cancer, these observer memories would be less frequent in cancer patients than in PTSD samples.

Another area of potential interest is hotspots of trauma memories which have been identified in PTSD samples, are associated with intense reliving and reflect the worst moments of trauma (Holmes, Grey, & Young, 2005). For PTSD patients "hotspots" were often associated with a severe negative view of the self and threat to

physical integrity and were commonly associated with emotions of anger and sadness as well as emotions typical of PTSD; fear, helplessness and horror. It would be interesting to investigate whether hotspots occur in intrusive imagery reported by cancer patients.

Although it has been suggested that adhering to a strict PTSD framework when understanding distress in cancer patients may be unwarranted, the field can still utilise theoretical models arising from PTSD research. There is a high degree of comorbidity between depression, PTSD and anxiety in terms of reports of distressing intrusive cognitions and thus consulting this broad literature is necessary to drive future research questions in psycho-oncology.

6.5.6. Summary

Future research would benefit from adopting prospective designs in order to clarify the causal relationships between intrusive cognitions and distress reported by cancer patients. Experimental designs (e.g. visuospatial tasks) and assessments (e.g. stroop, IAT, functional imaging) may provide alternative approaches for investigating how intrusive cognitions are developed and maintained. Potential areas of interest include assessing risk factors for developing intrusive cognitions, focussing on other factors such as social support and using the PTSD literature to drive research questions with cancer patients. Further intervention research assessing the effectiveness of imagery rescripting and other intrusion-focused interventions for cancer patients would prove valuable.

6.6. Summary of contribution

The three studies presented in this thesis add to psycho-oncology research in a number of ways. By moving away from a strict trauma framework, patients not meeting full criteria for PTSD, those reporting future-oriented as well as past-oriented intrusive cognitions and those reporting intrusive cognitions indirectly related to the cancer experience can be recognised. Interview methods may be most appropriate for assessing the complex phenomenology of intrusive cognitions and this has rarely been utilised in previous research (Kangas et al, 2002).

Based on detailed exploration of intrusion qualities in cancer patients, this research has allowed comparisons to be made between intrusive cognitions reported by cancer patients, non-clinical and clinical populations. For the first time, research assessing intrusive cognitions in cancer patients has moved beyond identifying that they

exist, but that they share similar qualities with clinical groups, such as being frequent, uncontrollable, severely distressing and associated with high levels of intrusion and avoidance. Intrusive memories were also similar to those reported in PTSD and depressed samples (e.g. Birrer et al, 2007), as they were extremely vivid, associated with feelings of 'nowness,' and re-experiencing of emotional sensations. However, there were significant differences between the intrusions reported by cancer patients and those reported in clinical samples. If the PTSD framework is entirely appropriate for understanding the experience of cancer as a traumatic event, the identification of identical types of intrusive memories would be expected. However, although there were similarities, several key aspects of the intrusions reported by cancer patients were different. For example, cancer patients were more likely to report verbal intrusions rather than visual intrusions and when visual intrusions were reported they were associated with less overall impact and were not associated with physical sensations. Other key findings were the positive relationship between anxiety severity and intrusive cognitions and the positive relationship between intrusive cognitions and aspects of maladaptive adjustment including anxious preoccupation and helplessness-hopelessness.

This research is also the first to apply information processing theories of psychological disorders, including dual representation theory (Brewin et al, 1996) and the cognitive model of PTSD (Ehlers & Clark, 1995; Ehlers & Clark, 2000) to understanding intrusive cognitions in cancer patients. Importantly, psychological variables, such as negative appraisal of intrusive cognitions were shown to add to intrusion specific distress, general distress, and intrusion-specific coping, even after controlling for intrusion frequency. This research drew a novel distinction between visual and verbal intrusions in cancer patients by showing that visual intrusions are associated with more subjective distress and uncontrollability.

Finally, this investigation is the first to include an intervention component comprising a direct imagery technique (Holmes et al, 2007) focussed on negative intrusive imagery in cancer patients to alleviate psychological distress. Previous psycho-oncology research has emphasised the benefit of tailor-made psychological therapies that take into account the specific needs of individuals (Zakowski et al, 2004). The case studies described in Study 3 demonstrated the utility of applying a retrieval competition account to psychological distress in cancer patients because simply pairing negative

imagery with imagery that was positive and easily accessible was successful in reducing negative intrusion characteristics, anxiety and depression.

Collectively, the present findings may inform clinical practice by highlighting the role of intrusive cognitions in anxiety within mixed samples of cancer patients, highlighting the variety and complexity of intrusive cognitions which are experienced and allowing new therapeutic techniques to be incorporated within existing clinical practice, such as therapies developed in clinical populations to directly target intrusive cognitions.

6.7. Publications

Study 1 was presented at the British Health Psychology Conference in Nottingham and the International Psycho-Oncology Society (IPOS) Conference at Imperial College London:

Burnet, K.L., Brewin, C.R., Watson, M. (2007). Intrusive cognitions and anxiety in cancer patients. *Psycho-Oncology 16* (9): S132-S133, p1-133

From the screening data of Study 1, an article was published investigating whether anxiety varies according to treatment type in early stage prostate cancer patients:

Burnet, K.L., Brewin, C.R., Watson, M., Dearnaley, D., Parker, C. (2007). Does active surveillance for men with localized prostate cancer carry psychological morbidity? BJU International, 100 (3), 540–543.

Study 1 was published in February 2008:

Whitaker, K.L., Brewin, C.R., Watson, M. (2008). Intrusive cognitions and anxiety in cancer patients. *Journal of Psychosomatic Research, 64,* 509-517

References

Aldridge, D. (1991). Single case research designs for the clinician. *Journal of the Royal Society of Medicine, 84,* 249-252.

Alter, C. L., Pelcovitz, D., Axelrod, A., Goldenberg, B., Harris, H., Meyers, B. et al. (1996). Identification of PTSD in cancer survivors. *Psychosomatics, 37,* 137-143.

American Psychiatric Association (1994). *Diagnostic and statistical manual of mental disorders*. (4th ed.) Washington DC: American Psychiatric Association.

Amir, M. & Ramati, A. (2002). Post-traumatic symptoms, emotional distress and quality of life in long-term survivors of breast cancer: a preliminary research. *Journal of Anxiety Disorders, 16,* 191-206.

Anagnostopoulos, F., Kolokotroni, P., Spanea, E., & Chryssochoou, M. (2006). The Mini-Mental Adjustment to Cancer (Mini-MAC) scale: construct validation with a Greek sample of breast cancer patients. *Psycho-Oncology, 15,* 79-89.

Andersen, B. L., Shelby, R. A., & Golden-Kreutz, D. M. (2007). RCT of a psychological intervention for patients with cancer: I. Mechanisms of change. *Journal of Consulting and Clinical Psychology, 75,* 927-938.

Andrade, J., Kavanagh, D. J., & Baddeley, A. (1997). Eye-movements and visual imagery: A working memory approach to the treatment of post-traumatic stress disorder. *British Journal of Clinical Psychology, 36,* 209-223.

Andrykowski, M. A. & Cordova, M. J. (1998). Factors associated with PTSD symptoms following treatment for breast cancer: Test of the Andersen model. *Journal of Traumatic Stress, 11,* 189-203.

Andrykowski, M. A., Cordova, M. J., McGrath, P. C., Sloan, D. A., & Kenady, D. E. (2000). Stability and chance in posttraumatic stress disorder symptoms following breast cancer treatment: A 1-year follow-up. *Psycho-Oncology, 9,* 69-78.

Andrykowski, M. A., Cordova, M. J., Studts, J. L., & Miller, T. W. (1998). Posttraumatic stress disorder after treatment for breast cancer: Prevalence of diagnosis and use of the PTSD checklist - Civilian version (PCL-C) as a screening instrument. *Journal of Consulting and Clinical Psychology, 66,* 586-590.

Andrykowski, M. A. & Manne, S. L. (2006). Are psychological interventions effective and accepted by cancer patients? I. Standards and levels of evidence. *Annals of Behavioral Medicine, 32,* 93-97.

Arathuzik, D. (1994). Effects of cognitive-behavioral strategies on pain in cancer patients. *Cancer Nursing, 17,* 207-214.

Arntz, A., Tiesema, N., & Kindt, M. (2007). Treatment of PTSD: A comparison of imaginal exposure with and without imagery rescripting. *Journal of Behavior Therapy and Experimental Psychiatry, 38,* 345-370.

Arntz, A. & Weertman, A. (1999). Treatment of childhood memories: theory and practice. *Behaviour Research and Therapy, 37,* 715-740.

Baddeley, A. & Andrade, J. (2000). Working memory and the vividness of imagery. *Journal of Experimental Psychology: General, 129,* 126-145.

Baer, R. A. (2003). Mindfulness training as a clinical intervention: A conceptual and empirical review. *Clinical Psychology-Science and Practice, 10,* 125-143.

Baider, L., Denour, A. K., & Kaplan, A. (1997). Psychological distress and intrusive thoughts in cancer patients. *Journal of Nervous and Mental Disease, 185,* 346-348.

Baider, L., Peretz, T., Hadani, P. E., & Koch, U. (2001). Psychological intervention in cancer patients: a randomized study. *General Hospital Psychiatry, 23,* 272-277.

Bakke, A. C., Purtzer, M. Z., & Newton, P. (2002). The effect of hypnotic-guided imagery on psychological well-being and immune function in patients with prior breast cancer. *Journal of Psychosomatic Research, 53,* 1131-1137.

Barkham, M. & Mellor-Clark, J. (2003). Bridging evidence-based practice and practice-based evidence: Developing a rigorous and relevant knowledge for the psychological therapies. *Clinical Psychology & Psychotherapy, 10,* 319-327.

Baum, A. & Posluszny, D. M. (2001). Traumatic stress as a target for intervention with cancer patients. In A.Baum & B. L. Andersen (Eds.), *Psychosocial Interventions for Cancer* (pp. 143-174). Washington DC: American Psychological Association.

Beck, A. T. (1976). *Cognitive therapy and the emotional disorders.* New York: International Universities Press.

Birrer, E., Michael, T., & Munsch, S. (2007). Intrusive images in PTSD and in traumatised and non-traumatised depressed patients: A cross-sectional clinical study. *Behaviour Research and Therapy, 45,* 2053-2065.

Bisson, J. I., Ehlers, A., Matthews, R., Pilling, S., Richards, D., & Turner, S. (2007). Psychological treatments for chronic post-traumatic stress disorder. *The British Journal of Psychiatry, 190,* 97-104.

Blake, D. D., Weathers, F. W., Nagy, L. M., Kaloupek, D. G., Gusman, F. D., Charney, D. S. et al. (1995). The development of a clinician-administered PTSD scale. *Journal of Traumatic Stress, 8,* 75-90.

Blanchard, E. B. & Hickling, E. J. (1997). *After the crash: Assessment and treatment of motor vehicle accident survivors.* Washington DC: American Psychological Association.

Bleiker, E. M. A., Pouwer, F., van der Ploeg, H. M., Leer, J. W. H., & Ader, H. J. (2000). Psychological distress two years after diagnosis of breast cancer: frequency and prediction. *Patient Education and Counseling, 40,* 209-217.

Boelen, P. A., van den Bout, J., & van den Hout, M. A. (2003). The role of negative interpretations of grief reactions in emotional problems after bereavement. *Journal of Behavior Therapy and Experimental Psychiatry, 34,* 225-238.

Bremner, J. D., Vermetten, E., Vythilingam, M., Afzal, N., Schmahl, C., Elzinga, B. et al. (2004). Neural correlates of the classic color and emotional stroop in women with abuse-related posttraumatic stress disorder. *Biological Psychiatry, 55,* 612-620.

Brennan, J. (2001). Adjustment to cancer-coping or personal transition? *Psycho-Oncology, 10,* 1-18.

Brewin, C. R. (2007). Autobiographical memory for trauma: Update on four controversies. *Memory, 15,* 227-248.

Brewin, C. R. (2001). A cognitive neuroscience account of posttraumatic stress disorder and its treatment. *Behaviour Research and Therapy, 39,* 373-393.

Brewin, C. R. (2006). Understanding cognitive behaviour therapy: A retrieval competition account. *Behaviour Research and Therapy, 44,* 765-784.

Brewin, C. R. (1998). Intrusive autobiographical memories in depression and post-traumatic stress disorder. *Applied Cognitive Psychology, 12,* 359-370.

Brewin, C. R., Christodoulides, J., & Hutchinson, G. (1996). Intrusive thoughts and intrusive memories in a nonclinical sample. *Cognition & Emotion, 10,* 107-112.

Brewin, C. R., Dalgleish, T., & Joseph, S. (1996). A dual representation theory of post traumatic stress disorder. *Psychological Review, 103,* 670-686.

Brewin, C. R. & Holmes, E. A. (2003). Psychological theories of posttraumatic stress disorder. *Clinical Psychology Review, 23,* 339-376.

Brewin, C. R., Hunter, E., Carroll, F., & Tata, P. (1996). Intrusive memories in depression: An index of schema activation? *Psychological Medicine, 26,* 1271-1276.

Brewin, C. R., Reynolds, M., & Tata, P. (1999). Autobiographical memory processes and the course of depression. *Journal of Abnormal Psychology, 108,* 511-517.

Brewin, C. R., Watson, M., McCarthy, S., Hyman, P., & Dayson, D. (1998a). Intrusive memories and depression in cancer patients. *Behaviour Research and Therapy, 36,* 1131-1142.

Brewin, C. R., Watson, M., McCarthy, S., Hyman, P., & Dayson, D. (1998b). Memory processes and the course of anxiety and depression in cancer patients. *Psychological Medicine, 28,* 219-224.

Buchanan, T. W. (2007). Retrieval of emotional memories. *Psychological Bulletin, 133,* 761-779.

Burnet, K. L., Parker, C., Dearnaley, D., Brewin, C. R., & Watson, M. (2007). Does active surveillance for men with localized prostate cancer carry psychological morbidity? *British Journal of Urology International, 100,* 540-543.

Butler, L. D., Koopman, C., Classen, C., & Spiegel, D. (1999). Traumatic stress events and emotional support in women with metastatic breast cancer: Cancer-related traumatic stress symptoms associated with past and current stressors. *Health Psychology, 18,* 555-560.

Bywaters, M., Andrade, J., & Turpin, G. (2004). Determinants of the vividness of visual imagery: The effects of delayed recall, stimulus affect and individual differences. *Memory, 12,* 479-488.

Carver, C. S. (2006). Approach, avoidance, and the self-regulation of affect and action. *Motivation and Emotion, 30,* 105-110.

Carver, C. S. & Scheier, M. F. (1998). *On the self-regulation of behavior.* New York: Cambridge University Press.

Cautela, J. R. (1977). Covert conditioning: Assumptions and procedures. *Journal of Mental Imagery, 1,* 53-64.

Cautela, J. R. (1971). Covert extinction. *Behavior Therapy, 2,* 192-200.

Cella, D. F., Mahon, S., & Donovan, M. (1990). Cancer recurrence as a traumatic event. *Behavioral Medicine, 16,* 15-22.

Clark, D. A. & Purdon, C. L. (1995). The assessment of unwanted intrusive thoughts- a review and critique of the literature. *Behaviour Research and Therapy, 33,* 967-976.

Clark, D. A. & Rhyno, S. (2005). Unwanted intrusive thoughts in nonclinical individuals: Implications for clinical disorders. In D.A.Clark (Ed.), *Intrusive thoughts in clinical disorders: Theory, research, treatment,* (pp. 1-29). New York: Guilford Press.

Clohessy, S. & Ehlers, A. (1999). PTSD symptoms, response to intrusive memories and coping in ambulance workers. *British Journal of Clinical Psychology, 38,* 251-265.

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences*. (2nd ed.) New Jersey: Lawrence Erlbaum Associates.

Conway, M., Meares, K., & Standart, S. (2004). Images and goals. *Memory, 12,* 525-531.

Conway, M. A. (2001). Sensory-perceptual episodic memory and its context: autobiographical memory. *Philosophical Transactions of the Royal Society B-Biological Sciences, 356,* 1375-1384.

Conway, M. A. & Pleydell-Pearce, C. W. (2000). The construction of autobiographical memories in the self-memory system. *Psychological Review, 107,* 261-288.

Cordova, M. J., Andrykowski, M. A., Kenady, D. E., McGrath, P. C., Sloan, D. A., & Redd, W. H. (1995). Frequency and correlates of posttraumatic-stress-disorder-like symptoms after treatment for breast cancer. *Journal of Consulting and Clinical Psychology, 63,* 981-986.

Cordova, M. J., Cunningham, L. L. C., Carlson, C. R., & Andrykowski, M. A. (2001). Social constraints, cognitive processing, and adjustment to breast cancer. *Journal of Consulting and Clinical Psychology, 69,* 706-711.

Cordova, M. J., Giese-Davis, J., Golant, M., Kronenwetter, C., Chang, V., & Spiegel, D. (2007). Breast cancer as trauma: Posttraumatic stress and posttraumatic growth. *Journal of Clinical Psychology in Medical Settings, 14,* 308-319.

Crawford, J. R., Henry, J. D., Crombie, C., & Taylor, E. P. (2001). Normative data for the HADS from a large non-clinical sample. *British Journal of Clinical Psychology, 40,* 429-434.

Davidson, P. R. & Parker, K. C. H. (2001). Eye Movement Desensitization and Reprocessing (EMDR): A Meta-Analysis. *Journal of Counseling and Clinical Psychology, 69,* 305-316.

Dawson, R. W. & McMurray, N. E. (1978). Desensitization without hierarchical presentation and concomitant relaxation. *Australian Journal of Psychology, 30,* 119-132.

Day, S., Holmes, E., & Hackmann, A. (2004). Occurrence of imagery and its link with early memories in agoraphobia. *Memory, 12,* 416-427.

Deimling, G. T., Kahana, B., Bowman, K. F., & Schaefer, M. L. (2002). Cancer survivorship and psychological distress in later life. *Psycho-Oncology, 11,* 479-494.

Devine, D., Parker, P. A., Fouladi, R. T., & Cohen, L. (2003). The association between social support, intrusive thoughts, avoidance, and adjustment following an experimental cancer treatment. *Psycho-Oncology, 12,* 453-462.

Donaldson, V. W. (2000). A clinical study of visualization on depressed white blood cell count in medical patients. *Applied Psychophysiology and Biofeedback, 25,* 117-128.

Duhamel, K. N., Ostroff, J. S., Bovbjerg, D. H., Pfeffer, M., Morasco, B., Papadopoulos, E. et al. (2000). Trauma-Focused Intervention after bone marrow transplantation : A case study. *Behavior Therapy,* 175-186.

Dunmore, E., Clark, D. M., & Ehlers, A. (1999). Cognitive factors involved in the onset and maintenance of PTSD. *Behaviour Research and Therapy, 37,* 809-829.

Dunmore, E., Clark, D. M., & Ehlers, A. (2001). A prospective study of the role of cognitive factors in persistent posttraumatic stress disorder after physical or sexual assault. *Behaviour Research and Therapy, 39,* 1063-1084.

Edelman, S., Bell, D. R., & Kidman, A. D. (1999). A group cognitive behaviour therapy programme with metastatic breast cancer patients. *Psycho-Oncology, 8,* 295-305.

Edwards, D. (2007). Restructuring implicational meaning through memory-based imagery: Some historical notes. *Journal of Behavior Therapy and Experimental Psychiatry, 38,* 306-316.

Ehlers, A. & Clark, D. M. (2000). A cognitive model of posttraumatic stress disorder. *Behaviour Research and Therapy, 38,* 319-345.

Ehlers, A., Hackmann, A., & Michael, T. (2004). Intrusive re-experiencing in post-traumatic stress disorder: Phenomenology, theory, and therapy. *Memory, 12,* 403-415.

Ehlers, A., Mayou, R. A., & Bryant, B. (1998). Psychological predictors of chronic posttraumatic stress disorder after motor vehicle accidents. *Journal of Abnormal Psychology, 107,* 508-519.

Ehlers, A. & Steil, R. (1995). Maintenance of intrusive memories in posttraumatic stress disorder: a cognitive approach. *Behavioural and Cognitive Psychotherapy, 23,* 217-249.

Elzinga, B. M. & Bremner, J. D. (2002). Are the neural substrates of memory the final common pathway in posttraumatic stress disorder (PTSD)? *Journal of Affective Disorders, 70,* 1-17.

Epping-Jordan, J. E., Compas, B. E., & Howell, D. C. (1994). Predictors of Cancer Progression in Young-Adult Men and Women - Avoidance, Intrusive Thoughts, and Psychological Symptoms. *Health Psychology, 13,* 539-547.

Epping-Jordan, J. E., Compas, B. E., Osewiecki, D. M., Oppedisano, G., Gerhardt, C., Primo, K. et al. (1999). Psychological adjustment in breast cancer: Processes of emotional distress. *Health Psychology, 18,* 315-326.

Fairbrother, N. & Rachman, S. (2006). PTSD in victims of sexual assault: test of a major component of the Ehlers-Clark theory. *Journal of Behavior Therapy and Experimental Psychiatry, 37,* 74-93.

Ferrell, B. R., Ferrell, B. A., Ahn, C., & Tran, K. (1994). Pain management for elderly patients with cancer at home. *Cancer, 74,* 2139-2146.

First, M. B., Gibbon, M., Spitzer, R. L., & Williams, J. B. W. (2002). *Structured Clinical Interview for DSM-IV Axis 1 Disorders.* New York: Biometrics Research.

Foa, E. B., Riggs, D. S., Dancu, V., & Rothbaum, B. O. (1993). Reliability and validity of a brief instrument for assessing post-traumatic stress disorder. *Journal of Traumatic Stress, 6,* 459-473.

Foa, E. B., Rothbaum, B. O., Riggs, D. S., & Murdock, R. (1991). Treatment of posttraumatic stress disorder in rape victims: A comparison between cognitive-behavioural procedures and counselling. *Journal of Consulting and Clinical Psychology, 59,* 715-723.

Francati, V., Vermetten, E., & Bremner, J. D. (2007). Functional neuroimaging studies in posttraumatic stress disorder: Review of current methods and findings. *Depression and Anxiety, 24,* 202-218.

Freeston, M. H., Ladouceur, R., Provencher, M., & Blais, F. (1995). Strategies used with intrusive thoughts: context appraisal, mood and efficacy. *Journal of anxiety disorders., 9,* 201-215.

Gabrieli, J. D. E., Fleischman, D. A., Keane, M. M., Reminger, S. L., & Morrell, F. (1995). Double dissociation between memory systems underlying explicit and implicit memory in the human brain. *Psychological Science, 6,* 76-82.

Gedo, P. M. (1999). Single case studies in psychotherapy research. *Psychoanalytic Psychology, 16,* 274-280.

Gilbert, P., Baldwin, M. W., Irons, C., Baccus, J. R., & Palmer, M. (2006). Self-criticism and self-warmth: An imagery study exploring their relation to depression. *Journal of International Psychotherapy: An International Quarterly, 20,* 183-200.

Gilbert, P. & Irons, C. (2004). A pilot exploration of the use of compassionate images in a group of self-critical people. *Memory, 12,* 507-516.

Grassi, L., Buda, P., Cavana, L., Annunziata, M. A., Torta, R., & Varetto, A. (2005). Styles of coping with cancer: The Italian version of the mini-mental adjustment to cancer (Mini-MAC) scale. *Psycho-Oncology, 14,* 115-124.

Graves, K. D. (2003). Social cognitive theory and cancer patients' quality of life: A meta-analysis of psychosocial intervention components. *Health Psychology, 22,* 210-219.

Green, B. L., Epstein, S. A., Krupnick, J. L., & Rowland, J. H. (1997). Trauma and medical illness: assessing trauma-related disorders in medical settings. In J.P.Wilson & T. M. Keane (Eds.), *Assessing Psychological Trauma and PTSD* (pp. 160-191). New York: Guilford Press.

Green, B. L., Rowland, J. H., Krupnick, J. L., Epstein, S. A., Stockton, P., Stern, N. M. et al. (1998). Prevalence of posttraumatic stress disorder in women with breast cancer. *Psychosomatics, 39,* 102-111.

Greenberg, D. B., Kornblith, A. B., Herndon, J. E., Zuckerman, E., Schiffer, C. A., Weiss, R. B. et al. (1997). Quality of life for adult leukemia survivors treated on clinical trials of cancer and leukemia group B during the period 1971-1988 - Predictors for later psychological distress. *Cancer, 80,* 1936-1944.

Greenwald, A. G., Mcghee, D. E., & Schwartz, J. L. K. (1998). Measuring individual differences in implicit cognition: The implicit association test. *Journal of Personality and Social Psychology, 74,* 1464-1480.

Grunert, B. K., Smucker, M. R., Weis, J. M., & Rusch, M. D. (2003). When prolonged exposure falls: Adding an imagery-based cognitive restructuring component in the treatment of industrial accident victims suffering from PTSD. *Cognitive and Behavioral Practice, 10,* 333-346.

Grunert, B. K., Weis, J. M., Smucker, M. R., & Christianson, H. F. (2007). Imagery rescripting and reprocessing therapy after failed prolonged exposure for post-traumatic stress disorder following industrial injury. *Journal of Behavior Therapy and Experimental Psychiatry, 38,* 317-328.

Gurevich, M., Devins, G. M., & Rodin, G. M. (2002). Stress response syndromes and cancer: Conceptual and assessment issues. *Psychosomatics, 43,* 259-281.

Gurevich, M., Devins, G. M., Wilson, C., McCready, D., Marmar, C. R., & Rodin, G. M. (2004). Stress response syndromes in women undergoing mammography:

A comparison of women with and without a history of breast cancer. *Psychosomatic Medicine, 66,* 104-112.

Hackmann, A. (2005). Compassionate imagery in the treatment of early memories in Axis I anxiety disorders. In P.Gilbert (Ed.), *Compassion: Conceptualisations, research and use in psychotherapy* (pp. 352-368). London: Brumner-Routledge.

Hackmann, A. (1998). Working with images in clinical psychology. In A.S.Bellack & M. Hersen (Eds.), *Comprehensive Clinical Psychology* (pp. 301-318). Elsevier.

Hackmann, A., Clark, D. M., & McManus, F. (2000). Recurrent images and early memories in social phobia. *Behaviour Research and Therapy, 38,* 601-610.

Hackmann, A., Ehlers, A., Speckens, A., & Clark, D. M. (2004). Characteristics and content of intrusive memories in PTSD and their changes with treatment. *Journal of Traumatic Stress, 17,* 231-240.

Hackmann, A. & Holmes, E. (2004). Reflecting on imagery: A clinical perspective and overview of the special issue of Memory on mental imagery and memory in psychopathology. *Memory, 12,* 389-402.

Hakamata, Y., Matsuoka, Y., Inagaki, M., Nagamine, M., Hara, E., Imoto, S. et al. (2007). Structure of orbitofrontal cortex and its longitudinal course in cancer-related post-traumatic stress disorder. *Neuroscience Research, 59,* 383-389.

Hampton, M. R. & Frombach, I. (2000). Women's experience of traumatic stress in cancer treatment. *Health Care for Women International, 21,* 67-76.

Harvey, A., Watkins, E., Mansell, W., & Shafran, R. (2004). *Cognitive behavioural processes across psychological disorders: a transdiagnostic approach to research and treatment, .* Oxford: Oxford University Press.

Hawton, K., Salkovskis, P., Kirk, J., & Clark, D. (2002). *Cognitive Behaviour Therapy for Psychiatric Problems: A Practical Guide.* London: Oxford University Press.

Hayes, S. C., Luoma, J. B., Bond, F. W., Masuda, A., & Lillis, J. (2006). Acceptance and commitment therapy: Model, processes and outcomes. *Behaviour Research and Therapy, 44,* 1-25.

Hellawell, S. J. & Brewin, C. R. (2002). A comparison of flashbacks and ordinary autobiographical memories of trauma: cognitive resources and behavioural observations. *Behaviour Research and Therapy, 40,* 1143-1156.

Hellawell, S. J. & Brewin, C. R. (2004). A comparison of flashbacks and ordinary autobiographical memories of trauma: content and language. *Behaviour Research and Therapy, 42,* 1-12.

Hersen, M. & Barlow, D. H. (1978). *Single case experimental designs. Strategies for studying behavior change.* New York: Pergamon Press.

Hipkins, J., Whitworth, M., Tarrier, N., & Jayson, G. (2004). Social support, anxiety and depression after chemotherapy for ovarian cancer: A prospective study. *British Journal of Health Psychology, 9,* 569-581.

Hirsch, C. R. & Holmes, E. A. (2007). Mental imagery in anxiety disorders. *Psychiatry, 6,* 161-165.

Hirsch, C. R., Mathews, A., Clark, D. M., Williams, R., & Morrison, J. (2003). Negative self-imagery blocks inferences. *Behaviour Research and Therapy, 41,* 1383-1396.

Hirsch, C. R., Meynen, T., & Clark, D. M. (2004). Negative self-imagery in social anxiety contaminates social interactions. *Memory, 12,* 496-506.

Holmes, E., Mathews, A., Dalgleish, T., & Mackintosh, B. (2006). Positive interpretation training: effects of mental imagery versus verbal training on positive mood. *Behavior Therapy, 37,* 237-247.

Holmes, E. A. (2004). Intrusive, emotional mental imagery and trauma: experimental and clinical clues. *Imagination, Cognition and Personality, 23,* 147-154.

Holmes, E. A., Arntz, A., & Smucker, M. R. (2007). Imagery rescripting in cognitive behaviour therapy: Images, treatment techniques and outcomes. *Journal of Behavior Therapy and Experimental Psychiatry, 38,* 297-305.

Holmes, E. A. & Bourne, C. (2008). Inducing and modulating intrusive emotional memories: A review of the trauma film paradigm. *Acta Psychologica, 127,* 553-566.

Holmes, E. A., Brewin, C. R., & Hennessy, R. G. (2004). Trauma films, information processing, and intrusive memory development. *Journal of Experimental Psychology-General, 133,* 3-22.

Holmes, E. A., Crane, C., Fennell, M. J. V., & Williams, J. M. G. (2007). Imagery about suicide in depression - "Flash-forwards"? *Journal of Behavior Therapy and Experimental Psychiatry, 38,* 423-434.

Holmes, E. A., Grey, N., & Young, K. A. D. (2005). Intrusive images and "hotspots" of trauma memories in Posttraumatic Stress Disorder: an exploratory investigation of emotions and cognitive themes. *Journal of Behavior Therapy and Experimental Psychiatry, 36,* 3-17.

Holmes, E. A., Lang, T. J., & Shah, D. M. (in press). Developing interpretation bias modification as a 'cognitive vaccine' for depressed mood - Imagining positive events makes you feel better than thinking about them verbally. *Journal of Abnormal Psychology*.

Holmes, E. A. & Mathews, A. (2005). Mental imagery and emotion: A special relationship? *Emotion, 5,* 489-497.

Holmes, E. A., Mathews, A., Mackintosh, B., & Dalgleish, T. (2008). The causal effect of mental imagery on emotion assessed using picture-word cues. *Emotion, 8,* 395-409.

Horowitz, M., Wilner, N., & Alvarez, W. (1979). Impact of Events Scale: A measure of subjective stress. *Psychosomatic Medicine, 41,* 209-218.

Horowitz, M. J. (1970). *Image formation and cognition*. New York: Appleton-Century-Crofts.

Horowitz, M. J. (1986). *Stress Response Syndromes*. (2nd ed.) New York: Aronson.

Hull, A. M. (2002). Neuroimaging findings in post-traumatic stress disorder - Systematic review. *British Journal of Psychiatry, 181,* 102-110.

Hunt, M. & Fenton, M. (2007). Imagery rescripting versus in vivo exposure in the treatment of snake fear. *Journal of Behavior Therapy and Experimental Psychiatry, 38,* 329-344.

Hussain-Gambles, M. A., Atkin, K., & Leese, B. (2004). Why ethnic minority groups are under-represented in clinical trials: a review of the literature. *Health and Social Care in the Community, 12,* 382-388.

Jacobsen, P. B., Widows, M. R., Hann, D. M., Andrykowski, M. A., Kronish, L. E., & Fields, K. K. (1998). Posttraumatic stress disorder symptoms after bone marrow transplantation for breast cancer. *Psychosomatic Medicine, 60,* 366-371.

Jacobson, N. S., Folette, W. C., & Revenstorf, D. (1984). Psychotherapy outcome research: methods for reporting variability and evaluating clinical significance. *Behavior Therapy, 15,* 336-352.

Jacobson, N. S., Roberts, L. J., Berns, S. B., & McGlinchey, J. B. (1999). Methods for defining and determining the clinical significance of treatment effects: Description, application, and alternatives. *Journal of Consulting and Clinical Psychology, 67,* 300-307.

Jacobson, N. S. & Truax, P. (1991). Clinical significance: a statistical approach to defining meaningful change in psychotherapy research. *Journal of Consulting and Clinical Psychology, 59,* 12-19.

Janoff-Bulman, R. (1992). *Shattered assumptions: Towards a new psychology of trauma.* New York: Free Press.

Johnson, L. E. & Benight, C. C. (2003). Effects of trauma-focused research on recent domestic violence survivors. *Journal of Traumatic Stress, 16,* 567-571.

Jones, C., Harvey, A. G., & Brewin, C. R. (2007). The organisation and content of trauma memories in survivors of road traffic accidents. *Behaviour Research and Therapy, 45,* 151-162.

Joseph, S. (2000). Psychometric evaluation of Horowitz's Impact of Event Scale: A Review. *Journal of Traumatic Stress, 13,* 101-113.

Jung, C. G. (1960). The transcendent function. In *The collected works of C.G. Jung, Vol 8: The structure and dynamics of the psyche* (2 ed., pp. 67-91). London: Routledge & Kegan Paul.

Kaasa, S., Malt, U., Hagen, S., Wist, E., Moum, T., & Kvikstad, A. (1993). Psychological distress in cancer patients with advanced disease. *Radiotherapy and Oncology, 27,* 193-197.

Kabat-Zinn, J. (2003). Mindfulness-based interventions in context: Past, present, and future. *Clinical Psychology-Science and Practice, 10,* 144-156.

Kangas, M., Henry, J. L., & Bryant, R. A. (2002). Posttraumatic stress disorder following cancer - A conceptual and empirical review. *Clinical Psychology Review, 22,* 499-524.

Kangas, M., Henry, J. L., & Bryant, R. A. (2005). The relationship between acute stress disorder and posttraumatic stress disorder following cancer. *Journal of Consulting and Clinical Psychology, 73,* 360-364.

Kassam-Adams, N. & Newman, E. (2002). The reactions to research participation questionnaires for children and for parents (RRPQ-C and RRPQ-P). *General Hospital Psychiatry, 24,* 336-342.

Kavanagh, D. J., Freese, S., Andrade, J., & May, J. (2001). Effects of visuospatial tasks on desensitization to emotive memories. *British Journal of Clinical Psychology, 40,* 267-280.

Kazdin, A. E. (2006). Mechanisms of change in psychotherapy: Advances, breakthroughs, and cutting-edge research (do not exist). In R.R.Bootzin & P. E. McKnight (Eds.), *Strengthening research methodology: Psychological measurement and evaluation* (pp. 77-101). Washington DC: American Psychological Association.

Kazdin, A. E. (1999). The meanings and measurement of clinical significance. *Journal of Consulting and Clinical Psychology, 67,* 332-339.

Kazdin, A. E. (1982). *Single-case research designs: Methods for clinical and applied settings.* New York: Oxford University Press.

Kazdin, A. E. (2001). Progression of therapy research and clinical application of treatment require better understanding of the change process. *Clinical Psychology-Science and Practice, 8,* 143-151.

Kelly, B., Raphael, B., Smithers, M., Swanson, C., Reid, C., McLeod, R. et al. (1995). Psychological responses to malignant melanoma. *General Hospital Psychiatry, 17,* 126-134.

Kemps, E. & Tiggemann, M. (2007). Reducing the vividness and emotional impact of distressing autobiographical memories: The importance of modality-specific interference. *Memory, 15,* 412-422.

Kolcaba, K. & Fox, C. (1999). The effects of guided imagery on comfort of women with early stage breast cancer undergoing radiation therapy. *Oncology Nursing Forum, 26,* 67-72.

Kosslyn, S. M. (1994). *Image and brain: The resolution of the imagery debate.* Cambridge, MA: MIT Press.

Kosslyn, S. M., Ganis, G., & Thompson, W. L. (2001). Neural foundations of imagery. *Nature Review, Neuroscience, 2,* 635-642.

Kuyken, W. & Brewin, C. R. (1999). The relation of early abuse to cognition and coping in depression. *Cognitive Therapy and Research, 23,* 665-677.

Kuyken, W. & Brewin, C. R. (1994). Intrusive memories of childhood abuse during depressive episodes. *Behaviour Research and Therapy, 32,* 525-528.

Kwekkeboom, K., Huseby-Moore, K., & Ward, S. (1998). Imaging ability and effective use of guided imagery. *Research in Nursing & Health, 21,* 189-198.

Kwekkeboom, K. L. (2000). Measuring imaging ability: Psychometric testing of the Imaging Ability Questionnaire. *Research in Nursing & Health, 23,* 301-309.

Kwekkeboom, K. L., Kneip, J., & Pearson, L. (2003). A pilot study to predict success with guided imagery for cancer pain. *Pain Manag Nurs, 4,* 112-123.

Lang, P. J. (1977). Imagery in therapy: An information processing analysis of fear. *Behavior Therapy, 8,* 862-886.

Laposa, J. M. & Alden, L. E. (2003). Posttraumatic stress disorder in the emergency room: exploration of a cognitive model. *Behaviour Research and Therapy, 41,* 49-65.

Lazarus, R. S. & Folkman, S. (1984). *Stress, Appraisal and Coping*. New York: Springer.

LeDoux, J. E., Iwata, J., Cicchetti, P., & Reis, D. J. (1988). Different projections of the central amygdaloid nucleus mediate autonomic and behavioural correlates of conditioned fear. *Journal of Neuroscience, 8,* 2517-2529.

Lee, D. (2005). The perfect nurturer: A model to develop a compassionate mind within the context of cognitive therapy. In P.Gilbert (Ed.), *Compassion: Conceptualisations, research and use in psychotherapy* (pp. 326-351). London: Brumner-Routledge.

Lengacher, C. A., Bennett, M. P., Gonzalez, L., Gilvary, D., Cox, C. E., Cantor, A. et al. (2008). Immune responses to guided imagery during breast cancer treatment. *Biological Research for Nursing, 9,* 205-214.

Leon-Pizarro, C., Gich, I., Barthe, E., Rovirosa, A., Farrus, B., Casas, F. et al. (2007). A randomized trial of the effect of training in relaxation and guided imagery techniques in improving psychological and quality-of-life indices for gynecologic and breast brachytherapy patients. *Psycho-Oncology, 16,* 971-979.

Lepore, S. (2001). A social-cognitive processing model of emotional adjustment to cancer. In A.Baum & B. L. Andersen (Eds.), *Psychosocial Interventions for Cancer* (pp. 99-116). Washington DC: American Psychological Association.

Lepore, S. J. & Helgeson, V. S. (1998). Social constraints, intrusive thoughts, and mental health after prostate cancer. *Journal of Social and Clinical Psychology, 17,* 89-106.

Lepore, S. J., Ragan, J. D., & Jones, S. (2000). Talking facilitates cognitive-emotional processes of adaptation to an acute stressor. *Journal of Personality and Social Psychology, 78,* 499-508.

Lepore, S. J., Silver, R. C., Wortman, C. B., & Wayment, H. A. (1996). Social constraints, intrusive thoughts, and depressive symptoms among bereaved mothers. *Journal of Personality and Social Psychology, 70,* 271-282.

Leuner, H. (1969). Guided affective imagery (GAI): A method of intensive psychotherapy. *American Journal of Psychotherapy, 23,* 4-22.

Levine, E. G., Eckhardt, J., & Targ, E. (2005). Change in post-traumatic stress symptoms following psychosocial treatment for breast cancer. *Psycho-Oncology, 14,* 618-635.

Lewis, J. A., Manne, S. L., Duhamel, K. N., Vickburg, S. M. J., Bovbjerg, D. H., Currie, V. et al. (2001). Social support, intrusive thoughts, and quality of life in breast cancer survivors. *Journal of Behavioral Medicine, 24,* 231-245.

Lyles, J. N., Burish, T. G., Krozely, M. G., & Oldham, R. K. (1982). Efficacy of relaxation training and guided imagery in reducing the aversiveness of cancer chemotherapy. *Journal of Consulting and Clinical Psychology, 50,* 509-524.

Manne, S., Glassman, M., & Du Hamel, K. (2000). Intrusion, avoidance, and psychological distress among individuals with cancer. *Psychosomatic Medicine, 63,* 658-667.

Manne, S. L. (1999). Intrusive thoughts and psychological distress among cancer patients: The role of spouse avoidance and criticism. *Journal of Consulting and Clinical Psychology, 67,* 539-546.

Matsuoka, Y., Inagaki, M., Sugawara, Y., Imoto, S., Akechi, T., & Uchitomi, Y. (2005). Biomedical and psychosocial determinants of intrusive recollections in breast cancer survivors. *Psychosomatics, 46,* 203-211.

Matsuoka, Y., Nagamine, M., & Uchitomi, Y. (2006). Intrusion in women with breast cancer. In N.Kato, M. Kawata, & R. K. Pitman (Eds.), *PTSD: Brain mechanisms and clinical implications* (pp. 169-178). Tokyo: Springer-Verlag.

Matsuoka, Y., Nakano, T., Inagaki, M., Sugawara, Y., Akechi, T., Imoto, S. et al. (2002). Cancer-related intrusive thoughts as an indicator of poor psychological adjustment at 3 or more years after breast surgery: a preliminary study. *Breast Cancer Research and Treatment, 76,* 117-124.

Matsuoka, Y., Yamawaki, S., Inagaki, M., Akechi, T., & Uchitomi, Y. (2003). A volumetric study of amygdala in cancer survivors with intrusive recollections. *Biological Psychiatry, 54,* 736-743.

Mayou, R., Bryant, B., & Duthie, R. (1993). Psychiatric Consequences of Road Traffic Accidents. *British Medical Journal, 307,* 647-651.

Mayou, R. A., Ehlers, A., & Bryant, B. (2002). Posttraumatic stress disorder after motor vehicle accidents: 3 year follow up of a prospective longitudinal study. *Behaviour Research and Therapy, 40,* 675.

McBride, C. M., Clipp, E., Peterson, B. L., Lipkus, I. M., & Demark-Wahnefried, W. (2000). Psychological impact of diagnosis and risk reduction among cancer survivors. *Psycho-Oncology, 9,* 418-427.

McNally, R. J. (2006). Cognitive abnormalities in post-traumatic stress disorder. *Trends in Cognitive Sciences, 10,* 271-277.

McNally, R. J. (2003). Progress and controversy in the study of posttraumatic stress disorder. *Annual Review of Psychology, 54,* 229-252.

Mehnert, A. & Koch, U. (2007). Prevalence of acute and post-traumatic stress disorder and comorbid mental disorders in breast cancer patients during primary cancer care: A prospective study. *Psycho-Oncology, 16,* 181-188.

Michael, T., Ehlers, A., Halligan, S. L., & Clark, D. M. (2005). Unwanted memories of assault: what intrusion characteristics are associated with PTSD? *Behaviour Research and Therapy, 43,* 613-628.

Moore, R. J. & Spiegel, D. (1999). Uses of guided imagery for pain control by African-American and White women with metastatic breast cancer. *Integrative Medicine, 2,* 115-126.

Moorey, S. (1991). Adjuvant Psychological Therapy - A cognitive-behavior therapy for cancer. *Coping with Cancer and Beyond : Cancer Treatment & Mental Health, 5,* 55-63.

Moorey, S. & Greer, S. (1989). *Psychological therapy for patients with cancer.* Oxford: Heinemann Medical Books.

Moorey, S. & Greer, S. (2002). *Cognitive Behaviour Therapy for people with cancer.* Oxford: Oxford University Press.

Moorey, S., Greer, S., & Watson, M. (1991). The factor structure and factor stability of the Hospital Anxiety and Depression Scale in patients with cancer. *British Journal of Psychiatry, 158,* 255-259.

Morrow, G. R. (1986). Effect of the cognitive hierarchy in the systematic desensitization treatment of anticipatory nausea in cancer patients - A component comparison with relaxation only, counseling, and no treatment. *Cognitive Therapy and Research, 10,* 421-446.

Morrow, G. R. & Dobkin, P. L. (1988). Anticipatory nausea and vomiting in cancer patients undergoing chemotherapy treatment: Prevalence, etiology, and behavioral interventions. *Clinical Psychology Review, 8,* 517-556.

Morrow, G. R. & Morrell, C. (1982). Behavioral treatment for the anticipatory nausea and vomiting induced by cancer chemotherapy. *New England Journal of Medicine, 307,* 1476-1480.

Moulds, M. L., Kandris, E., Williams, A. D., & Lang, T. J. (2008). The use of safety behaviours to manage intrusive memories in depression. *Behaviour Research and Therapy, 46,* 573-580.

Mundy, E. A., Blanchard, E. B., Cirenza, E., Gargiulo, J., Maloy, B., & Blanchard, C. G. (2000). Posttraumatic stress disorder in breast cancer patients following autologous bone marrow transplantation of conventional cancer treatments. *Behaviour Research and Therapy, 38,* 1015-1027.

Naidich, J. B. & Motta, R. W. (2000). PTSD- related symptoms in women with breast cancer. *Journal of Psychotherapy in Independent Practice, 1,* 35-54.

Nakano, T., Wenner, M., Inagaki, M., Kugaya, A., Akechi, T., Matsuoka, Y. et al. (2002). Relationship between distressing cancer-related recollections and hippocampal volume in cancer survivors. *American Journal of Psychiatry, 159,* 2087-2093.

Nelson, J. & Harvey, A. G. (2003). An exploration of pre-sleep cognitive activity in insomnia: Imagery and verbal thought. *British Journal of Clinical Psychology, 42,* 271-288.

Newman, E. & Kaloupek, D. G. (2004). The risks and benefits of participating in trauma-focused research studies. *Journal of Traumatic Stress, 17,* 383-394.

Newman, E., Walker, E. A., & Gefland, A. (1999). Assessing the ethical costs and benefits of trauma-focused research. *General Hospital Psychiatry, 21,* 187-196.

Nolen-Hoeksema, S. & Morrow, J. (1991). Effects of rumination and distraction on naturally occurring depressed mood. *Cognition and Emotion, 7,* 561-570.

Nordin, K. & Glimelius, B. (1998). Reactions to gastrointestinal cancer - Variation in mental adjustment and emotional well-being over time in patients with different prognoses. *Psycho-Oncology, 7,* 413-423.

Nunes, D. F. T., Rodriguez, A. L., Hoffmann, F. D., Luz, C., Braga, A. P. F., Muller, M. C. et al. (2007). Relaxation and guided imagery program in patients with breast cancer undergoing radiotherapy is not associated with neuroimmunomodulatory effects. *Journal of Psychosomatic Research, 63,* 647-655.

O'Donnell, M. L., Elliott, P., Wolfgang, B. J., & Creamer, M. (2007). Posttraumatic appraisals in the development and persistence of posttraumatic stress symptoms. *Journal of Traumatic Stress, 20,* 173-182.

Obsessive Compulsive Cognitions Working Group (2001). Development and validation of the Obsessive Beliefs Questionnaire and the Interpretation of Intrusions Inventory. *Behaviour Research and Therapy, 39,* 987-1006.

Ohanian, V. (2002). Imagery rescripting within cognitive behavior therapy for bulimia nervosa: An illustrative case report. *International Journal of Eating Disorders, 31,* 352-357.

Orr, S. P., Pitman, R. K., Lasko, N. B., & Herz, L. R. (1993). Psychophysiological assessment of posttraumatic stress disorder imagery in World-War-II and Korean combat veterans. *Journal of Abnormal Psychology, 102,* 152-159.

Osborn, R. L., Demoncada, A. C., & Feuerstein, M. (2006). Psychosocial interventions for depression, anxiety, and quality of life in cancer survivors: Meta-analyses. *International Journal of Psychiatry in Medicine, 36,* 13-34.

Palmer, S. C., Kagee, A., Coyne, J. C., & DeMichele, A. (2004). Experience of trauma, distress, and posttraumatic stress disorder among breast cancer patients. *Psychosomatic Medicine, 66,* 258-264.

Parle, M., Jones, B., & Maguire, P. (1996). Maladaptive coping and affective disorders among cancer patients. *Psychological Medicine, 26,* 735-744.

Patel, T., Brewin, C. R., Wheatley, J., Wells, A., Fisher, P., & Myers, S. (2007). Intrusive images and memories in major depression. *Behaviour Research and Therapy, 45,* 2573-2580.

Payne, D. K., Hoffman, R. G., Theodoulou, M., Dosik, M., & Massie, M. J. (1999). Screening for anxiety and depression in women with breast cancer. *Psychosomatics, 40,* 64-69.

Pennebaker, J. W. (1992). Putting stress into words: Health, linguistic and therapeutic implications. *Behaviour Research and Therapy, 31,* 539-548.

Pennebaker, J. W. (1997). Writing about emotional experiences as a therapeutic process. *Psychological Science, 8,* 162-166.

Pennebaker, J. W., Kiecolt-Glaser, J. K., & Glaser, R. (1998). Disclosure of traumas and immune function: Health implications for psychotherapy. *Journal of Consulting and Clinical Psychology, 56,* 239-245.

Perls, F. S. (1971). *Gestalt therapy verbatim.* New York: Bantam.

Pitman, R. K., Lanes, D. M., Williston, S. K., Guillaume, J. L., Metzger, L. J., Gehr, G. M. et al. (2001). Psychophysiologic assessment of posttraumatic stress disorder in breast cancer patients. *Psychosomatics, 42,* 133-140.

Post-White, J. (2002). Clinical indication for use of imagery in oncology practice. In D.M.Edwards (Ed.), *Voice Massage, Scripts for Guided Imagery* (pp. 319). Pittsburgh, P.A: Oncology Nursing Society.

Primo, K., Compas, B. E., Oppedisano, G., Howell, D. C., Epping-Jordan, J. E., & Krag, D. N. (2000). Intrusive thoughts and avoidance in breast cancer: Individual differences and association with psychological distress. *Psychology & Health, 14,* 1141-1153.

Rachman, S. (2007). Unwanted intrusive images in obsessive compulsive disorders. *Journal of Behavior Therapy and Experimental Psychiatry, 38,* 402-410.

Rachman, S. (1981). Unwanted intrusive cognitions. *Advances in Behavior Research and Therapy, 3,* 89-99.

Raphael, B. (1997). The interaction of trauma and grief. In D.Black, M. Newman, J. Harris-Hendricks, & G. Mezey (Eds.), *Psychological trauma: A developmental approach* (pp. 31-43). London: Gaskell.

Reynolds, M. & Brewin, C. R. (1998). Intrusive cognitions, coping strategies and emotional responses in depression, post-traumatic stress disorder and a non-clinical population. *Behaviour Research and Therapy, 36,* 135-147.

Reynolds, M. & Brewin, C. R. (1999). Intrusive memories in depression and posttraumatic stress disorder. *Behaviour Research and Therapy, 37,* 201-215.

Ringu, T. & Mullen, K. (2005). The Buddhist use of compassionate imagery in Buddhist mediation. In P.Gilbert (Ed.), *Compassion: Conceptualisations, research and use in psychotherapy* (pp. 218-238). London: Brumner-Routledge.

Roberts, K. J., Lepore, S. J., & Helgeson, V. S. (2005). Social cognitive correlates of adjustment to prostate cancer. *Psycho-Oncology*.

Roffe, L., Schmidt, K., & Ernst, E. (2005). A systematic review of guided imagery as an adjuvant cancer therapy. *Psycho-Oncology, 14,* 607-617.

Rusch, M. D., Grunert, B. K., Mendelsohn, R. A., & Smucker, M. R. (2000). Imagery rescripting for recurrent, distressing images. *Cognitive and Behavioral Practice, 7,* 173-182.

Salkovskis, P. M. (1985). Obssessive-compulsive problems: a cognitive behavioral analysis. *Behaviour Research and Therapy, 23,* 571-583.

Salkovskis, P. M. (1989). Cognitive-behavioral factors and the persistence of intrusive thoughts in obsessional problems. *Behaviour Research and Therapy, 27,* 682.

Salkovskis, P. M. & Campbell, P. (1994). Thought suppression induces intrusion in naturally occuring negative intrusive thoughts. *Behaviour Research and Therapy, 32,* 1-8.

Scheier, M. F. & Carver, C. S. (2003). Goals and confidence as self-regulatory elements underlying health and illness behavior. In L.D.Cameron & H. Leventhal (Eds.), *The Self-Regulation of Health and Illness Behaviour* (pp. 17-41). London: Routledge.

Scott, J. L., Halford, W. K., & Ward, B. G. (2004). United we stand? The effects of a couple-coping intervention on adjustment to early stage breast or gynecological cancer. *Journal of Consulting and Clinical Psychology, 72,* 1122-1135.

Shalev, A. Y., Orr, S. P., & Pitman, R. K. (1993). Psychophysiological assessment of traumatic imagery in Israeli civilian patients with posttraumatic stress disorder. *American Journal of Psychiatry, 150,* 620-624.

Shapiro, F. (2001). *Eye movement desensitization and reprocessing: Basic principles, protocols and procedures.* (2 ed.) New York: Guilford.

Shelby, R. A., Golden-Kreutz, D. M., & Andersen, B. L. (2005). Mismatch of PTSD symptoms and DSM-IV symptom clusters in a cancer sample: Exploratory factor analysis of the PTSD Checklist-Civilian Version. *Journal of Traumatic Stress, 18,* 347-357.

Simonton, O. C., Matthews-Simonton, S., & Creighton, J. O. (1978). *Getting Well Again.* Los Angeles: J.P. Torcher Inc.

Simonton, S., Sherman, A. C., Suen, J. Y., Steele, R. W., Hines, R. J., & Smith, G. R. (2000). Effects of imagery on blastogenic response to varicella zoster antigen in cancer patients recovering from radiotherapy. *Psychosomatic Medicine, 62,* 113.

Sloman, R. (2002). Relaxation and imagery for anxiety and depression control in community patients with advanced cancer. *Cancer Nursing, 25,* 432-435.

Smith, A. P. R., Henson, R. N. A., Dolan, R. J., & Rugg, M. D. (2004). fMRI correlates of the episodic retrieval of emotional contexts. *Neuroimage, 22,* 868-878.

Smith, J. E., Richardson, J., Hoffman, C., & Pilkington, K. (2005). Mindfulness-Based Stress Reduction as supportive therapy in cancer care: systematic review. *Journal of Advanced Nursing, 52,* 315-327.

Smith, M. Y., Redd, W., DuHamel, K., Vickberg, S. J., & Ricketts, P. (1999a). Validation of the PTSD Checklist-Civilian Version in survivors of bone marrow transplantation. *Journal of Traumatic Stress, 12,* 485-499.

Smith, M. Y., Redd, W. H., Peyser, C., & Vogl, D. (1999b). Post-traumatic stress disorder in cancer: A review. *Psycho-Oncology, 8,* 521-537.

Smucker, M. R., Dancu, C., Foa, E. B., & Niederee, J. L. (1995). Imagery rescripting: A new treatment for survivors of childhood sexual abuse suffering from posttraumatic stress. *Journal of cognitive psychotherapy: An international quarterly, 9,* 3-17.

Smyth, J. M. (1998). Written emotional expression: Effect sizes, outcome types and moderating variables. *Journal of Consulting and Clinical Psychology, 66,* 174-184.

Snaith, R. P. & Zigmond, A. S. (1994). *HADS: Hospital Anxiety and Depression Scale*. Windsor: NFER Nelson.

Somerville, K., Cooper, M., & Hackmann, A. (2007). Spontaneous imagery in women with bulimia nervosa: An investigation into content, characteristics and links to childhood memories. *Journal of Behavior Therapy and Experimental Psychiatry, 38,* 435-446.

Speckens, A. E. M., Ehlers, A., Hackmann, A., Ruths, F. A., & Clark, D. M. (2007). Intrusive memories and rumination in patients with post-traumatic stress disorder: A phenomenological comparison. *Memory, 15,* 249-257.

Speckens, A. E. M., Ehlers, A., Hackmann, A., & Clark, D. M. (2006). Changes in intrusive memories associated with imaginal reliving in posttraumatic stress disorder. *Journal of Anxiety Disorders, 20,* 328-341.

Speckens, A. E. M., Hackmann, A., Ehlers, A., & Cuthbert, B. (2007). Imagery special issue: Intrusive images and memories of earlier adverse events in patients with obsessive compulsive disorder. *Journal of Behavior Therapy and Experimental Psychiatry, 38,* 411-422.

Spinhoven, P., Ormel, J., Sloekers, P. P. A., Kempen, G. I. J. M., Speckens, A. E. M., & VanHemert, A. M. (1997). A validation study of the Hospital Anxiety and Depression Scale (HADS) in different groups of Dutch subjects. *Psychological Medicine, 27,* 363-370.

Stampfl, T. & Levis, D. J. (1967). Essentials of implosive therapy: A learning theory based psychodynamic behavioural therapy. *Journal of Abnormal Psychology, 72,* 496-503.

Stark, D. P. H. & House, A. (2000). Anxiety in cancer patients. *British Journal of Cancer, 83,* 1261-1267.

Starr, S. & Moulds, M. L. (2006). The role of negative interpretations of intrusive memories in depression. *Journal of Affective Disorders, 93,* 125-132.

Steil, R. & Ehlers, A. (2000). Dysfunctional meaning of posttraumatic intrusions in chronic PTSD. *Behaviour Research and Therapy, 38,* 537-558.

Stopa, L. & Jenkins, A. (2007). Images of the self in social anxiety: Effects on the retrieval of autobiographical memories. *Journal of Behavior Therapy and Experimental Psychiatry, 38,* 459-473.

Stuart, A. D. P., Holmes, E. A., & Brewin, C. R. (2006). The influence of a visuospatial grounding task on intrusive images of a traumatic film. *Behaviour Research and Therapy, 44,* 611-619.

Stuber, M. L., Meeske, K., Gonzalez, S., Houskamp, B. M., & Pynoos, R. (1994). Posttraumatic stress after childhood cancer: 1. The role of appraisal. *Psycho-Oncology, 3,* 305-312.

Sundin, E. C. & Horowitz, M. J. (2002). Impact of Event Scale: Psychometric properties. *British Journal of Psychiatry, 180,* 205-209.

Syrjala, K. L., Donaldson, G. W., Davis, M. W., Kippes, M. E., & Carr, J. E. (1995). Relaxation and imagery and cognitive-behavioral training reduce pain during cancer treatment - A controlled clinical trial. *Pain, 63,* 189-198.

Tatrow, K. & Montgomery, G. H. (2006). Cognitive behavioural therapy techniques for distress and pain in breast cancer patients: A meta-analysis. *Journal of Behavioral Medicine, 29,* 17-27.

Teachman, B. A., Woody, S. R., & Magee, J. C. (2006). Implicit and explicit appraisals of the importance of intrusive thoughts. *Behaviour Research and Therapy, 44,* 785-805.

Tjemsland, L., Soreide, J. A., & Malt, U. F. (1998). Posttraumatic distress symptoms in operable breast cancer III: Status one year after surgery. *Breast Cancer Research and Treatment, 47,* 141-151.

Troesch, L. M., Rodehaver, C. B., Delaney, E. A., & Yanes, B. (1993). The influence of guided imagery on chemotherapy-related nausea and vomiting. *Oncology Nursing Forum, 20,* 1179-1185.

Van Der Kolk, B. A. & Van Der Hart, O. (1989). Janet Pierre and the breakdown of adaptation in psychological trauma. *American Journal of Psychiatry, 146,* 1530-1540.

Vickberg, S. M. J., Bovbjerg, D. H., Duhamel, K. N., Currie, V., & Redd, W. H. (2000). Intrusive thoughts and psychological distress among breast cancer survivors: Global meaning as a possible protective factor. *Behavioral Medicine, 25,* 152-160.

Vrana, S. R., Cuthbert, B. N., & Lang, P. J. (1986). Fear imagery and text processing. *Psychophysiology, 23,* 247-253.

Vythilingam, M., Blair, K. S., McCaffrey, D., Scaramozza, M., Jones, M., Nakic, M. et al. (2007). Biased emotional attention in post-traumatic stress disorder: a help as well as a hindrance? *Psychological Medicine, 37,* 1445-1455.

Walker, E. A., Newman, E., Koss, M., & Bernstein, D. (1997). Does the study of victimization revictimize the victims? *General Hospital Psychiatry, 19,* 403-410.

Walker, L. G. (2004). Hypnotherapeutic insights and interventions: A cancer odyssey. *Contemporary Hypnosis, 21,* 35-45.

Walker, L. G., Heys, S. D., Walker, M. B., Ogston, K., Miller, I. D., Hutcheon, A. W. et al. (1999). Psychological factors can predict the response to primary chemotherapy in patients with locally advanced breast cancer. *European Journal of Cancer, 35,* 1783-1788.

Walker, L. G., Sharp, D. M., Walker, A. A., & Walker, M. B. (2007). Relaxation, visualisation, and hypnotherapy. In J.Barraclough (Ed.), *Enhancing Cancer Care: Complementary Therapy and Support* (pp. 245-257). Oxford: Oxford University Press.

Walker, M. B., Walker, L. G., Simpson, E., Hutcheon, A. W., Sarkar, T. K., Heys, S. D. et al. (2000). Do relaxation and guided imagery improve survival in women with locally advanced breast cancer? *Psycho-Oncology, 9,* 355.

Wallace, K. G. (1997). Analysis of recent literature concerning relaxation and imagery interventions for cancer pain. *Cancer Nursing, 20,* 79-87.

Warburton, N. (2000). *Thinking from A to Z.* London: Routledge.

Watkins, E. (2004). Adaptive and maladaptive ruminative self-focus during emotional processing. *Behaviour Research and Therapy, 49,* 1037-1052.

Watson, M. (1993). Anticipatory nausea and vomiting - Broadening the scope of psychological treatments. *Supportive Care in Cancer, 1,* 171-177.

Watson, M., Greer, S., Rowden, L., Gorman, C., Robertson, B., Bliss, J. M. et al. (1991). Relationships between emotional control, adjustment to cancer and depression and anxiety in breast cancer patients. *Psychological Medicine, 21,* 51-57.

Watson, M., Haviland, J. S., Greer, S., Davidson, J., & Bliss, J. M. (1999). Influence of psychological response on survival in breast cancer: a population-based cohort study. *Lancet, 354,* 1331-1336.

Watson, M., Homewood, J., Haviland, J., & Bliss, J. M. (2005). Influence of psychological response on breast cancer survival: 10-year follow-up of a population-based cohort. *European Journal of Cancer, 41,* 1710-1714.

Watson, M., Law, M., dos Santos, M., Greer, S., Baruch, J., & Bliss, J. (1994). The Mini-MAC: Further development of the mental adjustment to cancer scale. *Journal of Psychosocial Oncology, 12,* 33-46.

Weathers, F. W., Huska, J. A., & Keane, T. M. (1991). *The PTSD Checklist-Civilian Version (PCL-C). (Available from F.W. Weathers, National Center for PTSD, Boston Veterans Affairs Medical Center, 150 S. Huntington Avenue, Boston, MA 02130).*

Wegner, D. M., Schneider, D. J., Carter, S. R., & White, T. L. (1987). Paradoxical effects of thought suppression. *Journal of Personality and Social Psychology, 53,* 13.

Wegner, D. M. & Zanakos, S. (1984). Chronic thought suppression. *Journal of Personality, 62,* 615-640.

Wells, A. (1990). Panic disorder in association with relaxation induced anxiety - An attentional training approach to treatment. *Behavior Therapy, 21,* 273-280.

Wells, A. (2007). The attention training technique: Theory, effects, and a metacognitive hypothesis on auditory hallucinations. *Cognitive and Behavioral Practice, 14,* 134-138.

Wells, A. & Hackmann, A. (1993). Imagery and core beliefs in health anxiety: contents and origins. *Behavioural and Cognitive Psychotherapy, 21,* 265-273.

Whalley, M. G., Farmer, E., & Brewin, C. R. (2007). Pain flashbacks following the July 7th 2005 London bombings. *Pain, 132,* 332-336.

Wheatley, J. & Brewin, C. (2005). *Rescripting intrusive visual memories for depression. Therapist guidelines and techniques.*

Wheatley, J., Brewin, C. R., Patel, T., Hackmann, A., Wells, A., Fisher, P. et al. (2007). "I'll believe it when I can see it": Imagery rescripting of intrusive sensory memories in depression. *Journal of Behavior Therapy and Experimental Psychiatry, 38,* 371-385.

White, C. A. (2004). Meaning and its measurement in psychosocial oncology. *Psycho-Oncology, 13,* 468-481.

Widows, M. R., Jacobsen, P. B., & Fields, K. K. (2000). Relation of psychological vulnerability factors to posttraumatic stress disorder symptomatology in bone marrow transplant recipients. *Psychosomatic Medicine, 62,* 873-882.

Wild, J., Hackmann, A., & Clark, D. M. (2008). Rescripting early memories linked to negative images in social phobia: A pilot study. *Behavior Therapy, 39,* 47-56.

Wild, J., Hackmann, A., & Clark, D. M. (2007). When the present visits the past: Updating traumatic memories in social phobia. *Journal of Behavior Therapy and Experimental Psychiatry, 38,* 386-401.

Wilkins, W. (1971). Social and cognitive factors underlying the effectiveness of Wolpe's procedure. *Psychological Bulletin, 76,* 311-317.

Williams, A. D. & Moulds, M. L. (2007). Negative appraisals and cognitive avoidance of intrusive memories in depression: a replication and extension. *Depression and Anxiety, 0,* 1-8.

Wolpe, J. (1958). *Psychotherapy by reciprocal inhibition*. Pala Alto, CA: Stanford University Press.

Zakowski, S. G., Ramati, A., Morton, C., Johnson, P., & Flanigan, R. (2004). Written emotional disclosure buffers the effects of social constraints on distress among cancer patients. *Health Psychology, 23,* 555-563.

Zigmond, A. S. & Snaith, R. P. (1983). The Hospital Anxiety and Depression Scale. *Acta Psychiatrica Scandinavica, 67,* 361-370.

Appendices

6.8. HADS (Zigmond & Snaith, 1983)

This questionnaire will help you to let us know how you are. Read each item and tick the response which comes closest to how you have felt in the last few days. Don't take too long over your replies, your immediate reaction to each item will probably be more accurate than a long thought-out response.

Thank you for completing this questionnaire.

I feel tense or 'wound up':

3	☐	Most of the time
2	☐	A lot of the time
1	☐	From time to time, occasionally
0	☐	Not at all

I still enjoy the things I used to enjoy:

0	☐	Definitely as much
1	☐	Not quite so much
2	☐	Only a little
3	☐	Hardly at all

I get a sort of frightened feeling as if something awful is about to happen:

3	☐	Very definitely and quite badly
2	☐	Yes, but not too badly
1	☐	A little, but it doesn't worry me
0	☐	Not at all

I can laugh and see the funny side of things:

0	☐	As much as I always could
1	☐	Not quite so much now
2	☐	Definitely not so much now
3	☐	Not at all

Worrying thoughts go through my mind:

3	☐	A great deal of the time
2	☐	A lot of the time
1	☐	From time to time but not too often
0	☐	Only occasionally

I feel cheerful:

3	☐	Not at all
2	☐	Not often
1	☐	Sometimes
0	☐	Most of the time

I can sit at ease and feel relaxed:

0	☐	Definitely
1	☐	Usually
2	☐	Not often
3	☐	Not at all

I feel as if I am slowed down:

☐	Nearly all the time	3
☐	Very often	2
☐	Sometimes	1
☐	Not at all	0

I get a sort of frightened feeling like 'butterflies' in the stomach:

☐	Not at all	**0**
☐	Occasionally	**1**
☐	Quite often	**2**
☐	Very often	**3**

I have lost interest in my appearance:

☐	Definitely	3
☐	I don't take as much care as I should	2
☐	I may not take quite as much care	1
☐	I take just as much care as ever	0

I feel restless as if I have to be on the move:

☐	Very much indeed	**3**
☐	Quite a lot	**2**
☐	Not very much	**1**
☐	Not at all	**0**

I look forward with enjoyment to things:

☐	As much as I ever did	0
☐	Rather less than I used to	1
☐	Definitely less than I used to	2
☐	Hardly at all	3

I get sudden feelings of panic:

☐	Very often indeed	**3**
☐	Quite often	**2**
☐	Not very often	**1**
☐	Not at all	**0**

I can enjoy a good book or radio or TV programme:

☐	Often	0
☐	Sometimes	1
☐	Not often	2
☐	Very seldom	3

Total A: ☐ D: ☐

6.9. IES (Horowitz et al, 1979)

Below is a list of comments made by people after stressful experiences, such as the intrusive (thoughts/memories/ images) you describe. Please check each item, indicating how frequently these comments were true for you DURING THE PAST SEVEN DAYS.
If they did not occur during that time, please mark the "not at all" column. .

FREQUENCY

Comment	Not at all	Rarely	Sometimes	Often
1. I thought about it when I didn't mean to.				
2. I avoided letting myself get upset when I thought about it or was reminded of it.				
3. I tried to remove it from my memory.				
4. I had trouble falling asleep or staying asleep because of pictures or thoughts about it that came into my mind.				
5. I had waves of strong feelings about it.				
6. I had dreams about it.				
7. I stayed away from reminders of it.				
8. I felt as if it hadn't happened or it wasn't real.				
9. I tried not to talk about it.				
10. Pictures about it popped into my mind.				
11. Other things kept making me think about it.				
12. I was aware that I still had a lot of feelings about it, but I didn't deal with them.				
13. I tried not to think about it.				
14. Any reminder brought back feelings about it.				
15. My feelings about it were kind of numb.				

6.10. Interview Schedule- Intrusive cognitions (Patel et al, 2007)

1. MEMORIES

1. **In the last week have you had any particular memories from a particular episode or event in your past that keeps coming back into your mind?** *(If last week was exceptional then ask about a typical week).*

YES/NO
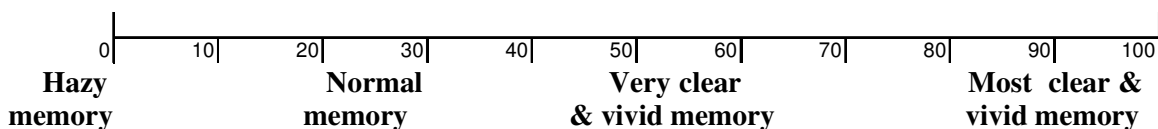   **(Prompts – When you were feeling the most depressed or memories of particular negative events)**

2. **What are the two most distressing memories?** *(If more than 2 then inform the patient that we will just be concentrating on the two most distressing memories).*

Memory 1 -
When did this episode happen? How old were you at the time of this memory?

Can you briefly describe the memory that you have?

a) Please rate the vividness of your memory for the experience:

```
  0|    10|    20|    30|    40|    50|    60|    70|    80|    90|    100
Hazy           Normal          Very clear           Most  clear &
memory         memory          & vivid memory       vivid memory
```

b) What are the emotions that you associate with this memory?

```
  0|    10|    20|    30|    40|    50|    60|    70|    80|    90|    100
Not at all       A little         Somewhat           Very much so
```

Sad: Guilty: Ashamed: Other *(specify):*

Angry: Anxious: Helpless:

c) When you have this memory, does it feel like it is not just a past event but is happening all over again right now?

```
  0|    10|    20|    30|    40|    50|    60|    70|    80|    90|    100
Not at all       A little         Somewhat           Very much so
```
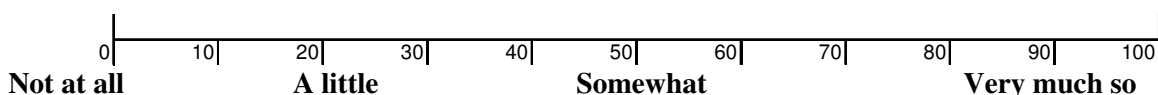
d) When you remember the event do you re-experience emotions the same as, or very similar to, those that were felt in the actual event?

```
  0|    10|    20|    30|    40|    50|    60|    70|    80|    90|   100
```
Not at all   **A little**   **Somewhat**   **Very much so**

e) When you remember the event do you re-experience physical feelings the same as, or very similar to, those that were felt in the actual event?

```
  0|    10|    20|    30|    40|    50|    60|    70|    80|    90|   100
```
Not at all   **A little**   **Somewhat**   **Very much so**

f) How many times did you experience the intrusive memory in the last week?

```
  0|    10|    20|    30|    40|    50|    60|    70|    80|    90|   100
```
None of   **Half the**   **All of**
the time   **the time**   **the time**

g) When you experience the intrusive memory on average how long does it last?

seconds/minutes/hours

h) How much did the intrusive memory interfere with your daily life?

```
  0|    10|    20|    30|    40|    50|    60|    70|    80|    90|   100
```
Not at all   **A little**   **Somewhat**   **Very much so**

i) How uncontrollable was your intrusive memory in the last week?

```
  0|    10|    20|    30|    40|    50|    60|    70|    80|    90|   100
```
Not at all   **A little**   **Somewhat**   **Very much so**

j) How distressing was your intrusive memory?

```
  0|    10|    20|    30|    40|    50|    60|    70|    80|    90|   100
```
Not at all   **A little**   **Somewhat**   **Very much so**
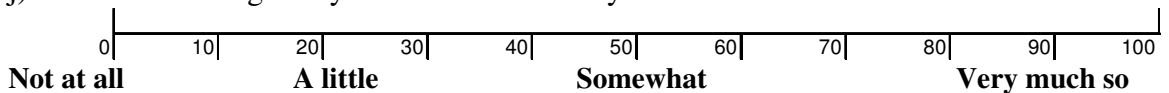
Memory 2: Repeat above questions

2. IMAGES

1. **In the last week have you had any other mental pictures or images that keep coming (spontaneously) to mind and usually involve the same kinds of things?** *(If last week was exceptional then ask about a typical week).*

YES/NO

2. **What are the two most distressing images?** *(If more than 2 then inform the patient that we will just be concentrating on the two most distressing images).*
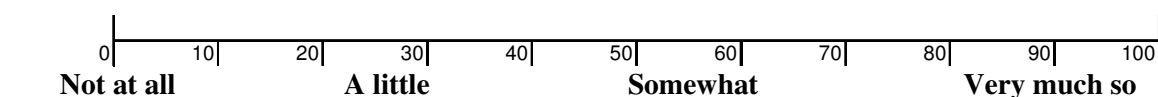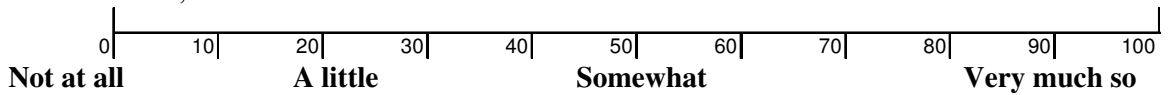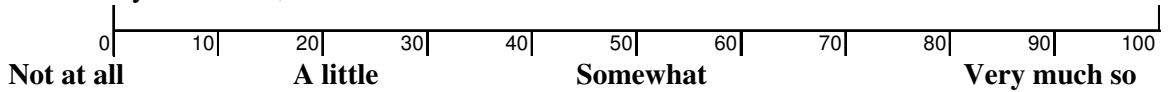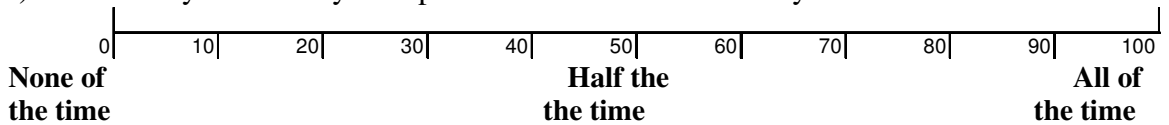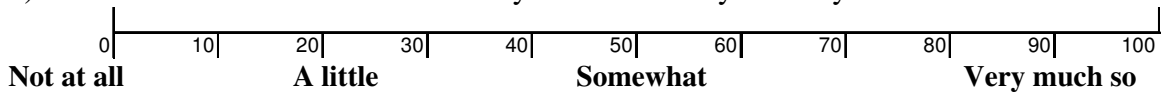
Image 1 -
Can you briefly describe what you see in the image?

a) Please rate the vividness of your image:

0	10	20	30	40	50	60	70	80	90	100
Hazy memory		**Normal memory**			**Very clear & vivid memory**				**Most clear & vivid memory**	

b) What are the emotions that you associate with this image?

0	10	20	30	40	50	60	70	80	90	100
Not at all		**A little**			**Somewhat**				**Very much so**	

Sad: **Guilty:**   **Ashamed:**   **Other** *(specify):*

Angry: **Anxious:**   **Helpless:**

c) When you have this image, does it feel like it is not just a past event but is happening all over again right now?

0	10	20	30	40	50	60	70	80	90	100
Not at all		**A little**			**Somewhat**				**Very much so**	

d) How many times did you experience the intrusive image in the last week?

0	10	20	30	40	50	60	70	80	90	100
None of the time					**Half the time**				**All of the time**	
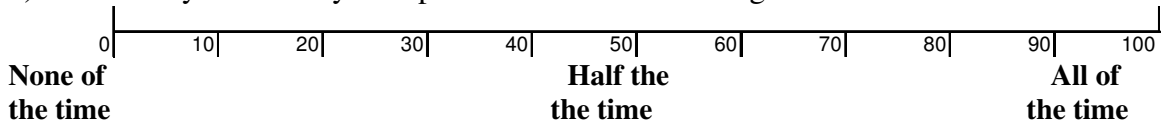
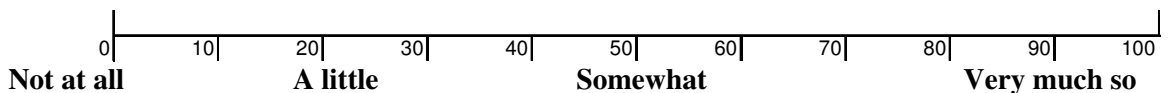e) When you experience the intrusive image on average how long does it last?

seconds/minutes/hours

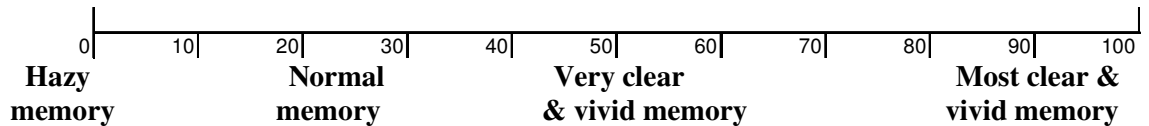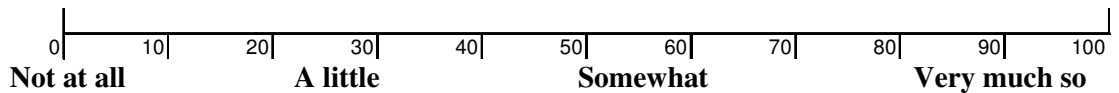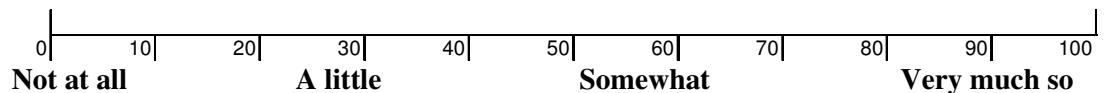f) How much did the intrusive image interfere with your daily life?
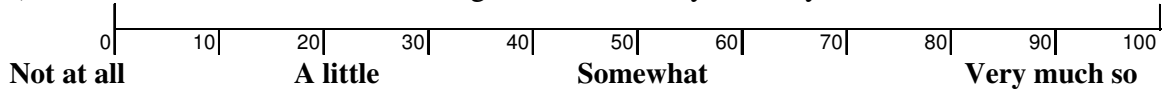
```
     0|    10|    20|    30|    40|    50|    60|    70|    80|    90|   100
Not at all        A little        Somewhat              Very much so
```

g) How uncontrollable was your intrusive image in the last week?

```
     0|    10|    20|    30|    40|    50|    60|    70|    80|    90|   100
Not at all        A little        Somewhat              Very much so
```

h) How distressing was your intrusive image?

```
     0|    10|    20|    30|    40|    50|    60|    70|    80|    90|   100
Not at all        A little        Somewhat              Very much so
```

Image 2: Repeat above questions

3. THOUGHTS

Have you been aware in the past week of thoughts that keep coming spontaneously into your mind? *(If last week was exceptional then ask about a typical week).*

YES/NO

What are the two most distressing thoughts? *(If more than 2 then inform the patient that we will just be concentrating on the two most distressing voices).*

Thought 1:
What kind of spontaneous intrusive thoughts do you have?

a) Are your thoughts always the same or do they vary?

```
     0|    10|    20|    30|    40|    50|    60|    70|    80|    90|   100
Always          Mostly          Mostly the             Always
different        different        same                   the same
```

b) What are the emotions that you associate with this thought?

```
     0|    10|    20|    30|    40|    50|    60|    70|    80|    90|   100
  Not at all          A little          Somewhat             Very much so
```
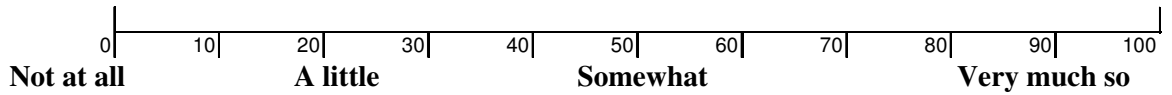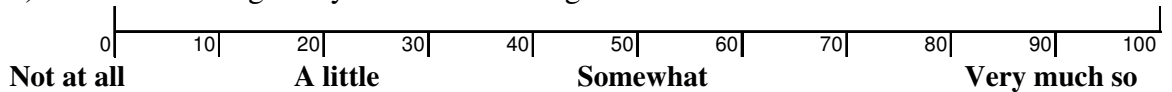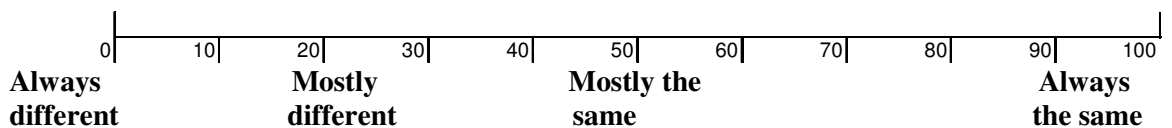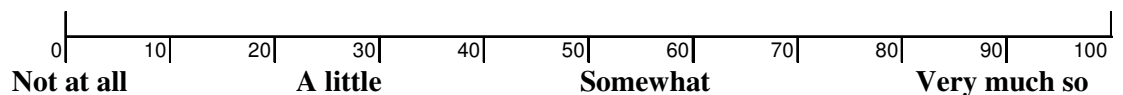
Sad: **Guilty:**   **Ashamed:**   **Other** *(specify):*

Angry: **Anxious:**   **Helpless:**

c) How many times did you experience the intrusive thought in the last week?

| 0 | 10| 20| 30| 40| 50| 60| 70| 80| 90| 100 |

None of
the time

Half the
the time

All of
the time
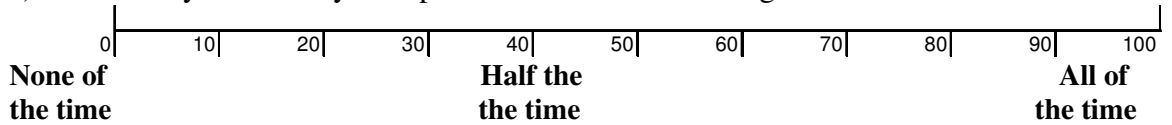
d) When you experience the intrusive thought on average how long does it last?

seconds/minutes/hours

e) How much did the intrusive thought interfere with your daily life?
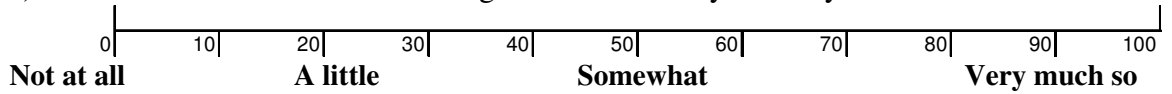
| 0 | 10| 20| 30| 40| 50| 60| 70| 80| 90| 100 |

Not at all

A little

Somewhat

Very much so

f) How uncontrollable was your intrusive thought in the last week?

| 0 | 10| 20| 30| 40| 50| 60| 70| 80| 90| 100 |

Not at all

A little

Somewhat

Very much so

g) How distressing was your intrusive thought?

| 0 | 10| 20| 30| 40| 50| 60| 70| 80| 90| 100 |

Not at all

A little

Somewhat

Very much so
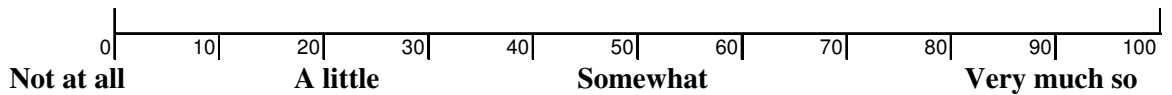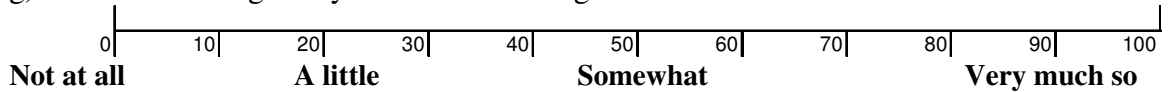
Thought 2: Repeat above questions

6.11. Mini-MAC (Watson et al, 1994)

A number of statements are given below which describe people's reactions to having cancer. Please tick the box to the right of each statement, indicating how far it applies to you **at present**.

	Definitely does **not** apply to me	Does **not** apply to me	Applies to me	**Definitely** applies to me
1. At the moment I take one day at a time				
2. I see my illness as a challenge				
3. I've put myself in the hands of God				
4. I feel like giving up				
5. I feel very angry about what has happened to me				
6. I feel completely at a loss about what to do				
7. It is a devastating feeling				
8. I count my blessings				
9. I worry about the cancer returning or getting worse				
10. I try to fight the illness				
11. I distract myself when thoughts about my illness come into my head				
12. I can't handle it				
13. I am apprehensive				
14. I am not very hopeful about the future				
15. I feel there is nothing I can do to help myself				
16. I think this is the end of the world				
17. Not thinking about it helps me cope				
18. I am very optimistic				
19. I've had a good life what's left is a bonus				

20. I feel that life is hopeless				
21. I can't cope	240			
22. I am upset about having cancer				
23. I am determined to beat this disease				
24. Since my cancer diagnosis I now realise how precious life is and I'm making the most of it				
25.I have difficulty in believing that this happened to me				
26. I make a positive effort not to think about my illness				
27. I deliberately push all thoughts of cancer out of my mind				
28.I suffer great anxiety about it				
29. I am a little frightened				

6.12. PSS-I (Foa et al, 1993)

1) Briefly describe below the stressful event reported by the individual.

2) Did the event evoke fear, helplessness and horror? (circle magnitude)

Fear:	0 Little or none	1 Moderate	2 Intense
Helplessness	0 Little or none	1 Moderate	2 Intense
Horror	0 Little or none	1 Moderate	2 Intense

How long before the interview did the event occur?

_____	< one month
_____	1-6 months
_____	6-12 months
_____	>12 months

For each item listed below, ascertain the individual experienced the symptoms during the past two weeks. Probe all positive responses in order to determine severity of the symptom (e.g. in the past two weeks, how often have you had bad dreams or nightmares), then rate the severity on the scale presented below. Rating scale (ratings made over the past two weeks)

0 = not at all
1 = once per week or less/a little bit/once in a while
2 = 2-4 times per week/somewhat/half the time
3 = 5 or more times per week/very much/almost always

Re-experiencing symptoms (need one)
1. Have you had recurrent intrusive distressing thoughts or recollections about the event? _____ _____
2. Have you had recurrent bad dreams about the event?_____ _____
3. Have you had the experience of suddenly reliving the event, flashbacks of in, acting or feeling as if it were re-occurring?_____ _____
4. Have you been intensely emotionally upset when reminded of the event (includes anniversary reactions)?_____ _____

Avoidance symptoms (need three)
5. Have you persistently been making efforts to avoid thoughts or feelings associated with the event?_____ _____
6. Have you persistently been making efforts to avoid activities, situations or places that remind you of the event?_____ _____
7. Are there any important aspects of the event that you still cannot remember?

   _____ _____
8. Have you markedly lost interest in free time activities since the event?

   _____ _____
9. Have you felt detached or cut off from others around you since the event?

   _____ _____
10. Have you felt that your ability to experience emotions is less? ____ ____
11. Have you felt that any future plans or hopes have changed because of the event? _____ _____

Arousal symptoms (need two)

12. Have you been having persistent difficulty falling or staying asleep?
_____ _____

13. Have you been continuously irritable or having outbursts of anger?
_____ _____

14. Have you been having persistent difficulty concentrating?_____ _____

15. Are you overly alert since the event?_____ _____

16. Have you been jumpier, more easily startled, since the event?____ _____

17. Have you been having intense physical reactions (for example, break into a sweat, hear beating fast) when reminded of the event? _____ _____

Indicate below if the problems you rated in Part 1 have interfered with any of the following areas of the person's life DURING THE PAST MONTH. Mark Y for Yes and N for No. Remember that interference must be due to problems above and not due to general problems associated with having cancer.

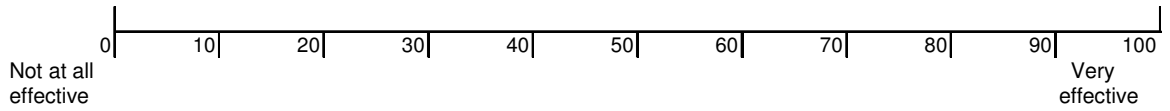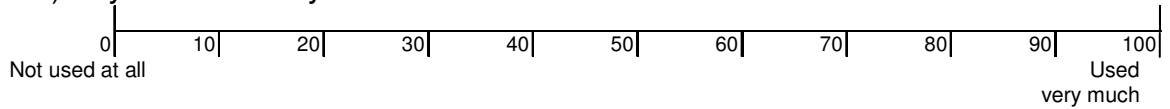|		Y	N
1.	Work	Y	N
2.	Household chores and duties	Y	N
3.	Relationships with friends	Y	N
4.	Fun and leisure activities	Y	N
5.	School work	Y	N
6.	Relationships with your family	Y	N
7.	Sex life	Y	N
8.	General satisfaction with life	Y	N
9.	Overall level of functioning in all areas of your life	Y	N

6.13. RIQ (Clohessy & Ehlers, 1999) and coping

1. A number of statements are given below which describe possible reactions to the intrusions you have reported. Please tick the box to the right of each statement, indicating how far you agree with each of the statements.

	Totally agree 1	2	3	4	5	6	Totally disagree 7
1.Something is wrong with me							
2. Some day I will go out of my mind							
3. I am inadequate							
4. I cannot cope							
5. I have a psychological problem							
6. I will not achieve goals that are important to me							

2. We would also like to know how you cope with the intrusions you have reported. Please indicate, by marking on the following scale how much you have participated in the following techniques for coping and how effective these coping strategies are.

a) I try to distract myself

0	10	20	30	40	50	60	70	80	90	100

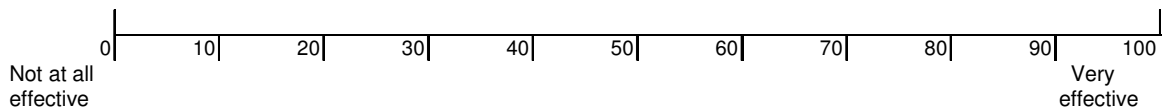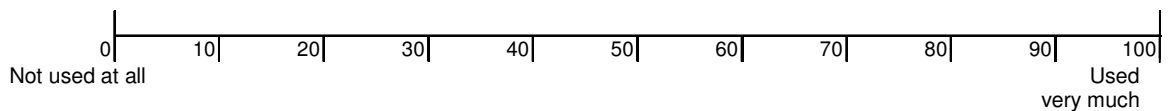Not used at all   Used very much

0	10	20	30	40	50	60	70	80	90	100

Not at all effective   Very effective

b) I try to push the intrusions out of my mind

0	10	20	30	40	50	60	70	80	90	100

Not used at all   Used very much

0	10	20	30	40	50	60	70	80	90	100

Not at all effective   Very effective

c) I dwell on it

0	10	20	30	40	50	60	70	80	90	100

Not used at all   Used very much

0	10	20	30	40	50	60	70	80	90	100

Not at all effective   Very effective
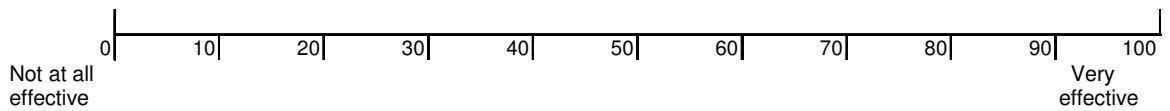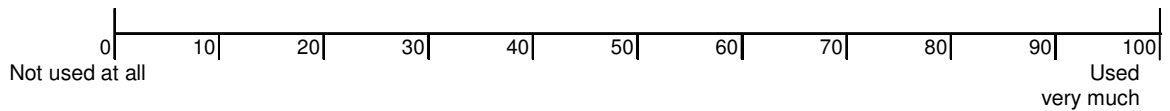
6.14. RPQ (Kassam-Adams & Newman, 2002)

We want to know your opinions about what it was like *for you* to be in this study. What it was like for you to be interviewed about the types of intrusive thoughts/ memories/ images you experience. Your answers will help us understand how people feel about being in studies like this one. We REALLY want to hear your opinions, even if there were things you did not like.

For each item below, please circle the number under the answer that is true for you. There are no right or wrong answers.

	Strongly Disagree	Disagree	Maybe (in the middle)	Agree	Strongly Agree
1. Being in this study was boring.	1	2	3	4	5
2. I am glad that I was in this study.	1	2	3	4	5
3. It was my choice if I was in the study (I could have said no even if other people wanted me to say yes).	1	2	3	4	5
4. Being in this study made me feel upset or sad.	1	2	3	4	5
5. The things I said will stay private (no one else will know I said them).	1	2	3	4	5
6. I am sorry I was in this study.	1	2	3	4	5
7. Being in this study made me feel good about myself.	1	2	3	4	5
8. I was told the truth about the study before it started.	1	2	3	4	5
9. I feel good about helping other people by being in this study.	1	2	3	4	5
10. I knew I could skip questions or parts of the study if I wanted to.	1	2	3	4	5
11. I knew I could stop at any time.	1	2	3	4	5
12. I knew I could ask to take a break whenever I wanted.	1	2	3	4	5

DO YOU HAVE ANY COMMENTS OR SUGGESTIONS FOR THE RESEARCHERS? (Please write here or on the back of this sheet).

6.15. Anxiety and Depression subsections of the SCID (First et al, 2002).

Now I would like to ask you some specific questions about problems you may have had. We'll go into more detail about them later.

1 = not present, 2 = unsure or equivocal 3 = present

1. In the last month, has there ever been a period of time when you were feeling depressed or down most of the day nearly every day?
   1   2   3

2. In the last six months have you been particularly nervous or anxious?
   1   2   3

If answer is 2/3 for any of above, continue with relevant questions corresponding to 1. 2. or 3. below.

(NOTE: ?= inadequate information, 1 =absent or false 2 =sub threshold, 3 = threshold or true)

3. Are your concerns related/unrelated to your cancer diagnosis?

1. Current major depressive disorder

MDE Criteria

In the last month….
Has there been a period of time when you were feeling depressed or down most of the day nearly every day? (What was that like?)

If YES: How long did it last? (As long as 2 weeks?)

What about losing interest or pleasure in things you usually enjoyed?
If YES: Was it nearly every day? How long did it last (As long as 2 weeks?)

For the following questions, focus on the worst two weeks in the past month (or else the past 2 weeks if equally depressed for one month)

During this (2 week period)
..how was your appetite? (What about compared to your usual appetite? Did you have to force yourself to eat? Eat less/more than usual? Did you lose/gain weight? How much? Were you trying to lose/gain weight?)

…..how were you sleeping? (Trouble falling or staying asleep, waking frequently, waking too early OR sleeping too much? How many hours a night compared to usual? Was that nearly every night?)

….were you so fidgety or restless that you were unable to sit still? (was it so bad other people noticed? What did they notice? Was that nearly every day?)
If NO
What about the opposite? Talking or moving more slowly than is normal for you? (was it so bad other people noticed? What did they notice? Was that nearly every day?)

A. Five or more of the following symptoms have been present during the same two week period and represent a change from previous

(1) depressed mood every day, as indicated by subjective report (e.g. feels sad or empty) or observation made by others (e.g. appears tearful).
(2) Markedly diminished interest or pleasure at all, or almost all, activities most of the day, nearly every day (as indicated by subjective account or observation by others).
(3) Significant weight loss when not dieting, or weight gain (change of more than 5% of body weight or decrease/increase in appetite nearly every day).
(4) Insomnia or hypersomnia nearly every day
(5) Psychomotor agitation or retardation nearly every day (observed by others, not merely subjective feelings of restlessness or being slowed down).
(NOTE: CONSIDER BEHAVIOUR DURING INTERVIEW)

(6) Fatigue or loss of energy nearly every day?

During this time…
How did you feel about yourself?
(worthless? Nearly every day?)

Did you have trouble thinking or
concentrating? (What kind of things did
it interfere with?) (Nearly every day?)

IF NO: Was it hard to make decisions
about everyday things? (Nearly every
day?)

…were things so bad that you were
thinking a lot about death or that you
would be better off dead? What about
thinking of hurting yourself?

IF YES: Did you do anything to hurt
yourself?

If unclear- has (depressive episode)
made it difficult to work, take care of
things at home, or get along with other
people?

Just before this began, were you
physically ill?
If YES: what did the doctor say?
Just before this began, were you using
any medications?
If YES: any change in the amount you
were using?

Just before this began, were you
drinking or using street drugs?

Did this occur soon after someone close
to you died?

How many times have you been
depressed nearly every day for at least
two weeks and had several of the
symptoms you described?

(7) Feeling worthlessness or excessive
or inappropriate guilt (which may be
delusional) nearly every day (not
merely self-reproach or guilt about
being sick)

NOTE CODE 1 or 2 if only self-esteem

(8) diminished ability to think or
concentrate, or indecisiveness,
nearly every day (subjective or
observed)
(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
NOTE: Code 1 for self mutilation W/O
suicidal intent.

AT LEAST 5 OF ABOVE ARE
CODED 3 AND AT LEAST ONE OF
THESE ITEMS IS (1) OR (2)

(No Criterion B in SCID).

C. The symptoms cause clinically
significant distress or impairment in
social, occupational or other important
areas of functioning

D. The symptoms are not due to the
direct physiological effects of a
substance (drug abuse, medication) or
to a general medical condition (e.g.
Parkinson's, stroke, metabolic
conditions, endocrine conditions, viral
infections, certain cancers)

E. Not better accounted for by
bereavement (after loss of loved one)
Total no of MD Episodes: (code 99 if
can't count) but should be above 5
otherwise minor depressive disorder.

2. Generalised Anxiety Disorder

You've said that in the last 6 months you have been particularly nervous or anxious….
OR in the last 6 months have you been particularly nervous or anxious….?

Do you also worry a lot about bad things that might happen?

IF YES, What do you worry about?
How much do you worry about (events/activities?)
During the past 6 months, would you say you have been worrying more days than not?
When you are worrying in this way, do you find it hard to stop yourself?

When did this anxiety start?

Now I am going to ask you some questions about symptoms that often go along with being nervous.
Thinking about those periods in the past six months when you're feeling nervous or anxious….
..do you often feel physically restless-can't sit still?
…do you often feel keyed up or on edge?
..do you often tire easily?
..do you have trouble concentrating or does your mind go blank?
..are you often irritable?
..are your muscles often tense?
..do you often have trouble falling or staying asleep?

If unclear- what effect has the anxiety, worry or physical symptoms had on your life? Has it made it hard for you to do your work or be with your friends?

A. Excessive anxiety and worry (apprehensive expectation), occurring more days than not for at least six months, about a number of events or activities (such as work or school performance)
B. The person finds it difficult to control worry.

(Does not occur exclusively during the course of a mood disorder, psychotic disorder or a pervasive developmental disorder.)

C. The anxiety and worry are associated with three or more of the following six symptoms present for more days than not for the past six months.

 (1) restlessness or feeling keyed up or on edge
 (2) being easily fatigued
 (3) difficulty concentrating or mind going blank
 (4) irritability
 (5) muscle tension
 (6) sleep disturbance (difficulty falling or staying asleep, or restless unsatisfying sleep).
 (At least 3 "C" are coded 3)

D. The focus of the anxiety and worry is not confined to the features of another axis 1 disorder e.g about having a panic attack, social phobia, OCD, separation disorder, anorexia, somatization disorder, hypochondriasis and the anxiety and worry do not occur exclusively during PTSD.
E. The anxiety, worry or physical symptoms cause clinically significant distress or impairment in social, occupational, or other important areas of functioning.

Just before you began having this anxiety, were you taking any drugs, caffeine, diet pills or other medicine?

(How much caffeine, tea or caffeinated soda do you drink a day?)

Just before these problems began were you physically ill?

F. Not due to the direct physiological effects of a substance or general medical condition

General medical conditions include Hyper and hypo-thyroidism, hypoglycaemia, hyper parathyriodism, pheochrmomcytoma, congestive heart failure, arryythmias, pulmonary embolism, chronic obstructive pulmonary disease, pneumonia, hyperventilation, B-12 deficiency, porphyria, CNS neoplasms, vestibular dysfunction, encephalitis

Etiological substances include cocaine, amphetamines, cannabis, hallucinogens, PCO, or alcohol or withdrawal from CNS depressants.

GAD criteria A, B, C, D, E and F are coded 3.

Indicate current severity:
Mild 1. few, if any symptoms
Moderate 2- symptoms of functional impairment
Severe 3-any symptoms in excess of those required.

Age at onset?
Code 99 if unknown

ADJUSTMENT DISORDERS

Do you think that your cancer diagnosis has anything to do with getting your symptoms?

What effect have your symptoms had on you and your ability to do things? How upset were you? Has it made it hard for you to do your work or be with friends?

Have you had this reaction many times before?

Were you having them even before the stressor happened?

How long has it been since the stressor/ complications arising from the stressor were over?

Criteria for AD:

A. The development of emotional or behavioural symptoms in response to an identifiable stressor occurring within 3 months of the onset of the stressor
B. These symptoms/behaviours are clinically significant as evidenced by
i. marked distress in excess of what would be expected from exposure to the stressor
ii. significant impairment in social or occupational functioning
C. The stress-related disturbance does not meet criteria for another specific Axis 1 disorder and is not merely an exacerbation of a pre-existing Axis I or Axis II disorder.
D. The symptoms do not represent bereavement
E. Once the stressor has terminated, the symptoms do not persist for more than an additional 6 months.

Make diagnosis of adjustment disorder based on predominant symptoms:

Adjustment disorder with depressed mood
Adjustment disorder with anxiety
Adjustment disorder with mixed anxiety and depressed mood
Unspecified adjustment disorder