

UTILIZATION AND OUTCOMES OF EXPOSURE THERAPY IN CHILD AND  
ADOLESCENT USUAL CARE

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# Utilization and Outcomes of Exposure Therapy in Child and Adolescent Usual Care

## ABSTRACT

Exposure-based therapy approaches are efficacious for a range of youth anxiety, avoidance, and related problems. However, exposure is frequently underused and there is little or no difference in effectiveness between exposure-based interventions and usual care on anxiety-related problems. The present study examined the rate and patterns of exposure therapy use and the relationship between exposure use and treatment progress in youth receiving public mental health services in Hawai‘i from 2006-2015. Therapist-reported treatment characteristics, therapist and client variables, and other outcome data were examined using two cross-classification modeling approaches. First, a cross-classified logistic regression determined predictors of exposure use in anxiety-related treatment cases. A second cross-classified regression model then examined whether anxiety-related treatment progress was predicted by amount of exposure use after controlling for other variables. Of 6,616 treatment episodes in which an anxiety-related problem was addressed at any time during treatment, exposure was used in only 1,372 (20.7%). Exposure was more likely to be used when fewer externalizing problems were also targeted, in more recent years, and when anxiety seemed a more salient problem (such as when a youth experienced increased emotional impairment, when multiple anxiety-related problems were targeted within an episode, and when a youth carried an anxiety-related diagnosis). Contrary to expectations, therapist doctorate degree was not associated with exposure use. Four or more months of exposure in an episode was associated with higher anxiety-related treatment progress. This association occurred primarily in the community-based residential treatment setting, and persisted after

accounting for other significant predictors of improved anxiety-related outcomes (longer episodes, greater number of other practices, fewer treatment months in which externalizing problems were targeted, and several variables indicative of lower impairment). These findings suggest that while usual care therapists underutilize exposure, conditions predicting its increased likelihood of use appear well-considered and appropriate. Further, dissemination efforts have likely been helpful in increasing exposure utilization in this system of care. However, any treatment improvement associated with exposure use appears contingent on a specific set of circumstances suggestive of sufficient duration of implementation and possibly when barriers to treatment success are attenuated. Practice and future research implications are discussed.

## Table of Contents

Acknowledgements.....	ii
Abstract.....	iv
List of Tables.....	viii
List of Figures.....	ix
List of Appendices.....	x
Introduction.....	1
Exposure Therapy: Etiology, Modalities, and Rationale.....	4
Efficacy of Exposure Therapy.....	8
Effectiveness of Exposure Therapy.....	19
The Underutilization of Exposure Interventions.....	23
Summary of the Current State of Exposure Research.....	27
Study Aims.....	28
Method.....	30
Study Setting.....	30
Participants.....	31
Measures.....	34
Procedures.....	38
Data Analytic Strategy.....	39
Results.....	48
Analysis 1: Predicting the Use of Exposure.....	48

Analysis 2: Predicting Anxiety-Related Improvement.....	51
Discussion.....	55
Implications for Dissemination/Implementation and Systems of Care.....	69
Limitations.....	72
Future Directions.....	75
Tables 1-10.....	80-89
Figure 1.....	90
Appendices.....	91-120
References.....	121

## List of Tables

Table 1: Characteristics of youth treated for anxiety-related problems ( $n = 3511$ ).....	80
Table 2: Treatment episodes with one or more anxiety-related target ( $k = 6616$ ).....	81
Table 3: Therapists' highest degree ( $n = 655$ ).....	82
Table 4: Agencies grouped by level-of-care ( $n = 83$ ).....	83
Table 5: Significant predictors of exposure use likelihood across treatment episodes ( $k = 5682$ ).....	84
Table 6: Significant predictors of total anxiety progress across treatment episodes, main effects model ( $k = 5682$ ).....	85
Table 7: Mean total anxiety progress for exposure use and level-of-care categories, main effects model.....	86
Table 8: Significant predictors of total anxiety progress, including interaction between exposure and level-of-care, across treatment episodes, ( $k = 5682$ ).....	87
Table 9: Number of episodes and mean total anxiety progress for exposure use by level-of-care interactions in main analysis ( $k = 5682$ ).....	88
Table 10: Mean final progress rating for each anxiety-related target per exposure use category across all treatment episodes ( $k = 6616$ ).....	89

## **List of Figures**

Figure 1: Final progress ratings across anxiety-related treatment targets and total progress score for all treatment episodes (k = 6616).....	90
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## **List of Appendices**

Appendix A: Level of Care Descriptors.....	91
Appendix B: Monthly Treatment Progress Summary (MTPS) Form (2008) .....	93
Appendix C: Monthly Treatment Progress Summary (2008) Instructions and Codebook.....	96
Appendix D: Child and Adolescent Functional Assessment Scale.....	108
Appendix E: Child and Adolescent Mental Health Division Notice of Privacy Practices .....	109
Appendix F: Further Discussion of Data Analytic Plan.....	114

## **CHAPTER 1. INTRODUCTION**

Exposure therapy seeks to put anxious, avoidant, obsessive, and/or traumatized clients in proximity to feared stimuli in a repeated, structured, productive way to decrease fear, distress and/or impairment related to those stimuli (e.g., Bornheimer, 2014). Exposure is deeply rooted in behavioral research on fear responses, which can be traced to seminal studies by Watson and Jones (e.g., Watson & Rayner, 1920; Jones, 1924). While the famous work with little Albert has been the subject of controversy, the classic repeated pairing of a neutral stimulus (a white rat) with an aversive stimulus (a loud noise) in order to develop a conditioned fear in a one-year-old boy is one of the earliest studies to suggest that fear can be learned via conditioning (Watson & Rayner, 1920; Harris, 1979). Several years later, Jones seems to have been the first to apply this principle in a therapeutic context resembling exposure therapy. She worked with toddlers with various phobias by gradually associating feared stimuli such as rats or rabbits with a positive stimulus (mealtime) until the fear subsided and the children were able to interact with the animals without distress (Jones, 1924).

Mowrer expanded on these studies a decade later, providing further credence to the idea that fear is a conditioned as well as an instinctive response, through both rat and human experiments pairing aversive and neutral stimuli (e.g., Mowrer, 1939). Using novel electric shock experiments, Mowrer (1939) concluded that anxiety<sup>1</sup> is anticipatory in nature (as evidenced by subjects experiencing maximum physiological arousal prior to, and not during or after, the application of an electric shock), and serves as a conditioned reaction to pain. Further, he established that anxiety serves the adaptive role of preventing painful stimuli from occurring

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<sup>1</sup> While anxiety and fear have been differentiated on the grounds that fear has a consciously perceived and/or imminent object and anxiety does not (e.g., Barlow, 2000; Mowrer, 1939), these two terms will be used synonymously in the present study.

by promoting avoidance of such stimuli (Mowrer, 1939). Other researchers have since further specified the adaptive nature of the fear system via the Yerkes-Dodson law, which indicates that appropriate levels of anxiety play a role in promoting adaptive functioning by heightening awareness and increasing vigilance, particularly with regard to new, novel, or complex tasks (Beidel & Alfano, 2011; Crespi, 1942).

While an adaptive level of anxiety can facilitate performance, excessive anxiety results in steady declines in adaptive functioning and increases in pathologically avoidant behavior (Crespi, 1942). Lang (1968) first proposed a three-component model of anxiety that included physiological responses, behavioral responses, and cognitions (originally referred to as subjective distress), and noted that pathological anxiety can emerge within or across each of these domains. Extreme physiological responses to fear in children include those that are both situational (e.g., headaches, stomachaches, sweating, shortness of breath), and persistent (e.g., decreased heart rate variability), and can manifest as both cause and/or effect of a fear response (e.g., Ginsburg, Riddle, & Davies, 2006; Monk et al., 2001). Behavioral responses are typically framed within the context of reducing or avoiding distress related to a given fear, and can include overt and often oppositional avoidance (e.g., crying, tantrums, clinging to parents), more passive avoidance (e.g., refusing to speak in social situations; acting sick to avoid school), and repetitive and/or ritualized actions (e.g., checking, counting, or washing things) to avoid or lessen distress (see Beidel & Alfano, 2011, for a review).

Impairments in thinking are difficult to discern in children, given that many young children are unable to clearly articulate thoughts related to their fears. Nevertheless, excessive and pervasive worry about everyday events (e.g., performance on tests or safety of family members) or persistent, often unrealistic obsessive thoughts (e.g., “my heart will stop and I will

die") have been found in older children and adolescents (Prins, 2001). Some evidence has suggested that pathological anxiety is associated with attentional and interpretive biases (i.e., disproportionately attending to feared stimuli and associating threat with neutral stimuli; see Muris & Field, 2008, for a review) and consequent heightened fear-potentiated startle responses (Stein et al., 2010).

Mental health problems that manifest in collections of symptoms such as those noted above have been categorized and labeled within the American Psychiatric Association (APA)'s Diagnostic and Statistical Manual of Mental Disorders (DSM-5; APA, 2013). These diagnoses have been refined over time, and currently include disorders that are directly related to fear and anxiety (e.g., generalized anxiety disorder, social anxiety disorder, specific phobias, panic disorder), as well as obsessive-compulsive disorder (OCD) and stress-related disorders (e.g., Post-Traumatic Stress Disorder or PTSD). Such diagnoses can be seen in up to 15% of children and adolescents (e.g., Beidel & Alfano, 2011).

Anxiety, obsessions/compulsions, and post-traumatic stress share important common features despite recently receiving separate chapters in DSM-5 (Friedman, Resick, Bryant, Strain, Horowitz, & Spiegel, 2011; Stein et al., 2010). In addition to shared biological correlates (e.g., amygdala hyper-responsivity) and shared cognitive symptoms (e.g., pervasive worry), all of these disorders have been argued to share similar underlying processes (Barlow, 2000; Friedman et al., 2011; Mowrer, 1960; Stein et al., 2010). Mowrer (1960) defined a process he believed was common across anxiety problems in which a conditioned stimulus (e.g., thought, image, object) is paired with an aversive unconditioned stimulus and thereby elicits a conditioned response (i.e., fear, anxiety, or distress). Once the conditioned anxiety response is acquired, it serves as a discriminative stimulus that evokes avoidance, escape or otherwise

distress-reducing behaviors (i.e., compulsions), which are negatively reinforced by the reduction of anxiety (Mowrer, 1960). However, more recent research has called the commonality of this process into question, given, for example, the difficulty in linking a clear process of stimulus conditioning to the diffuse and expansive anxiety of Generalized Anxiety Disorder. Barlow's Triple Vulnerability model instead suggests that early life experiences (e.g., modeling by early caregivers) and/or proximal learning (e.g., acute trauma) interact with biological factors (e.g., a genetic predisposition to behavioral inhibition) in the development of pathological anxiety (Barlow, 2000). In this model, a classically-conditioned stimulus response is not necessary for the development of a disorder. For example, an over-controlling family environment, in which a child experiences little personal control, might heighten individual feelings of perceived uncontrollability and subsequently produce non-specific fears across a variety of situations (Barlow, 2000). As discussed below, the mechanism of exposure therapy fits either conceptualization of pathological anxiety, and has been used to address explicitly-defined impairing discriminant stimuli vis-a-vis Mowrer and broader locus-of-control liabilities vis-a-vis Barlow.

### **Exposure Therapy: Etiology, Modalities, and Rationale**

**Etiology of exposure treatment.** Joseph Wolpe is regarded as the first to formulate a structured treatment protocol for anxiety based on the principles established by Watson, Jones, Mowrer, and others (e.g., Tryon, 2005). Via the process that eventually became known as systematic desensitization, Wolpe treated patients suffering from a range of neuroses and phobias by exposing them to a feared stimulus, triggering distress responses and then immediately guiding them through a process of progressive full-body relaxation (Wolpe, 1961). Wolpe believed that his success in treating these patients was driven by the process of

reciprocal inhibition, originally proposed by Sherrington (1908), by which two incompatible psychological states (i.e., anxiety and relaxation) cannot exist simultaneously. He suggested that an inhibitory learning process occurs over multiple trials of associating relaxation with a feared stimulus, resulting in a replacement of the fear with a feeling of relaxation (Wolpe, 1961). While the inhibitory learning theory behind exposure has persisted over time, Wolpe's proposed mechanism for facilitating that learning has not. Contemporaries of Wolpe achieved similar successes by exposing phobic and anxious patients to feared stimuli without pairing with relaxation techniques (Tryon, 2005). A literature review by Marks (1975) compiled more than a decade of this evidence and concluded that systematic desensitization was no more effective than exposure to anxiety- or fear-related stimuli, and in the process coined the term exposure therapy.

**Exposure modalities.** Specific exposure therapy processes and practices vary (Abramowitz, 1996; Marks, 1975; Tryon, 2005). In his review of treatment studies, Marks noted that clients could be exposed to feared stimuli gradually (via the development of a fear hierarchy and systematic exposure to increasingly more challenging items within that hierarchy) or they could be flooded (i.e., exposed abruptly to highly-aversive stimuli until distress decreased; Marks, 1975). Marks also noted that fears could be encountered imaginarily (e.g., prolonged thought exercises) in-vivo (e.g., exposure to stimuli in the physical world), or interoceptively (e.g., instigating physical sensations such as hyperventilation), for long or short durations, and that these exercises could be therapist-facilitated or performed by patients outside of session (Marks, 1975). Technological advances have further nuanced these variations: the imaginal/in-vivo distinction has been further enriched by virtual exposure performed through the use of computers with sophisticated multi-sensory interfaces designed to replicate real-

world situations, and client-led exposure sessions in particular and anxiety treatment in general can now be facilitated by computer, without any in-person interactions with a therapist (e.g., Khanna & Kendall, 2010; Krijn, Emmelkamp, Olafsson, & Biemond, 2004).

**Rationale for exposure and proposed mechanism of change.** Given the diverse assortment of exposure therapy modalities (e.g., Abramowitz, 1996; Khanna & Kendall, 2010; Krijn et al., 2004; Tryon, 2005), the question of whether there is a singular mechanism of change underlying these treatments arises. Over the past two decades, strictly behavioral and strictly cognitive models explaining the principles behind exposure's efficacy have been proposed. Tryon (2005) offers a thorough review of both, with behavioral models including habituation (a decreased fear response due to repeated stimulation), extinction (e.g., the removal of the unconditioned stimulus for a phobic behavior), and counterconditioning (replacement of a pathological response with an adaptive response). Cognitive models include self-efficacy (developing a positive view of one's ability to cope), expectation (fostering the belief that one will successfully overcome anxiety), and cognitive restructuring (changing one's perception of a phobic object/situation from one of danger to one of innocuousness; Tryon, 2005). These narrow models have been rejected in favor of more comprehensive learning models incorporating many of their elements (e.g., Bouton, 1993; Craske, 2014; Rescorla & Wagner, 1972; Tryon, 2005; Tryon & McKay, 2009).

Unlike Wolpe's systematic desensitization hypothesis that anxiety and fear can be inhibited by an incompatible replacement stimulus such as relaxation, Rescorla and Wagner (1972) theorized that the mechanism of exposure therapy is the violation of expectancy. In this inhibitory learning model, exposure treatment creates a situation in which the feared consequence of an aversive stimulus does not occur, thus inhibiting previously-learned

maladaptive reactions and enabling new learning related to the aversive stimulus to commence (Craske, 2014). Explained from the connectionist perspective, the therapist facilitates dissonance by encouraging the client to behave adaptively in response to an aversive stimulus (e.g., an anxious thought or a fear-inducing situation), and the learning process modifies synaptic weights (i.e., the influence of the firing of one neuron upon another) related to that stimulus (Tryon, 2005). Additional exposure trials repeat this dissonance-formation/consonance-seeking process, further strengthening new neural connections indicative of adaptive functioning (Tryon, 2005). This new therapeutic conditioned stimulus (CS)-unconditioned stimulus (US) relationship competes with, rather than replaces, the pathological CS-US relationship. Accordingly, the permanence of this new learning is moderated by time and memory, and without continued and varied reinforcement of the conditioned stimulus, the response can revert to a maladaptive one (Bouton, 1993). Some preliminary support for this theory has been found in neuroimaging studies in which glucose metabolic rates were found to decrease significantly for patients undergoing CBT therapy for OCD (Baxter et al., 1992; Schwartz, Stoessel, Baxter, Martin, & Phelps, 1996). A meta-analysis of social phobia treatment studies and a recent study on exposure therapy for traumatized war veterans provide some additional support for the permanence principle of this theory, indicating that an increased number of exposure trials across a treatment episode was associated with enhanced outcomes (Crawford, Wolf, Kretzmer, Dillon, Thors, & Vanderploeg, 2017; Feske & Chambless, 1995).

Craske and others have applied these principles to optimize exposure through maximizing the degree to which expectancy is violated (Craske, 2014). Such optimization has included, among other strategies: choosing exercises that result in lengthier exposure to situations in which a feared consequence does not occur, thereby increasing the permanence of

the learning experience (Craske, 2014); pairing multiple fear-provoking stimuli in one exposure session to rapidly generalize the learning experience across domains (Culver, Vervliet, & Craske, 2015); removing safety signals and behaviors during exposure exercises to minimize distractors or interference to learning (Sloan & Telch, 2002), and avoiding engagement with anxious patients in cognitive coping talk prior to exposure to optimize the link between the feared stimulus and the absence of a feared consequence without introducing any stipulations or conditions to this relationship (Craske, 2014). This latter strategy is also indirectly supported by a recent study of therapist practices indicating that pre-exposure preparation, which included elements of coping self-talk, did not contribute to enhanced exposure outcomes, while processing exposure tasks after they occurred (and thus potentially extending the dissonance-formation process) resulted in improved outcomes (Tiwari, Kendall, Hoff, Harrison, & Fizur, 2013).

### **Efficacy of Exposure Therapy**

Beginning in the 1990s, psychologists turned considerable attention to developing treatments that could be tested and shown to be efficacious (i.e., superior to a control group in an experimental setting) in order to elucidate which interventions therapists should use to maximize beneficial outcomes (Chambless & Hollon, 1998). One of the decisions made by those tasked with creating the benchmarks for identifying what were then called empirically-supported treatments (ESTs) was that treatments must be manualized in order to achieve the highest level of empirical validation (American Psychological Association, 1995). Promising individual therapeutic processes like exposure were thus grouped and ordered into cognitive-behavioral treatment (CBT) packages such as Kendall's popular and well-researched "The Coping Cat." This therapy combines exposure with psycho-education, coping skill

development, and self-evaluation, among other elements, into a comprehensive anxiety treatment program (Kendall, 1994). A possibly unintended consequence of the decision for the manualization criteria was the decline in research on individual practice elements such as exposure alone, calling into question what, if any, practices within a manual serve as the “specific ingredients” to affect positive change (e.g., Ahn & Wampold, 2001, p.251). While there has been a reconsideration of specific practice elements, or modules, embedded in empirically-supported treatment manuals (e.g., Chorpita, Daleiden & Weisz, 2005), the majority of anxiety treatment efficacy studies have not examined exposure by itself (Abramowitz, Deacon, & Whiteside, 2012). Therefore, in the following discussion of the efficacy of exposure treatment, exposure-only interventions will be highlighted, and manualized cognitive behavior therapy interventions that include exposure will be discussed by default. Where no conclusive research focusing on children and adolescents exists, adult treatment literature will be discussed. Given that treatments are typically sorted by the diagnoses they address in the research literature, this discussion will be organized as such.

**Specific Phobias.** Perhaps because of their straightforward presentation, as well as their long history of psychological examination, specific phobias have received the most long-standing experimental research attention of all the child anxiety disorders. Much of this research predates the empirically-supported treatments movement, resulting in a number of studies examining exposure outside of the multi-component treatment manual context (Ollendick & King, 1998). Ollendick & King (1998) deemed exposure a well-established, efficacious intervention strategy for phobic youth based on controlled trials in which graduated exposure (an intervention in which children engaged in gradually more difficult and repeated exposure to a feared stimulus and were reinforced for their successes) was superior to other

efficacious treatments (i.e., verbal coping skills and live modeling) across various specific phobias. This status as a first-line treatment for specific child fears has persisted, and more recent single-case study research has suggested that exposure strategies are also effective in the treatment of phobias in the context of other severe comorbid conditions, including psychosis and autism (Nakamura, Schiffman, Lam, Becker, & Chorpita, 2006; Rapp, Vollmer, & Hovanetz, 2006).

### **Generalized Anxiety Disorder, Social Phobia, and Separation Anxiety Disorder.**

Generalized anxiety disorder (GAD), social phobia (or social anxiety disorder), and separation anxiety disorder (SAD) were the original target diagnoses of The Coping Cat intervention (Kendall, 1994). GAD is characterized as an excessive and persistent state of worry in one or more areas of an individual's life; social phobia refers to pathological worry related to negative judgment, embarrassment, or ridicule in social settings; and SAD involves unrealistic worry accompanying separation from home or caregivers (Evans et al., 2005). Randomized controlled trials (RCTs) have historically examined these three diagnoses together due in part to the similarity of their respective treatments, in which children receive extensive psychoeducation on the nature of fear and the skills used to cope with it and then apply such knowledge/skills as they practice fear-inducing situations (e.g., Barrett, 1998; Kendall, 1994; Kendall, Flannery-Schroeder, Panichelli-Mindel, Southam-Gerow, Henin, & Warman, 1997). This diagnostic grouping has been supported by the finding that improvement is typically consistent across diagnoses (Biedel & Alfano, 2011). Across more than 15 trials, The Coping Cat and other analogous manualized treatments outperformed wait-list control conditions and resulted in an average of 65% of children no longer meeting diagnostic criteria for an anxiety disorder at the end of treatment (Kendall, Robin, Hedtke, Suveg, Flannery-Schroeder, & Gosch, 2005). More

recently, this treatment protocol has been modified for computerized use, and an initial randomized controlled trial found computer-based CBT to be as effective as in-person CBT and superior to a control condition in reducing rates of anxiety disorder diagnosis (Khanna & Kendall, 2010). Across all variations of The Coping Cat, exposure has been cited as a core component of the treatment package (Kendall et al., 2005). While research isolating exposure treatment across these three disorders is limited, Nakamura, Pestle & Chorpita (2009) utilized a differential sequencing model across four pathologically anxious children diagnosed with some combination of these three diagnoses. Each child received one of three treatment conditions (exposure-only, cognitive-only, and exposure plus cognitive treatment) in an order that varied for each participant. Although parent reports of treatment progress were inconclusive, child-reported anxiety levels decreased significantly during exposure treatment conditions but not during cognitive treatment conditions (Nakamura et al., 2009).

Research examining exposure therapy separately for GAD, SAD, or social phobia among children and adolescents is limited. Among these diagnoses, social phobia treatment has received the most attention (Beidel & Alfano, 2011). Group cognitive behavioral interventions that emphasize exposure exercises have reduced social anxiety symptoms below diagnostic threshold for 45% to 81% of participants, with these rates beating those of control conditions across published studies (Hayward, Varady, Albano, Thienemann, Henderson, & Schatzberg, 2000; Beidel, Turner, & Morris, 2000; Beidel, Turner, & Young, 2006). Regarding socially phobic adults, a meta-analysis by Feske & Chambless (1995) indicated that exposure-only interventions were as effective as multi-component cognitive-behavioral interventions at reducing anxious and depressed symptoms among participants. Ougrin's (2011) meta-analysis indicated that social phobia was the only adult anxiety diagnosis (among social phobia, PTSD,

OCD, and panic disorder) for which exposure-only therapy resulted in superior outcomes compared to cognitive-only therapy.

In the limited intervention research examining separation anxiety disorder, two treatments with a heavy focus on parent involvement (Parent-Child Interaction Therapy and a cognitive behavioral parent training protocol) have been found to be superior to control groups in reducing separation anxiety symptoms (Choate, Pincus, Eyeberg, & Barlow, 2005; Eisen, Raleigh, & Neuhoff, 2008). One of these treatments explicitly trained parents in conducting both imaginal and in-vivo exposure exercises with their children, and both treatments included significant contingency management elements for parents, in which they were trained to avoid responding to reassurance-seeking behaviors from anxious children and to encourage and praise efforts at engaging in anxiety-provoking separation behaviors.

The majority of children in early Coping Cat RCTs carried a primary diagnosis of GAD, and exposure has also been a component of several successful interventions studied on small samples of youth with GAD using time series designs (Clementi & Alfano, 2014; Eisen & Silverman, 1998; Kane & Kendall, 1989; Kendall, 1994, Kendall et al., 1997). In the adult anxiety literature, exposure exercises for GAD have been specified as worry exposure (e.g., Hoyer, Beesdo, Gloster, Runge, Höfler, & Becker, 2009). Such exercises might involve a client recording his/her description of a particular worry and listening to it repeatedly without engaging in any safety or reassurance-seeking behaviors (Ladouceur, Dugas, Freeston, Léger, Gagnon & Thibodeau, 2000). Such worry exposure has been shown to be superior to a waitlist control and as effective as applied relaxation at reducing symptoms and impairment related to adult generalized anxiety (Hoyer et al., 2009).

**Panic Disorder.** Panic disorder involves the repeated experience of intense fear, distress or foreboding due to spontaneous physiological symptoms such as accelerated heart rate, shortness of breath, choking sensations, dizziness, sweating, or a sense of depersonalization (Evans et al., 2005). This fear often results in heightened anticipation of the onset of these symptoms in places from which escape is perceived as impossible, and a consequent avoidance of such places, also known as agoraphobia (Evans et al., 2005).

Exposure treatments for panic disorder are typically both *in vivo* and interoceptive. The low prevalence of panic disorder in youth has resulted in limited investigations of efficacious treatment, but a cognitive-behavioral treatment model adopted from the adult treatment research (i.e., Panic Control Treatment, or PCT) has been the subject of case studies and one controlled trial (Barlow & Sneider, 1983; Ollendick, 1995; Pincus, May, Whitton, Mattis, & Barlow, 2010). This intervention, which involves panic management procedures (e.g., breathing retraining), cognitive restructuring, and *in vivo* situational and interoceptive exposure exercises in and out of session, resulted in reduction of panic symptoms below clinical range for six out of seven adolescents examined in two case studies, and was compared favorably to a wait-list condition on self- and clinician-report measures of anxiety and panic (Pincus et al., 2010).

While the specific effects of exposure have not been parsed out in such studies of adolescents, exposure-only interventions have been found to be beneficial among panic-disordered adults (e.g., Bouchard, Gauthier, Laberge, Fench, Pelletier, & Godbout, 1996; De Beurs, Van Balkom, Lange, Koele, & Van Dyck, 1995; Margraf & Schneider, 1991). Although studies suggest equivalent treatment gains can also be made using cognitive interventions (Beck, Stanley, Baldwin, Deagle, & Averill, 1994; Bouchard et al., 1996; Margraf & Schneider, 1991), researchers have acknowledged that exposure exercises are difficult to completely exclude from

cognitive treatment, as cognitive restructuring typically involves testing unrealistic hypotheses (e.g., I will have a panic attack and die) related to feared situations, and such hypothesis testing necessarily involves exposure to the feared stimuli in question (e.g. Bouchard et al., 1996).

**Obsessive-Compulsive Disorder.** Obsessive-compulsive disorder (OCD) involves recurrent obsessive thoughts and/or repetitive behaviors that an individual feels the urgent need to perform (Evans et al., 2005). While compulsions (e.g., checking, cleaning, repeating, rearranging, or counting things) are common across youth with OCD, obsessional thoughts are more developed in adolescents, and frequently include contamination fears, concerns about illness or disease, and thoughts related to inflicting harm upon oneself or others, symmetry, religion, sex, and somatization (Beidel & Anthony, 2011). Younger children are often unable to identify a clear obsessive thought related to a given compulsion (Swedo, Rapoport, Leonard, Lenane, & Cheslow, 1989). Exposure-based treatment for child and adolescent OCD is based on an exposure/response prevention (ERP) intervention originally proposed by Meyer (1966), which includes elements of exposing an individual to a feared stimulus (e.g., touching a toilet seat) and preventing the individual's compulsive response from occurring (e.g., washing hands; Abramowitz, 1996). A randomized controlled trial comparing (a) CBT treatment that included elements of ERP, (b) sertraline medication (a commonly-prescribed selective serotonin reuptake inhibitor), (c) CBT + sertraline, and (d) a pill placebo found that all active treatments were more effective than placebo at improving OCD-related problems, and that CBT + sertraline resulted in the greatest symptom reductions (March et al., 2004). CBT resulted in significantly higher rates of remission than sertraline (39% compared to 21%), and the authors concluded that OCD treatment in youth should begin with either CBT alone or a combination of CBT and sertraline (March et al., 2004). Further, a recent meta-analysis of child OCD and anxiety treatment

compared ERP interventions for OCD to CBT interventions for child anxiety disorders and found the effect size of ERP on OCD ( $k=9$ , mean ES = 1.93) significantly higher than the effect size of CBT on other anxiety disorders ( $k=44$ , mean ES = 0.89; Ale, McCarthy, Rothschild, & Whiteside, 2015). The authors suggested that this differential effect might be due to additional practice components within the CBT treatment protocol that might have diluted the effects of the exposure portion of the intervention (Ale et al., 2015). A similar dilution effect was proposed in a review by Beidel & Alfano (2011) when they found the effect size of ERP (ES = 1.60) compared favorably to CBT (ES = 0.97) for OCD across studies. Although the conclusion that exposure and response prevention are the primary active ingredients in child OCD treatment remains plausible, numerous studies comparing exposure therapy to cognitive therapy for adults with OCD have typically not found differences between the two treatments (e.g., Emmelkamp, Visser, & Hoekstra, 1988; Van Oppen, De Haan, Van Balkom, Spinhoven, Hoogduin, & Van Dyck, 1995; Whittal, Thordarson, & McLean, 2005).

**Post-Traumatic Stress Disorder.** Post-traumatic stress disorder (PTSD) is unique among the diagnoses mentioned above in that it requires a significant stressor to precede the onset of pathological anxiety or distress (Evans et al., 2005). To qualify for a PTSD diagnosis, an individual must either experience or witness an event/events involving actual or threatened death, serious injury, or compromised physical integrity of the individual or those witnessed. The individual consequently suffers a collection of persisting symptoms, including re-experiencing the event, avoidance of stimuli associated with the event, negative changes in cognition or mood, hyperarousal, and/or depersonalization (Beidel & Alfano, 2011). Such trauma can take the form of one isolated event or repeated, cumulative stressors, known as complex or Type II trauma (APA, 2013; Beidel & Alfano, 2011). The heterogeneity of the

types of traumatic experiences children can experience (sexual assault, natural disasters, car accidents, etc.) has resulted in difficulty establishing consistently efficacious treatments for PTSD. Randomized treatment trials targeting Type II trauma (i.e., repeated sexual abuse) have indicated that trauma-focused cognitive-behavioral therapy (TF-CBT) is superior to nondirective supportive therapy and child-centered therapy (Cohen, Deblinger, Mannarino, & Steer, 2004; Cohen, Mannarino, & Knudsen, 2005). TF-CBT has received the highest classification of empirical support (“well-established”) for complex traumatic stress as a result (Chaffin & Friedrich, 2004; Chambless & Hollon, 1998). Studies focusing on single traumatic events have also begun to emerge indicating that similar interventions are efficacious at reducing PTSD symptoms, with one of these studies comparing CBT favorably to a wait-list control (Smith, Yule, Perrin, Tranah, Dalgleish, & Clark, 2007) and another finding CBT and a meditation/relaxation intervention resulted in similarly beneficial outcomes (Catani, Schauer, Elbert, Missmahl, Bette, & Neuner, 2009). Notably, all TF-CBT and CBT interventions under examination included a significant exposure component, which consisted of careful revisiting of a traumatic event via narratives, drawings, and imaginal or in-vivo methods to reduce distress related to the event (often referred to as prolonged exposure; Beidel & Alfano, 2011). Among adults with PTSD, some evidence has suggested that exposure-only therapy results in equivalent symptom reduction rates compared to CBT (Paunovic & Öst, 2001), and another study indicated that exposure was superior to both relaxation training and eye movement desensitization and reprocessing (EMDR) therapy (Taylor, Thordarson, Maxfield, Fedoroff, Lovell, & Ogrodniczuk, 2003). Recent work has also indicated that prolonged exposure was associated with large declines in PTSD symptoms for war veterans suffering a comorbid traumatic brain injury, and that this effect was enhanced by increasing the number of prolonged

exposure sessions a client received (Crawford et al., 2017). However, as with OCD, studies have not indicated discernable differences when comparing imaginal exposure treatment to cognitive therapy in adults (e.g., Marks, Lovell, Noshirvani, Livanou, & Thrasher, 1998).

**Distillation and modularization of treatment for anxiety disorders.** A limitation of manualized treatments is that they discourage the investigation of specific change processes given their packaging of multiple therapeutic elements into a single intervention. Chorpita, Daleiden, & Weisz (2005) have worked to address this concern using a distillation and matching model, an empirical approach to summarize specific treatment technique profiles described in various manualized treatments. Originally aggregating information across 49 successful treatment trials, the researchers created frequency counts of the relative occurrence of more molecular treatment techniques or practice elements (e.g., exposure, time-out, psychoeducation, etc.), as well as the circumstances in which these techniques were applied (e.g., the age and ethnicity of children who had been successfully treated in a given study), creating the foundation for a modularized approach to CBT delivery. Modularized CBT allows for individual therapeutic practices to be thoughtfully assembled during a treatment episode based on a decision-making algorithm designed to better match and adapt to client needs and to address interference and barriers as they arise (Chorpita, Taylor, Francis, Moffitt, & Austin, 2004). Apart from such practical enhancements related to CBT delivery, an additional benefit of this work has been that it has allowed for renewed examination of individual therapeutic practice elements. Perhaps most relevant to the current discussion, an updated summary by Chorpita & Daleiden (2009) expanded the number of treatment studies used to inform their distillation and matching model from 49 to 322. This analysis indicated that exposure therapy was the single most common practice element within the empirically-tested interventions for

childhood anxiety and trauma-related problems, occurring in 80% and 91% (respectively) of all successful interventions studied for these problem areas (Chorpita et al., 2009).

A recent study examined anxiety treatment for youth with a variety of anxiety disorders by comparing modularized CBT to The Coping Cat manualized intervention. Researchers found that children who received exposure earlier via the modularized treatment (i.e., beginning exposure treatment at an average of session 2, compared to session 7 as prescribed in the manualized intervention) required fewer treatment sessions to achieve treatment gains equivalent to those made via the manualized treatment (Gryczkowski, Tiede, Dammann, Jacobsen, Hale, & Whiteside, 2012). The researchers concluded that prioritizing exposure earlier in anxiety treatment could result in shorter treatment episodes. In an earlier study, Chorpita and colleagues (2004) utilized modular CBT across eleven anxious youth in a multiple baseline design, and found that all subjects who completed treatment ( $n = 7$ ) neither met criteria for their primary diagnosis at the end of treatment nor at 6-month follow up. The researchers attributed this success to the flexibility inherent in modularized CBT, via which practice elements that fit an individual client's circumstances could be delivered as needed (e.g., rewards for increasing at-home compliance or cognitive therapy for depressive symptoms; Chorpita et al., 2004). These and other intervention studies previously discussed (e.g., Nakamura et al., 2006) suggest that modularized CBT offers a promising opportunity to examine the active components of efficacious treatment in general and exposure in particular.

Taken together, the various studies described above have indicated that exposure therapy is equivalent or superior to other anxiety treatments across numerous diagnoses when examined as a stand-alone intervention (e.g., Ollendick & King, 1998), and that exposure is the most common component of empirically-supported manualized child anxiety treatment protocols

(Chorpita & Daleiden, 2009). While promising, it is important to note that these results are based on efficacy studies, in which researchers have exerted considerable control over youth and therapist selection, treatment settings and modalities, and study conditions, and the active treatment is often compared to presumably inactive control conditions (Weisz & Kazdin, 2010).

### **Effectiveness of Exposure Therapy**

In intervention science terminology, efficacy is not equivalent to effectiveness.

Effectiveness research examines psychological interventions tested on representative samples of community-referred youth treated by practitioners in clinical service settings, particularly compared to the typical services youth receive (Weisz & Kazdin, 2010). While effectiveness was an initial focus of the American Psychological Association's task force in its strategy to determine empirically-supported interventions (American Psychological Association, 1995), explorations of treatment efficacy have been much more common than effectiveness studies over the past two decades (e.g. Chorpita & Daleiden, 2014). An understanding of the state of the research on exposure's effectiveness is critical to the relevance of the current study's aims.

One promising means to measure treatment effectiveness is by employing an efficacious treatment within a community mental health setting and comparing it to the typical services offered in that setting, often referred to as usual care or treatment-as-usual (Southam-Gerow, Weisz, Chu, McLeod, Gordis, Connor-Smith, 2010). A limited number of such examinations related to child anxiety have emerged in the last decade. In one of the earliest, CBT and treatment-as-usual (TAU) were both associated with improvement in generalized anxiety, social anxiety, and/or phobias, with no significant differences between the two groups (Barrington, Prior, Richardson, & Allen, 2005). A follow up study by Southam-Gerow et al. (2010) again found no significant differences between the two treatments. Importantly, success rates for both

groups as measured by percentage of children who no longer met diagnostic criteria at treatment end were slightly better than those found in comparable CBT efficacy studies' treatment conditions (74% of usual care group; 67% of CBT treatment group; compared to a mean of 65% across efficacy studies as reported in Kendall et al., 2005). As a partial explanation for the findings, the authors noted that only 59% of therapists in the CBT treatment group employed exposure practices and TAU therapists delivered substantially more supplemental services (e.g., additional therapy, group therapy) compared to the CBT group (Southam-Gerow et al., 2010). While this might explain the failure to find differences between the two effectiveness conditions, it does not address why the overall improvement rates of both TAU and CBT were similar to those found for CBT in efficacy studies.

Altering the context of services to inner-city schools, Ginsburg, Becker, Drazdowski, & Tein (2012) found that usual care services delivered by community clinicians were equivalent to CBT (delivered by the same clinicians) in reducing child anxiety symptoms, improving global functioning, and diagnosis remission rates at 1-month follow-up, which were slightly less than those found in comparable efficacy studies (57% for TAU, 43% for CBT, compared to 65% across efficacy studies as in Kendall et al., 2005). The authors noted that these comparable improvement rates might be attributable to TAU therapists' relatively high ratings on measures of their adherence to certain elements of CBT processes, including agenda-setting and homework (though exposure use in TAU was not discussed; Ginsburg et al., 2010). Contrary to these findings, a recent study by Storch and colleagues (2013) found that CBT was superior to treatment-as-usual (TAU) for treating anxiety disorders in children with autism, with 38% of children achieving anxiety-related diagnostic remission in CBT compared to 5% in the TAU condition. However, the authors noted that their TAU condition was "designed to reflect the

typical community treatment services that could be received by children” (Storch et al., 2013, p. 136). As such, participants were simply offered the opportunity to initiate or continue receiving interventions of their choosing without influence by the study authors. Fewer than half participated in psychotherapy, and this might have contributed to poor results (Storch et al., 2013). Similarly, Chiu and colleagues implemented a modularized anxiety treatment program in a school setting and found that the treated group improved substantially more on a measure of global improvement compared to a waitlist control (Chiu et al., 2013). The considerable variability of the control conditions in general and TAU in particular for these effectiveness studies (and the lack of careful documentation of TAU conditions in effectiveness studies more broadly) is an issue that has received recent concern (Kazdin, 2015). Thorough consideration of the characteristics of usual care is essential, both to increase the interpretability and generalizability of effectiveness study findings and to better understand a treatment modality that frequently compares favorably to more structured evidence-based treatments.

There are no effectiveness studies that compare exposure therapy to other treatments outside of the manualized context, although recent studies by Weisz, Chorpita, and colleagues have suggested that delivering CBT in the more flexible modularized context discussed above results in enhanced treatment effects across a range of youth problem areas compared to both manualized CBT and TAU (Chorpita et al., 2013; Weisz et al., 2012). Examining multiple problem areas together (i.e., depression, anxiety, and conduct problems), the researchers found that indices of externalizing, internalizing, and total problems decreased significantly more and more quickly in the modularized treatment condition than in either the manualized or TAU conditions immediately after follow up (with no difference between the manualized CBT and TAU groups), and that significant differences remained between the modularized treatment

condition and TAU upon two-year follow-up (Chorpita et al., 2013; Weisz et al., 2011).

Though anxiety treatment (and thus exposure) was not examined separately from treatment for depression and conduct problems in this study, Gryczkowski and colleagues' (2012) aforementioned modularized anxiety treatment design, which employed exposure earlier in treatment than the manualized intervention and resulted in faster progress, suggests that the increased flexibility inherent in modular approaches has the potential to affect anxiety outcomes in particular.

Effectiveness research related to youth anxiety treatment in general and exposure in particular is in its infancy. The limited effectiveness studies that have utilized a usual care treatment comparison group have not disentangled exposure from multi-practice treatment manuals to determine its discrete effect on anxiety problems. Further, while usual care has resulted in equivalent or even slightly (though non-significantly) better outcomes than comparison CBT interventions for anxiety problems, no effectiveness study has examined the extent to which youth TAU therapists utilized exposure therapy, with multiple studies explicitly instructing TAU therapists not to engage in CBT interventions, including exposure (Ginsburg et al., 2010; Southam-Gerow et al., 2010). At the least, such constraints limit the ability to accurately understand usual care therapist behaviors, and at worst might result in the artificial diminishing of the effects of treatment-as-usual services. Finally, the effectiveness of exposure-based interventions for youth has been tested entirely in outpatient settings (e.g., school mental health, university clinics). While exposure-focused CBT interventions employed in residential facilities have been associated with symptom reduction for youth with OCD and trauma, such interventions have not been compared to residential usual care that does not include exposure (e.g., Cohen, Mannarino, Jankowski, Rosenberg, Kodya, & Wolford, 2016; Leonard et al.,

2016). There is a similar absence of data comparing exposure use to other interventions in other levels-of-care such as family therapy, therapeutic foster care, and inpatient hospital care. Much remains to be learned about the utilization and potential effect of exposure in the context of typical service settings.

### **The Underutilization of Exposure Interventions**

Despite the demonstrated efficacy of exposure and interventions that include exposure for anxiety, phobias, trauma, and obsessive-compulsive problems, exposure treatments have been underused. In a review of PTSD treatment delivered to over 4,000 veterans, researchers found that exposure therapy was used in only 20% of cases, and that the comparable usage rate was only 58% among 11 PTSD therapists nationally recognized for their expertise in exposure treatment (Foy, Kagan, McDermott, Leskin, Sippelle, & Paz, 1996; Litz, Blake, Gerardi, & Keane, 1990). On more recent questionnaires related to exposure for PTSD, non-CBT trained and CBT-trained therapists retrospectively reported low lifetime use of exposure therapy (17% and 66%, respectively), and trained CBT therapists reported using exposure in only approximately one half of their PTSD cases (Becker, Zayfert, & Anderson, 2004). In a recent follow-up study examining therapists' use of different treatment practices two years after receiving specialized CBT training, child and adolescent therapists reported that exposure was their least-used intervention strategy for anxiety problems, reporting utilization in only 35% of cases (Chu, Talbott Crocco, Arnold, Brown, Southam-Gerow, & Weisz, 2015). A preliminary analysis of the system of care currently under study indicated that therapists endorsed using exposure in only 11% of initial treatment episodes of child and adolescent cases that included treatment targets of anxiety, trauma, avoidance, phobias, or shyness (Milette-Winfree, Okado, Mueller, Higa-McMillan, & Nakamura, 2015). Finally, as noted above, the one existing

controlled effectiveness trial that examined therapists' usage rates of exposure in a manualized anxiety treatment context found that exposure interventions were used in only 59% of cases (Southam-Gerow et al., 2010).

There are a number of potential explanations for this underutilization. First, researchers have noted that exposure can be a difficult and resource-intensive intervention, often requiring implementation beyond the typical treatment context (e.g., outside of a clinic office and/or for a duration longer than a standard psychotherapy session, Chu et al., 2015; Cloitre, 2011; Becker et al., 2004). Second, some PTSD therapists have limited familiarity with exposure as an intervention strategy (Becker et al., 2004). Third, even among those familiar with exposure, therapists often report concerns related to treatment delivery (Becker et al., 2004; Boudewyns & Shipley, 2012). Such concerns are typically related to perceived client discomfort that could lead to disengagement or retraumatization, as well as therapist discomfort with administering exposure and/or fear of malpractice litigation (Becker et al., 2004; Boudewyns & Shipley, 2012; Hembree & Cahill, 2007; Kovacs, 1996). Schare & Wyatt (2013) coined the term "exposophobia" (p. 243) to describe this phenomenon, noting that empirical research has not supported therapists' misgivings about exposure treatment and therefore this underuse is at least in part due to the therapist's own anxiety. Regarding therapist demographic variables, survey data indicate that women and non-Ph.D.-level therapists use exposure therapy for adults less than men and Ph.D.s. (van Minnen, Hendriks, & Olff, 2010; Whiteside, S. P., Deacon, B. J., Benito, K., & Stewart, E., 2016). Therapists who are women, older, and have a training degree other than a Ph.D. also report more negative impressions of exposure therapy (Deacon et al., 2013). More broadly, the lack of specific training in the use of evidence-based practices, the impression of treatment manuals as being too rigid to apply to a given clinician's diverse client

population, and the belief that such treatments require too much time, money, or support to implement have all been associated with lower rates of evidence-based practice (EBP) adoption (see Nakamura, Higa-McMillan, Okamura, & Shimabukuro, 2011 for a review). A recent study suggests that these concerns have affected exposure use specifically, indicating that therapists who endorsed greater openness to evidence-based practices were more likely to utilize exposure (Becker-Haines, Okamura, Wolk, Rubin, Evans, & Beidas, 2017).

The presence of comorbid psychopathology that can be prioritized in treatment over anxiety symptoms may also play a role in a therapist's limited use of exposure therapy (Milette-Winfree & Mueller, 2017). Comorbidity in this case refers to the existence of both internalizing (e.g., anxiety, depression, or somatic problems) and externalizing (e.g., disruptive behavior, hyperactivity problems) pathology in a given youth (e.g., Costello, Mustillo, Erkanli, Keeler, & Angold, 2003). Research has frequently suggested that when approached separately, externalizing problems are referred for treatment at disproportionately higher rates than internalizing problems (Angold, Costello, & Erkanli, 1999; Bradshaw, Buckley, & Ialongo, 2008; Costello & Janiszewski, 1990; Goodman, Lahey, Fielding, Dulcan, & Regier, 1997). A recent study expanded on these findings, indicating that when child and adolescent therapists are confronted with youth who have received comorbid internalizing (e.g., anxiety) and externalizing (e.g., disruptive behavior) diagnoses, they disproportionately target externalizing problems in treatment (Milette-Winfree & Mueller, 2017). While these findings relate to the problems on which therapists focus rather than the practices they use, inferences about intervention choices can be hypothesized. If anxiety is rarely identified, or identified as only one of many other more pressing treatment targets in comorbid cases, the utilization of exposure to treat it is likely to be low.

Given the infrequent use of exposure in community treatment, little is known about the quality of exposure treatments delivered in this setting. Previous research related to community therapists' patterns of service delivery has only cursorily examined exposure treatment, and the results of existing studies have not been encouraging. For example, Borntrager, Chorpita, Orimoto, Love, & Mueller (2013) examined community therapists' reports of practice elements (PEs) used in treatment. These reports were compared to coders' evaluations of the extensiveness of use of a given PE in the same set of recorded sessions (0=no explicit mention of the PE; 1=a fleeting action or mention related to the PE; 2=a brief but explicit discussion of the PE; 3= explicit discussion or behavior reflecting the PE; Borntrager, 2013). The researchers found that while therapists' reports aligned closely with session coders' counts of PEs, in order for this alignment to occur, coders had to lower the threshold for what counted as a particular practice, given that clinicians commonly endorsed practices that examiners classified as a "brief/fleeting mention or incomplete execution of PEs" (p. 378). Notably, exposure was one of the practices under study (though it was only endorsed 8 times across all coded sessions) and achieved an average rating of 1.02 on the 0 to 3 extensiveness scale (Borntrager et al., 2013). Similarly, in a study that video recorded 96 usual care therapists delivering evidence-based practices for disruptive behavior, researchers found that therapists commonly utilized some EBPs (e.g., problem solving, positive reinforcement, and psychoeducation) and not others (e.g., homework and role playing), but that practices were typically delivered with low duration and low thoroughness (Garland, Brookman-Frazee, Hurlburt, Accurso, Zoffnes, & Haine-Schlagel, 2010). Taken together, these studies provide preliminary evidence of usual care therapists' low-fidelity and likely low-frequency or low-intensity delivery of evidence-based practices, including exposure, across multiple community health settings.

Dissemination and implementation research has emerged in the last decade delineating best practices for promoting high-fidelity use of evidence-based practices in general, such as offering dynamic and versatile training programs, monitoring therapists regularly for adherence, and enlisting key stakeholders to promote EBPs, among other strategies (e.g., Beidas & Kendall, 2010; Becker, Becker, & Ginsburg, 2012; Nakamura et al., 2014). Becker et al. (2012) analyzed school therapists' session content for anxiety problems after they received intensive 2-day workshops on modularized CBT and found that therapists utilized exposure in 100% of cases under study. Though only a small number of cases were studied ( $n = 16$ ), such results are encouraging in their indication that therapists' patterns of exposure use may be amenable to change and that use of EBPs might be gradually increasing in recent years. Notably, considerable resources have been allocated to the dissemination and implementation of EBPs (e.g., training and outreach initiatives, performance feedback systems development, and consumer education efforts) in the system of care under study, offering an opportunity to determine whether exposure use has increased over the duration of these efforts (Nakamura et al., 2014).

### **Summary of the Current State of Exposure Research**

Researchers have made in-roads regarding the processes underlying exposure therapy (e.g., Craske, 2014). The efficacy of exposure and/or interventions that include exposure has been well-supported (e.g., Kendall et al., 2005). Techniques have been proposed to optimize exposure's impact, such as earlier and more frequent use in a treatment episode (e.g., Feske & Chambless, 1995; Gryczkowski et al., 2012). However, the effectiveness of exposure, particularly as measured against treatment-as-usual, is not clear (e.g., Southam-Gerow, et al., 2010). Additionally, exposure is underused in mental health settings, and it is not known under

what circumstances or in what settings exposure is used by child/adolescent community therapists. Finally, the relationship between exposure use and anxiety-related therapy outcomes in usual care is unknown.

### **Study Aims**

The current study sought to examine the usage and associated outcomes of exposure therapy in a large usual care setting that provides multiple levels-of-care (e.g., in-home therapy, residential treatment, hospital services), with the hope of expanding the research on exposure treatment for anxiety and related problems in several important ways. First, the study sought to evaluate and inform efforts to train and promote therapists' use of exposure therapy by determining under what circumstances therapists were more and less likely to use it for anxiety-related targets. It was hypothesized that increased likelihood of exposure use would be associated with more recent treatment end dates, given recent initiatives to disseminate evidence-based practices, both broadly and in the system of care under study. It was also hypothesized that as the proportion of treatment months in which therapists targeted externalizing problems increased, the likelihood of using exposure would decrease. Regarding therapist characteristics, it was hypothesized that doctorate-level training would be associated with increased likelihood of exposure use given aforementioned research indicating enhanced opinions and use of exposure associated with Ph.D. degree (notably, gender and age of therapist have been associated with exposure in previous research, but were not available in the present study). These predictor variables were examined along with various covariates related to treatment episode (episode length, mean number of practices used per month, number and type of unique anxiety-related targets endorsed in treatment, current presence of an anxiety-related diagnosis), client (gender, age, race, number of previous treatment episodes, emotional

impairment at episode start), and provider agency (level-of-care) via a cross-classified logistical predictive model.

After these patterns of use were determined, the study then sought to contribute to the effectiveness and usual care literature related to treatment outcomes associated with exposure use. A measure of anxiety-related treatment progress was examined using a cross-classified predictive model. A variable reflecting the months of exposure use in treatment was tested to determine whether amount of monthly exposure use predicted improved treatment progress after accounting for covariates related to treatment episode (episode length, treatment end date, proportions of episode in which anxiety problems and externalizing problems were a focus, mean number of practices other than exposure endorsed per month, presence of an anxiety-related diagnosis), client (sex, age, race, number of previous treatment episodes, emotional impairment at onset of episode), therapist (highest degree earned), and service delivery agency (level-of-care). The episode month in which exposure was first endorsed was also examined to determine whether this timing moderated the association between exposure use and treatment progress. It was hypothesized that a greater number of months of exposure use would be associated with significantly higher final progress ratings on anxiety and related targets, and that the earlier onset of exposure use in treatment would enhance the relationship between exposure and maximum progress ratings. Such results would provide new evidence suggesting exposure contributes to effective treatment for anxiety-related problems in usual care, and could additionally help to specify under what conditions exposure is maximally useful in order to inform community mental health practices.

## **CHAPTER 2. METHOD**

### **Study Setting**

Within the Hawaii system of care, public mental health services are provided to youth and families through the Department of Education's school-based programs and an additional array of services contracted by the Department of Health's Child and Adolescent Mental Health Division (CAMHD, 2012). Upon meeting eligibility for CAMHD services, youth and their families are assigned a care coordinator, who assists in the management, planning, and coordination of treatment (e.g., CAMHD, 2012). Therapeutic services are contracted through various youth mental health provider agencies and include multiple levels-of-care, which range in intensity from least restrictive (i.e., outpatient and intensive in-home services) to most restrictive (i.e., a locked sexual offender program and locked residential hospitals; see Appendix A for a description). Additional levels-of-care include two types of manualized family therapy, community-based foster care, group home care, residential treatment, and emergency services, among others. Given the study's purpose of examining exposure treatment as it is applied in routine treatment settings, the study sample included treatment episodes within all levels-of-care.

Numerous investigations have examined the effects of practice selection on treatment outcome within the CAMHD system (Denenny & Mueller, 2012; Love, 2014; Orimoto, Mueller, & Nakamura, 2013), although none have examined exposure therapy for anxiety-related problems. Such studies are made possible by unique data collection systems in place, which allow for an examination of treatment characteristics not typically available in large community mental health settings. These data, collected using the Monthly Treatment Progress Summary (MTPS; see description below), include therapists' self-reported practices on a

month-to-month basis, client demographics, and several metrics of improvement, including therapist-reported progress, functional impairment, and successful discharge (CAMHD, 2008). This system of care has the potential to provide insight into the evolution of therapists' acceptance of evidence-based practices such as exposure given the EBP dissemination and implementation efforts described above (Nakamura et al, 2014). Furthermore, the archival data that emerge from this system of care allow for the examination of specific therapist practices in a bona fide usual care setting. For example, steps taken in previous studies to ensure that usual care therapists were not engaging in practices that were too similar to the CBT protocol under examination (e.g., Southam-Gerow et al., 2010) do not apply in this study. The practice of exposure can be examined by isolating those treatment episodes in which it occurs without influencing the episodes to which they are being compared. This is one of several of the concerns identified by Kazdin (2015) related to treatment-as-usual research that can be addressed using these data, as well as identifying important characteristics of TAU (e.g., goals of treatment) so that a clear distinction between exposure treatment and non-exposure treatment can be determined, and controlling for typically uncontrolled variables in EBP-TAU comparison studies such as treatment dosage.

## **Participants**

**Youth participants.** Participant information was drawn from a large dataset that initially included 22,788 youth who had any recorded interaction with CAMHD from July 1, 2001 through August 31, 2015 (including many youth who were registered but never received services or received services prior to the date range of the study, which was by necessity tied to the implementation of the MTPS). Youth with no MTPS data were excluded, reducing the sample to 6,777 youth. Youth were then removed who (a) had none of four anxiety-related

targets described below endorsed on any MTPS (new  $n = 4396$ ; see Monthly Treatment Progress Summary and Data Analytic Strategy for details), (b) did not receive treatment during the date range of the study (new  $n = 3513$ ), and (c) were missing all MTPS practice or treatment progress data for anxiety-related targets (see Data Preparation for more information). This resulted in a final sample of 3,511 youth, ages 3 to 19 (with an average age of 13.7 years at the start of their first episode under study), receiving treatment within the CAMHD system of care between July 1, 2006 and August 31, 2015 (see Table 1). Youth participants were predominately male (61.8%) and racially diverse (57% categorized as multi-racial). The most common primary diagnoses youth received in their first episode were related to disruptive behavior (31.0%), anxiety/traumatic stress/obsessions/compulsions (14.4%), attention problems (14.4%) and depression (10.9%). Change in diagnosis over time was addressed by examining diagnoses at the episode level in statistical analyses. Secondary and tertiary diagnoses are also recorded in the dataset, and when considering these over time, 28.6% of youth under study had at least one anxiety-related diagnosis during at least one treatment episode within the study's date range. See Table 1 for frequencies of other primary diagnostic categories and other demographic information. Youth had an average of 2.85 total treatment episodes. Of these, an average of 1.88 episodes per youth included one or more anxiety-related target. This resulted in a total of 6,616 treatment episodes that met criteria for the present study, with an average of 200 days in length and 7.81 MTPSs per episode across levels-of-care (see Table 2). Anxiety-related targets were endorsed at an average rate of 69% of treatment months within an episode, and a mean of 16.7 intervention practices were used each month. Youth typically experienced moderate emotional impairment across episodes as reflected by a mean episode CAFAS

Mood/Emotions subscale score of 17.9 (See Child and Adolescent Functional Assessment Scale below).

**Therapist participants.** MTPS clinical data were provided by MTPS reporters (henceforth, defined as “therapists” or “clinicians”). Available therapist descriptive data were limited, but as seen in Table 3, treatment was delivered by 655 therapists in the system of care, 63 of whom were doctorate-level therapists. Among these, 12 were Ph.D. clinical psychologists, 26 were Psy.D. clinical psychologists, 16 were M.D.s, and 9 had other doctorate degrees. The remainder of service providers consisted of 351 masters-level clinicians in the fields of counseling, psychology, or marriage and family therapy, 159 masters of social work, 41 clinicians with other masters degrees, 29 bachelors-level clinicians, 8 clinicians who finished high school and four whose degree could not be determined. The credentialing database used for the present study did not include information regarding therapist age, gender, or ethnicity. Therapist characteristics were likely consistent with those noted in prior studies, which have reported CAMHD therapists as about 75% female, ethnically diverse, and having a mean age of around 40 years (Nakamura, Higa-McMillan, Okamura, & Shimabukuro, 2011; Orimoto, Higa-McMillan, Mueller, & Daleiden, 2012).

**Provider agency/level-of-care.** As seen in Table 4, services were provided by a total of 83 different agencies. These agencies were classified by differences in (a) the organization providing services ( $n = 16$ ), (b) the island on which the agency was housed ( $n = 4$ ), and (c) the type of service the agency provided (e.g., intensive in-home therapy, functional family therapy, hospital-based services) in order to capture maximum random variance across agencies. Due to similarities among many of the 16 service classifications noted in the original dataset and to facilitate data analysis, these were condensed into nine categories of level-of-care in the

statistical models described below (see Appendix A for a description of services subsumed within each level-of-care). Episodes most commonly fell under the intensive in-home ( $n = 3083$ , 46.6%), therapeutic foster ( $n = 1028$ , 15.5%), community-based residential ( $n = 972$ , 14.7%), and hospital-based ( $n = 517$ , 7.8%) levels-of-care (see Table 2).

## Measures

**Monthly Treatment Progress Summary (MTPS; CAMHD, 2005; Appendix B).** The MTPS is a therapist report form designed to collect ongoing information on service formats, settings, service dates, treatment targets, practice elements, client progress ratings, medications and dosage, reason for discharge, and discharge living situation. Each section of the MTPS has predefined responses and open-ended fields to provide therapists with the opportunity to write in their responses. Since 2006, contracted therapists within CAMHD have been required to complete MTPSs each month for all youth in order to receive reimbursement for their services (Nakamura, Higa-McMillan, & Chorpita, 2012). Due to this requirement, MTPS completion rates are very high (96.6%). CAMHD has provided statewide trainings on using the MTPS and has created the Instructions and Codebook for Therapist Monthly Summaries, which is available to therapists online (see Appendix C; CAMHD, 2008).

In the event that multiple therapists provide services for a client within the month reflected by the MTPS (mean clinicians per episode = 1.36), the therapist who is most familiar with the youth, family, and services provided during that month completes the MTPS after consulting with the other therapists and is linked to the “Clinician ID” on the form (CAMHD, 2012). A qualified supervisor then verifies the accuracy of the information, signs and dates the MTPS, and sends the form to the Care Coordinator by the fifth day of each month. All

statewide MTPS data are entered into the Child and Adolescent Mental Health Management Information System (CAMHMIS) through standardized procedures at the various Family Guidance Centers. The CAMHMIS is a data management system that is compliant with the standards set by the Health Insurance Portability and Accountability Act (HIPAA).

***Treatment targets and progress ratings.*** On the MTPS, therapists are instructed to identify up to ten treatment targets addressed during the month, from a list of 48 predefined responses and two write-in fields. They then assign progress ratings to each of the identified targets, based on the extent of progress achieved between the child's baseline level of functioning and the goal for that target. Progress ratings are ranked on a seven-point (0-6) scale with the following anchors: Deterioration (<0%), No Significant Change (0-10%), Minimal Improvement (11-30%), Some Improvement (31-50%), Moderate Improvement (51-70%), Significant Improvement (71-90%), and Complete Improvement (91-100%), with higher numbers indicating greater improvement.

Prior research has found that treatment targets relate to diagnoses in a predictable manner (Daleiden, Lee, & Tolman, 2004). In addition, Nakamura, Daleiden, and Mueller (2007) found that one-half to two-thirds of target selections were stable from intake to three, six and nine-months into treatment and Daleiden and colleagues (2004) found moderate treatment target stability from baseline to one-month ( $k = 0.66$ ) and three-months ( $k = 0.52$ ) into treatment. Love, Okado, Orimoto, and Mueller (2016) conducted exploratory and confirmatory factor analyses of the treatment targets and found evidence for a five-factor structure corresponding to the areas of disinhibition, societal rules evasion, social engagement deficits, emotional distress, and management of biodevelopmental outcomes, and Milette-Winfrey & Mueller (2017) used non-parametric tests to determine treatment targets associated with

externalizing and internalizing disorders, and found these targets were closely related to the respective problem areas within which they were categorized.

With regard to progress ratings associated with these treatment targets, Nakamura et al. (2007) found significant correlations between progress ratings on MTPS forms completed by therapists and other measures of clinical functioning and improvement. For example, compared with the Child and Adolescent Functional Assessment Scale (CAFAS; Hodges, 1994), where higher scores indicate more impairment, the MTPS progress ratings were significantly negatively correlated ( $r = -0.22$  to  $-0.44$ ) at one-, three-, and nine-month follow-ups. Notably, the CAFAS is completed by administrative program staff and not by therapists. These correlations provide evidence of convergent validity for the progress ratings on the MTPS.

***Intervention strategies.*** Each month, therapists are also instructed to indicate intervention strategies (i.e., practice elements or PEs) utilized with youth in the given MTPS month from a list of 63 predefined responses and three write-in options. Daleiden et al. (2004) noted a moderate one-month ( $k = 0.65$ ) and three-month ( $k = 0.5$ ) stability of PE choice from the start of treatment. An exploratory factor analysis of the PEs suggested a three-factor structure, including Behavioral Management (15 PEs), Cognitive/Self-Coping (19 PEs, with exposure falling within this category, factor loading = .55), and Family Interventions (13 PEs; Orimoto, Higa-McMillan, et al., 2012). Factors were found to be correlated ( $r = 0.46$ - $0.52$ ) and to have adequate to good internal consistency (Orimoto, Higa-McMillan, et al., 2012). Additionally, the PEs have established adequate inter-rater reliability (intraclass correlations [ICCs] = 0.6 or higher for some PEs) and convergent validity with audio-recordings of treatment sessions rated and coded by independent observers (Borntrager et al., 2013; Daleiden et al., 2004).

**Child and Adolescent Functional Assessment Scale (CAFAS; Hodges, 1994).** The CAFAS is a 200-item clinician measure that assesses youths' level of functional impairment (see Appendix D). Based on clinical interviews, case managers in CAMHD assign behavioral descriptions ordered by level of impairment within eight domains of functioning: School Role Performance, Home Role Performance, Community Role Performance, Behavior Toward Others, Mood/Emotions, Mood/Self-Harmful Behavior, Substance Use, and Thinking. Scores for each subscale are calculated by scoring the highest level of impairment (i.e., severe = 30, moderate = 20, mild = 10, no/minimal = 0) endorsed within the respective domain. Total scores are obtained by summing across the eight subscales. Interpretation guidelines for the total score suggest: 0-10 = "None to minimal impairment", 20-40 = "Likely can be treated on an outpatient basis", 50-90 = "May need additional services beyond outpatient care", 100-130 = "Likely needs care which is more intensive than outpatient and/or which includes multiple sources of supportive care", and 140+ = "Likely needs intensive treatment, the form of which would be shaped by the presence of risk factors and the resources available within the family and the community." Internal consistency of the CAFAS across items has been determined as adequate ( $\alpha = 0.73$  to  $0.78$ ), with high inter-rater reliability across sites (intraclass correlations [ICCs]  $\geq 0.84$ ; Hodges, 1995; Hodges & Wong, 1996). Concurrent validity studies have found that CAFAS scores are valid proxies to estimate treatment change, and are related to severity of psychiatric diagnosis, intensity of care provided, restrictiveness of living settings, juvenile justice involvement, social relationship difficulties, school-related problems, and risk factors (Hodges & Gust, 1995; Mueller, Tolman, Higa-McMillan, & Daleiden, 2010; Nakamura et al., 2007). An exploratory factor analysis of the eight CAFAS subscales indicated a two-factor structure, with the Mood/Emotions, Mood/Self-Harmful Behavior, and Thinking subscales

grouped within an internalizing factor (factor loadings = .46-.58), and the remaining subscales grouped within an externalizing factor (factor loadings = .50-.75; Ebetsutani, Francis, & Chorpita, 2008). Of these subscale scores, the Mood/Emotions subscale is the most relevant to the present study, as it is the only subscale score that describes impairment specifically related to anxiety. For example, a sample description of a CAFAS Mood/Emotions subscale score of 30 is, “Fears, worries or anxieties result in poor attendance at school (i.e., absent for at least one day per week on average) or marked social withdrawal (will not leave the home to visit with friends)” (Hodges, 1994, p. 7).

## **Procedures**

**Data source.** The Research Evaluation and Training Program (RET) within CAMHD provided a limited dataset with clinical and demographic data from CAMHMIS for the service period in question. CAMHMIS maintains records on all CAMHD clients, consistent with CAMHD's data storage procedures (CAMHD, 2012). All therapist data were electronically extracted from the credentialing database that is developed and maintained by the Credentialing Office of CAMHD. This database provided therapists' education level and professional information (e.g., specialty).

**Human subjects considerations.** Upon entry into CAMHD, the legal guardian of the youth receives a complete description of CAMHD's privacy policies and signs the Notice of Privacy Practices consent form, which allows for the use of data for research purposes (see Appendix E). This consent form adheres to the HIPAA and Family Educational Rights and Privacy Act standards. This study received exempt approval from University of Hawai'i at Mānoa's Institutional Review Board due to (a) the nature of this study being archival, (b) the fact that legal guardians of youth under study are required to sign the Notice of Privacy

Practices to receive services, and (c) the data-limited nature of the data (i.e., no directly identifiable client information).

## **Data Analytic Strategy**

**Selection of episodes based on anxiety-related targets/progress ratings and episode start date.** In the present study, the endorsement at any time during a treatment episode of any combination of six targets that were theoretically related to anxiety based on their definition in the codebook for using the MTPS (see Appendix C) and empirically related to internalizing problems was used as an initial episode inclusion criterion (Milette-Winfree & Mueller, 2017). These targets were: anxiety, avoidance, compulsive behavior, shyness, phobias/fears, and traumatic stress. Two of these targets were removed from this inclusion criterion after preliminary analyses. Compulsive behavior was omitted given its removal from a revised version of the MTPS in 2008 due to extremely low earlier endorsement rates (occurring in 10 of 6656 episodes in the preliminary dataset; CAMHD, 2012). Shyness was also removed due to somewhat low endorsement rates (occurring in 205 of 6656 episodes in the preliminary dataset) and lower bivariate correlations between final progress ratings on shyness and two of the other targets, trauma and phobias/fears (Pearson's  $r = 0.37$  and  $0.42$ ,  $p < 0.01$ ) compared to correlations between other targets ( $r_s$  ranging from  $0.50$  to  $0.55$ ,  $p < 0.001$ ). The other four targets were retained due to (a) their various similarities noted in the introduction and (b) adequate Cronbach's alphas for anxiety-related progress ratings when examining episodes in which all four targets occurred together ( $n = 155$ ,  $\alpha = 0.76$ ) or when any combination of three of the four targets occurred ( $n = 1516$ , range of  $\alpha = 0.73 - 0.75$ ). These targets occurred at varying rates in the sample, with anxiety occurring in 3636 (54.9%) episodes, phobias/fears occurring in

3469 (52.4%) episodes, avoidance occurring in 2231 (33.7%) of episodes, and traumatic stress occurring in 1480 (22.4%) of episodes.

The study's date range of July 1, 2006, through August 31, 2015, noted above was chosen because July 2006 was the first month in which providers were required to complete an MTPS form in order to receive reimbursement for services, thereby substantially reducing the frequency of missing MTPS data (CAMHD, 2012).

**Analysis 1: Predicting the use of exposure when anxiety-related targets were present.** Therapist endorsement of the practice element (PE) of exposure on the MTPS was used to derive a dichotomous criterion variable. If a therapist endorsed using exposure as an intervention during an episode in which any of the four anxiety-related targets described were endorsed on any MTPS, this variable was coded as 1, otherwise this variable was coded as 0.

It was hypothesized that the probability of exposure therapy use would increase as a function of the recency of a given treatment episode. Treatment end date, broken into 15 six-month increments and one two-month increment, was therefore included in the analysis as a predictor variable. This served as a proxy for time of service and more accurately captured the entirety of a service episode than treatment start date. Six-month time increments were used to better interpret results (i.e., an estimate of the increase in odds of exposure endorsement per one day increase in episode end date was too small for statistical software to report, whereas utilizing a variable indicative of year increments might not provide a sufficiently-detailed analysis of change over time). The two-month increment reflected the final two months of the date range of the study (July 1, 2015 through August 31, 2015), and included those episodes that either (a) were closed in the last two months of data collection or (b) were ongoing at the

end of data collection. The *n*-size of episodes within this shorter date interval was similar to that of the other six-month ranges (*n* = 379; mean number of episodes per date range = 348, *SD* = 67).

It was also hypothesized that in any given treatment episode in which an anxiety-related target was endorsed, the degree to which externalizing treatment targets were also endorsed would predict reduced likelihood that exposure was used in that treatment episode. Externalizing targets, as defined by Milette-Winfree & Mueller (2017), included: willful misconduct/delinquency, oppositional or non-compliant behavior, hyperactivity, attention problems, aggression, self-injurious behavior, anger, empathy, and peer or sibling conflict. A continuous variable that reflected the proportion of months in a treatment episode in which any of these externalizing problems was endorsed served as a predictor variable.

It was hypothesized that therapists with Ph.D. degrees were more likely to use exposure. There were only 12 Ph.D. clinical psychologists represented in the dataset, which was an insufficient *n* size to gauge potential effects of Ph.D. degree on likelihood of using exposure. Therefore Ph.D. clinical psychologists were subsumed within all doctorate-level clinical psychologists, resulting in a total *n* of 63 doctorate-level providers. See Table 3 for descriptions and frequencies of the highest degrees held by treatment providers.

Given the few hypotheses regarding factors predicting likelihood of exposure use, a number of other factors were also included as confounding variables and to explore whether previously unreported treatment characteristics might affect therapists' usage of exposure therapy. These included level-of-care as described in Appendix A (e.g., intensive in-home therapy, multisystemic therapy, therapeutic foster care, hospital-based care, etc.), youth age,

youth sex, youth race, presence of an anxiety disorder diagnosis, number of previous treatment episodes, whether a youth received exposure in a previous episode, youth's emotional impairment as measured by the CAFAS mood/emotions subscale score at treatment episode onset, mean number of practices other than exposure endorsed per month, type and total number of unique anxiety-related problems targeted in the episode, and proportion of episode months in which at least one anxiety-related problem was targeted. The relationship between exposure use and the presence in a treatment episode of each of the four anxiety-related targets (anxiety, avoidance, phobias/fears, and traumatic stress) was examined at the bivariate level, and those targets that significantly predicted exposure use were entered in the full model.

**Analysis 2: Predicting anxiety-related improvement as a function of the use of exposure.** “Total anxiety progress,” a composite score representing mean therapist final progress rating on any anxiety-related targets endorsed within a treatment episode as reported on the MTPS (with scores ranging from 0 to 6) served as the criterion variable for this analysis. This composite score was created due to both conceptual and empirical relationships between the four anxiety targets under study (anxiety, avoidance, phobias/fears, and traumatic stress). Conceptual relationships are discussed in the introduction, and were supported by preliminary analyses indicating that progress ratings of any two anxiety targets occurring together were significantly correlated and progress ratings across three or more anxiety targets occurring together were acceptably consistent (see Data Analytic Strategy for statistical information). The resulting composite score had a mean of 2.89, a standard deviation of 1.49, and a reasonably normal distribution (see Figure 1 for a visual depiction).

The primary predictor variable of interest in Analysis 2 represented the amount of exposure use during a treatment episode. Multiple ways of measuring this variable were

considered (i.e., as a dichotomous variable indicative of any use/no use in an episode, as a continuous variable indicating the number of months in which exposure was endorsed, as a categorical variable reflecting ranges of months of exposure use, and as a proportion of months in which exposure was endorsed out of total episode months). A four-category variable was chosen because (a) this method allowed for the optimal balance of distribution of episodes across categories and maximum number of such categories (see Results), and (b) this variable allowed for the examination of the hypothesis that more months of exposure use would be associated with improved treatment progress, as suggested by Crawford and colleagues (2017) and Feske & Chambless (1995). Categories were defined as no months of exposure use, one month of use, two to three months of use, and four or more months of use. This variable was analyzed along with other covariates related to agency (level-of-care), therapist (doctorate level of education), client (sex, race, age), and episode (anxiety diagnosis, recency of treatment episode end date, treatment episode length, proportions of episode months in which anxiety-related problems and externalizing problems were targeted, number of previous treatment episodes for the youth, mean number of therapeutic practices used per month, and emotional functional impairment at onset of episode as measured by CAFAS Emotions/Feelings subscale score). While many of these covariates were conceptualized as confounds, the interaction between exposure use and other categorical variables (e.g., therapist doctoral degree, agency level-of-care) was examined if main effects were found for those covariates. Related to the hypothesis that early exposure use within an episode would also enhance outcomes, a continuous variable indicative of which month exposure was first identified on the MTPS within a given episode was examined outside of the main analyses to determine if it was associated with improved treatment progress.

**Data preparation.** First, minimum and maximum values (i.e., response ranges) for each item, subscale, and totals of all measures were calculated to identify impossible values and potential data entry errors. MTPS data were inspected to ensure that each MTPS included had at least one anxiety-related treatment target, respective progress ratings for each selected treatment target, and at least one PE. Of the 40,372 MTPS entries with an anxiety-related target endorsed, 674 (1.7%) either did not report an associated progress rating or did not identify any PE, which was consistent with previous research (e.g., Love, et al., 2010). Second, the means, standard deviations, skewness, and kurtosis of relevant variables were examined in order to obtain a preliminary and broad understanding of the data. Finally, the assumptions of conducting multi-level models (MLMs) of cross-classified data were analyzed (e.g., normal distribution of residuals for continuous criterion variables, sufficient variance in the criterion variable accounted for by the various classifications of data in the analysis, and non-multicollinear predictors; Heck et al., 2013; Quene & van den Bergh, 2004; Raudenbush & Byrk, 2002). Results of these analyses are reported in Appendix F.

**Missing data.** As described below, multilevel modeling of cross-classified data was utilized as the major analytic strategy for this study. It is common for participants within a cross-classified study to have unequal (and missing) amounts of data (Heck et al., 2013; Quene & van den Bergh, 2004). With multilevel data structures and maximum likelihood estimation, listwise deletion is not necessary. Where full information maximum likelihood estimation is available, unbalanced higher level sample sizes and missing data can be accommodated, or multiple imputation can be utilized to replace missing values; however, the assumption that the missing data in the sample are missing at random (MAR) should be examined (Quene & van

den Bergh, 2004; Little & Rubin, 1987). Retaining individuals with partial data is actually useful in developing an argument that the data are likely missing at random.

As in previous studies utilizing CAMHD data, CAFAS data were missing from the dataset at a high rate (930 out of 6616 treatment episodes; Milette-Winfrey & Mueller, 2017). The only other data that were missing involved four episodes in which a therapist's degree status was not reported. A Missing Values Analysis run in the Statistical Package for Social Sciences (SPSS) determined the data were Missing At Random (Little & Rubin, 1987). As such, an episode-level multiple imputation with five iterations was used to generate five simulated datasets in which the 930 missing CAFAS values and four degree values were estimated and imputed. Single-level analyses of these five simulated datasets were then compared to determine whether any coefficients,  $F$  values, or  $p$  values changed significantly across the original dataset and the five iterative datasets. In the case of both Analysis 1 and Analysis 2, none of these values changed substantially to suggest they might affect main analyses. Therefore, each analysis was run twice, both including and excluding the CAFAS mood subscale score variable and the degree variable, and results were compared. When CAFAS score and degree were added into the models, no relationships between other predictor variables and the criterion variables changed significantly for either analysis. Therefore the analyses reported below include the CAFAS Mood/Emotions score and degree variables. This prompted the exclusion of the 934 episodes in which CAFAS score and doctoral degree status were missing for main analyses, resulting in a total of 5,682 episodes analyzed in the two main statistical models.

A second issue related to missing data involves the consideration of empty cells when examining categorical interactions in a statistical model. In this dataset, the interaction between

categories of exposure use and categories of level-of-care was examined. This interaction resulted in 36 cells of data, eight of which were empty (e.g., exposure use was never reported for four or more months in the sexual misconduct residential treatment level-of-care; see Table 9 for additional empty cells). Cochran (1952) indicates that such observed zero values in cells are not problematic as long as the expected values for these cells are not below five in more than 20% of cells under analysis. Only two of the 36 cells examined (5.5%) had expected values less than 5, suggesting that these empty cells did not affect the validity of these analyses.

**Main analyses.** Cross-classified multi-level analyses were chosen due to the imperfect nesting of episodes within higher-order levels. Cross-classified data structures differ from typical hierarchical data structures in that for the latter data structure each individual (or level-1 subject) is nested in only one higher level unit. In contrast, in cross-classified data structures, some individuals may be fully nested in higher level units, while others may be only partially nested (i.e., cross-classified) in more than one higher level unit (Raudenbush & Byrk, 2002). For example, three treatment episodes might be nested within one youth, but each episode-youth combination could be nested within a different therapist and a different provider agency. This data structure can be more accurately measured using cross-classification modeling as opposed to hierarchical MLM (Fielding & Golding, 2006). The study followed the guidelines discussed by Heck et al. (2013), Peugh (2010), and Fielding & Goldstein (2006), and are described in detail in Appendix F.

**Supplemental Analyses.** Several additional analyses were performed to (a) test a hypothesis that could not be evaluated using the main analyses and (b) further assess level-of-care characteristics. Regarding (a), episodes in which exposure was utilized were isolated and the relationship between the month in which exposure was first utilized and total anxiety

progress was examined. A uni-level generalized linear modeling approach was utilized, and this relationship was examined in the context of the covariates used in Analysis 2 above.

Regarding (b), level-of-care differences in two variables (proportion of months of anxiety targets and emotional impairment at treatment onset) were examined to better understand the differences in anxiety progress across levels-of-care.

## **Chapter 3: RESULTS**

Exposure was utilized during one or more months in 20.7% ( $n = 1372$ ) of all episodes under study. In 156 (11.4%) of these episodes, exposure use occurred only in months without any anxiety-related target; these were nonetheless categorized as exposure episodes in Analysis 1. Given that the main predictor variable of interest in Analysis 2 measured the number of months in which exposure co-occurred with at least one anxiety target, these 156 episodes received a score of 0 on that variable and were thus added to the 5,244 episodes in which exposure was not used for that analysis. Mean total anxiety progress ratings were similar between these two groups of episodes ( $m = 2.79$  and  $2.86$ , respectively). The number of months that exposure was used coincident with the endorsement of anxiety-related problems varied. It was most commonly used for one month ( $n = 510$ , 37.2% of exposure episodes), followed by 2-3 months ( $n = 373$ , 27.2% of exposure episodes) and then 4 or more months ( $n = 333$ , 24.3% of exposure episodes).

### **Analysis 1: Predicting the use of exposure when anxiety-related targets were present.**

A cross-classified logistic regression model examined predictors of exposure use in the context of random variance between therapists and service provider agencies. The results of the cross-classified model are presented in Table 5. As noted in Method: Missing Data, episodes missing CAFAS scores and information related to doctoral degree were removed from analyses, resulting in 5682 episodes analyzed. Note that the intercept has a highly significant negative beta value because (a) exposure was only used in 20.7% of episodes, and as such the odds of exposure being used without considering any variables in the model are below 1, resulting in a beta value that is necessarily negative and (b) reference categories reflected by the intercept were most commonly conditions in which exposure was less likely to occur (i.e., no anxiety

diagnosis, shorter episode length, fewer practices used in treatment and fewer anxiety targets selected), further lowering the beta value and odds ratio. Episode end date recency (measured in six month intervals) increased the odds of exposure use, odds ratio (OR) = 1.03,  $B = 0.03$ ,  $t = 2.37$ ,  $p = 0.02$ . Given the approximately nine years and 16 date intervals encompassed within the time period of the study, this suggests that the most recent episodes were 60% (odds ratio = 1.03<sup>16</sup> or 1.60) more likely to include exposure than the earliest episodes. As the proportion of months in which externalizing targets were endorsed increased from 0 to 1, the odds of exposure use decreased by 60%, odds ratio = 0.40,  $B = -0.91$ ,  $t = -5.88$ ,  $p < 0.001$ . There was no association between doctorate degree and exposure use,  $B = -0.11$ ,  $t = -0.35$ ,  $p = 0.73$ .

The above results persisted despite several other significant predictors of exposure use. The two most robust of these predictors were total months in the treatment episode,  $B = 0.09$ ,  $t = 11.13$ ,  $p < 0.001$ , odds ratio [OR] = 1.09, and mean total number of practices/interventions utilized per month,  $B = 0.10$ ,  $t = 12.17$ ,  $p < 0.001$ , OR = 1.10. For every additional month that a treatment episode persisted, the odds of exposure being used increased by 9%. Similarly, with every additional intervention strategy (other than exposure) used in a treatment month, odds of exposure use increased by 10%. Given a mean (SD) of 16.71(9.91) practices other than exposure endorsed per treatment month, this indicates that as the number of practices used increased by one standard deviation, the odds of exposure use increased by a magnitude of 2.57 (157%).

Several other factors also predicted the likelihood of exposure use. These included the youth's CAFAS Mood/Emotions score at start of treatment ( $B = 0.02$ ,  $t = 2.41$ ,  $p = 0.02$ , OR = 1.016), number of unique anxiety targets (ranging from 1 to 4) identified once or more during an episode ( $B = 0.26$ ,  $t = 3.78$ ,  $p < 0.001$ , OR = 1.30), proportion of total episode months in

which anxiety targets were selected (ranging from 0.03 to 1.00,  $B = 0.55$ ,  $t = 2.78$ ,  $p < 0.001$ , OR = 1.74), and presence of an anxiety diagnosis ( $B = 0.28$ ,  $t = 3.78$ ,  $p < 0.001$ , OR = 1.32). Given that CAFAS scores are in 10-point increments, this suggests that one unit increase in CAFAS score (e.g., from 10 to 20) resulted in a 1.17-fold (17%) increase in odds of exposure use. The odds of exposure use increased by 30% for each additional anxiety target endorsed in an episode, by 74% as the proportion of episode months in which anxiety was targeted increased from 0 to 1, and by 32% when a youth was diagnosed with an anxiety-related disorder.

When examined at the bivariate level, the presence of the phobias/fears target in an episode resulted in a reduced likelihood of exposure use. This relationship persisted in the full model, with the endorsement of phobias/fears any time in an episode resulting in a 27% decrease in the odds of exposure use,  $B = -0.31$ ,  $t = -2.67$ ,  $p = 0.01$ , OR = 0.73. Regarding level-of-care, the hospital-based service classification was chosen as the reference category because it had the highest rate of exposure use among all levels-of-care (37.9% of cases). Placement in either sexual misconduct residential treatment or crisis/respite home resulted in a respective 96% and 95% decreased likelihood of exposure use,  $B_s = -3.15$  &  $-2.94$ ,  $t_s = -2.62$  &  $-2.57$ , ORs = 0.04 and 0.05,  $p = 0.01$ , compared to hospital-based placement. Notably, placement in the functional family therapy level-of-care was not a significant predictor of exposure use despite no endorsement of exposure in any episode within this level-of-care. This finding is due to an extremely high standard error for the beta value of this variable stemming from an absence of variance and should be interpreted with caution. Finally, Asian youth who did not identify as mixed-race were more likely to receive exposure than all other youth,  $B = 0.45$ ,  $t = 2.50$ ,  $p = 0.01$ , OR = 1.56.

Covariance parameter estimates indicated that agencies and clinicians continued to account for significant random variance after fixed effects were added into the equation, (ICC = 0.195 for agency, ICC = 0.380 for therapist, random variance estimates = 0.80 and 2.02 respectively, Z-scores = 2.68 & 8.54,  $p<=0.01$ ). Notably, this model resulted in a sizeable decrease in random variance accounted for by agency (compared to an ICC of 0.301 in the null model), and a slight increase in the random variance accounted for by therapist (compared to an ICC of 0.355 in the null model).

Finally, the cross-classified model correctly predicted exposure use/non-use in 89.0% of cases, a significant increase compared to the null model's 79.3% successful prediction rate (Wald  $z = 21.58, p<.001$ ). The model correctly predicted 61.6% of the cases in which exposure was used and 96.2% of the cases in which exposure was not used.

#### **Analysis 2: Predicting anxiety-related improvement as a function of the use of exposure.**

**Main effects model.** A cross-classification linear regression model initially examined main effects of exposure use and other covariates related to total anxiety progress (see Table 6 for results). As in Analysis 1, episodes missing CAFAS scores and information related to doctoral degree were removed from analyses, resulting in 5,682 episodes analyzed. As hypothesized, 4+ months of exposure in the presence of anxiety targets was associated with higher total anxiety progress. Specifically, the beta values for the no months, one month, and two to three month categories of exposure were significantly negative compared to the 4+ months category, range of  $B = -0.37$  to  $-0.25$ , range of  $t = -3.89$  to  $-2.23, p \leq 0.03$  (see Table 7 for estimated marginal means across exposure use categories). There were no significant differences between the three lower-use categories, with mean estimated progress ratings falling between 3.05 and 3.18. Comparing the standardized difference between estimated mean anxiety

total progress for episodes with high (4+ months) exposure use to mean anxiety total progress ratings for all other episodes resulted in a Cohen's *d* effect size of 0.38. This result persisted in the context of a number of other factors that also predicted total anxiety progress, described below.

Total months of treatment ( $B = 0.04, t = 14.23, p < 0.001$ ) and mean practices used per month in an episode ( $B = 0.03, t = 8.68, p < 0.001$ ) predicted total anxiety progress. The proportion of total episode months in which externalizing targets were endorsed was associated with reduced total anxiety progress ( $B = -0.19, t = -3.20, p = 0.001$ ), while the proportion of months in which anxiety targets were a focus of treatment predicted a higher total anxiety progress score ( $B = 0.43, t = 6.03, p < 0.001$ ). CAFAS Mood/Emotions score at treatment onset ( $B = -0.01, t = -3.67, p < 0.001$ ) and number of previous treatment episodes ( $B = -0.03, t = -4.83, p < 0.001$ ), both predicted lower total anxiety progress. Treatment progress also differed as a function of level-of-care, with the lowest mean anxiety progress in the community-based residential treatment setting (estimated marginal mean [EMM] = 2.47, S.E. = 0.16; this level-of-care served as the reference group in the analysis) and the highest mean anxiety progress in the multisystemic therapy (EMM = 3.78, S.E. = 0.18) and functional family therapy (EMM = 3.85, S.E. = 0.27) treatment settings. See Table 7 for total anxiety progress score EMMs for all levels of care. The difference in mean anxiety progress between community-based residential treatment and all other levels-of-care either met or approached statistical significance (range of  $t_s = 1.88-6.21$ , range of  $p_s = 0.001 - 0.07$ ). All the above results persisted after holding other non-significant factors constant, including episode end date, therapist doctorate degree, the presence of an anxiety diagnosis, and youth sex, age, and race.

**Interaction model.** Given the significant differences in total anxiety progress across various levels-of-care, an interaction effect was tested to determine whether the main effect of exposure use occurred across or primarily in specific levels-of-care. As can be seen in Tables 8 and 9, the overall interaction effect was significant,  $F(16) = 3.30, p < 0.001$ , with the highest category of exposure use (4+ months) predicting improved total anxiety progress when compared to the three lower-use categories specifically in the community-based residential treatment setting. Given that 4+ months of usage was the reference category, this difference is reflected by significantly negative beta values of the other three usage groups as reported in Table 8, range of  $Bs = -0.97$  to  $-1.27$ , range of  $ts = -7.14$  to  $-4.49, p < 0.001$ . Effect size (i.e., the standardized mean difference in total anxiety progress score between anxiety episodes with 4+ months of exposure and all other episodes within the community-based residential treatment level-of-care) as measured using Cohen's  $d$  was 0.50. This interaction occurred in the context of the factors reported in the main effects model above.

In both models utilized in Analysis 2, the cross-classifications of youth, clinician, and agency continued to account for significant random variance after fixed effects were entered (respective variance parameter estimates = 0.14, 0.33, and 0.07, Wald Zs = 4.32, 9.16, and 2.06,  $p < 0.001, < 0.001, = 0.04$ , respectively). The estimated random variance accounted for by youth classification decreased from 9.2% to 6.7% and the estimated random variance accounted for by agency decreased from 14.5% to 3.15%. The estimated random variance accounted for by the therapist level increased from 14.5% to 16.1%. This was due to a decrease in the residual episode-level random variance in the model and not caused by an increase in the covariance parameter related to therapist. These results suggest that the fixed effects in the model account

for approximately 27% of the variance between youth, 78% of the variance between agencies, and little or no variance between therapists.

**Results of supplemental analyses.** Contrary to expectation, earlier initiation of exposure use in a treatment episode was associated with reduced total anxiety progress ( $B = 0.026, t = 3.11, p = 0.002$ ). Given the potential confounds of short treatment episodes and low dosages of exposure contributing to this reduction in anxiety progress scores, the sample was further limited to only those cases in which exposure was endorsed for 4 or more months and the analysis was re-run. Earlier exposure use was not associated with anxiety progress for this subset of episodes ( $B = 0.006, t = 0.36, p = 0.72$ ).

Analyses of variance indicated that both the proportion of months in which anxiety targets were endorsed and a youth's emotional impairment at treatment onset differed as a function of level-of-care,  $F(8,6607) = 238.02, p < 0.001$ ,  $F(8,5677) = 39.66, p < 0.001$ , respectively. Regarding months of anxiety targets, this proportion score was significantly lower in functional family therapy (mean = 0.48) and multisystemic therapy (mean = 0.50) than in other levels-of-care (overall mean = 0.67). Regarding emotional impairment at treatment onset, youth had significantly higher initial mood/emotions CAFAS scores in the hospital-based level-of-care (mean = 23.11) than in other levels-of-care (overall mean = 17.89).

## **Chapter 4: DISCUSSION**

This study is the first to specifically examine exposure therapy for anxious youth across multiple levels of care in a child and adolescent mental health system to determine (a) factors associated with its use and (b) its association with outcomes. Exposure was used in less than one quarter of anxiety-related treatment episodes. As hypothesized, exposure was more likely to be used in more recent episodes and less likely to be used when externalizing problems were more often targeted. Contrary to the hypothesis, doctoral level of training was unrelated to exposure use. These results persisted despite many other predictors of exposure use in the cross-categorical model. Four predictors that seemed indicative of the salience of anxiety (presence of an anxiety-related diagnosis, higher CAFAS Mood/Emotions impairment score at treatment onset, number of different anxiety targets endorsed, proportion of episode months in which anxiety problems were a focus) predicted higher exposure use, while a predictor potentially indicative of less salient (or less acute) anxiety predicted reduced use (selection of the phobias/fears target, discussed below). Two additional treatment variables (mean number of practices endorsed per month and number of episode months), one agency-level predictor (level-of-care) and two variables that were difficult to interpret (whether the youth in treatment received exposure in a previous episode and/or was of Asian race) predicted greater likelihood of exposure use. Youth age, sex, and number of previous episodes were unrelated to exposure use.

Regarding exposure's relationship to improved outcomes, four or more months of exposure use was associated with a higher score on the composite measure of anxiety-related treatment progress. When the interaction between exposure use and level-of-care was examined, this association was found to occur primarily in community-based residential

treatment. These findings persisted after including multiple statistically-significant covariates in the cross-categorical model. Effect sizes for the difference in anxiety progress between high monthly exposure use and all other cases were moderate (Cohen's  $d = 0.38$  for the main effect model and  $0.50$  for the interaction model). Total months of treatment, proportion of episode months in which anxiety problems were targeted, and mean number of practices (other than exposure) used per month predicted higher progress. Higher number of previous episodes, proportion of months in which externalizing problems were targeted, and level of emotional impairment as indicated by CAFAS mood/emotions score predicted less progress. Other variables (therapist doctorate degree, youth sex, youth age, presence of an anxiety diagnosis, and episode end date) did not significantly predict progress.

**Exposure utilization.** As hypothesized, exposure was used more frequently over time, likely due in part to the dissemination and implementation efforts conducted nationally and/or undergone in this system of care over the past decade (Nakamura et al., 2014). However, the overall 20.7% nine-year rate of exposure use was low (and within the range of what has been found in other studies; e.g., Foy et al., 1996). On the positive side, the percentage of youth who received exposure for anxiety problems rose from 12.2% in episodes that began in the last six months of 2006 to 20.5% in episodes that began in the first half of 2015. These findings converge with previous evidence that therapists' acceptance and use of evidence-based practices can be fostered through therapist training efforts (e.g., Becker et al., 2012). However, there are three additional caveats to this increase in the usage rate of exposure. First, and as discussed below, exposure use does not necessarily equate to effective exposure use. Second, when used, exposure was most commonly reported for only one month of treatment (in the context of a mean number of nine episode months). Third, reliance on therapist self-report opens up the

possibility that endorsement of exposure use reflects some other reporting bias. For example, therapist endorsement of evidence-based practices like exposure might reflect organizational pressures stemming from dissemination efforts rather than genuine execution of a given practice. While this possibility cannot be disconfirmed, coding of session recordings by Borntager and colleagues (2013) suggests that when therapists endorsed using exposure practices, session coders found that exposure was indeed conducted, but commonly characterized as a “brief/fleeting mention or incomplete execution” (Borntrager et al., 2013, p. 378). This suggests that many therapists might have gleaned a sufficient knowledge of exposure practices from training efforts or other sources to introduce them in session, but an insufficient knowledge to thoroughly implement them. In sum, while the reported use of exposure for anxiety is low and of uncertain quality in usual care, there is a discernible and encouraging reported increase in its use over the last nine years, at least in this system of care.

Also as predicted, and complimentary to recent research indicating that therapists disproportionately focus on externalizing treatment targets in this system of care (Milette-Winfree & Mueller, 2017), the proportion of months in which a therapist endorsed externalizing treatment targets was associated with a reduced likelihood of exposure use. This finding provides preliminary evidence suggesting that a disproportionate focus on externalizing problems results not only in less focus on internalizing targets but also less use of exposure even in cases with anxiety-related targets. The reasons for this pattern are unknown. Externalizing problems are common in this system-of-care, and they continued to be common in this sample despite its restriction to youth experiencing anxiety-related problems. Indeed, disruptive behavior disorders (typically Oppositional Defiant Disorder and/or Conduct Disorder) were the most common primary diagnoses in this study and occurred at more than double the rate of

anxiety-related primary diagnoses. This presence of externalizing problems might prompt therapists to prioritize them by default (or by biased heuristics) in many of these cases, leading to less use of exposure. Even when anxiety is present and targeted, exposure can be a difficult practice to implement given it is thought to be resource-consuming and anxiety-provoking (e.g., Chu et al., 2015; Becker et al., 2004). Indeed, the overall low rates of exposure use found in other studies could be due at least in part to clients presenting with multiple problems, requiring therapists to make such difficult choices.

Findings also suggest that therapists are more likely to use exposure when anxiety is a more salient problem (as evidenced by high emotional impairment at treatment onset, the presence of an anxiety diagnosis, a high proportion of months in which anxiety was treated, and the number of different anxiety targets identified in treatment), which suggests an acknowledgement and understanding of the potential benefits of exposure use, especially when anxiety is a major or salient problem. This is additionally, if tentatively, supported by the finding that targeting of phobias/fears in treatment was associated with reduced likelihood of exposure use. In this system of care, where youth must meet criteria for “severe emotional/behavioral disturbance” to gain entry (CAMHD, 2012), the common phobias and fears that a youth experiences might be a less-critical focus of treatment than other anxiety-related functional impairment (e.g., school refusal, major trauma, or panic attacks) and might therefore be dealt with using other, less demanding, strategies.

Contrary to the stated hypothesis, none of the random variance between therapists was captured by whether a therapist had a doctorate degree. In this diverse system of care, where therapists receive training from a variety of institutions with diverse training philosophies, a doctorate degree simply might not signify a particular allegiance to evidence-based practice

utilization (Nakamura et al., 2014). Additionally, research correlating Ph.D. degree with increased exposure use has typically been done using surveys of clinicians at large (e.g., indexed by state licensing boards as in Whiteside et al., 2016). Given this research occurred in a state system of care, related organizational characteristics (e.g., provider agency norms or supervisors' preferences for intervention strategies) might influence therapists' decisions above and beyond the effect of education level. That said, there remained a significant amount of variance in the likelihood of exposure use between therapists. Identifying what therapist factors predict exposure use could improve targeting of dissemination and implementations efforts.

Episode level-of-care accounted for considerable variance in exposure use, with children receiving hospital-based care, community-based residential treatment, and intensive in-home therapy the most likely to receive exposure, while disruptive youth in high-security sexual misconduct residential treatment and children receiving functional family therapy received exposure rarely if at all, even though all episodes in the study included some anxiety-related targets. The relatively high rate of exposure use in hospital-based care is somewhat unexpected, given youth who received hospital-based services were highly-impaired and frequently experiencing significant crises (e.g., suicidality, psychosis, or mania) upon onset of services, and episode length was typically quite short (mean months of treatment = 1.50, SD = 1.79). That exposure was never endorsed in the functional family therapy level-of-care is not particularly surprising given that this therapeutic modality typically targets disruptive youth and attempts to address their functional impairment by focusing on family relational functioning (Alexander & Robbins, 2011). Similarly, the sexual misconduct residential treatment centers under study serve highly aggressive male youth who often have engaged in sexually deviant or assaultive behaviors, and therefore anxiety problems might not typically be prioritized in

treatment (CAMHD, 2012). Indeed, this could reflect and extend the more general finding of externalizing targets being associated with less exposure. When sexual offense and/or other serious externalizing problems (e.g., violence toward others and recidivism) occur, anxiety is still sometimes targeted but it is not targeted with exposure. Given the specialized nature of these programs, treatment components are likely highly-prescribed, with a predominant focus on the serious rules/norms violations that are the cause for program entry. As such, staff training in exposure at such programs might not be feasible, cost-effective, or perceived as relevant by providers or program administrators.

As noted, the significant relationship between exposure use and treatment progress persisted despite total episode length and number of practices per month predicting the likelihood of exposure use. These variables seem to best be interpreted as confounds, given that based on basic probability, the likelihood of a therapist randomly endorsing exposure use on the MTPS increases for every additional month in treatment and for every discrete practice the therapist has selected (e.g., if the therapist has selected 32 of 63 practices in a month, the random chance of one of those practices being exposure is about 51%).

Regarding the remaining two predictors of increased exposure utilization, little more than conjecture can be offered. Youth who received exposure therapy in a past episode were more likely to receive it than youth who had never received it, and this effect persisted after removing the first episode for a given youth from analyses. This finding might reflect continuity in treatment planning across episodes, or it could be indicative of a youth/family requesting a specific intervention across different providers. While these hypotheses cannot be addressed with the data available for this study, the latter would comport with the dissemination and implementation efforts that have occurred in this system of care, which have focused not

only on therapist training, but also on initiatives to educate mental health consumers on the benefits of using evidence-based practices and to empower them to seek out such services (Nakamura et al., 2014). Finally, regarding Asian race predicting increased likelihood of exposure use, this is a difficult finding to interpret in the present study given that the multi-racial category in this population is highly comprised of individuals of at least partial Asian descent. Perhaps those youth identifying as fully Asian might undergo acculturation issues that materialize as avoidance or anxiety related to engaging in an unfamiliar socio-cultural system that incorporates a mix of eastern, western, and Pacific island cultural norms, and therapists react to this avoidance by fostering efforts to ‘expose’ such youth to these cultural norms. Follow-up studies might benefit from examining anxiety problems among ‘pure’ Asian youth to determine whether they are differentiated from those of other Hawaii youth.

**Exposure and outcomes.** This study is the first to indicate that extended utilization of exposure (4+ months) in a treatment-as-usual context, when compared to reasonably analogous treatment that included no or few months of exposure, coincided with substantially improved outcomes on a composite measure of anxiety treatment progress. This association occurred despite a variety of other significant factors predicting treatment progress. However, it is crucial to note that this relationship was driven by the interaction between (a) four or more months of exposure use in an episode and (b) treatment delivery in a community-based residential treatment setting. While there was a significant relationship between 4+ months of exposure and anxiety progress when the interaction effect was not included in the analysis (overall Cohen’s  $d = 0.38$ ), the intensive in-home level-of-care was the only other placement in which anxiety progress was highest for 4+ months of exposure use, and this relationship was small and non-significant (See Table 9 for estimated marginal means). These results indicate

that while the significant association between high usage of exposure and treatment progress occurred across the sample, this association was primarily due to treatment episodes occurring in the community-based residential setting.

Results imply that when exposure was used over sufficient time in an appropriately-controlled treatment setting, positive outcomes were observed. Why these two seemingly necessary conditions might apply is not known. One possibility is that they allowed for the reduction of variability in the quality and context of exposure delivery in the system of care at large in order for exposure-specific effects to emerge. Regarding the quality of exposure, as Garland et al. (2010) and Borntrager et al. (2013) have noted, community therapists often deliver evidence-based practices with low fidelity. While no direct measure of fidelity or dosage exists in the current dataset, measuring the number of months in which exposure was used allows for the potential filtering of episodes in which, for example, exposure was attempted for one session and then stopped, or possibly when a “brief/fleeting mention or incomplete execution” of exposure occurred (Borntrager et al., 2013, p. 378).

Regarding the context of exposure use, the finding that high amounts of exposure were related to improved progress primarily in the community residential treatment setting seems to suggest that the residential treatment context balances sufficient structure and duration of exposure with an adequately stabilized population of youth to allow for exposure to have a potential effect on anxiety-related outcomes. A majority of youth receiving services in this system of care experience significant environmental, social, and economic stressors (Chorpita & Daleiden, 2009). Given therapists’ reported practical and logistical difficulties with delivering exposure, such youth might not have the sufficient support structure to ensure that exposure is delivered effectively in home, explaining why exposure, even in high amounts, did not result in

statistically improved outcomes in the intensive in-home level-of-care. Studies have suggested that youth are placed in residential treatment in part to circumvent the treatment barriers inherent in a difficult home environment (Pottick, Warner, & Yoder, 2005). Such might also be the case here: when youth are placed in a setting in which conditions for exposure treatment are supportive (e.g., treatment sessions cannot easily be avoided; between-session exposure homework is undertaken and monitored), the potential of exposure therapy is more fully-realized. These conditional findings offer an interesting analog to efficacy studies, in which various common advantageous conditions (e.g., motivated, treatment-seeking families, relatively low levels of comorbid externalizing problems, and service delivery in carefully-controlled and well-supervised settings) are also likely to contribute to enhanced treatment outcomes.

On the opposite end of the level-of-care spectrum, it is also noteworthy that while exposure was relatively frequently-used in the hospital-based treatment setting, it did not result in improved outcomes. Hospital-based services are typically indicated for youth undergoing significant mental health crises (e.g., suicidal ideation/attempt; acute psychosis, etc.; CAMHD, 2012), and these youth had significantly higher CAFAS mood/emotions scores than those in any other level-of-care. That such youth do not benefit from exposure therapy, even with prolonged months of use, suggests that very high youth functional impairment might inhibit the implementation and/or benefits of exposure therapy. All this said, these findings do not imply that the qualities inherent in 4+ months of community-based residential exposure treatment cannot be replicated in shorter treatment episodes or other levels-of-care. While there is little evidence of any larger scale iatrogenic effects of exposure (worsening of anxiety-related targets), these findings could serve as an important caveat for a therapist considering exposure

use and its cost-effectiveness: if exposure is to be used, it should be used thoughtfully, with a commitment to sufficient dosage, and having planned and problem solved for potential barriers.

Suggestive of a ‘more is better’ approach to treating anxiety, the length of treatment episode, number of practices endorsed per month, and proportion of the episode in which anxiety problems were a focus of treatment were also predictive of improved anxiety treatment progress. A similar positive relationship between number of practices used and progress (a) on disruptive behavior problems, (b) on mood difficulties, and (c) within the community-based residential service setting in this system-of-care has been previously found, suggesting that more and more diverse treatment techniques used generally result in better outcomes (Izmirian, 2016; Love, 2014; Orimoto, 2014; Stumpf, Tolman, Mueller, Chorpita, & Daleiden, 2007), and that these findings seem to hold for anxiety-related outcomes as well. Similarly, Southam-Gerow and colleagues (2010) identified increased treatment and types of treatment in the TAU comparison group as a primary reason for the inability to differentiate the effects of CBT from usual care in their effectiveness study. Putting all of this together, a tentative but plausible conclusion might be that youth in this sort of system of care might benefit from treatment characterized by trying many practices (likely many with low intensity and fidelity by research standards) and persisting until something works.

An interesting exception to the above finding involves the two levels-of-care with the highest mean total anxiety progress scores, functional family therapy (mean = 3.85) and multisystemic therapy (mean = 3.78). Divergent from the overall sample, these levels-of-care also had the lowest mean proportion of months of anxiety endorsed in treatment and both had low rates of exposure use (with exposure never used in functional family therapy and used in 6% of multisystemic therapy cases). While these results might suggest family therapy as a

potent treatment for anxiety problems, they might also be due to other factors given that (a) youth and their families are referred to these levels of care because of disruptive behavior problems rather than anxiety (CAMHD, 2012) and (b) meta-analytic research has indicated that family involvement in youth anxiety treatment has a non-significant impact on anxiety outcomes (Thulin, Svirsky, Serlachius, Andersson, & Öst, 2014). Although only tentative conclusions can be drawn, one possibility is that anxiety problems as conceptualized in the context of family treatment for disruptive youth are qualitatively different from those for more traditionally anxious youth. For example, a therapist might target a youth's initial anxiety or fear related to his parents implementing a strict rewards and consequences plan in the home, and this anxiety might abate quickly and near-completely as the plan is consistently implemented over time. Another possibility is that these two intervention strategies result in improved outcomes across psychological problems due to inherent general factors indicative of high-quality service delivery (e.g., high quality assurance, frequent therapist supervision, and/or intensity of services; Alexander & Robbins, 2011; Denenny & Mueller, 2012). In partial support of this hypothesis, studies of this system of care found that multisystemic therapy resulted in improved progress ratings compared to intensive in-home therapy for disruptive behavior problems, and demonstrated the quickest and highest level of progress on the treatment target of suicide among all levels of care (Denenny & Mueller, 2012; Okado, Wilkie, Jackson, & Mueller, 2015). In light of this, it is noteworthy that the very low mean anxiety progress in community-based residential settings when exposure was not used (mean total anxiety progress = 2.23) jumped to a level resembling those found in these two high-quality treatment settings (mean = 3.50) when exposure was used extensively.

When a therapist focused more on externalizing problems (as measured by proportion of months in treatment in which externalizing problems were targeted), associated total anxiety progress was lower. This variable's relationship with anxiety treatment outcomes is likely similar to its relationship with exposure use: when anxiety problems receive reduced focus compared to other problems, therapists seem to choose different intervention strategies to address them and anxiety outcomes might deteriorate slightly as a result. Specifically, total anxiety progress decreased by an estimated mean of 0.19 points as the proportion of externalizing months increased from 0 to 1. Such findings begin to address prior calls for research on the relationship between treatment outcomes and disproportionate focus on externalizing problems (e.g. Milette-Winfree & Mueller, 2017). Notably, the present findings do not examine treatment progress on other targets, and it might be the case that diminished anxiety progress is balanced by enhanced progress on externalizing problems. At minimum these preliminary results warrant a thorough evaluation of the differential effect of externalizing treatment focus on both internalizing and externalizing targets.

Two variables indicative of greater impairment (number of previous episodes and higher CAFAS Mood/Emotions score at treatment onset) predicted lower total anxiety progress. While these results are somewhat self-evident, they supplement the previously-discussed finding that exposure had no discernible effect in the hospital-based treatment setting, where youth with the highest levels of emotional impairment were placed. These three findings seem to suggest that, at least in this system of care, there might be certain highly impaired youth who are resistant to anxiety treatment in general and exposure treatment in particular. Whether this is due to severity of youth psychopathology, insufficient implementation of exposure, or a combination of these and other factors is unclear. However, the findings seem to suggest that

level of impairment should be taken into consideration when therapists decide to commit to exposure use or not.

As in the analysis of exposure utilization, much of the variance in anxiety progress between provider agencies was captured by the level-of-care predictor, while therapist-level random variance remained unaccounted for by doctorate degree status in this model. These results suggest that other therapist-specific factors contribute to anxiety treatment progress. While beyond the scope of the present study, further examination of (a) other practices therapists use to treat anxiety, (b) a more complete list of therapist demographic and professional characteristics, and (c) therapists' beliefs and attitudes related to anxiety treatment might all be useful in better understanding and accounting for between-therapist variability in anxiety outcomes.

Supplemental analyses indicated that the episode month in which exposure was begun had no effect on outcomes. Notably, Gryczkowski and colleagues (2012) reported faster progress for anxiety problems when exposure was started around the second treatment session as opposed to the seventh treatment session in an episode. Unfortunately, the MTPS might not be a sufficiently sensitive instrument to discern such fine-grained differences in treatment course given it can only examine treatment at the month-to-month level. Further, exposure was endorsed in the first month of treatment in 832 of the 1132 episodes in the sample, resulting in most of the cases under study possibly meeting Gryczkowski's criterion of early endorsement. Additionally, in 278 of those 832 episodes in which exposure was used within the first month of treatment, exposure was only endorsed once, suggesting early but not sustained use for many cases. Such a short and potentially incomplete exposure effort might be somewhat iatrogenic in this system of care, given that at the bivariate level, the mean final progress rating for one

month of exposure use was lower than that of no exposure use for three of four anxiety-related targets and for the total anxiety progress composite score (see Table 10). Given the questionable quality of exposure endorsed in such limited amounts, this might have further confounded these results. These findings indicate that further research is necessary to confirm the enhanced effect of early use of exposure in community mental health.

Finally, the present findings point to a tentative association between exposure and improved treatment progress over time, though significant concerns remain regarding exposure's use and effectiveness in this system of care. Despite the encouraging findings related to the potential effect of exposure therapy reported here, there remain a high number of episodes in which exposure use occurred for short durations with no observable impact on treatment progress. Additionally, there is evidence that when exposure is used, it is implemented with low quality and/or intensity (Borntrager et al., 2013). These results are sobering given the multi-faceted efforts to promote evidence-based practice use that have been ongoing in this system of care since 2008 (Nakamura et al., 2014). That said, it is also noteworthy and encouraging that the subset of episodes that were largely responsible for the enhanced outcomes related to exposure in this study (i.e., high usage in community residential care) all occurred within the context of these dissemination efforts (episode end date range: March 30, 2008 through August 31, 2015). Further, total anxiety progress increased significantly as a function of time at the bivariate level, but this effect was reduced to non-significance when examined in the full model,  $F(1,2711) = 2.91, p = 0.09$ . This suggests that other factors might be accounting for longitudinal variance in anxiety progress. It is plausible that exposure might be one such factor given its increased utilization over time. Taken together, these results provide tentative correlational evidence of the positive impact of EBP

dissemination and implementation efforts in this system of care, though they also indicate that much work remains to foster universal high-quality exposure use among treatment providers.

### **Implications for Dissemination/Implementation and Systems of Care**

Dissemination and implementation (D&I) efforts have likely been helpful in increasing exposure use, but exposure remains an under-used intervention in this system of care, and in a majority of episodes under study it had little or no discernible effect on outcomes. This study suggests that future efforts to promote exposure therapy should focus on enhancing both utilization and quality of use. In this system of care, among the few therapists with known training, the training for exposure typically occurred over the course of a single half-day seminar in which multiple other intervention strategies were also taught (Nakamura et al., 2014). Given the previously-reported difficulties therapists have endorsed in implementing exposure, it is likely that many therapists were unable to master its use with such limited training. Notably, a train-the-trainer model of EBP dissemination has also been recently implemented in this system of care on a small scale (Nakamura et al., 2014). One component of this model is an emphasis on continual contact between therapists and their supervisors, who have been trained in various evidence-based practices and are able to monitor and provide feedback related to intervention delivery. While the impact of this strategy has not yet been assessed, such additional oversight and support could be a lynchpin in improving exposure-associated treatment outcomes. Indeed, the generally higher levels of anxiety progress in the two evidence-based programs, both with structured and ongoing supervision, suggest that such dissemination models are needed. Given that results of this study seem to suggest exposure is worth doing if it is done in sufficient amount and when treatment-interfering factors are minimized, community therapists could possibly benefit from intensive, longer-term initial

trainings and persistent post-training supervision and support to increase the rate of high-quality, high-duration exposure use in the context of common barriers.

An important caveat to the above suggestions related to D&I efforts is that there are likely cases in which a therapist is presented with an anxiety-related problem and makes the thoughtful choice not to engage in exposure therapy, possibly even despite sufficient knowledge and competency regarding the practice. There are at least two reasons this might occur. As previously noted, therapists in this sample are often faced with competing demands, one of which is the common occurrence of comorbid externalizing problems. It is unclear under what circumstances therapists should and should not change strategies to shift focus in treatment from, for example, delinquent behavior to traumatic stress. In such cases, it is plausible that an externalizing problem is so severe that it should take precedence over an anxiety problem in treatment (as suggested earlier with regard to sexual misconduct treatment). A therapist might decide that beginning a course of prolonged exposure would stymy other treatment aimed at reducing dangerous or violent behaviors, and therefore might address trauma fleetingly if at all.

Another plausible situation in which a therapist might thoughtfully choose not to use exposure is when an anxiety problem is perceived as relatively minor or fleeting, but still worthy of clinical attention. Evidence indicating that the target of phobias/fears is associated with reduced use of exposure provides tentative support for this idea. Following the previously-proposed notion that the typical phobias and fears of youth in this system of care might be minor or secondary concerns compared to the main reason for referral, such concerns might be addressed with other, less resource-intensive interventions (relaxation exercises or coping skill development, for example). An examination of Table 10 and Figure 1 suggests that despite the reduced likelihood of therapists using exposure for such cases, the target of phobias/fears

actually appears to achieve somewhat higher progress ratings than other anxiety targets. Tying this finding to (a) efficacy research that indicates therapies including exposure are typically equivalent but only sometimes superior to other interventions for anxiety problems (e.g., Whittal, et al., 2005) and (b) TAU studies that indicate usual care therapists are achieving similar or slightly better results on anxiety problems than their CBT-utilizing counterparts (e.g., Southam-Gerow et al., 2010), it seems likely that exposure is not always the only solution for anxiety-related difficulties. In such cases, D&I experts might benefit less from pushing a potentially unwanted/unneeded intervention upon therapists doing productive work, and instead attempting to learn from the successes of these therapists to further advance the D&I field. All this said, further examination of Table 10 indicates that the 4+ months category of exposure therapy is associated with approximately a half-point higher mean progress rating on the phobias/fears target compared to no exposure use at the bivariate level, suggesting that if phobias/fears are pervasive for a youth, exposure remains a promising treatment option.

Additional system of care implications relate to identifying and addressing barriers to effective exposure use. This study has implicated therapist decisions (e.g., bias toward treating externalizing problems), youth impairment (e.g., CAFAS mood/emotions score), and other practical concerns (e.g., inconsistent session attendance or low engagement) as likely barriers to effective exposure utilization. Systems of care could therefore potentially benefit from enhanced monitoring and assessment of the therapists who use exposure, the youth whom exposure is meant to treat, and the environment in which exposure is attempted. Regarding therapist monitoring, at minimum, in this system of care, the simple alteration of the MTSP to allow therapists to indicate precisely which practice(s) they use for which targets they endorse would improve understanding of the relationship between the problems addressed with

exposure and the progress achieved. In addition to such increased monitoring of exposure usage, a valid measure of exposure quality could be utilized periodically to monitor therapists' service delivery, with low scores resulting in remediation that could include additional training and supervision.

Regarding youth monitoring, recent evidence from this system of care has indicated that youth functional impairment as measured by the total CAFAS score is predictive of whether a youth will be successfully or unsuccessfully discharged from a given level-of-care (Jackson, Hill, Sender, & Mueller, 2016). Based on the findings here that high anxiety-related impairment might limit a youth's positive exposure outcomes, similar examinations of critical levels of impairment above which exposure is contraindicated could advance the field. Notably, the quality of exposure implementation would also need to be taken into account in such an analysis in order for results to be meaningful.

Finally, regarding monitoring of practical/environmental barriers, previous evidence has found that an intervention in which a therapist collaboratively elicited and problem-solved potential barriers to treatment engagement with parents via a semi-structured interview resulted in increased participation in a parent management training program (Nock & Kazdin, 2005). System-of-care administrators might benefit from implementing a similar strategy adapted to address common exposure barriers prior to the onset of treatment in order to effectively address them and maximize treatment engagement and outcomes.

### **Limitations**

The findings in this study should be interpreted with caution. First, reliance on monthly retrospective self-report data from therapists can limit confidence in the results. Although the use of self-report is a practical method of studying treatment-as-usual, it is likely less exact than

observational coding at identifying subtleties in treatment delivery (Borntrager et al., 2013; Garland et al., 2010). This is particularly true of the MTPS, given it is designed to describe treatment across a month rather than at the individual session level. Further, the fact that therapists are the sole source of information for both of the criterion variables and many of the major predictor variables in the study creates the possibility of other treatment, therapist, or system effects that are driving these findings. For example, previously-suggested organizational pressures related to therapists' use of evidence-based practices might unduly influence how the MTPS is completed in some cases. Reverse causality is another concern; it could be that when any given practice (i.e., exposure) results in treatment progress in one month, the therapist will continue to use it for multiple months to continue that progress, resulting in enhanced outcomes for those practices used over multiple months compared to those used once and discarded. Future research could examine sequential applications of exposure and related anxiety treatment progress to determine whether earlier progress predicted later exposure use, and then examine whether other anxiety-related practices exhibit the same patterns of progress. All this said, the psychometric properties of the MTPS have held up reasonably well over the past decade, and given the low endorsement rate of exposure in the sample overall and the relatively normal distribution of total anxiety progress rating scores, the findings presented here do not seem to reflect explicit self-presentation biases on the part of therapists, at least regarding use of exposure in treatment.

A second limitation of this study is its inability to account for high levels of random variance between therapists in either their likelihood of using exposure therapy or the extent of their progress on anxiety-related problems in treatment. This is not surprising given the only therapist-level variable included in the model (doctoral degree status) was unrelated to either

anxiety outcomes or exposure use. Notably, much of the recent work related to therapists' acceptance and utilization of evidence-based practices has focused on proximal variables such as personal beliefs and attitudes about evidence-based practices and perceptions of systemic/organizational factors that either promote or discourage their use, though variance accounted for by these factors has typically been small (e.g., Becker-Haines et al., 2017; Nakamura et al., 2011). Future studies that incorporate these or other factors into statistical models such as those utilized here might be helpful in better discerning therapist-related predictors of exposure use and effectiveness.

Another set of limitations concerns the four-category variable chosen to reflect exposure use in the present study. First, and related to previously-discussed limitations of the MTPS, this variable measures the number of months exposure was endorsed in a treatment episode but does not measure the number of episodes or billable hours of exposure within a month. Considerable variance might exist within each exposure use category due to this insensitivity of the measurement instrument. Further, the division of exposure use into categories indicative of unequal months of exposure use might have influenced findings. For example, the 4+ month category of exposure use was comprised of a range of four to 70 months of exposure treatment across episodes, and this wide range of months was compared to three much narrower categories that consisted of zero, one, or two to three months of exposure endorsement. However, the slope of anxiety progress as predicted by months of exposure within the 4+ month category was non-significant ( $b = .012, t(331) = .85, p = .40$ ;  $b = .032, t(330) = 1.82, p = .07$  after 70-month outlier was removed), and a comparison of mean total anxiety progress between episodes with two and three months of exposure also resulted in no significant differences

(respective means = 2.86 and 3.03,  $t(371) = -1.08$ ,  $p = 0.28$ ). These findings suggest that the four group ordinal categorization did not substantially distort findings.

A final limitation relates to the limited  $n$  sizes within several cells when examining the interaction between level-of-care and months of exposure use and their relationship to total anxiety progress. As noted in Table 9, 15 out of 32 total cells were comprised of fewer than 10 treatment episodes. While this does not violate statistical assumptions (see Method: Data Analytic Strategy: Missing data; Cochran, 1952), it limits the ability to interpret potentially interesting results. For example, the extremely few episodes in which exposure was utilized in both the sexual misconduct residential treatment and crisis/respite home levels of care had mean anxiety progress scores that were lower than those associated with no exposure use in these levels of care, but  $ns$  within these cells were too small to interpret these findings. Conversely, 2-3 months of exposure use appeared related to higher progress ratings in the multisystemic therapy level of care compared to other categories of exposure use in that level of care, but only seven episodes fell within this category, again rendering such findings difficult to interpret. Despite these limitations, the cell indicative of 4+ months of exposure within community-based residential treatment contained 64 episodes in the main analysis, which was a sufficient  $n$  to allow for interpretation of the main findings presented in this study.

### **Future Directions**

The findings presented here suggest several areas of future study in addition to those suggested earlier. First, at least two types of replication studies related to exposure use and treatment outcomes are needed. Specifically, an examination of anxiety-related outcomes and their association with multiple months of exposure use delivered in another community-based setting and/or in a specific residential treatment setting is necessary to verify the findings

presented here. Given literature suggesting gains made in residential treatment are not maintained after services end, such a study should also include a follow-up component (e.g., Frensch & Cameron, 2002). Additionally and perhaps more importantly, an analysis of the underlying constructs that 4+ months of exposure and residential treatment might represent (i.e., high-quality exposure use of sufficient duration while also minimizing pertinent treatment barriers) is necessary to determine whether these are indeed the active ingredients that lead to more positive outcomes. Such an analysis, as well as other recommendations described above, would necessarily require more sensitive measures of treatment session content than the MTPS, as well as valid measures of exposure fidelity and common exposure treatment barriers. The development of such measures would likely be helpful in advancing effectiveness research, dissemination and implementation efforts, and the enhancement of system-of-care administration.

Regarding the development of a measure of exposure fidelity, such work might begin by adapting the distillation and matching framework utilized by Chorpita and colleagues (2004) to discern the common elements across established manualized/modularized exposure interventions (recommended dosage; the use of a fear hierarchy to rate anxiety provoking situations; debriefing after exposure practice exercises, etc.). Once the fundamental aspects of exposure are discerned, further nuances could then be incorporated as research continues to emerge related to enhanced exposure delivery (e.g., by incorporating strategies to increase the violation of expectancy during exposure exercises as in Craske, 2014). Consultation with or behavioral analysis of expert exposure practitioners who operate outside of typical research contexts could then be undertaken to further enhance the development of this measure. Such

therapists might have unique and useful perspectives on how to adapt exposure treatment to the limitations of usual care or other treatment settings.

Regarding the development of a measure of exposure treatment barriers, there are many domains to consider when examining factors that might limit exposure effectiveness. As previously suggested, barriers could be related to the physical environment (e.g., lack of transportation or insufficient session time), engagement (e.g., therapists' reluctance to deliver exposure therapy or parents' ambivalence about ensuring a youth's attendance in session), youth impairment (e.g., highly-pervasive anxiety, comorbid externalizing problems, or other psychopathology such as autism or intellectual disability), or other domains. The development of a measure that assesses for such multi-dimensional treatment barriers could help to identify cases in which extra effort should be undertaken to deliver exposure therapy, as well as those cases in which the likelihood of successful exposure is critically low, thereby suggesting its contraindication.

More broadly, there is a need for far more treatment-as-usual research that is conducted independently of other treatment studies, taking care to avoid common pitfalls of usual-care research (e.g., artificially constraining TAU services in order to accommodate a comparison treatment group as in Southam-Gerow et al., 2010) and resulting in a more thoughtful and unbiased examination of usual care services. Given demands for increased accountability of health services, the opportunity seems ripe for the development, implementation and analysis of data tracking methods in addition to those described above that will likely both improve mental health service and advance treatment-as-usual research. One worthwhile object of such data tracking might be the number and type of practices usual care therapists use in treatment, given this study joins several others in this system of care in suggesting that the application of more

and more varied practices predicts better treatment progress (e.g., Izmirian, 2016). Such findings suggest that the mechanism of improvement and the choices being made by therapists might be quite different from those presumed by efficacy researchers and evidence-based practice experts. Further practice based research can begin to address such issues and bring a better balance to the research-practice bridge.

Another area of future research involves the examination of therapist factors that influence exposure use, given current analyses failed to account for therapist variance in exposure use or anxiety progress. Notably, on a recently-developed questionnaire measuring therapists' beliefs about exposure, high scores (indicative of more negative beliefs) predicted limited endorsement of exposure use in a clinical vignette (Deacon et al., 2013). Such a questionnaire could be incorporated into future studies in this system of care to elucidate therapist factors contributing to exposure use. That said, the questionnaire's exclusive examination of therapists' negative beliefs related to exposure could substantially limit findings, given it does not offer the opportunity for a therapist to explain what he or she might choose to do instead of exposure, and might further imply that it is wrong to use interventions other than exposure for anxiety-related problems. Therefore, future examinations of therapist decisions when confronted with anxiety problems might benefit from taking a more open-ended approach in order to elicit a wider range of responses and to better ascertain the potentially effective practices other than exposure that usual care therapists are employing.

Finally, further consideration of agency-specific effects related to exposure use and anxiety-related treatment progress could advance the field. While the level-of-care predictor variable accounted for significant between-agency variance in both exposure use and anxiety treatment progress, significant random variance between agencies remained in both analyses.

Given that these agencies are organizations of diverse size, operating in diverse locations (e.g., across various islands and in both urban and rural settings), and prioritizing a variety of leadership, training, and service delivery prerogatives (Nakamura et al., 2011), future analyses of such characteristics could be helpful in identifying key organizational traits that impact exposure use and anxiety outcomes specifically, and evidence-based practice delivery and overall treatment outcomes more broadly.

**Table 1.** Characteristics of youth treated for anxiety-related problems ( $n = 3511$ ).

	Total Sample
Mean age (SD) at first episode start	13.7(3.4)
Count (%) of sex	
Male	2169(61.8)
Female	1342(38.2)
Count (%) of race:	
Not Available	294(8.4)
American Indian	18(0.5)
Asian	273(7.8)
Black or African-American	52(1.5)
Native Hawaiian and Pacific Islander	369(10.5)
White or Caucasian	472(13.4)
Other Race or Ethnicity	31(0.9)
Multiracial	1999(57.0)
Count (%) of primary diagnosis at first episode:	
Disruptive behavior	1085(31.0)
Depressive disorder	521(10.9)
Bipolar/Mood disorder	169(6.0)
ADHD	536(14.4)
Thought disorder	70(2.4)
Anxiety/Trauma/OCD	451(14.4)
Adjustment disorder	268(5.2)
Substance use disorder	139(6.1)
Other diagnosis	272(4.9)
Count (%) of any anxiety diagnosis in any episode:	1005(28.6)
Mean (SD) number of treatment episodes	2.85(2.72)

**Note.** Percentages within Total Sample column reflect the percentage of the total sample with a given sex, race, or primary diagnosis. ADHD = Attention Deficit/Hyperactivity Disorder, all subtypes. OCD = Obsessive-Compulsive Disorder.

**Table 2.** Treatment episodes with one or more anxiety-related target ( $k = 6616$ ).

	Total Sample
Mean (SD) length of episode in days	200.0(221.7)
Mean start date of episode	10/16/2010
Mean (SD) number of MTPSs per episode	7.81(7.21)
Mean (SD) of the following treatment characteristics:	
Proportion of episode months in which anxiety targets endorsed	0.69(0.34)
Mean number of practices endorsed per month	16.7(9.9)
CAFAS Mood Subscale Score	17.9(7.1)
Count (%) of episodes in which the following targets were endorsed:	
Anxiety	3636(54.9)
Avoidance	2231(33.7)
Phobias or Fears	3469(52.4)
Traumatic Stress	1480(22.4)
Mean (SD) final progress rating for the following anxiety targets:	
Anxiety	3.0(1.5)
Avoidance	2.5(1.6)
Phobias or Fears	3.1(1.6)
Traumatic Stress	2.7(1.5)
Total Anxiety Progress	2.9(1.5)
Count (%) of episodes in the following levels-of-care:	
Hospital-based services	517(7.8)
Sexual misconduct residential treatment	82(1.2)
Respite/Crisis home	323(4.9)
Community-based residential treatment	972(14.7)
Therapeutic foster care	1028(15.5)
Multisystemic therapy	379(5.7)
Functional family therapy	113(1.7)
Outpatient services	119(1.8)
Intensive in-home therapy	3083(46.6)

**Note.** Percentages within Total Sample column reflect the percentage of the total sample with the characteristic in the corresponding row.

**Table 3.** Therapists' highest degree ( $n = 655$ ).

	Count (%) of Therapists
<u>Total doctorate level therapists:</u>	63 (9.6)
Clinical Doctorate of Philosophy (Ph.D.)	12 (1.8)
Doctorate of Psychology (Psy.D.)	26 (4.0)
Medical Doctor (M.D.)	16 (2.4)
Other doctorate	9 (1.4)
<u>Total non-doctorate level therapists:</u>	588 (89.8)
Counseling/psychology/therapy-related Master's degree	351 (53.6)
Master's degree in social work	159 (24.3)
Other Master's degree	41 (6.3)
Bachelor's degree	29 (4.4)
High school graduate	8 (1.2)
<u>Other/unspecified degree:</u>	4 (0.6)

**Note.** Percentages within Total Sample column reflect the percentage of the total sample with the characteristic in the corresponding row.

**Table 4.** Agencies grouped by level-of-care ( $n = 83$ ).

	Count (%) of agencies
Hospital-Based Services	5 (6.0)
Sexual Misconduct Residential Treatment	3 (3.6)
Respite/Crisis Home	10 (12.0)
Community-Based Residential Treatment	7 (8.4)
Therapeutic Foster Care	24 (28.9)
Multisystemic Therapy	6 (7.2)
Functional Family Therapy	3 (3.6)
Outpatient Services	8 (9.6)
Intensive In-Home	17 (20.5)

*Note.* Percentages within Total Sample column reflect the percentage of the total sample with the characteristic in the corresponding row.

**Table 5.** Significant predictors of exposure use likelihood across treatment episodes ( $k = 5682$ ).

Fixed Effects	<i>B</i>	<i>S.E.</i>	<i>T</i>	<i>Df</i>	<i>Sig.</i>	<i>Odds Ratio</i>	95% C.I. for Odds Ratio	
							<i>Lower</i>	<i>Upper</i>
<i>Intercept</i>	-5.55	0.75	-7.37	23	<0.001	0.004	0.001	0.02
<i>Episode end date</i> <sup>1</sup>	0.03	0.01	2.37	1	0.02	1.03	1.01	1.06
<i>Proportion of months of externalizing treatment in episode</i>	-0.91	0.15	-5.88	1	<0.001	0.40	0.30	0.55
<i>Total episode months</i>	0.09	0.08	11.13	1	<0.001	1.09	1.07	1.11
<i>Mean number of unique practices used per month</i>	0.10	0.01	12.17	1	<0.001	1.10	1.09	1.12
<i>CAFAS Mood/Emotions score at treatment onset</i>	0.02	0.01	2.41	1	0.02	1.02	1.003	1.03
<i>Number of unique anxiety targets identified for treatment</i>	0.26	0.07	3.78	1	<0.001	1.30	1.14	1.49
<i>Proportion of months of anxiety treatment in episode</i>	0.55	0.19	2.87	1	<0.001	1.74	1.19	2.54
<i>Presence of an anxiety disorder diagnosis</i> <sup>2</sup>	0.28	0.11	2.61	1	0.01	1.32	1.07	1.62
<i>Fears/phobias targeted in treatment</i> <sup>2</sup>	-0.31	0.12	-2.67	1	0.01	0.73	0.59	0.92
<i>Level of care = Sexual misconduct residential treatment</i> <sup>3</sup>	-3.15	1.20	-2.62	8	0.01	0.04	0.004	0.45
<i>Level of care = Crisis/Respite home</i> <sup>3</sup>	-2.94	1.14	-2.57	8	0.01	0.05	0.006	0.50
<i>Youth race = Asian</i> <sup>2</sup>	0.45	0.18	2.50	1	0.01	1.56	1.10	2.20
<i>Youth received exposure in a previous episode</i> <sup>2</sup>	0.39	0.13	3.04	1	0.002	1.47	1.15	1.88
Random Effects	<i>estimate</i>	<i>S.E.</i>	<i>Z-score</i>		<i>Sig.</i>		<i>Lower</i>	<i>Upper</i>
<i>Agency</i>	0.80	0.30	2.68		0.01		0.38	1.65
<i>Therapist</i>	2.02	0.24	8.54		<0.001		1.60	2.54

*Note.* <sup>1</sup>Episode end date is measured in six-month-long intervals beginning on July 1, 2006. <sup>2</sup>Dichotomous variable, 1=true/yes, 0=false/no. <sup>3</sup>These two categories of level-of-care are compared to the reference category of hospital-based care (which had the highest proportion of exposure use among all levels-of-care). Likelihood of exposure use did not differ between hospital-based services and any other level-of-care, therefore other levels-of-care are not reported. CAFAS= Child and Adolescent Functional Assessment Scale. Significant predictors in the model are in bold-face. Other non-significant factors in the model not displayed in the table are: therapist doctorate degree,  $t = -.35, p = .75$ ; number of previous treatment episodes,  $t = -.85, p = .39$ , youth sex,  $t = .51, p = .61$  and youth age at episode onset,  $t = .05, p = .47$ .

**Table 6.** Significant predictors of total anxiety progress across treatment episodes, main effects model (k = 5682).

Fixed Effects	<i>B</i>	<i>S.E.</i>	<i>T</i>	<i>Df</i>	<i>Sig.</i>	95% C.I. for Odds	
						<i>Lower</i>	<i>Upper</i>
<i>Intercept</i>	-6.29	0.62	15.59	1	<0.001	1.33	2.41
<i>No exposure use</i> <sup>1</sup>	-0.37	0.09	-3.89	3	<0.001	-0.55	-0.18
<i>One month of exposure</i> <sup>1</sup>	-0.32	0.11	-3.02	3	0.003	-0.53	-0.11
<i>2-3 months of exposure</i> <sup>1</sup>	-0.25	0.11	-2.23	3	0.03	-0.46	-0.03
<i>Total episode months</i>	0.04	0.003	14.23	1	<0.001	0.04	0.05
<i>Mean practices used per month</i>	0.03	0.003	8.68	1	<0.001	0.02	0.04
<i>Proportion of months of externalizing treatment in episode</i>	-0.19	0.06	-3.20	1	0.001	-0.31	-0.07
<i>Proportion of months of anxiety treatment in episode</i>	0.43	0.72	6.03	1	<0.001	0.29	0.58
<i>CAFAS Mood/Emotions score at treatment onset</i>	-0.01	0.003	-3.67	1	<0.001	-0.02	-0.005
<i>Number of previous treatment episodes</i>	-0.03	0.007	-4.83	1	<0.001	-0.05	-0.02
<i>Level of care = Hospital-based</i> <sup>2</sup>	0.46	0.24	1.90	8	0.07	-0.03	0.96
<i>Level of care = Sexual misconduct residential</i> <sup>2</sup>	0.58	0.31	1.88	8	0.07	-0.04	1.20
<i>Level of care = Crisis/respite home</i> <sup>2</sup>	0.74	0.21	3.44	8	0.001	0.30	1.17
<i>Level of care = Therapeutic foster</i> <sup>2</sup>	0.44	0.16	2.69	8	0.01	0.11	0.77
<i>Level of care = MST</i> <sup>3</sup>	1.31	0.21	6.21	8	<0.001	0.88	1.74
<i>Level of care = FFT</i> <sup>2</sup>	1.38	0.30	4.67	8	<0.001	0.79	1.98
<i>Level of care = Intensive in-home</i>	0.52	0.17	3.02	8	0.005	0.17	0.88
<i>Level of care = Other outpatient</i>	1.05	0.25	3.89	8	<0.001	0.55	1.56

Note. <sup>1</sup>These categories of exposure use are compared here to the reference category of 4+ months of exposure use.

<sup>2</sup>These categories of level-of-care are compared to the reference category of community-based residential treatment, which had the lowest mean total anxiety progress among all levels-of-care. CAFAS = Child and Adolescent Functional Assessment Scale. MST = Multisystemic Therapy. FFT = Functional Family Therapy. Other non-significant factors in the model not displayed in the table are: episode end date,  $F(1,2714)=2.34$ ,  $p=.13$ ; therapist doctorate degree,  $F(1,471)=.81$ ,  $p=.37$ ; youth sex,  $F(1,2397)=1.92$ ,  $p=.17$ ; youth anxiety diagnosis,  $F(1,3682)=1.349$ ,  $p=.22$ ; youth race,  $F(7,2394)=1.03$   $p=.41$ ; and youth age,  $F(1,3430)=.06$ ,  $p=.81$ . Random effects in this model are identical to those in Table 8, therefore they are not reported here.

**Table 7.** Mean total anxiety progress for exposure use and level-of-care categories, main effects model.

Exposure Use	Mean Total Anxiety Progress	Std. Error
0 months	3.05	0.09
1 month	3.10	0.11
2-3 months	3.18	0.12
4+ months	3.42	0.13

Level of Care	Mean Total Anxiety Progress	Std. Error
Community-based residential treatment	2.47	0.16
Hospital-based services	2.93	0.21
Sexual misconduct residential treatment	3.05	0.29
Crisis/respite home	3.21	0.18
Intensive in-home	2.99	0.12
Therapeutic foster care	2.91	0.12
Multisystemic therapy	3.78	0.18
Functional family therapy	3.85	0.27
Other outpatient services	3.53	0.22

*Note.* “Mean” values in this table reflect estimated marginal means generated via the main effect model described in Table 6.

**Table 8.** Significant predictors of total anxiety progress, including interaction between exposure and level-of-care, across treatment episodes, (k = 5682).

Fixed Effects	B	S.E.	t	Df	Sig.	95% C.I. for Odds	
						Lower	Upper
Intercept	2.59	0.30	8.63	1	<0.001	2.00	3.18
No exposure x residential treatment <sup>1</sup>	-1.27	0.18	-7.14	16	<0.001	-1.62	-0.92
1 month exposure x residential treatment <sup>1</sup>	-0.97	0.22	-4.49	16	<0.001	-1.39	-0.55
2-3 months exposure x residential treatment <sup>1</sup>	-1.03	0.21	-4.81	16	<0.001	-1.45	-0.61
Total episode months	0.04	0.003	14.46	1	<0.001	0.04	0.05
Mean number of unique practices used per month	0.03	0.003	8.62	1	<0.001	0.02	0.04
Proportion of months of externalizing treatment in episode	-0.19	0.06	-3.11	1	0.002	-0.31	-0.07
Proportion of months of anxiety treatment in episode	0.45	0.07	6.19	1	<0.001	0.31	0.59
CAFAS Mood/Emotions score at treatment onset	-0.01	0.003	-3.60	1	<0.001	-0.01	-0.004
Number of previous treatment episodes	-0.03	0.01	-4.93	1	<0.001	-0.05	-0.02
Random Effects	Estimate	S.E.	Wald Z		Sig.		
Youth	0.14	0.03	4.32		<0.001	0.09	0.22
Clinician	0.33	0.04	9.16		<0.001	0.27	0.41
Agency	0.07	0.03	2.06		0.04	0.03	0.17

Note.<sup>1</sup>These interactions of exposure and level-of-care are compared to the reference interaction of 4+ months of exposure and community-based residential treatment. Other interaction effects are not presented here. <sup>2</sup>Episode end date is measured in six-month intervals beginning on July 1, 2006. CAFAS = Child and Adolescent Functional Assessment Scale. Given the significant interaction between exposure use and level-of-care, individual effects for each of these variables are not interpretable and therefore not reported here. Other non-significant factors in the model not displayed in the table are: episode end date,  $F(1,2711)=2.91$ ,  $p=.09$ , therapist doctorate degree,  $F(1,474)= .90$ ,  $p=.34$ ; youth sex,  $F(1,2414)=2.14$ ,  $p=.14$ ; youth anxiety diagnosis,  $F(1,3658)= 1.33$ ,  $p=.25$ ; youth race,  $F(1,2395)=1.03$ ,  $p=.41$ ; and youth age,  $F(1,2814)=.02$ ,  $p=.88$ .

**Table 9.** Number of episodes and mean total anxiety progress for exposure use by level-of-care interactions in main analysis (k = 5682).

Level of Care	Exposure Use	Number of Episodes	Mean Total Anxiety Progress	Std. Error
Community-based residential treatment	0 months	630	2.23	0.16
	1 month	90	2.53	0.21
	2-3 months	89	2.46	0.22
	4+ months	64	3.50	0.23
Hospital-based services	0 months	282	2.84	0.22
	1 month	84	2.82	0.25
	2-3 months	63	2.79	0.27
	4+ months	15	2.68	0.40
Sexual misconduct residential treatment	0 months	64	2.99	0.30
	1 month	2	2.08	0.96
	2-3 months	0	N/A	N/A
	4+ months	0	N/A	N/A
Crisis/respite home	0 months	249	3.09	0.18
	1 month	2	2.77	0.94
	2-3 months	0	N/A	N/A
	4+ months	0	N/A	N/A
Intensive in-home	0 months	2068	2.88	0.12
	1 month	202	2.88	0.15
	2-3 months	125	2.89	0.17
	4+ months	179	3.04	0.16
Therapeutic foster care	0 months	811	2.80	0.11
	1 month	46	2.48	0.23
	2-3 months	35	3.11	0.25
	4+ months	35	2.64	0.26
Multisystemic therapy	0 months	314	3.65	0.18
	1 month	6	3.95	0.54
	2-3 months	7	4.66	0.56
	4+ months	6	3.26	0.59
Functional family therapy	0 months	108	3.71	0.27
	1 month	0	N/A	N/A
	2-3 months	0	N/A	N/A
	4+ months	0	N/A	N/A
Other outpatient services	0 months	99	3.41	0.22
	1 month	5	4.05	0.62
	2-3 months	0	N/A	N/A
	4+ months	1	1.11	N/A

*Note.* N/A indicates no total anxiety progress score statistics could be calculated because there were no observed values within these cells. “Mean” values in this table reflect estimated marginal means generated via the interaction effect model described in Table 8.

**Table 10.** Mean final progress rating for each anxiety-related target per exposure use category across all treatment episodes ( $k = 6616$ ).

### Anxiety

Exposure Use	Mean Progress Rating
0 Months	2.96
1 Month	3.06
2-3 Months	3.16
4+ Months	3.64

### Phobias or Fears

Exposure Use	Mean Progress Rating
0 Months	3.12
1 Month	2.89
2-3 Months	2.90
4+ Months	3.63

### Traumatic Stress

Exposure Use	Mean Progress Rating
0 Months	2.64
1 Month	2.42
2-3 Months	2.70
4+ Months	3.22

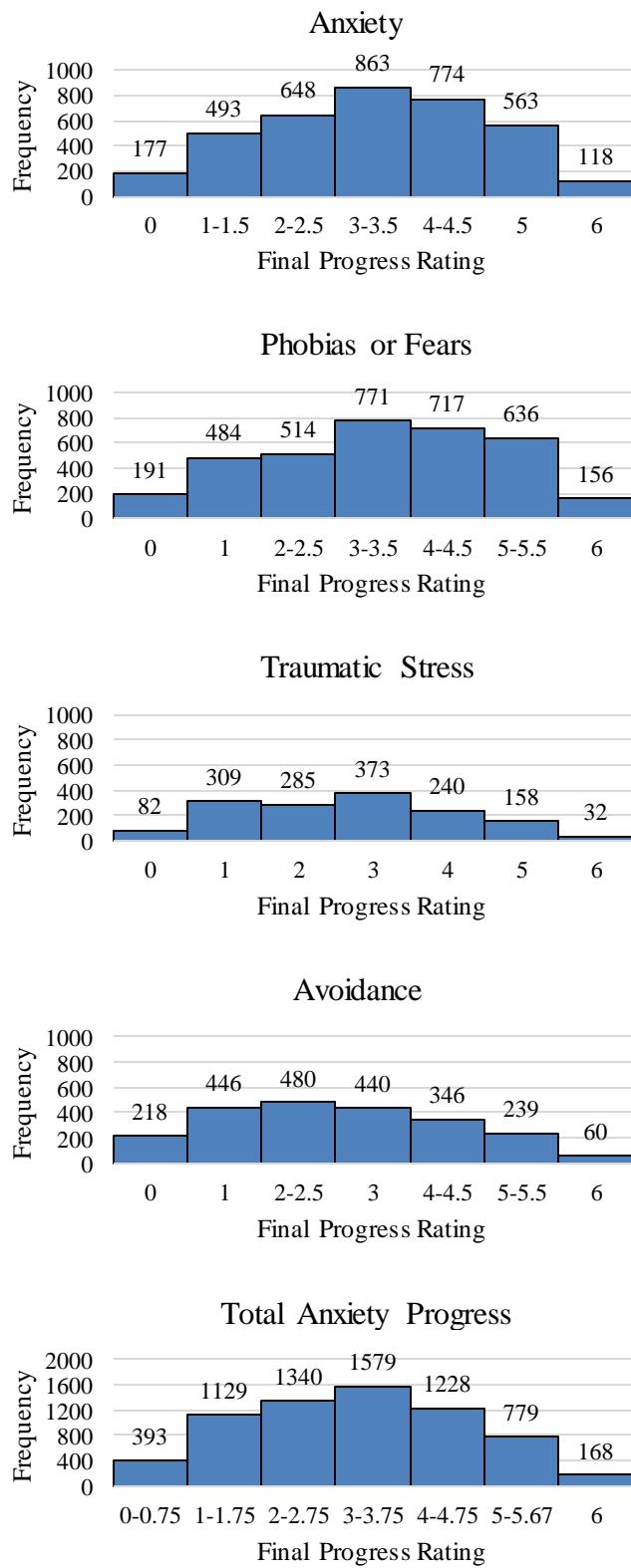
### Avoidance

Exposure Use	Mean Progress Rating
0 Months	2.42
1 Month	2.55
2-3 Months	2.79
4+ Months	3.42

### Total Anxiety Progress

Exposure Use	Mean Progress Rating
0 Months	2.86
1 Month	2.81
2-3 Months	2.93
4+ Months	3.54

**Figure 1.** Final progress ratings across anxiety-related treatment targets and total progress score for all treatment episodes ( $k = 6616$ ).



## Appendix A: Level of Care Descriptors\*

<b>Level of Care</b>	<b>Service Categories within Level of Care (n of episodes in dataset)</b>	<b>Description of Service Category</b>
<b>Hospital-Based Services</b>	Hospital-based Residential Care (450)	Intensive, psychiatric and nursing treatment in a 24/7 locked facility for youth with severe behavioral health conditions requiring immediate symptom stabilization.
	Partial Hospitalization (67)	Time-limited, non-residential day treatment for youth with serious emotional disturbances, intended to keep youth with family/community. Provides transitional services for youth who no longer require intensive supervision.
<b>Sexual Misconduct Residential Treatment</b>	Residential Sex Offender Program (47)	Treatment and small group living in a 24-hour locked care facility for youth with sexually aggressive or deviant offending behavior who pose a high risk to the community.
	High-Security Residential Care (35)	Treatment and 24 hour care in a small, secured group setting for youth with behavioral and emotional problems related to sexual offending, aggression, or deviance who pose a moderate risk to the community.
<b>Respite/Crisis Home</b>	Therapeutic Respite Home (87)	Short term (typically <48 hours) care/supervision in a transitional home setting for youth with emotional/behavioral challenges to prevent disruptions in the regular living arrangement
	Therapeutic Crisis Home (182)	Short-term, 24/7 crisis stabilization services for youth with urgent/emergent mental health needs and without the need for treatment in a psychiatric setting.
<b>Community-Based Residential Treatment</b>	Community Mental Health Shelter (54)	Temporary (24 hour) care by trained professional and paraprofessional staff for youth awaiting treatment facility placement.
	Community-Based Residential Services (972)	24/7 treatment/supervision for youth with behavioral, emotional and/or family problems. Program structure includes onsite education, diagnostic, and treatment services not available in the community.
<b>Therapeutic Foster Care</b>	Therapeutic Group Home (238)	24 hour care by trained professional and paraprofessional staff for youth in need of a structured, small group, community-based setting.

Transitional Family Home (746)	Intensive, short term treatment (6-8 months or 1-3 months for crisis stabilization) for youth with emotional/behavioral challenges intended to reunite youth with family or other longer term family home. May be used to transition youth from more restrictive placements.
Multidimensional Therapeutic Foster Care (44)	Intensive treatment provided in a foster family setting for youth with delinquent and/or disruptive behaviors and emotional challenges. Prepares aftercare resources (parents, relatives, etc.) for youth's return.
<b>Multisystemic Therapy</b>	Multisystemic Therapy (379)  Manualized, time-limited (~5 months), family/community-based treatment for juvenile offenders with serious anti-social behavior, targeting behavior change in youth's natural environment
<b>Functional Family Therapy</b>	Functional Family Therapy (113)  Manualized family-based treatment (3-6 months) in a home or clinic setting consisting of 8-12 one-hour sessions and up to 30 hours of direct services for youth experiencing externalizing behavior disorders, family problems, and often an additional co-morbid internalizing behavioral/emotional problem.
<b>Intensive In-Home</b>	Intensive In-Home (3087)  Youth-and family-centered interventions in the youth's current living environment, targeting identified treatment outcomes with approved evidence based practices.
<b>Outpatient Services</b>	Medication Management (4)  Ongoing assessment of youth's response to medication, symptom management, side effects, adjustment and/or change in medication and in medication dosage provided by a certified psychiatrist or licensed nurse.  Outpatient therapy (115)  Regularly-scheduled outpatient face-to-face individual, group, or family therapeutic services that do not fall within any of the above categories.

\*These summaries are derived from Hawaii Department of Health (2012) and Hawaii Departments of Education and Health (200

## Appendix B: Monthly Treatment and Progress Summary (MTPS) Form (2008)

### SERVICE PROVIDER MONTHLY TREATMENT & PROGRESS SUMMARY Child and Adolescent Mental Health Division (CAMHD)

**Instructions:** Please complete and electronically submit this form to CAMHD by the 5<sup>th</sup> working day of each month (summarizing the time period of 1<sup>st</sup> to the last day of the previous month). The information will be used in service review, monitoring, planning and coordination in accordance with CAMHD policies and standards. Mahalo!

Client Name:	CR #:	DOB:
Month/Year of Services:	Eligibility Status:	Level of Care (one per form):
Axis I Primary Diagnosis:	Axis I Secondary Diagnosis:	Axis I Tertiary Diagnosis:
Axis II Primary Diagnosis:	Axis II Secondary Diagnosis:	

**Service Format (circle all that apply):**

Individual      Group      Parent      Family      Teacher      Other: \_\_\_\_\_

**Service Setting (circle all that apply):**

Home      School      Community      Out of Home      Clinic/Office      Other: \_\_\_\_\_

Service Dates:	
----------------	--

**Targets Addressed This Month (number up to 10):**

Activity Involvement	Community Involvement	Hyperactivity	Positive Peer Interaction	Shyness
Academic Achievement	Contentment, Enjoyment, Happiness	Learning Disorder, Underachievement	Phobia/Fears	Sleep Disturbance
Adaptive Behavior/Living Skills	Depressed Mood	Low Self-Esteem	Positive Thinking/Attitude	Social Skills
Adjustment to Change	Eating, Feeding Problems	Mania	Pregnancy Education/Adjustment	Speech and Language Problems
Aggression	Empathy	Medical Regimen Adherence	Psychosis	Substance Use
Anger	Enuresis, Encopresis	Occupational Functioning/Stress	Runaway	Suicidality
Anxiety	Fire Setting	Oppositional/Non-Compliant Behavior	School Involvement	Traumatic Stress
Assertiveness	Gender Identity Problems	Peer Involvement	School Refusal/Truancy	Treatment Engagement
Attention Problems	Grief	Peer/Sibling Conflict	Self-Control	Willful Misconduct, Delinquency
Avoidance	Health Management	Personal Hygiene	Self-Injurious Behavior	Other: _____
Cognitive-Intellectual Functioning	Housing/Living Situation	Positive Family Functioning	Sexual Misconduct	Other: _____

CR # \_\_\_\_\_ (please repeat the number here)

**Progress Ratings This Month (check appropriate rating for any target numbers endorsed as targets):**

#	Deterioration < 0%	No Significant Changes 0%-10%	Minimal Improvement 11%-30%	Some Improvement 31%-50%	Moderate Improvement 51%-70%	Significant Improvement 71%-90%	Complete Improvement 91%-100%	Date (If Complete)
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								

**Intervention Strategies Used This Month (check all that apply):**

Activity Scheduling	Emotional Processing	Line of Sight Supervision	Personal Safety Skills	Stimulus or Antecedent Control
Assertiveness Training	Exposure	Maintenance or Relapse Prevention	Physical Exercise	Supportive Listening
Attending	Eye Movement, Tapping	Marital Therapy	Play Therapy	Tangible Rewards
Behavioral Contracting	Family Engagement	Medication/ Pharmacotherapy	Problem Solving	Therapist Praise/Rewards
Biofeedback, Neurofeedback	Family Therapy	Mentoring	Psychoeducation, Child	Thought Field Therapy
Care Coordination	Free Association	Milieu Therapy	Psychoeducation, Parent	Time Out
Catharsis	Functional Analysis	Mindfulness	Relationship or Rapport Building	Twelve-Step Program
Cognitive	Goal Setting	Modeling	Relaxation	Other:
Commands	Guided Imagery	Motivational Interviewing	Response Cost	Other:
Communication Skills	Hypnosis	Natural and Logical Consequences	Response Prevention	Other:
Crisis Management	Ignoring/Differential Reinforcement of Other Behavior	Parent Coping	Self-Monitoring	
Cultural Training	Individual Therapy for Caregiver	Parent/Teacher Monitoring	Self-Reward/ Self-Praise	
Discrete Trial Training	Insight Building	Parent/Teacher Praise	Skill Building	
Educational Support	Interpretation	Peer Pairing	Social Skills Training	

CR # \_\_\_\_\_ (please repeat the number here)

Psychiatric Medications (List All)	Total Daily Dose	Dose Schedule	Check if Change	Description of Change
			<input type="checkbox"/>	

Projected Discharge Date: \_\_\_\_\_  Check if Discharged During Current Month

**IF YOUTH WAS DISCHARGED THIS MONTH, PLEASE COMPLETE ITEMS A & B:**

**A. Discharge Living Situation (check one):**

<input type="checkbox"/> Home	<input type="checkbox"/> Foster Home	<input type="checkbox"/> Group Care	<input type="checkbox"/> Residential Treatment
<input type="checkbox"/> Institution/Hospital	<input type="checkbox"/> Jail/Correctional Facility	<input type="checkbox"/> Homeless/Shelter	<input type="checkbox"/> Other: _____

**B. Reason(s) for Discharge (check all that apply):**

<input type="checkbox"/> Success/Goals Met	<input type="checkbox"/> Insufficient Progress	<input type="checkbox"/> Family Relocation
<input type="checkbox"/> Runaway/Elopement	<input type="checkbox"/> Refuse/Withdraw	<input type="checkbox"/> Eligibility Change <input type="checkbox"/> Other: _____

**Outcome Measures:** Optional. If you have any of the following data, please report the most recent scores:

CAFAS (8 Scales): (1-School: _____ ) (2-Home: _____ ) (3-Community: _____ ) (4-Behavior Toward Others: _____ )	Date: _____
(5-Moods/Emotions: _____ ) (6-Self-Harm: _____ ) (7-Substance: _____ ) (8-Thinking: _____ ) (Total: _____ )	Date: _____
CASII/CALOCUS (Total): CASII/CALOCUS (Level of Care):	Date: _____
CBCL (Total Problems T): CBCL (Internalizing T): CBCL (Externalizing T):	Date: _____
YSR (Total Problems T): YSR (Internalizing T): YSR (Externalizing T):	Date: _____
TRF (Total Problems T): TRF (Internalizing T): TRF (Externalizing T):	Date: _____
Arrested During Month? (Y/N): _____	School attendance (% of days): _____

**Comments/Suggestions** (attach additional sheets if necessary):

Provider Agency & Island: _____	Clinician Name and ID#: _____
Provider Supervisor Signature: _____	Clinician Signature: _____
Submitted to CAMHD (date): _____	Care Coordinator: _____

## **Appendix C: Monthly Treatment Progress Summary (2008) Instructions and Codebook**

### **DOH Child and Adolescent Mental Health Division Instructions and Codebook for Provider Monthly Treatment and Progress Summary Effective July 1, 2008**

*The instructions and codebook are to be used in conjunction with the CAMHD Service Provider Monthly Treatment and Progress Summary form. This codebook defines the numerous terms and possible responses necessary to accurately complete the form. For questions regarding these definitions or the use of the Monthly Treatment and Progress Summary, please contact the Clinical Services Office at 733-9349.*

#### **Instructions**

Please complete and electronically submit to CAMHD the Monthly Treatment and Progress Summary by the 5<sup>th</sup> working day of the month. The summary should pertain to the previous month's services. This form should be completed by the clinician who is most familiar with the current status of the youth and family and with the services provided during the month. When necessary, the responding clinician should gather information from other provider team members to assure the most accurate description possible. Once completed by the clinician, the form should be reviewed and signed by a qualified supervisor.

At the top section, please write the Client Name, CR Number, Date of Birth (DOB), Home School, School Complex, Eligibility Status [i.e., Educationally Supportive (IDEA), Support for Emotional and Behavioral Development (SEBD), Mental Health Only], Axis I Primary Diagnosis, Axis I Secondary Diagnosis, Axis I Tertiary Diagnosis, Axis II Primary Diagnosis, Axis II Secondary Diagnosis, Level of Care, and Month/Year of Services. If some Diagnosis fields do not apply to the youth, please leave those fields blank. The Month/Year of Services refers to the month in which the service was provided, not the date the Monthly Provider Summary was completed. For example, if the report is submitted in the first week of June, the Month/Year of Services would read "May," because the services were delivered in May. For youth receiving more than one level of care during the month, please complete a separate form for each.

Under Service Format, please indicate whether services were delivered in the following manner (more than one format can be selected):

- Individual –Working with youth directly
- Group –Working with youth along with other youths receiving services
- Parent –Working directly with parents or caregivers, with youth not present
- Family – Working with parents or caregivers and youth together. Can include other family members
- Teacher – Working with a teacher directly
- Other – Another format not specified above; please write description

Under Service Setting, please note whether services were delivered in the following locations (more than one setting can be selected):

## **CAMHD Provider Monthly Summary Instructions and Codebook**

Home – Working with youth or family members in the youth’s home  
School – Working with youth or professionals in the youth’s educational setting, other than in the context of an IEP/MP meeting  
Community – Working with youth or others in the youth’s community/neighborhood  
Out of Home – Working with the youth or family in a residential facility  
Clinic/Office – Working with the youth or family in a clinical office  
Other – Another setting not specified above; please write description

For Service Dates, please provide the dates for each service provided during that month. If additional space is required, please continue writing dates in the area below the boxes provided. If the service was provided out of home (i.e., continuously), please provide start and end dates for that month’s services and put the word “to” in between in one of the boxes.

### **Targets**

Targets are the strengths and needs being addressed as part of the mental health services for that youth.

When completing the Targets Addressed This Month, please put numbers (1, 2, 3...) rather than checkmarks (X, ✓) to the left of each target addressed. This is so that progress ratings in the next section can be attached to each target. For example, if “Academic Achievement” was targeted, place a “1” in the box to the left of that target on the form. Numbers do not need to reflect any particular order. If more than 10 targets were addressed during the month, please provide only those you feel are the 10 most important. If a target was addressed for which there is no option, please number the “other” box, and write in the target.

The list of treatment targets is intended to provide a summary of strengths and needs that are commonly targeted for change during mental health service provision. These problem areas are NOT diagnostic descriptions and the primary targets for treatment may change over time for a particular youth. For example, when treating a youth with an eating disorder, treatment may target eating/feeding behavior at one point, but target medical regimen adherence or positive family functioning on other occasions. These treatment targets are for progress summary purposes and should NOT replace the detailed specification of goals and objectives as part of the treatment planning process.

### **Definitions of Targets**

1. **Academic Achievement** – Issues related to general level or quality of achievement in an educational or academic context. This commonly includes performance in coursework, and excludes cognitive-intellectual ability/capacity issues (#11) and specific challenges in learning or achievement (#24)
2. **Activity Involvement** – Issues related to general engagement and participation in activities. Only code here those activities that are not better described by the particular activity classes of school involvement (#40), peer involvement (#30), or community involvement (#12).
3. **Adaptive Behavior/Living Skills** – Skills related to independent living, social functioning, financial management, and self-sufficiency that are not better captured under other codes

## **CAMHD Provider Monthly Summary Instructions and Codebook**

- such as personal hygiene (#33), self-management/self-control (#43), social skills (#47), housing/living situation (#22), or occupational functioning/stress (#28).
- 4. **Adjustment to Change** – Issues related to a youth's global response to a life transition or specific challenge (e.g., change of school, living situation, treatment transition or discharge, etc.).
  - 5. **Aggression** – Verbal and/or physical aggression, or threat thereof, that results in intimidation, physical harm, or property destruction.
  - 6. **Anger** – Emotional experience or expression of agitation or destructiveness directed at a particular object or individual. Common physical feelings include accelerated heartbeat, muscle tension, quicker breathing, and feeling hot.
  - 7. **Anxiety** – A general uneasiness that can be characterized by irrational fears, panic, tension, physical symptoms, excessive anxiety, worry, or fear.
  - 8. **Assertiveness** – The skills or effectiveness of clearly communicating one's wishes. For example, the effectiveness with which a child refuses unreasonable requests from others, expresses his/her rights in a non-aggressive manner, and/or negotiates to get what s/he wants in their relationships with others.
  - 9. **Attention Problems** – Described by short attention span, difficulty sustaining attention on a consistent basis, and susceptible to distraction by extraneous stimuli.
  - 10. **Avoidance** – Behaviors aimed at escaping or preventing exposure to a particular situation or stimulus.
  - 11. **Cognitive-Intellectual Functioning** – Issues related to cognitive-intellectual ability/capacity and use of those abilities for positive adaptation to the environment. This includes efforts to increase IQ, memory capacity, or abstract problem-solving ability.
  - 12. **Community Involvement** – Issues related to the amount of involvement in specific community activities within the child's day.
  - 13. **Contentment/Enjoyment/Happiness** – Refers to issues involving the experience and expression of satisfaction, joy, pleasure, and optimism for the future.
  - 14. **Depressed Mood** – Behaviors that can be described as persistent sadness, anxiety, or "empty" mood, feelings of hopelessness, guilt, worthlessness, helplessness, decreased energy, fatigue, etc.
  - 15. **Eating/Feeding Problems** – Knowledge or behaviors involved with the ingestion or consumption of food. May include nutritional awareness, food choice, feeding mechanics (e.g., swallowing, gagging, etc.), and social factors relating with eating situations.
  - 16. **Empathy** – Identifications with and understanding of another person's situation, feelings, and motives.
  - 17. **Enuresis/Encopresis** – Enuresis refers to the repeated pattern of voluntarily or involuntarily passing urine at inappropriate places during the day or at night in bed or clothes. Encopresis refers to a repeated pattern of voluntarily or involuntarily passing feces in inappropriate places.
  - 18. **Fire Setting** – Intentionally igniting fires.
  - 19. **Gender Identity Problems** – Issues related with a youth's self-concept or self-understanding involving gender roles and social behaviors in relation to their biological sex. This does not address self-concept issues involving sexual orientation, which would be coded as "other."
  - 20. **Grief** – Feelings associated with a loss of contact with a significant person in the youth's environment (e.g., parent, guardian, friend, etc.).

## **CAMHD Provider Monthly Summary Instructions and Codebook**

21. **Health Management** – Issues related to the improvement or management of one's health, inclusive of both physical illness and fitness. In addition to dealing with the general development of health-oriented behavior and management of health conditions, this target can also focus on exercise or lack of exercise.
22. **Housing/Living Situation** – Refers to finding or stabilizing an appropriate living situation for a youth.
23. **Hyperactivity** – Can be described by fidgeting, squirming in seat, inability to remain seated, talking excessively, difficulty engaging in leisure activities quietly, etc.
24. **Learning Disorder, Underachievement** – Refers to specific challenges with learning or educational performance that are not better accounted for by cognitive-intellectual functioning (#11) or general academic achievement (#1).
25. **Low Self-Esteem** – An inability to identify or accept his/her positive traits or talents, and accept compliments. Verbalization of self-disparaging remarks and viewing him or herself in a negative manner.
26. **Mania** – An inflated self-perception that can be manifested by loud, overly friendly social style that oversteps social boundaries, and high energy and restlessness with a reduced need for sleep.
27. **Medical Regimen Adherence** – Knowledge, attitudes, and behaviors related to regular implementation procedures prescribed by a health care professional. Commonly include lifestyle behaviors (e.g., exercise, nutrition), taking medication, or self-administration of routine assessments (e.g., taking blood samples in a diabetic regimen).
28. **Occupational Functioning/Stress** – Issues related to career interests, seeking employment, obtaining work permits, job performance, or managing job stress or strain that are not better characterized under other targets (e.g., anxiety).
29. **Oppositional/Non-Compliant Behavior** – Behaviors that can be described as refusal to follow adult requests or demands or established rules and procedures (e.g., classroom rules, school rules, etc.).
30. **Peer Involvement** – A greater involvement in activities with peers. Activities could range from academic tasks to recreational activities while involvement could range from working next to a peer to initiating an activity with a peer.
31. **Peer/Sibling Conflict** – Peer and/or sibling relationships that are characterized by fighting, bullying, defiance, revenge, taunting, incessant teasing and other inappropriate behaviors.
32. **Phobia/Fears** – Irrational dread, fear, and avoidance of an object, situation, or activity.
33. **Personal Hygiene** – Challenges related to self-care and grooming.
34. **Positive Family Functioning** – Issues related with healthy communication, problem-solving, shared pleasurable activities, physical and emotional support, etc. in the context of an interaction among multiple persons in a family relation, broadly defined.
35. **Positive Peer Interaction** – Social interaction and communication with peers that are prosocial and appropriate. This differs from peer involvement (#30) in that it focuses on interactional behavior, styles, and intentions, whereas peer involvement targets actual engagement in activities with peers regardless of interactional processes.
36. **Positive Thinking/Attitude** – This target involves clear, healthy, or optimistic thinking, and involves the absence of distortions or cognitive bias that might lead to maladaptive behavior.
37. **Pregnancy Education/Adjustment** – Issues related to helping a pregnant youth prepare and adjust to parenthood.

## **CAMHD Provider Monthly Summary Instructions and Codebook**

38. **Psychosis** – Issues related to atypical thought content (delusions of grandeur, persecution, reference, influence, control, somatic sensations), and/or auditory or visual hallucinations.
39. **Runaway** – Running away from home or current residential placement for a day or more.
40. **School Involvement** – Detailed description of amount of involvement in specific school activities within the child's scheduled school day.
41. **School Refusal/Truancy** – Reluctance or refusal to attend school without adult permission for the absence. May be associated with school phobia or fear manifested by frequent somatic complaints associated with attending school or in anticipation of school attendance, or willful avoidance of school in the interest of pursuing other activities.
42. **Self-Injurious Behavior** – Acts of harm, violence, or aggression directed at oneself.
43. **Self-Management/Self-Control** – Issues related to management, regulation, and monitoring of one's own behavior.
44. **Sexual Misconduct** – Issues related with sexual conduct that is defined as inappropriate by the youth's social environment or that includes intrusion upon or violation of the rights of others.
45. **Shyness** – Social isolation and/or excessive involvement in isolated activities. Extremely limited or no close friendships outside the immediate family members. Excessive shrinking or avoidance of contact with unfamiliar people.
46. **Sleep Disturbance** – Difficulty getting to or maintaining sleep.
47. **Social Skills** – Skills for managing interpersonal interactions successfully. Can include body language, verbal tone, assertiveness, and listening skills, among other areas.
48. **Speech and Language Problems** – Expressive and/or receptive language abilities substantially below expected levels as measured by standardized tests.
49. **Substance Abuse/Substance Use** – Issues related to the use or misuse of a common, prescribed, or illicit substances for altering mental or emotional experience or functioning.
50. **Suicidality** – Issues related to recurrent thoughts, gestures, or attempts to end one's life.
51. **Traumatic Stress** – Issues related to the experience or witnessing of life events involving actual or threatened death or serious injury to which the youth responded with intense fear, helplessness, or horror.
52. **Treatment Engagement** – The degree to which a family or youth is interested and optimistic about an intervention or plan, such that they act willfully to participate and work toward the success of the plan.
53. **Willful Misconduct/Delinquency** – Persistent failure to comply with rules or expectations in the home, school, or community. Excessive fighting, intimidation of others, cruelty or violence toward people or animals, and/or destruction of property.

### **Progress Ratings**

Please provide a single progress rating for each target selected above (up to 10). Numbers 1 through 10 in the left column refer to the targets selected in the Targets Addressed This Month section above. For example, had you selected "Academic Achievement" above, there would be a "1" in the box to the left of that target on that section. Then, the first row of the Progress Ratings, labeled "1," is where you would note the progress ratings associated with academic achievement.

Please place a mark (X, ✓ ) in the column corresponding to your subjective rating of progress associated with this target. When possible, your overall subjective ratings should be informed by

## CAMHD Provider Monthly Summary Instructions and Codebook

a review of objective measures such as any available and relevant questionnaires or behavioral observation data. For example, if a youth receives a T-score of 70 during an intake assessment and the treatment goal is to reduce this score to 60, then if a youth receives a T-score of 65 during a monthly assessment, than 50% progress may be reported [i.e.,  $70 - 65 / 70 - 60 = 5 / 10 = 50\%$ ]. Or if a youth gets into 10 fights per week initially and the treatment goal is to reduce fighting to 0 fights per week, then during a month in which the youth was fighting only 3 times per week, that would reflect 70% progress [i.e.,  $10 - 3 / 10 - 0 = 7 / 10 = 70\%$ ].

**Anchors refer to changes from baseline or beginning of services for that target.** Thus, a youth who had reached 90% of an initial goal would receive a rating of “significant improvement.” If that progress were to decline to 70% in the following month, the youth would then get a rating of “moderate improvement” for that target for that month (not “deterioration”). “Deterioration” refers to when a target gets worse from the time it was initially addressed. If there is a break in addressing a specific target (e.g., a target is addressed, then not addressed for a month, then addressed again in a later month), use the initial baseline from the first time as the point of comparison. Only when there is a break in the complete episode of care (i.e., discharge followed by later admission), should that reset the baseline for a given target.

If a goal is reached (improvement is complete), the provider may choose to note the date in the rightmost column. This implies that the target is no longer being addressed. Targets that are not complete should be rated again on the following month’s summary form.

### Intervention Strategies

Please place a mark (X, ✓) to the left of any intervention strategies used during the past month. There is no limit to how many may be checked. If strategies were employed that are not in the following list of definitions, please mark the “other” box and write in the strategy used.

### Definitions of Intervention Strategies

1. **Activity Scheduling** – The assignment or request that a child participate in specific activities outside of therapy time, with the goal of promoting or maintaining involvement in satisfying and enriching experiences.
2. **Assertiveness Training** – Exercises or techniques designed to promote the child’s ability to be assertive with others, usually involving rehearsal of assertive interactions.
3. **Attending** – Exercises involving the youth and caregiver playing together in a specific manner to facilitate their improved verbal communication and nonverbal interaction. Can involve the caregiver’s imitation and participation in the youth’s activity, as well as parent-directed play (previously called “Directed Play”).
4. **Behavioral Contracting** – Development of a formal agreement specifying rules, consequences, and a commitment by the youth and relevant others to honor the content of the agreement.
5. **Biofeedback/ Neurofeedback** – Strategies to provide information about physiological activity that is typically below the threshold of perception, often involving the use of specialized equipment.

## CAMHD Provider Monthly Summary Instructions and Codebook

6. **Care Coordination** – Coordinating among the youth’s service providers to ensure effective communication, receipt of appropriate services, adequate housing, etc.
7. **Catharsis** – Strategies designed to bring about the release of intense emotions, with the intent to develop mastery of affect and conflict.
8. **Cognitive** – Any techniques designed to alter interpretation of events through examination of the child’s reported thoughts, typically through the generation and rehearsal of alternative counter-statements. This can sometimes be accompanied by exercises designed to comparatively test the validity of the original thoughts and the alternative thoughts through the gathering or review of relevant information.
9. **Commands** – Training for caregivers in how to give directions and commands in such a manner as to increase the likelihood of child compliance.
10. **Communication Skills** – Training for youth or caregivers in how to communicate more effectively with others to increase consistency and minimize stress. Can include a variety of specific communication strategies (e.g., active listening, “I” statements).
11. **Crisis Management** – Immediate problem solving approaches to handle urgent or dangerous events. This might involve defusing an escalating pattern of behavior and emotions either in person or by telephone, and is typically accompanied by debriefing and follow-up planning.
12. **Cultural Training** – Education or interaction with culturally important values, rituals, or sites with no specific practices identified.
13. **Discrete Trial Training** – A method of teaching involving breaking a task into many small steps and rehearsing these steps repeatedly with prompts and a high rate of reinforcement.
14. **Educational Support** – Exercises designed to assist the child with specific academic problems, such as homework or study skills. This includes tutoring.
15. **Emotional Processing** – A program based on an information processing model of emotion that requires activation of emotional memories in conjunction with new and incompatible information about those memories.
16. **Exposure** – Techniques or exercises that involve direct or imagined experience with a target stimulus, whether performed gradually or suddenly, and with or without the therapist’s elaboration or intensification of the meaning of the stimulus.
17. **Eye Movement/ Tapping** – A method in which the youth is guided through a procedure to access and resolve troubling experiences and emotions, while being exposed to a therapeutic visual or tactile stimulus designed to facilitate bilateral brain activity.
18. **Family Engagement** – The use of skills and strategies to facilitate family or child’s positive interest in participation in an intervention.
19. **Family Therapy** – A set of approaches designed to shift patterns of relationships and interactions within a family, typically involving interaction and exercises with the youth, the caregivers, and sometimes siblings.
20. **Free Association** – Technique for probing the unconscious in which a person recites a running commentary of thoughts and feelings as they occur.
21. **Functional Analysis** – Arrangement of antecedents and consequences based on a functional understanding of a youth’s behavior. This goes beyond straightforward application of other behavioral techniques.
22. **Goal Setting** – Setting specific goals and developing commitment from youth or family to attempt to achieve those goals (e.g., academic, career, etc.).

## **CAMHD Provider Monthly Summary Instructions and Codebook**

23. **Guided Imagery** – Visualization or guided imaginal techniques for the purpose of mental rehearsal of successful performance. Guided imagery for the purpose of physical relaxation (e.g., picturing calm scenery) is not coded here, but rather coded under relaxation (#50).
24. **Hypnosis** – The induction of a trance-like mental state achieved through suggestion.
25. **Ignoring/Differential Reinforcement of Other Behavior** – The training of parents or others involved in the social ecology of the child to selectively ignore mild target behaviors and selectively attend to alternative behaviors.
26. **Individual Therapy for Caregiver** – Any therapy designed directly to target individual (non-dyadic) psychopathology in one or more of the youth's caregivers. If the therapy for caregivers involves marital therapy (#31) or communication skills (#10) those are not coded here, unless there are additional services for individual caregiver psychopathology, in which case all that apply should be coded.
27. **Insight Building** – Activity designed to help a youth achieve greater self-understanding.
28. **Interpretation** – Reflective discussion or listening exercises with the child designed to yield therapeutic interpretations. This does not involve targeting specific thoughts and their alternatives, which would be coded as cognitive/coping.
29. **Line of Sight Supervision** – Direct observation of a youth for the purpose of assuring safe and appropriate behavior.
30. **Maintenance/Relapse Prevention** – Exercises and training designed to consolidate skills already developed and to anticipate future challenges, with the overall goal to minimize the chance that gains will be lost in the future
31. **Marital Therapy** – Techniques used to improve the quality of the relationship between caregivers.
32. **Medication/ Pharmacotherapy** – Any use of psychotropic medication to manage emotional, behavioral, or psychiatric symptoms.
33. **Mentoring** – Pairing with a more senior and experienced individual who serves as a positive role model for the identified youth.
34. **Milieu Therapy** – A therapeutic approach in residential settings that involves making the environment itself part of the therapeutic program. Often involves a system of privileges and restrictions such as a token or point system.
35. **Mindfulness** – Exercises designed to facilitate present-focused, non-evaluative observation of experiences as they occur, with a strong emphasis of being “in the moment.” This can involve the youth’s conscious observation of feelings, thoughts, or situations.
36. **Modeling** – Demonstration of a desired behavior by a therapist, confederates, peers, or other actors to promote the imitation and subsequent performance of that behavior by the identified youth.
37. **Motivational Interviewing** – Exercises designed to increase readiness to participate in additional therapeutic activity or programs. These can involve cost-benefit analysis, persuasion, or a variety of other approaches.
38. **Natural and Logical Consequences** – Training for parents or teachers in (a) allowing youth to experience the negative consequences of poor decisions or unwanted behaviors, or (b) delivering consequences in a manner that is appropriate for the behavior performed by the youth.

## **CAMHD Provider Monthly Summary Instructions and Codebook**

39. **Parent Coping** – Exercises or strategies designed to enhance caregivers' ability to deal with stressful situations, inclusive of formal interventions targeting one or more caregiver.
40. **Parent/Teacher Monitoring** – The repeated measurement of some target index by the parent, teacher, or other adult involved in the child's social ecology.
41. **Parent/Teacher Praise** – The training of parents, teachers, or other adults involved in the social ecology of the child in the administration of social rewards to promote desired behaviors. This can involve praise, encouragement, affection, or physical proximity.
42. **Peer Pairing** – Pairing with another youth of same or similar age to allow for reciprocal learning or skills practice.
43. **Personal Safety Skills** – Training for the youth in how to maintain personal safety of one's physical self. This can include education about attending to one's sense of danger, body ownership issues (e.g., "good touch-bad touch"), risks involved with keeping secrets, how to ask for help when feeling unsafe, and identification of other high-risk situations for abuse.
44. **Physical Exercise** – The engagement of the youth in energetic physical movements to promote strength or endurance or both. Examples can include running, swimming, weight-lifting, karate, soccer, etc. Note that when the focus of the physical exercise is also to produce talents or competence and not just physical activity and conditioning, the code for "Skill Building" (#55) can also be applied.
45. **Play Therapy** – The use of play as a primary strategy in therapeutic activities. This may include the use of play as a strategy for clinical interpretation. Different from Attending (#3), which involves a specific focus on modifying parent-child communication. This is also different from play designed specifically to build relationship quality (#49).
46. **Problem Solving** – Techniques, discussions, or activities designed to bring about solutions to targeted problems, usually with the intention of imparting a skill for how to approach and solve future problems in a similar manner.
47. **Psychoeducational-Child** – The formal review of information with the child about the development of a problem and its relation to a proposed intervention.
48. **Psychoeducational-Parent** – The formal review of information with the caregiver(s) about the development of the child's problem and its relation to a proposed intervention. This often involves an emphasis on the caregiver's role in either or both.
49. **Relationship/Rapport Building** – Strategies in which the immediate aim is to increase the quality of the relationship between the youth and the therapist. Can include play, talking, games, or other activities.
50. **Relaxation** – Techniques or exercises designed to induce physiological calming, including muscle relaxation, breathing exercises, meditation, and similar activities. Guided imagery exclusively for the purpose of physical relaxation is also coded here.
51. **Response Cost** – Training parents or teachers how to use a point or token system in which negative behaviors result in the loss of points or tokens for the youth.
52. **Response Prevention** – Explicit prevention of a maladaptive behavior that typically occurs habitually or in response to emotional or physical discomfort.
53. **Self-Monitoring** – The repeated measurement of some target index by the child.
54. **Self-Reward/Self-Praise** – Techniques designed to encourage the youth to self-administer positive consequences contingent on performance of target behaviors.

## **CAMHD Provider Monthly Summary Instructions and Codebook**

55. **Skill Building** – The practice or assignment to practice or participate in activities with the intention of building and promoting talents and competencies.
56. **Social Skills Training** – Providing information and feedback to improve interpersonal verbal and non-verbal functioning, which may include direct rehearsals of the skills. If this is paired with peer pairing (#42), that should be coded as well.
57. **Stimulus/Antecedent Control** – Strategies to identify specific triggers for problem behaviors and to alter or eliminate those triggers in order to reduce or eliminate the behavior.
58. **Supportive Listening** – Reflective discussion with the child designed to demonstrate warmth, empathy, and positive regard, without suggesting solutions or alternative interpretations.
59. **Tangible Rewards** – The training of parents or others involved in the social ecology of the child in the administration of tangible rewards to promote desired behaviors. This can involve tokens, charts, or record keeping, in addition to first-order reinforcers.
60. **Therapist Praise/Rewards** – The administration of tangible (i.e., rewards) or social (e.g., praise) reinforcers by the therapist.
61. **Thought Field Therapy** – Techniques involving the tapping of various parts of the body in particular sequences or "algorithms" in order to correct unbalanced energies, known as thought fields.
62. **Time Out** – The training of or the direct use of a technique involving removing the youth from all reinforcement for a specified period of time following the performance of an identified, unwanted behavior.
63. **Twelve-Step Program** – Any programs that involve the twelve-step model for gaining control over problem behavior, most typically in the context of alcohol and substance use, but can be used to target other behaviors as well.

For medication interventions please list each psychiatric medication the youth is taking (e.g., Adderall ER), describe the prescribed total daily dose for each medication (e.g., 30 mg.), identify the prescribed dose schedule (e.g., 2x/week, 3x/day, 15-10-5/day, etc.), place a check mark in the appropriate box if there was a change in the medication or regimen during the reporting month, and provide a description of the change on the line to the right (e.g., new medication, daily dosage change from 10 to 30 mg, change in dose schedule from 5-5/day to 10-10-10/day, etc.).

For Projected End Date, please indicate the expected date for termination of the services for which this form was completed.

For Discharged During Month please indicate if the youth was discharged from your program during the reporting month. If the youth was discharged, please indicate the Living Situation that the youth was entering upon discharge and the Reason for Discharge. For Projected End Date, please indicate the expected date for termination of the services for which this form was completed.

## CAMHD Provider Monthly Summary Instructions and Codebook

### Living Situation upon Discharge

Please place a mark (X, ✓ ) to the left of statement that best describes the type of living environment in which the youth was expected to reside at the time of discharge. Please select only one option. If the youth's living situation at discharge is not well described by the following list of definitions, please mark the "other" box and write in the youth's living situation.

1. **Home** - Youth to live in a house, apartment, trailer, hotel, dorm, barrack, and/or single room occupancy. This excludes situations better characterized as foster homes.
2. **Foster Home**-Youth to reside in a foster home or therapeutic foster home. A foster home is a home that is licensed to provide foster care to children, adolescents, and/or adults.
3. **Group Care**-Youth to reside in a group care facility. This level of care may include a group home, therapeutic group home, or board and care. This excludes community-based residential and hospital-based residential care
4. **Residential Treatment**- Youth to reside in a community-based residential treatment, rehabilitation center, or other residential treatment that is not better characterized as a group home or institution/hospital facility. An organization, not licensed as a psychiatric hospital, whose primary purpose is the provision of individually planned programs of mental health treatment services in conjunction with residential care for children and youth. The services are provided in facilities that are certified by state or federal agencies or through a national accrediting agency.
5. **Institutional/Hospital**-Youth resides in an institutional care or hospital-based residential care facility with care provided on a 24 hour, 7 day a week basis. This level of care may include a skilled nursing/intermediate care facility, nursing homes, institutes of mental disease, inpatient psychiatric hospital, psychiatric health facility, Veterans Affairs hospital, or state hospital.
6. **Jail/Correctional Facility**-Youth resides in a Jail and/or Correctional facility with care provided on a 24 hour, 7 day a week basis. This level of care may include a jail, correctional facility, detention centers, prison, youth authority facility, juvenile hall, boot camp, or boys ranch.
7. **Homeless/Shelter**- A youth is considered homeless if s/he lacks a fixed, regular, and adequate nighttime residence or his/her primary nighttime residency is a supervised publicly or privately operated shelter designed to provide temporary living accommodations, an institution that provides a temporary residence for individuals intended to be institutionalized, or a public or private place not designed for, or ordinarily used as, a regular sleeping accommodation for human beings (e.g., on the street). Youth who were discharged due to extended runaway or elopement episode should be recorded in this category.

### Reason(s) for Discharge

Please place a mark (X, ✓ ) to the left of each statement that describes the reasons for discharging youth from the program during the reporting month. There is no limit to how many may be checked. If the discharge reason is not well characterized by the following list of definitions, please mark the "other" box and write in the reason.

## **CAMHD Provider Monthly Summary Instructions and Codebook**

1. **Success/Goals Met**-Youth was clinically discharged due to sufficient treatment progress (e.g., symptoms reduced, functioning improved), treatment goals were met, youth was evaluated and services were determined unnecessary, services were completed, or youth was moving to a less restrictive and intensive level of care.
2. **Insufficient Progress**-Youth was discharged from service without showing sufficient treatment progress to be judged as clinically successful (i.e., little symptom reduction, improvement in functioning, or goal attainment was achieved).
3. **Family Relocation**-Youth was discharged because the youth and family moved out of state or out of the service area.
4. **Runaway/Elopement**-Youth was discharged in association with an extended period of unavailability for treatment because the youth had runaway from home or eloped from the program.
5. **Refuse/Withdraw**-Youth was discharged due to parental refusal, non-participation in treatment, lack of consent, or other indication that client withdrew from services against professional advice.
6. **Eligibility Change**-Youth was discharged in association with a change in eligibility for services, such as a termination of a court order or commitment, aging out of child and adolescent services, loss of Medicaid insurance, etc.

Please provide any other Comments or Suggestions for the youth's care coordinator you think would be important.

If scores are available on any of the Outcome Measures recommended in the Interagency Practice Guidelines, please provide them along with dates in the optional section provided. Include whether or not youth was arrested during the past month, and an estimate of the percentage of school days that were attended. If school is attended in a residential setting, this counts toward the percentage of days attended.

For the CAFAS, the numbered spaces refer to the following scales: 1-School, 2-Home, 3-Community, 4-Behavior Towards Others, 5-Moods/Emotions, 6-Self-Harm, 7-Substance, 8-Thinking. "Total" refers to the sum of these 8 scales.

Please write the name of the agency including location (e.g., Maui, Big Island) and name of the clinicians (along with CAMHMIS ID#) and provider, along with appropriate signatures of the clinician completing the form and the qualified supervisor. Note the date that the form was submitted electronically to CAMHD and provide name of Care Coordinator.

## Appendix D: Child and Adolescent Functional Assessment Scale

CAFAS™ PROFILE : YOUTH'S FUNCTIONING																				
Youth's Name _____		ID# _____		Rater _____		Date _____ / _____ / _____		Site _____												
Level of Impairment	Role Performance: School/Work	Role Performance: Home	Role Performance: Community	Behavior Toward Others	Moods/ Self-Harm: Moods/ Emotions	Moods/ Self-Harm: Self-Harmful Behavior	Substance Use	Thinking												
<b>SEVERE</b> 30	1 2 3 4 5 6 7 8 9 10 11	41 42 43 44 45 46 47 48 49 50	66 67 68 69 70 71 72	88 90 91 92	116 117 118 119 120	142 143 144 145	154 155 156 157 158 159 160 161 162 163 164													
	<b>MODERATE</b> 20	12 13 14 15 16 17 18 19 20 21	51 52 53 54 55 56	73 74 75 76 77 78 79	93 94 95 96 97 98 99 100 101 102	121 122 123 124 125 126 127	146 147 148	165 166 167 168 169 170 171	187 188 189 190 191 192	○										
		<b>MILD</b> 10	22 23 24 25 26 27	57 58 59 60 61	80 81 82 83	103 104 105 106 107 108 109 110	128 129 130 131 132 133 134 135	149 150	172 173 174 175	193 194 195 196 197	○									
			<b>MINIMAL/NO</b> 0	28 29 30 31 32 33 34 35 36 37 38 39	62 63 64	84 85 86	111 112 113 114	136 137 138 139 140	151 152	176 177 178 179 180	198 199	○								
				<b>COULD NOT SCORE</b>	40	○	65	○	87	○	115	○	141	○	153	○	181	○	200	○

For each scale: (1) mark the item number(s) which corresponds to those marked on the CAFAS™ form, (2) fill in the circle indicating severity level, (3) connect the circles.

\* CAFAS® Self/Training Manual. ©Copyright 1990, 1994, 1996 by Kay Hodges, Ph.D. (3144 Old Burdett Road, Ann Arbor, MI 48105) [313] 769-9725; FAX [313] 769-1426. No part of this work may be altered, copied, or distributed without the written permission of the author. Unauthorized copying of this material is against the law and subject to criminal penalties.

9/96

2

## **Appendix E: Child and Adolescent Mental Health Division Notice of Privacy Practices**

Child and Adolescent Mental Health Division

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### **Notice of Privacy Practices Child and Adolescent Mental Health Division ("CAMHD")**

**THIS NOTICE DESCRIBES HOW MEDICAL INFORMATION ABOUT  
YOUR CHILD MAY BE USED AND DISCLOSED. IT ALSO EXPLAINS  
HOW YOU CAN GET ACCESS TO THIS INFORMATION. PLEASE  
REVIEW IT CAREFULLY.**

#### **Understanding Your Child's Protected Health Information:**

CAMHD staff and doctors take notes each time your child visits them. They write down what they think is your child's condition and how they plan to care for them. Your child's health record has information that can identify him or her. This kind of information is known as "Protected Health Information" (PHI). Your child's name and Social Security number are types of PHI.

If you know what is in the health record you can better protect your child's Protected Health Information. You can also ask how PHI will be used. You can decide if PHI should be disclosed. You can make sure that the health record is accurate.

#### **Our Duties:**

CAMHD must:

- Protect the privacy of PHI.
- Tell you about our legal duties.
- Tell you about our privacy practices. You have the right to know how CAMHD uses and discloses PHI.
- Abide by this notice.
- Give you a copy of this notice, even if you agreed to get it electronically.
- Notify you when your child's information has been breached.

CAMHD can change its privacy practices at any time. We will mail you a copy of any new notice within sixty days.

CAMHD will ask for your authorization before disclosing PHI. CAMHD can disclose PHI without your permission. However, any release of PHI will follow the law, as explained in this notice.

Effective September 23, 2013

## **Your Child's Health Information Rights:**

CAMHD owns your child's health record. However, the information in the record belongs to your child. On behalf of your child, you have the right to:

- View or get paper copies of PHI upon written request.
- Decide how we send PHI to you. For example, CAMHD usually sends information by mail. You may ask to get PHI by other means, such as fax. You may also ask us to send PHI to another address.
- Ask to limit the use and disclosure of PHI. CAMHD is not required by law to agree to every request.
- Ask for corrections to your child's health record.
- Get an accounting of PHI disclosures.
- Change your mind about allowing use or disclosures of PHI. This does not apply to disclosures that have already happened.
- Ask for confidential communications. CAMHD must accommodate reasonable requests.
- Restrict disclosure of your child's health information to a health plan for services you have paid for out of pocket and in full.

## **Information that does not identify your child is used in:**

- Medical and mental health research.
- Planning and improving services.
- Improving health care.

## **Examples of Disclosures for Treatment, Payment, and Health Care Operations:**

CAMHD sometimes has to share PHI with other agencies to provide services. CAMHD will only share the minimum necessary PHI with them. We will also require them to protect the PHI they receive.

**Treatment.** For example: A CAMHD professional notes your child's and the treatment team's expectations in the health record. A doctor logs the actions taken and his or her observations.

If it is necessary for the continued care and treatment of your child, CAMHD may release your child's treatment summary for services received during the previous five (5) year period to another health care provider without your permission. However, the health care provider who wants this information must first make a reasonable effort to obtain your authorization.

Effective September 23, 2013

**Payment.** For example: A provider sends a bill to CAMHD. The bill or accompanying materials may contain PHI, which requires your authorization.

Before we send a bill with your information or your child's information to a third party payor, you have the option to authorize us to release this PHI or pay for the services yourself. If you do not pay, CAMHD may send the bill along with any necessary PHI without your authorization.

**Regular Health Operations.** For example: CAMHD staff uses PHI to evaluate treatment outcomes. This helps CAMHD to improve our services.

### **With your Authorization:**

We will ask for your written permission to use and/or disclose your child's information for the following purposes:

- Marketing;
- What may constitute the sale of your PHI;
- Psychotherapy notes (if we maintain psychotherapy notes) and;
- Other uses and disclosures not described in this Notice.

### **Uses and Disclosures (Permission not Needed):**

CAMHD may disclose PHI without your permission. But any release of PHI will follow the law as explained below.

- **For judicial and administrative purposes.** CAMHD must disclose your child's PHI to a court when it is ordered by the court to do so, when it is necessary for the court to hear a legal action, and when failure to make the disclosure would be against public interest.
- **In the event of an emergency.** CAMHD may share your child's PHI when there is an emergency that requires an immediate sharing of information.
- **If there is a serious danger of threat or violence.** CAMHD may share your health information if it determines, in its best professional judgment, that there exists a serious danger or threat of violence toward another person. CAMHD will exercise its duty to exercise reasonable care to protect foreseeable victims.
- **If requested by the United States Department of Health and Human Services (DHHS) Secretary.** If required by the DHHS Secretary, CAMHD must disclose PHI for investigatory or monitoring purposes.

- **To comply with federal or State laws.** CAMHD may disclose PHI when the law requires it. CAMHD will only share what is necessary in order to comply with the law.
- **Report suspected abuse or neglect to appropriate Public Health and Law Enforcement authorities.** For example: should CAMHD suspect or receive a report of abuse or neglect of a minor at the hands of a parent, foster parent, family member, guardian or provider, CAMHD will report the suspected abuse or neglect to the necessary authorities, e.g., Child Protective Services, Police, etc. Some of the information that we report may contain limited health information about you.
- **Carry out Hawaii State mental health laws, as found in Hawaii Revised Statutes Chapter 334 and Hawaii Administrative Rules 11-175-31.** Your health information may be shared if the Director of Health feels it is necessary.
- **Comply with the Federal Protection and Advocacy for Mentally Ill Individuals Act of 1986.** To protect and advocate the rights of persons with mental illness who reside in facilities providing treatment or care.
- **Other Types of PHI.** There are stricter requirements for use and disclosure for some types of PHI. For example, mental health, drug and alcohol abuse, and human immunodeficiency virus (HIV)/ acquired immunodeficiency syndrome (AIDS) patient information. However, there are still limited circumstances in which these types of information may be used or shared without your authorization.

### **Family Educational Rights and Privacy Act (FERPA)**

Your child's records may also be considered "education records." CAMHD will only disclose information in your child's education records as allowed by FERPA regulations. The Department of Education provides you with your child's FERPA notice of privacy practice.

### **For More Information or to Report a Problem:**

If you need more information or want to file a privacy complaint, contact the CAMHD Privacy Coordinator:

CAMHD Privacy Coordinator  
3627 Kilauea Avenue, Suite 404  
Honolulu, HI 96816  
(808) 733-4198

You may also call the Department of Health Privacy Officer at (808) 586-4\_\_\_\_.

You can also file a privacy complaint with the U.S. Department of Health and Human Services. You may contact them at:

Office of Civil Rights  
U.S. Department of Health and Human Services  
90 7<sup>th</sup> Street Suite 4-100  
San Francisco, California 94103  
Phone: (415) 437-8310; (415) 437-8311 (TDD)  
FAX: (415) 437-8329  
E-mail: www.hhs.gov/ocr

No one will face retaliation for filing a complaint.

My signature below indicates that I have been provided with a copy of the notice of privacy practices.

Name: \_\_\_\_\_

Child's Name: \_\_\_\_\_

Signature: \_\_\_\_\_

Signature: \_\_\_\_\_

Date: \_\_\_\_\_

Date: \_\_\_\_\_

Relationship to child:  
\_\_\_\_\_

Distribution: Original to CAMHD  
Copy to Parent/Guardian.

Effective Date: April 14, 2003  
Revision Dates: 6/03; 11/07; 7/09; 9/13

Effective September 23, 2013

## **Appendix F: Further Discussion of Data Analytic Plan**

***Testing statistical modeling assumptions.*** Various assumptions of multi-level modeling were considered to ascertain the appropriateness of the data analytic plan. First, the assumption that residual variance in the criterion variable be normally distributed was examined. Regarding Analysis 1 (predicting exposure use), this assumption does not apply to binomial logistic regression analyses, given the variable is transformed to fit a binomial distribution with fixed error variance at the episode level of analysis (Heck, Thomas, & Tabata, 2012). Regarding Analysis 2 (predicting anxiety treatment progress), this assumption does apply, and the distribution of the criterion variable (total anxiety progress) violated the Kolmogorov-Smirnov test of normality ( $p<.001$ ). However, as seen in Figure 1, the distribution of this variable resembles a normal curve, and the distribution of residual variance in this variable when examined at the episode level was normal. Next, the assumption that higher-level classifications must account for significant random variance in the criterion variable in order to be included in a cross-classified model was considered (Heck et al., 2013). The variance accounted for by random youth, therapist, and agency factors was examined for the criterion variables in both analyses. For Analysis 1 (predicting exposure use), preliminary analysis of a null cross-classified model indicated that the likelihood of exposure use varied significantly as a function of random therapist (variance parameter estimate = 1.81, Intra-class correlation [ICC] = .355,  $p < .001$ ) and agency (variance parameter estimate = 1.42, ICC = .301,  $p < .001$ ) effects, but not youth effects (ICC= .016,  $p = .17$ ). These results suggest that approximately 35.5%, 30.1%, and 1.6% of the random variance in likelihood of exposure use is accounted for by therapist, agency, and youth effects, respectively. As such, youth effects did not appear to significantly influence likelihood of exposure use, and therefore the youth-level category was removed from the cross-classified model in Analysis 1. Youth-level variables (i.e, race and

gender) were consequently examined at the episode-level in this analysis. Regarding Analysis 2 (predicting anxiety treatment progress), all three higher-level classifications in the analysis accounted for a significant percentage of estimated random variance in total anxiety progress in the null model (youth: 9.2%, therapist: 14.5%, agency: 5.8%; respective variance parameter estimates = 0.211, 0.331, and 0.133, all  $p < .01$ ), and so were retained for the main analysis. There was no evidence of multicollinearity between predictor variables in either Analysis 1 or Analysis 2.

**Analytic procedure.** Heck et al. (2013), Peugh (2010), and Fielding & Goldstein (2006) note the following steps needed to conduct a multi-level analysis and describe how they can be applied to cross-classified analyses. In addition to the ICC calculations and descriptive analyses noted in Data Preparation, the restricted estimation maximum likelihood [REML] of parameter estimation was selected due to its tendency to lead to better estimates when there are a smaller number of groups in a study and to increase expediency of analysis (Heck et al., 2013). Scaling of one variable (episode end date) was performed to provide for easier interpretation of the data (see Method: Data Analytic Strategy for details; Heck et al., 2013).

The current study examined whether recency of treatment episode, therapist education level, comorbid externalizing problems, or other factors predicted the use/non-use of exposure therapy (Analysis 1) and whether exposure use predicted enhanced therapist-reported progress ratings (Analysis 2) after holding other variables constant for children receiving treatment for anxiety-related problems. The classifications under consideration consisted of a level one variable reflecting treatment episode, and cross-classified higher level variables reflecting youth, therapist and provider agency. The episode level included several of the main predictor variables of interest for both analyses. In Analysis 1 (predicting exposure use), proportion of

months in treatment in which externalizing problems were targeted and episode end date were examined at this level, along with several episode-level covariates (e.g., anxiety diagnoses and episode length). In Analysis 2, the main predictor variable of interest (months of exposure use) was also examined at the episode level while also accounting for other episode-level covariates. In Analysis 1, the higher-order classifications controlled for random between-therapist and between-agency variation. Highest degree earned was examined at the therapist level, and level-of-care was examined at the agency level. In Analysis 2, the higher-order classifications controlled for random between-youth, between-therapist, and between-agency variation. Youth sex and race were examined at the youth level, highest degree earned was examined at the therapist level, and level-of-care was examined at the agency level.

Below are the equations that represent the two multilevel models for the current study using Browne, Goldstein, & Rasbash's (2001) classification scheme. Models 1 and 2 correspond respectively with Analyses 1 and 2 noted above. The variables with the coefficient  $u$  represent the random effect of the cross-classification notated in the subscript of each variable. The number in parentheses indicates a separate higher-order random effect and the parentheses surrounding  $i$  indicate that individuals (i.e., episodes) are nested within the higher-order classification. Classification 1 is the identity classification, which applies to the lowest level (episode), and is typically not included (Brown et al., 2001). More specifically, in the first analysis, the equation includes the higher-order random effects of agency ( $u_{agency(i)}^{(3)}$ ) and clinician ( $u_{clinician(i)}^{(2)}$ ), but not youth, given the absence of significant random variability in likelihood of exposure use between youth. The equation for Analysis 2 includes the higher-order categories of agency ( $u_{0agency(i)}^{(4)}$ ), clinician ( $u_{0clinician(i)}^{(3)}$ ), and youth ( $u_{0youth(i)}^{(2)}$ ), as all three categories accounted for significant random variance in the null model.

**Model variables.** The variables included in the model are as follows:

Outcome variable (Model 1):  $\eta_i = \log$  odds of exposure utilization in a given episode, as calculated by the equation  $\ln(\frac{\pi_i}{1-\pi_i})$ , where  $\pi$  represents the probability of exposure use for episode  $i$

Outcome variable (Model 2):  $y_i =$  total anxiety progress in a given episode

Predictor variables:

*enddate*: six-month time interval in which a treatment episode ended

*uniquetargets*: the mean number of unique anxiety targets endorsed per month in a treatment episode

*anxtargets*: the proportion of months within an episode in which at least one anxiety-related target was endorsed

*exttargets*: the proportion of months within an episode in which at least one externalizing target was endorsed

*prevepisodes*: number of youth's previous treatment episodes

*prevexpYN*: whether or not a youth received exposure in a prior treatment episode

*practices*: mean number of unique practices/intervention strategies endorsed per treatment month

*CAFASMood*: score on the CAFAS Mood/Emotions subscale at start of treatment episode

*months*: length of episode in months

*age*: age of youth at start of episode

*sex*: sex of youth

*race*: race of youth (see Table 2 for race categories). For Analysis 1, preliminary bivariate analyses indicated youth identified as Asian were more likely to receive exposure therapy than other youth, and there were no other significant differences across other race classifications apart from the ‘race not available’ category’s association with reduced likelihood of exposure treatment. Because this finding could not be interpreted, it was not included in the model. Therefore *race* in Model 1 is a dichotomous variable reflecting whether or not a youth was identified as Asian. Given that preliminary analyses of variance found no differences in total anxiety progress between racial categories, in Model 2, *race* is measured as a categorical variable reflective of the eight race categories described in Table 2.

*doctorYN*: whether or not the clinician had a doctorate degree

*levelofcare*: the level-of-care in which an agency provided services

*exp*: the number of months in which a clinician used exposure therapy in an episode, broken into four categories (0 months of exposure, 1 month of exposure, 2-3 months of exposure, 4+ months of exposure).

### **Model 1: Predicting use of exposure when anxiety-related targets are present**

$$\eta_i = \ln\left(\frac{\pi_i}{1-\pi_i}\right) = \beta_0 + \beta_1 enddate_i + \beta_2 uniquetargets_i + \beta_3 anxtargets_i + \beta_4 exttargets_i + \beta_5 prevepisodes_i + \beta_6 prevexpYN_i + \beta_7 practices_i + \beta_8 CAFASMood_i + \beta_9 months_i + \beta_{10} age_i + \beta_{11} sex_i + \beta_{12} race_i + \beta_{13} doctorYN_i^{(2)} + \beta_{14} levelofcare_i^{(3)} + u_{agency(i)}^{(3)} + u_{clinician(i)}^{(2)}$$

In Model 1,  $\eta_i$  represents the log odds of exposure being utilized in any given episode.  $\beta_0$  reflects the log odds of exposure use across all agencies and clinicians when fixed effects are held to a constant value. Note that because the outcome is dichotomous, there is no separate residual variance at level 1 (i.e., for a logistic distribution, it is fixed at  $\frac{\pi^2}{3}$  or about 3.29) The

random variances for the higher-order classifications of agency and clinicians are assumed to be normally distributed with mean of zero and variance  $\sigma_{u(3)}^2$  and  $\sigma_{u(2)}^2$ , respectively. In this model, the  $\beta$  coefficients represent fixed effects of each predictor on the outcome. Those variables with  $\beta$  coefficients and no superscript classification numbers are fixed effects corresponding to the classification-1 (episode) level. Beta coefficients with superscripts 2 ( $doctorYN_i^{(2)}$ ) and 3 ( $levelofcare_i^{(3)}$ ) indicate predictors associated with those higher-order classifications.

### **Model 2: Predicting anxiety-related improvement as a function of the use of exposure**

$$y_i = \beta_0 + \beta_1 exp_i + \beta_2 enddate_i + \beta_3 anxtargets_i + \beta_4 exttargets_i + \beta_5 prevepisodes_i + \beta_6 practices_i + \beta_7 CAFASMood_i + \beta_8 months_i + \beta_9 age_i + \beta_{10} sex_i^{(2)} + \beta_{11} race_i^{(2)} + \beta_{12} doctorYN_i^{(3)} + \beta_{13} levelofcare_i^{(4)} + u_{0\text{agency}(i)}^{(4)} + u_{0\text{clinician}(i)}^{(3)} + u_{0\text{youth}(i)}^{(2)} + \varepsilon_i$$

In Model 2,  $y_i$  represents the mean total anxiety progress rating across all episodes,  $\beta_0$  reflects the mean total progress rating across all agencies, clinicians, and youth when fixed effects are held to a constant value, and  $\varepsilon_i$  represents the remaining unexplained episode-level variance in anxiety progress. The random variances for the higher-order classifications of agency, clinician, and youth are assumed to be normally distributed with mean of zero and variance  $\sigma_{u(4)}^2$ ,  $\sigma_{u(3)}^2$ , and  $\sigma_{u(2)}^2$ . The level-1 residual variance is also assumed to be normally distributed with mean of zero and variance  $\sigma_e^2$ . As noted in Results, this model was run again to test for a significant interaction between the *levelofcare* and *exp* variables. This equation is identical to the one above, with the exception of the added interaction term, and is represented as follows:

$$y_i = \beta_0 + \beta_1 exp_i + \beta_2 enddate_i + \beta_3 anxtargets_i + \beta_4 exttargets_i + \beta_5 prevepisodes_i + \beta_6 practices_i + \beta_7 CAFASMood_i + \beta_8 months_i + \beta_9 age_i + \beta_{10} sex_i^{(2)} + \beta_{11} race_i^{(2)} + \beta_{12} doctorYN_i^{(3)} + \beta_{13} levelofcare_i^{(4)} + u_{0\text{agency}(i)}^{(4)} + u_{0\text{clinician}(i)}^{(3)} + u_{0\text{youth}(i)}^{(2)} + \varepsilon_i$$

$$+ \beta_{13} levelofcare_i^{(4)} + \beta_{14} exp_i * levelofcare_i^{(4)} + u_{agency(i)}^{(4)} + u_{clinician(i)}^{(3)} + u_{youth(i)}^{(2)} + \varepsilon_i$$

### **Follow-up procedures**

To decrease the chances of Type I error, a modified Bonferroni procedure (Quene & van den Bergh, 2004) was conducted. Beta weights, standard errors, effect sizes, and *p* values were examined to determine whether these variables accounted for a significant proportion of the variance explained within the model.

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