

Types of Parental Involvement in CBT With Anxious Youth: A Preliminary Meta-Analysis

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Objective: Meta-analytic studies have not confirmed that involving parents in cognitive behavior therapy (CBT) for anxious children is therapeutically beneficial. There is also great heterogeneity in the type of

parental involvement included. We investigated parental involvement focused on contingency management (CM) and transfer of control (TC) as a potential outcome moderator using a meta-analysis with individual patient data. **Method:** Investigators of randomized controlled trials (RCTs) of CBT for anxious children, identified systematically, were invited to submit their data. Conditions in each RCT were coded based on type of parental involvement in CBT (i.e., low involvement, active involvement without emphasis on CM or TC, active involvement with emphasis on CM or TC). Treatment outcomes were compared using a 1-stage meta-analysis. **Results:** All cases involved in active treatment (894 of 1,618) were included for subgroup analyses. Across all CBT groups, means of clinical severity, anxiety, and internalizing symptoms significantly decreased posttreatment and were comparable across groups. The group without emphasis on CM or TC showed a higher proportion with posttreatment anxiety diagnoses than the low-involvement group. Between posttreatment and 1-year follow-up, the proportion with anxiety diagnoses significantly decreased in CBT with active parental involvement with emphasis on CM or TC, whereas treatment gains were merely maintained in the other 2 groups. **Conclusions:** CBT for anxious children is an effective treatment with or without active parental involvement. However, CBT with active parental involvement emphasizing CM or TC may support long-term maintenance of treatment gains. Results should be replicated as additional RCTs are published.

Keywords: anxiety disorders, cognitive behavior therapy, anxious children, parental involvement

Involving parents in cognitive behavior therapy (CBT) for anxious children is a common practice with a number of potential benefits. First, parental involvement may facilitate generalization of skills to “real-world” settings, particularly when parents are involved in facilitating children’s exposures to anxious situations outside the therapist’s office (Barmish & Kendall, 2005). Exposure is considered a key mechanism of change in anxiety-focused CBT, as it promotes desensitization to anxious stimuli (reviewed in Dubord, 2011). Silverman and Kurtines (1999) described the generalization process as a *transfer of control* (TC) from therapist to parent in which parents are taught to use contingency management (CM) to encourage children’s exposures to anxiety-provoking situations. Although CM is based on general principles of operant conditioning (rather than any particular theory of anxiety) and was originally developed and studied with children who had externalizing problems (Kazdin, 1997), it is applicable to anxious children

when its focus is to encourage and reward “brave” behavior (i.e., to facilitate exposure and therefore desensitization). Second, parental involvement may aid the continued use of skills learned in CBT beyond the end of therapy (Ginsburg, Silverman, & Kurtines, 1995). For example, after being involved in their child’s CBT, parents can often model healthy coping, remind their children to practice newly acquired coping skills, and continue to encourage and reward brave behavior through CM. Finally, involving parents in treatment may address parent-related obstacles to treatment success. Such obstacles may include parental anxiety, which is often associated with anxietyogenic parenting styles (Murray, Cooper, Creswell, Schofield, & Sack, 2007), parental frustration with the child (Crawford & Manassis, 2001), and parents’ tendency to inadvertently encourage avoidant coping (Barrett, Rapee, Dadds, & Ryan, 1996).

It is therefore surprising that the empirical evidence favoring parental involvement in CBT with anxious children is sparse.

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When reviewing nine trials that compared anxiety-focused CBT with an added family component (FCBT) and anxiety-focused CBT (CCBT), Creswell and Cartwright-Hatton (2007) concluded that FCBT was superior to no treatment, showed good maintenance of treatment effects, and was probably more effective than CCBT for children of anxious parents. However, the need for large, well-designed studies was also identified. An earlier review of nine randomized clinical trials of CBT with anxious youth that included parents (Barmish & Kendall, 2005) concluded that neither FCBT nor CCBT could be deemed superior based on existing evidence, and additional comparative research was needed.

Since then, four meta-analyses have failed to find differences in efficacy between CBT with and without parental involvement (In-Albon & Schneider, 2007; Reynolds, Wilson, Austin, & Hooper, 2012; Silverman, Pina, & Viswesvaran, 2008; Spielmans, Pasek, & McFall, 2007). Of note, the effect of parental involvement was not the primary research question in any of these meta-analyses, and most did not distinguish between children meeting diagnostic criteria and those having elevated symptoms only. In-Albon & Schneider (2007) compared 17 child-focused treatment arms and 14 family-focused treatment arms (defined as four or more sessions that included parents) and found similar effect sizes and similar percentages of patients recovered. Reynolds et al. (2012) analyzed results from 55 trials: 20 treatment arms with no parental involvement, 11 with “minimal involvement” (defined as a small number of sessions), 11 with “some involvement” (defined as parents involved routinely in selected sessions) and 18 with “significant involvement” (defined as parents involved in all or the majority of treatment sessions). All four conditions had effect sizes that were medium and significant. Silverman et al. (2008) examined 32 waitlist-controlled studies that reported diagnostic remission, anxiety symptom reduction, and reduction of other symptoms (seven treatment arms including parents and 12 not for remission reports; 10 treatment arms including parents and 25 not for anxiety symptoms; six treatment arms including parents and 12 not for other symptoms). They failed to find differences in remission rates or in effect sizes for anxiety-symptom reduction but found favorable effects for parental involvement in the reduction of other symptoms. Spielmans and colleagues’ (2007) meta-analysis included 35 studies and compared *full CBT* (defined as “nearly all involved the addition of some sort of parental component”; p. 649) versus *CBT only*. Effect sizes were similar for these two conditions.

At first glance, it would therefore appear that anxiety-focused CBT should focus exclusively on the child, with the parents’ role limited to escorting the child to and from therapy sessions. A closer look, however, illustrates the risks of drawing such a facile conclusion. First, each review or meta-analysis used different definitions of parental involvement, making them difficult to compare. Second, involvement was generally classified quantitatively (e.g., by number of sessions) potentially obscuring differences based on qualitative factors. Finally, all reviewers acknowledged heterogeneity in the type of parental involvement provided in the primary studies. For instance, in some studies, parents were taught to change the child’s behavior through contingency management (CM) and gradual transfer of control (TC) from therapist to parent occurred, whereas in other studies parents became co-clients and parental problems (such as parental anxiety) were addressed with little emphasis on CM

or TC (Breinholst, Esbjorna, Reinholdt-Dunnea, & Stallard, 2012). Improving family communication (e.g., Shortt, Barrett, & Fox, 2001), reducing parental intrusiveness and increasing parental autonomy granting (Wood, Piacentini, Southam-Gerow, Chu, & Sigman, 2006), and addressing parental thoughts and feelings about the child (Nauta, Scholing, Emmelkamp, & Minderaa, 2003) were targets of intervention in other parent programs. All of these forms of intervention suggest that further investigation of different types of parental involvement may be warranted.

Although there is a lack of evidence about processes of change when including parents in CBT, several authors have suggested that TC from therapist to parent contributes to improvement, and this is more likely to occur with parental involvement that includes CM (Khanna & Kendall, 2009; Silverman & Kurtines, 1999). Presumably, parents who are taught to use CM to encourage children to face feared situations are more likely to use this tool to assume control of their anxious child’s continued progress than those who are not. This idea suggests a potential benefit to investigating parental involvement with a focus on TC or CM as a potential moderator of outcome.

In addition to the lack of analysis for type of parental involvement, there is a dearth of meta-analyses examining the relationship between parental involvement and long-term maintenance of gains. This absence may be due to the scarcity of randomized control trials (RCTs) that address this link. However, considering the potentially important role of parents in maintaining CBT gains, a meta-analysis of available data is warranted.

Using individual patient data collected from RCTs assembled for a previous investigation of treatment moderators (Bennett et al., 2013), we explored the novel question of whether active parental involvement in CBT, with or without emphasis on changing the child’s behavior via CM or TC, is superior to child-focused CBT with limited parental involvement. We hypothesized that active parental involvement with high emphasis on CM or TC is most effective at both posttreatment and 1-year follow-up. Our method provides a unique opportunity to conduct such subgroup analyses, and to pool limited data on maintenance of treatment gains.

Method

Trial Search Method

Individual patient data were collected as part of a larger study that examined age effects on treatment outcomes of CBT for anxious children (see Bennett et al., 2013, for more detailed methods).

In this larger study, eligible RCTs were identified guided by the Cochrane Handbook for Systematic Reviews of Interventions (Higgins & Green, 2011) and PRISMA (Preferred Reporting Items for Systematic reviews and Meta-Analyses) for transparent reporting of systematic reviews (Moher, Liberati, Tetzlaff, Altman, & the PRISMA Group, 2009) methods. The search strategy proceeded as follows: (a) We sought existing systematic reviews and meta-analyses of the efficacy of CBT in child and adolescent anxiety in electronic databases relevant to psychology and psychiatry for the period of 1990–2011

(OVID–Medline, OVID–Embase, OVID–Cochrane Central, OVID–PsycINFO, and EBSCO CINAHL). The search used the key words *anxiety disorder/anxiety* (with field limits dependent on specific data base), *cognitive therapy/CBT*, *pediatric/paediatric* or *child* or *teen* or *adolescent* or *youth*. Then, studies were narrowed to randomized controlled trials published in the English language during the years of interest (a replicable strategy created by an experienced research librarian available from the author). (b) Reference lists of the eight published systematic reviews/meta-analyses identified were hand searched to identify RCTs; these existing reviews included potentially eligible primary RCTs published from 1966 to 2005. (c) Additional RCTs published from 2005 onwards were then identified by searching the same electronic databases (key words and search strategy available from the author). (d) Reference lists of all eligible RCTs identified were hand-searched, and (e) all collaborating authors reviewed the list and noted omissions. Nevertheless, even with this detailed search strategy, the possibility of publication bias exists (i.e., unpublished studies that we were unable to access).

Senior investigators of all RCTs identified that met the following eligibility criteria were then invited to contribute their individual patient data using a common template (see Bennett et al., 2013): (a) RCT comparing CBT to waitlisted or attention controls; (b) participants 6–18 years old; (c) pretreatment diagnosis of anxiety disorder other than posttraumatic stress disorder or obsessive–compulsive disorder (as these disorders require substantially different CBT protocols and are no longer considered anxiety disorders in the fifth edition of the *Diagnostic and Statistical Manual of Mental Disorders (DSM5; American Psychiatric Association, 2013)*); (d) outcome measures indicating presence or absence of anxiety disorder, severity of anxiety diagnosis, and self-report or parent-report measures of children’s anxiety symptoms. Contributing investigators were contacted if necessary to clarify the data in their studies or the nature of their interventions. Data were obtained from 18 of the 23 trials that met eligibility criteria. For the remaining five trials, either the study data were no longer available, or the investigators declined our request to participate. Four of the 18 included trials were limited to participants with social phobia; the other 14 included multiple anxiety diagnoses.

Groups Compared in the Current Study

Data from all trials included in the original study were utilized in this study. Of 1,618 participants in the original data set, 724 patients were excluded as they were in the waitlisted/active control groups and 894 patients in CBT groups were included for analyses (see Figure 1 and Table 1). Participants in waitlisted/active control groups were excluded because efficacy of CBT in comparison with these groups has been previously reported in a comprehensive meta-analysis (James, James, Cowdrey, Soler, & Choke, 2013). Therefore, we limited our comparison groups to CBT with limited parental involvement (Group 1), CBT with active parental involvement with low emphasis on CM or TC (Group 2), and CBT with active parental involvement with high emphasis on CM or TC (Group 3). We defined *limited parental involvement* (Group 1) as parental involvement in less than 50% of sessions or in only a short portion of each session (i.e., parental contact time with therapist < 50% that of the child). We

acknowledge that therapists in this condition likely had some flexibility with respect to parent contact in a given case, so parental contact may have been higher in some cases. We classified studies with parental involvement in greater than 50% of sessions and emphasis on contingency management or transfer of control techniques as Group 3. The remaining studies composed Group 2. Interventions in these Group 2 studies emphasized addressing parental anxiety, anxious modeling, dysfunctional parental beliefs or communication in relation to the child, family conflict, or other aspects of parental and family functioning that did not relate directly to managing the child’s anxious behaviors. Some Group 2 studies did include CM and TC among other treatment elements. Contributing investigators were contacted to clarify interventions for Groups 2 and 3 when necessary. Reliability of coding was checked by having an investigator experienced in this field but blind to the study results independently recode all groups based on descriptions in the original articles. There was agreement on all but one study, in which there was substantial parental involvement but the authors did not explicitly describe the nature of that involvement with respect to CM and TC in their article ($\kappa = 0.91$). Coding in this case was based on additional information from the contributing investigators.

Key Variables Measured at Baseline, Posttreatment, and Follow-Up

Clinical severity of anxiety diagnosis. The clinical severity rating score (0 to 8; based on symptom severity and interference with activities) in the Anxiety Disorder Interview Schedule (ADIS; Silverman & Albano, 1997) was recorded. The ADIS is a semi-structured diagnostic interview that is the most widely used in research pertaining to anxiety disorders in children (Schniering, Hudson, & Rapee, 2000).

Presence of anxiety diagnosis (remission rates). Presence or absence of an anxiety diagnosis was determined, also using the ADIS. An anxiety diagnosis is deemed to be present on this interview if the clinical severity rating score is 4 or above for a given disorder. Analyses were based on the primary anxiety diagnosis, as this data were most consistently available.

Internalizing symptoms and anxiety symptoms (for sensitivity analyses). The two standardized measures used most often in the included RCTs were the Child Behavior Checklist (CBCL–Parent Report; Achenbach, 1991) and the Revised Children’s Manifest Anxiety Scale (RCMAS–Child Report; Reynolds & Richmond, 1978). Changes in the CBCL internalizing problems *T* scores and in the RCMAS total anxiety *T* scores between pre- and posttreatment were measured. Pretreatment CBCL and RCMAS *T* scores were included as covariates when these variables were used as outcome measures. These variables were not included in the 1-year follow-up analysis due to missing data.

Statistical Methods

Descriptive statistics were used to summarize the characteristics of participants from 18 studies. For example, continuous variables were described using means and standard deviations (see Table 2). Frequency and cross-tabulate tables were used to describe discrete variables. Prior to the analysis, time-trend plots of the mean values on the four outcomes were produced for each group in order to visualize group differences from baseline to posttreatment to 12-month follow-up.

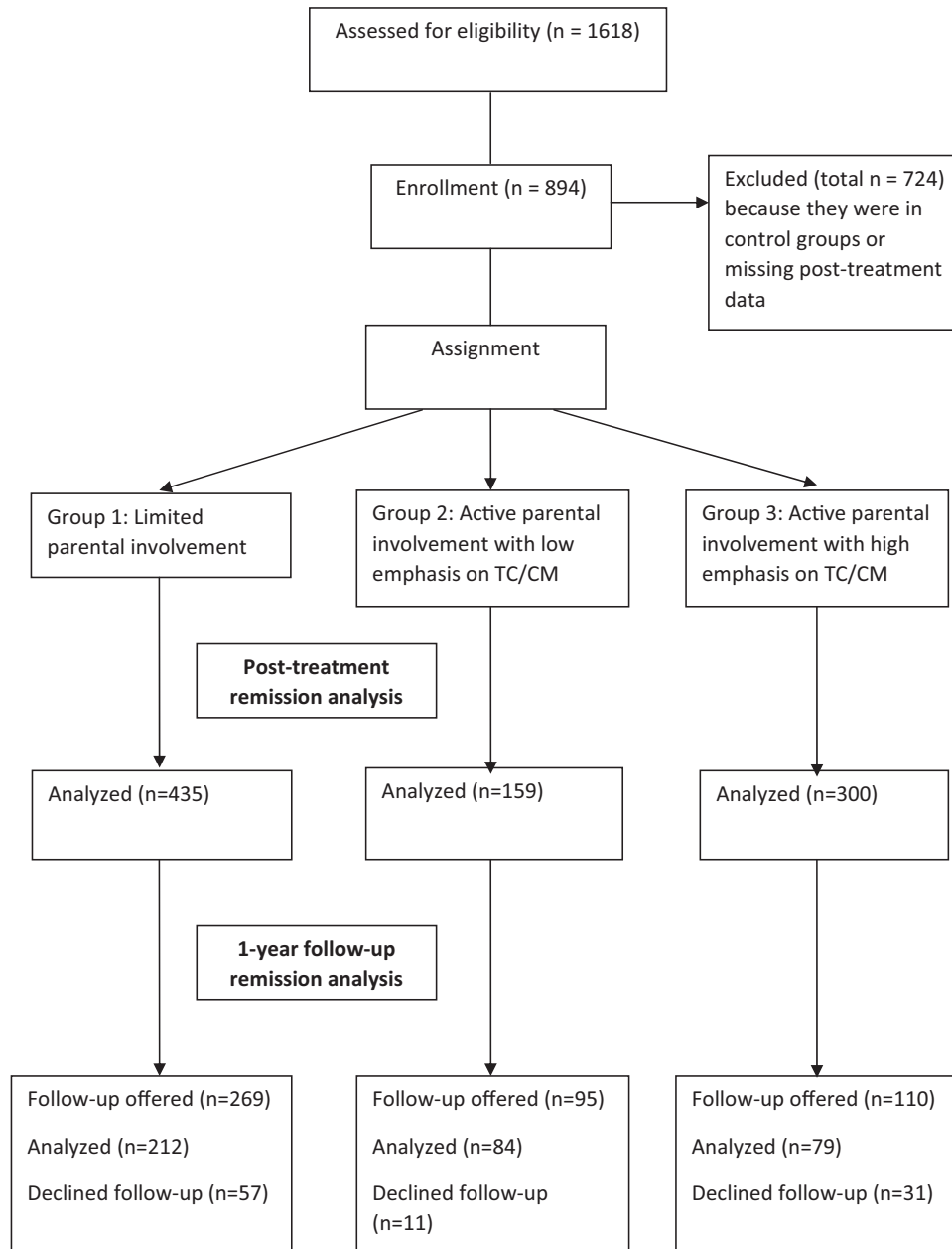


Figure 1. Flow of participants through pre- and post-treatment and follow-up assessments. TC = transfer of control; CM = contingency management.

A one-stage approach of individual participant data meta-analyses was performed. Hierarchical multiple linear and nonlinear regression models were constructed for continuous outcomes of severity ratings on ADIS, total *T* score on RCMAS, internalizing score on CBCL, and the binary outcome of anxiety diagnosis (presence/absence) separately. Restricted maximum likelihood and residual pseudo-likelihood methodologies were used accordingly. Time (Level 1) was nested within individuals, and individuals (Level 2) were nested within studies (Level 3). Between-study differences were assessed through two models: (a) random intercept model at the study level, and (b) random-effects model where group and study

interaction effect was allowed to vary between studies. Within-subject correlations were accounted for by specifying an appropriate covariance structure in the residual error.

We assessed a set of covariate effects one at a time by conducting a series of models that evaluate group effect, time effect, and Group \times Time interaction effect in the multilevel model. The latter effect would indicate differences in group trajectories over time, consistent with our hypothesis. Final models were chosen based on the lowest Akaike information criterion (AIC) for continuous variables and the ratio of the generalized chi-square statistics and its degrees of freedom for the dichotomous outcome variable. Autoregressive 1 and com-

Table 1
 Characteristics of Participants From Each Trial Included in Analyses

Center	Type of parental involvement	No. of participants included in analysis (%)	Total CBT time (minutes)	Group vs. individual treatment	Rounded age range (years)	% Male	% Comorbid depression	Setting		Availability of 1-yr follow-up data
								School	Clinic	
Baer & Garland (2005) ^a	1	6 (0.66%)	1,080	Group	13–16	50.0	0.0	✓		No
Barrett, Dadds, & Rapee (1996)	1 (n = 28), 3 (n = 25)	53 (5.84%)	840	Individual	6–14	60.4	N/A		✓	Yes
Beidel et al. (2000) & 2005 ^a	1	30 (3.31%)	1,689	Group	8–13	33.3	0.0			No
Bodden et al. (2008)	1 (n = 64), 2 (n = 64)	128 (14.11%)	975	Individual	8–17	41.4	6.3		✓	No
Dadds et al. (1997 & 1999)	1	61 (6.73%)	927	Group	7–13	26.2	0.0		✓	Yes
Flannery-Schroeder & Kendall (2000)	1	22 (2.43%)	1,325 (average)	Both	8–14	50.0	0.0		✓	No
Ginsburg & Drake (2002)	1	4 (0.44%)	450	Group	15–18	0.0	0.0	✓		No
Hudson et al. (2009)	3	60 (6.62%)	1,200	Group	6–16	63.3	0.0		✓	No
Kendall et al. (2008)	1 (n = 55), 2 (n = 56)	111 (12.24%)	960	Individual	7–14	57.7	6.3		✓	Yes
Kendall et al. (1997)	1	71 (7.83%)	1,089	Individual	9–14	63.4	1.4		✓	Yes
Kendall (1994)	1	29 (3.20%)	944	Individual	9–14	58.6	11.1		✓	Yes
Masia Warner et al. (2007) ^a	1	19 (2.09%)	498	Group	14–16	15.8	0.0	✓		No
Masia Warner et al. (2005) ^a	1	21 (2.32%)	570	Group	14–16	28.6	0.0	✓		No
Nauta et al. (2003)	1 (n = 37), 2 (n = 39)	76 (8.38%)	1 (750), 2 (1,100) (average)	Individual	7–16	53.9	10.5		✓	Yes
Rapee et al. (2006)	3	90 (9.92%)	1,080	Group	6–15	46.7	4.4		✓	No
Silverman . . . Carmichael (1999)	3	37 (4.08%)	1,140	Group	6–18	48.6	10.8		✓	Yes
Silverman . . . Serafini (1999)	3	40 (4.41%)	800	Individual	6–16	47.5	5.0		✓	No
Spence et al. (2006)	3	49 (5.40%)	960	Group	7–14	59.2	0.0		✓	Yes

Note. Type of parental involvement: 1 = low parental involvement, 2 = active parental involvement with low emphasis on contingency management (CM) & transfer of control (TC), 3 = active parental involvement with high emphasis on CM & TC. CBT = cognitive-behavior therapy.

^a Studies limited to participants with social phobia.

pound symmetry covariance structures were assumed for R-side and G-side modeling, respectively. Post hoc tests were used to examine differences between groups for each time point to test our initial hypothesis. Significance was considered at $p < .05$; multiple comparisons were adjusted using the Tukey method. All analyses were conducted using SAS Version 9.3 with PROC MIXED and PROC GLIMMIX. The nature of these analyses takes into account a lack of 1-year follow-up data for some studies and subjects, ensuring that studies with larger or smaller effect sizes posttreatment do not bias the 1-year follow-up results.

Results

Pretreatment Versus Posttreatment

Proportion with anxiety diagnosis present (remission analysis). Covariate analyses showed that gender, age, and duration of CBT exposure (in minutes) were not significant outcome predictors in the pretreatment versus posttreatment analysis, so no covariates were included in the model.

Between-group difference in the proportion with anxiety diagnosis present was significant, $F(2, 899) = 3.80, p = .02$, and time

effect on remission was also significant across groups, $F(1, 818) = 318.16, p < .0001$. Post hoc analyses, adjusted by the Tukey–Kramer procedure, showed that the group difference in the proportion with anxiety diagnosis present was only significant between Group 1 and Group 2, Group 1: $M = .43$ (i.e., 57% remission), standard error (SE) = .02, Group 2: $M = .50$ (i.e., 50% remission), $SE = .04$. In all groups, the presence of anxiety diagnosis decreased significantly at posttreatment.

Clinical severity of anxiety diagnosis. Time effect was highly significant, $F(1, 860) = 1313.69, p < .0001$, but between-group difference in means was not significant, $F(2, 20.5) = 0.87, p = .43$. A post hoc analysis showed that clinical severity ratings on ADIS significantly decreased in all three CBT groups at posttreatment, estimate = $-3.44, SE = 0.10, t(860) = -36.24, p < .0001$.

Anxiety symptoms and internalizing symptoms (sensitivity analyses). Between-group differences were not found for anxiety symptoms at posttreatment, $F(2, 9.33) = 0.92, p = .43$, but a significant effect for time was found, $F(1, 383) = 102.65, p < .0001$. A post hoc analysis using the Tukey–Kramer procedure revealed a significant decrease in anxiety symptoms across groups,

Table 2
Means (and Standard Deviations) for Continuous Measures by Group by Time Point

Measure	Baseline			Posttreatment			Follow-up		
	Group 1	Group 2	Group 3	Group 1	Group 2	Group 3	Group 1	Group 2	Group 3
RCMAS (<i>t</i> scores)	52.84 (10.74)	51.20 (11.26)	50.60 (10.56)	44.36 (11.62)	45.82 (13.26)	42.13 (10.46)	N/A	N/A	N/A
CBCL (<i>t</i> scores)	67.85 (9.56)	70.01 (9.17)	69.45 (9.35)	59.66 (10.23)	61.93 (9.70)	59.01 (9.82)	N/A	N/A	N/A
ADIS severity ratings	5.89 (1.71)	6.30 (1.08)	6.45 (1.14)	2.48 (2.64)	2.92 (2.71)	2.80 (2.35)	2.76 (2.17)	3.40 (2.56)	2.46 (2.05)

Note. RCMAS = Revised Children's Manifest Anxiety Scale; CBCL = Child Behavior Checklist, Internalizing Score; ADIS = Anxiety Disorders Interview Schedule.

mean difference = -7.30 , $SE = 0.72$, $t(383) = -10.13$, $p < .0001$.

For internalizing symptoms, the Group \times Time interaction was just significant, $F(2, 538) = 3.21$, $p = .04$. However, group comparisons showed that only time effect was significant in all three groups such that internalizing symptoms significantly decreased at posttreatment, Group 1: mean difference = -8.20 , $SE = 0.58$, $t(534) = -14.25$, $p < .0001$; Group 2: mean difference = -7.97 , $SE = 1.01$, $t(523) = -7.83$, $p < .0001$; Group 3: mean difference = -10.47 , $SE = 0.77$, $t(560) = -13.57$, $p < .0001$.

Posttreatment versus 1-year follow-up (maintenance of gains; remission analysis only). Eight studies provided 1-year follow-up data (see Table 1 for studies and Figure 1 for numbers). In the maintenance-of-gains analysis, comorbid depression (estimated odds ratio = 0.47, 95% confidence interval [CI] [0.24, 0.92], $p = .03$) was a significant predictor of the proportion with anxiety diagnosis present. Consequently, this variable was added as a covariate in the model.

Between the time points of posttreatment and 1-year follow-up, there was a significant Group \times Time interaction effect, $F(2, 357) = 11.69$, $p < .0001$. Plots revealed that the proportion with anxiety diagnosis present decreased significantly in Group 3 relative to the other two groups between posttreatment and 1-year follow-up (Figure 2). Post hoc comparisons of time effects, adjusted by the Tukey-Kramer procedure, showed that the proportion with anxiety diagnosis present was significantly lower in Group 3 at 1-year follow-up than at posttreatment (proportion with anxiety diagnosis present decreased by .28, posttreatment $M = .46$, $SE = .03$; 1-year follow-up $M = .18$, $SE = -.05$, $p < .001$). On the other hand, the proportion did not change significantly between posttreatment and 1-year follow-up in either Group 1 (difference = .004, posttreatment $M = .43$, 1-year follow-up $M = .43$ $SE = .04$, $p = .62$) or Group 2 (difference = .06, posttreatment $M = .50$, 1-year follow-up $M = .45$ $SE = .05$, $p = .94$). Chi-square analysis comparing attrition rates among the three groups was nonsignificant.

Post hoc, we performed additional analyses to examine age and comorbid externalizing disorders as potential confounding factors in our analyses. Age effects were examined by adding age into the model with or without an Age \times Treatment interaction, separately for each outcome. We did not find any significant effects at the 0.05 level. The effect of having a comorbid externalizing diagnosis on the ADIS (attention-deficit/hyperactivity disorder, oppositional defiant disorder, or conduct disorder) was examined in the same manner, and no significant effects were found at the 0.05 level

(note: we had insufficient questionnaire data to examine the effect of externalizing symptoms).

Discussion

Although limited by the nonrandom nature of the comparison groups, in the present study we were able to use individual patient data to examine the potential link between type of parental involvement and both short- and long-term effects of anxiety-focused CBT. The finding from previous meta-analyses, that CBT programs with and without active parental involvement show comparable efficacy at posttreatment, was replicated for most variables measured (In-Albon & Schneider, 2007; Reynolds et al., 2012; Silverman et al., 2008; Spielmanns et al., 2007) despite our novel attempt to distinguish among different types of parental involvement. Contrary to our first hypothesis, active parental involvement, regardless of type, was not associated with differential changes in clinical severity, anxiety symptoms, and internalizing symptoms between pretreatment and posttreatment compared with child-focused CBT with limited parental involvement.

However, active parental involvement in CBT without emphasis on CM or TC showed a lower remission rate than child-focused CBT with limited parental involvement. In contrast, no significant difference was found either between the two active parental involvement groups or between active parental involvement with emphasis on CM or TC and CBT with limited parental involvement. The latter finding is intriguing, as it could represent (a) a more intensive therapeutic focus on the child when parents are not also being trained in child management techniques; (b) therapists' flexibility to use clinical judgment regarding parent contact in the limited involvement condition, with good effect; (c) parents seeking out child management resources independently in the limited involvement condition; or (d) other phenomena related to therapeutic change in child CBT that merit further study. Such phenomena could be studied by measuring specific parental attitudes or behaviors to ascertain whether these change with intervention, and, if so, whether they moderate or mediate changes in children's anxiety.

Consistent with our second hypothesis and with the conclusions of Creswell and Cartwright-Hatton (2007), our remission analysis at 1-year follow-up showed that active parental involvement in CBT with emphasis on CM or TC was superior to (a) CBT with parental involvement without emphasis on these components, and (b) CBT without extensive parental involvement. Attrition rates did not differ significantly among groups, suggesting that these did not account for this finding. Interestingly, the rate of remission in

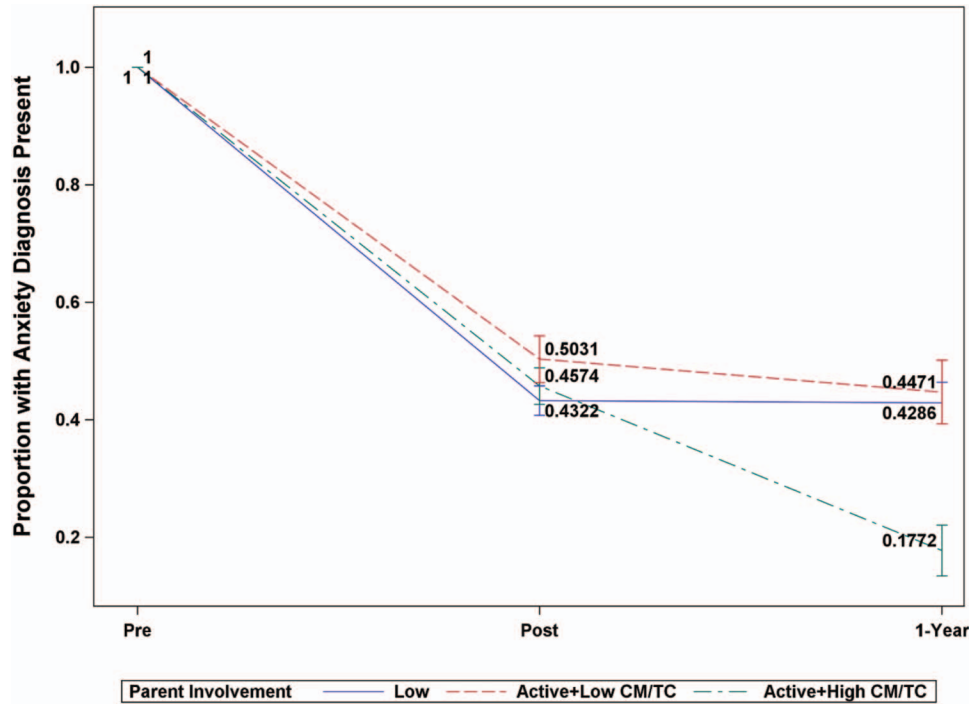


Figure 2. Presence of anxiety diagnosis at pre- and post-treatment and 1-year follow-up. CM = contingency management; TC = transfer of control. See the online article for the color version of this figure.

the high CM group continued to improve over time, whereas treatment gains were merely maintained in the other two groups. Perhaps parents' ability to coach their children in continued use of CBT strategies resulted in further therapeutic gains over time in the high CM group. Although we were not able to corroborate this finding using sensitivity analyses due to limited RCMAS and CBCL follow-up data, it provides initial support for the idea that type of parental involvement may moderate long-term CBT outcomes. If replicated, this finding would suggest that the additional time and resources required to train parents in CM and to transfer control to them may be justified in the long run, as this practice may enhance long-term treatment efficacy and thus potentially reduce the need for future mental health services.

Unlike Barrett, Dadds, and Rapee (1996) who found parental involvement effects that were more salient in younger children than older children, we did not find an interaction between the effect of parental involvement and age. Similarly, the presence or absence of externalizing comorbidity did not interact with treatment condition, so parental involvement did not appear to affect externalizing diagnoses. This result is contrary to the meta-analysis of Silverman et al. (2008) who found that parental involvement reduced nonanxiety symptoms and is also surprising in that CM in particular was originally developed for the management of externalizing behaviors (Kazdin, 1997). It is possible, however, that a more sensitive measure of externalizing symptoms (other than diagnosis) would have yielded a different result.

Limitations of this work pertain to study exclusion, heterogeneity of included studies, and inability to pursue certain analyses with the data available. First, publication bias is a general problem in the field that may have affected study inclusion. For example,

trials that can demonstrate significant group differences are more likely to be published than trials that cannot, potentially biasing analyses that are based on published trials alone. There may have been some further bias in the studies included in this particular article. The most common reason for eligible trials to be excluded was "data no longer available," favoring inclusion of data sets that had been regularly maintained over time (i.e., those from very well-established/well-organized research groups). Also, inclusion criteria for the original study eliminated studies that had usual care controls only (i.e., no waitlisted or attention controls), potentially excluding an important cohort from the present analysis.

Second, findings were likely affected by the diversity of studies included and the nonrandom nature of the assignment of subjects to comparison groups. For example, the estimation of group differences may have been affected by the fact that not all comparison conditions were included in all studies. Further, differences in patient characteristics (e.g., some trials limited to participants with social phobia, others including participants with multiple diagnoses), method of administration, and geographic locations among studies may have caused heterogeneity in our analyses. We did not have sufficient power to examine each of these differences separately. Last, despite our efforts to examine potential confounding factors, there is a risk of group differences relating to such factors in any nonrandom comparison such as this one.

Third, certain potentially important analyses could not be conducted. For example, including the baseline level of parental anxiety as a covariate would have been beneficial as a previous review found parental involvement to be particularly beneficial when parents are anxious themselves (Creswell & Cartwright-Hatton, 2007); however, data on this factor were inconsistently

available. Also, a lack of RCTs comparing different types of parental involvement in relation to treatment effects resulted in too little power to conduct a two-stage approach in meta-analysis, which might have been more reliable (Bowden, Tierney, Simmonds, Copas, & Higgins, 2011). However, a recent study suggests that a one-stage approach may be the most appropriate for subgroup analyses where some trials are missing participants in specified subgroup categories and a two-stage method could lack statistical power or result in aggregation bias (Stewart et al., 2012). Last, the follow-up interval in our study was limited to 1 year, and longer follow-up data should be examined in the future.

In conclusion, our study is the first to examine the effect of different types of parental involvement, as defined by level of intensity and behavioral techniques, on posttreatment and 1-year follow-up measures of anxiety diagnoses and symptoms. Our results suggest that different types of parental involvement may have an important effect on the maintenance of therapeutic gains in children and adolescents with anxiety disorders. Further investigation is warranted in rigorously designed RCTs. These trials should address both the overall question of what constitutes the most effective type of parental involvement as well as parental characteristics that may moderate or mediate the achievement of desired therapeutic gains.

References

References marked with an asterisk indicate studies included in the meta-analysis.

- Achenbach, T. M. (1991). *Manual for Child Behavior Checklist/4–18 and 1991 profile*. Burlington: University of Vermont, Department of Psychiatry.
- American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). Washington, DC: Author.
- *Baer, S., & Garland, E. J. (2005). Pilot study of community-based cognitive behavioral group therapy for adolescents with social phobia. *Journal of the American Academy of Child & Adolescent Psychiatry, 44*, 258–264. doi:10.1097/00004583-200503000-00010
- Barmish, A. J., & Kendall, P. C. (2005). Should parents be co-clients in cognitive-behavioral therapy for anxious youth? *Journal of Clinical Child and Adolescent Psychology, 34*, 569–581. doi:10.1207/s15374424jccp3403_12
- *Barrett, P. M., Dadds, M. R., & Rapee, R. M. (1996). Family treatment of childhood anxiety: A controlled trial. *Journal of Consulting and Clinical Psychology, 64*, 333–342. doi:10.1037/0022-006X.64.2.333
- Barrett, P. M., Rapee, R. M., Dadds, M. M., & Ryan, S. M. (1996a). Family enhancement of cognitive style in anxious and aggressive children. *Journal of Abnormal Child Psychology, 24*, 187–203. doi:10.1007/BF01441484
- *Beidel, D. C., Turner, S. M., & Morris, T. L. (2000). Behavioral treatment of childhood social phobia. *Journal of Consulting and Clinical Psychology, 68*, 1072–1080. doi:10.1037/0022-006X.68.6.1072
- *Beidel, D. C., Turner, S. M., Young, B., & Paulson, A. (2005). Social effectiveness therapy for children: Three-year follow-up. *Journal of Consulting and Clinical Psychology, 73*, 721–725. doi:10.1037/0022-006X.73.4.721
- Bennett, K., Manassis, K., Walter, S. D., Cheung, A., Wilansky-Traynor, P., Diaz-Granados, N., . . . Wood, J. J. (2013). Cognitive behavioral therapy age effects in child and adolescent anxiety: An individual patient data meta-analysis. *Depression and Anxiety, 30*, 829–841. doi:10.1002/da.22099
- *Bodden, D. H., Bogels, S. M., Nauta, M. H., De Haan, E., Ringrose, J., Appelboom, C., . . . Appelboom-Geerts, K. C. (2008). Child versus family cognitive-behavioral therapy in clinically anxious youth: An efficacy and partial effectiveness study. *Journal of the American Academy of Child & Adolescent Psychiatry, 47*, 1384–1394. doi:10.1097/CHI.0b013e318189148e
- Bowden, J., Tierney, J. F., Simmonds, M., Copas, A. J., & Higgins, J. P. T. (2011). Individual patient data meta-analysis of time-to-event outcomes: One-stage versus two-stage approaches for estimating the hazard ratio under a random-effects model. *Research Synthesis Methods, 2*, 150–162. doi:10.1002/jrsm.45
- Breinholst, S., Esbjorna, B. H., Reinholdt-Dunnea, M. L., & Stallard, P. (2012). CBT for the treatment of child anxiety disorders: A review of why parental involvement has not enhanced outcomes. *Journal of Anxiety Disorders, 26*, 416–424. doi:10.1016/j.janxdis.2011.12.014
- Crawford, A. M., & Manassis, K. (2001). Familial predictors of treatment outcome in childhood anxiety disorders. *Journal of the American Academy of Child & Adolescent Psychiatry, 40*, 1182–1189. doi:10.1097/00004583-200110000-00012
- Creswell, C., & Cartwright-Hatton, S. (2007). Family treatment of child anxiety: Outcomes, limitations, and future directions. *Clinical Child and Family Psychology Review, 10*, 232–252. doi:10.1007/s10567-007-0019-3
- *Dadds, M. R., Holland, D. E., Spence, S. H., Laurens, K. R., Mullins, M., & Barrett, P. M. (1999). Early intervention and prevention of anxiety disorders in children: Results at 2-year follow-up. *Journal of Consulting and Clinical Psychology, 67*, 145–150. doi:10.1037/0022-006X.67.1.145
- *Dadds, M. R., Spence, S. H., Holland, D. E., Barrett, P. M., & Laurens, K. R. (1997). Prevention and early intervention for anxiety disorders: A controlled trial. *Journal of Consulting and Clinical Psychology, 65*, 627–635. doi:10.1037/0022-006X.65.4.627
- Dubord, G. (2011). Part 12. Systematic desensitization. *Canadian Family Physician, 57*, 1299.
- *Flannery-Schroeder, E., & Kendall, P. C. (2000). Group and individual cognitive-behavioral treatments for youth with anxiety disorders: A randomized clinical trial. *Cognitive Therapy and Research, 24*, 251–278. doi:10.1023/A:1005500219286
- *Ginsburg, G. S., & Drake, K. L. (2002). School-based treatment for anxious African American adolescents: A controlled pilot study. *Journal of the American Academy of Child & Adolescent Psychiatry, 41*, 768–775. doi:10.1097/00004583-200207000-00007
- Ginsburg, G. S., Silverman, W. K., & Kurtines, W. M. (1995). Family involvement in treating children with phobic and anxiety disorders: A look ahead. *Clinical Psychology Review, 15*, 457–473. doi:10.1016/0272-7358(95)00026-L
- Higgins, J. P. T., & Green, S. (Eds.). (2011). *Cochrane handbook for systematic reviews of interventions: Version 5.1.0*. Retrieved from www.cochrane-handbook.org
- *Hudson, J. L., Rapee, R. M., Deveney, C., Schniering, C. A., Lyneham, H. J., & Bovopoulos, N. (2009). Cognitive-behavioral treatment versus an active control for children and adolescents with anxiety disorders: A randomized trial. *Journal of the American Academy of Child & Adolescent Psychiatry, 48*, 533–544. doi:10.1097/CHI.0b013e31819c2401
- In-Albon, T., & Schneider, S. (2007). Psychotherapy of childhood anxiety disorders: A meta-analysis. *Psychotherapy and Psychosomatics, 76*, 15–24. doi:10.1159/000096361
- James, A. C., James, G., Cowdrey, F. A., Soler, A., & Choke, A. (2013). Cognitive behavioural therapy for anxiety disorders in children and adolescents. *The Cochrane Database Systematic Reviews, 6*, Article No. CD004690. doi:10.1002/14651858.CD004690.pub3
- Kazdin, A. E. (1997). Parent management training: Evidence, outcomes, and issues. *Journal of the American Academy of Child & Adolescent Psychiatry, 36*, 1349–1356. doi:10.1097/00004583-199710000-00016

- *Kendall, P. C. (1994). Treating anxiety disorders in children: Results of a randomized clinical trial. *Journal of Consulting and Clinical Psychology, 62*, 100–110. doi:10.1037/0022-006X.62.1.100
- *Kendall, P. C., Flannery-Schroeder, E., Panichelli-Mindel, S. M., Southam-Gerow, M., Henin, A., & Warman, M. (1997). Therapy for youths with anxiety disorders: A second randomized clinical trial. *Journal of Consulting and Clinical Psychology, 65*, 366–380. doi:10.1037/0022-006X.65.3.366
- *Kendall, P. C., Hudson, J. L., Gosch, E., Flannery-Schroeder, E., & Suveg, C. (2008). Cognitive-behavioral therapy for anxiety disordered youth: A randomized clinical trial evaluating child and family modalities. *Journal of Consulting and Clinical Psychology, 76*, 282–297. doi:10.1037/0022-006X.76.2.282
- Khanna, M. S., & Kendall, P. C. (2009). Exploring the role of parent training in the treatment of childhood anxiety. *Journal of Consulting and Clinical Psychology, 77*, 981–986. doi:10.1037/a0016920
- *Masia Warner, C., Fisher, P. H., Shrout, P. E., Rathor, S., & Klein, R. G. (2007). Treating adolescents with social anxiety disorder in school: An attention control trial. *Journal of Child Psychology and Psychiatry, 48*, 676–686. doi:10.1111/j.1469-7610.2007.01737.x
- *Masia Warner, C., Klein, R. G., Dent, H. C., Fisher, P. H., Alvir, J., Albano, A. M., & Guardino, M. (2005). School-based intervention for adolescents with social anxiety disorder: Results of a controlled study. *Journal of Abnormal Child Psychology, 33*, 707–722. doi:10.1007/s10802-005-7649-z
- Moher, D., Liberati, A., Tetzlaff, J., Altman, D. G., & the PRISMA Group. (2009). Preferred Reporting Items for Systematic Reviews and Meta-Analyses: The PRISMA statement. *PLoS Medicine, 6*, e1000097. doi:10.1271/journal.pmed1000097
- Murray, L., Cooper, P., Creswell, C., Schofield, E., & Sack, C. (2007). The effects of maternal social phobia on mother-infant interactions and infant social responsiveness. *Journal of Child Psychology and Psychiatry, 48*, 45–52.
- *Nauta, M. H., Scholing, A., Emmelkamp, P. M. G., & Minderaa, R. B. (2003). Cognitive-behavioral therapy for children with anxiety disorders in a clinical setting: No additional effect of a cognitive parent training. *Journal of the American Academy of Child & Adolescent Psychiatry, 42*, 1270–1278. doi:10.1097/01.chi.0000085752.71002.93
- *Rapee, R. M., Abbott, M. J., & Lyneham, H. J. (2006). Bibliotherapy for children with anxiety disorders using written materials for parents: A randomized controlled trial. *Journal of Consulting and Clinical Psychology, 74*, 436–444. doi:10.1037/0022-006X.74.3.436
- Reynolds, C. R., & Richmond, B. O. (1978). What I think and feel: A revised measure of children's manifest anxiety. *Journal of Abnormal Child Psychology, 6*, 271–280. doi:10.1007/BF00919131
- Reynolds, S., Wilson, C., Austin, J., & Hooper, L. (2012). Effects of psychotherapy for anxiety in children and adolescents: A meta-analytic review. *Clinical Psychology Review, 32*, 251–262. doi:10.1016/j.cpr.2012.01.005
- Schniering, C. A., Hudson, J. L., & Rapee, R. M. (2000). Issues in the diagnosis and assessment of anxiety disorders in children and adolescents. *Clinical Psychology Review, 20*, 453–458. doi:10.1016/S0272-7358(99)00037-9
- Shortt, A. L., Barrett, P. M., & Fox, T. L. (2001). Evaluating the FRIENDS Program: A cognitive-behavioral group treatment for anxious children and their parents. *Journal of Clinical Child Psychology, 30*, 525–535. doi:10.1207/S15374424JCCP3004_09
- Silverman, W. K., & Albano, A. M. (1996). *The Anxiety Disorders Interview Schedule for DSM-IV: Child and Parent Versions*. London, England: Oxford University Press.
- Silverman, W. K., & Kurtines, W. M. (1999). A pragmatic perspective toward treating children with phobia and anxiety problems. In S. W. Russ & T. H. Ollendick (Eds.), *Handbook of psychotherapies with children and families* (pp. 505–521). New York, NY: Kluwer Academic/Plenum Press. doi:10.1007/978-1-4615-4755-6_26
- *Silverman, W. K., Kurtines, W. M., Ginsburg, G. S., Weems, C. F., Lumpkin, P. W., & Carmichael, D. H. (1999). Treating anxiety disorders in children with group cognitive-behavioral therapy: A randomized clinical trial. *Journal of Consulting and Clinical Psychology, 67*, 995–1003. doi:10.1037/0022-006X.67.6.995
- *Silverman, W. K., Kurtines, W. M., Ginsburg, G. S., Weems, C. F., Rabian, B., & Serafini, L. T. (1999). Contingency management, self-control, and education support in the treatment of childhood phobic disorders: A randomized clinical trial. *Journal of Consulting and Clinical Psychology, 67*, 675–687. doi:10.1037/0022-006X.67.5.675
- Silverman, W. K., Pina, A. A., & Viswesvaran, C. (2008). Evidence-based psychosocial treatments for phobic and anxiety disorders in children and adolescents. *Journal of Clinical Child & Adolescent Psychology, 37*, 105–130. doi:10.1080/15374410701817907
- *Spence, S. H., Holmes, J. M., March, S., & Lipp, O. V. (2006). The feasibility and outcome of clinic plus Internet delivery of cognitive-behavior therapy for childhood anxiety. *Journal of Consulting and Clinical Psychology, 74*, 614–621. doi:10.1037/0022-006X.74.3.614
- Spielmann, G. I., Pasek, L. F., & McFall, J. P. (2007). What are the active ingredients in cognitive and behavioral psychotherapy for anxious and depressed children? A meta-analytic review. *Clinical Psychology Review, 27*, 642–654. doi:10.1016/j.cpr.2006.06.001
- Stewart, G. B., Altman, D. G., Askie, L. M., Duley, L., Simmonds, M. C., & Stewart, L. A. (2012). Statistical analysis of individual participant data meta-analyses: A comparison of methods and recommendations for practice. *PLoS One, 7*, e46042. doi:10.1371/journal.pone.0046042
- Wood, J. J., Piacentini, J. C., Southam-Gerow, M., Chu, B. C., & Sigman, M. (2006). Family cognitive behavioral therapy for child anxiety disorders. *Journal of the American Academy of Child & Adolescent Psychiatry, 45*, 314–321. doi:10.1097/01.chi.0000196425.88341.b0

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