



Interventions to Improve Psychosocial Functioning following Pediatric TBI: Where Are We and Where Do We Need to Be

Shari L. Wade, Ph.D.
Professor
Cincinnati Children's Hospital Medical Center



Acknowledgements

Funding for the studies described here was provided by the National Institute on Disability and Rehabilitation Research, the National Institute of Child Health and Human Development, the National Institute of Mental Health, the Ohio Department of Public Safety, and the Colorado Brain Injury Trust Fund.

Thanks to the hundreds of children and families who have shaped our understanding of the challenges associated with TBI and what works.



Objectives

Provide a brief overview of the challenges children face following TBI.

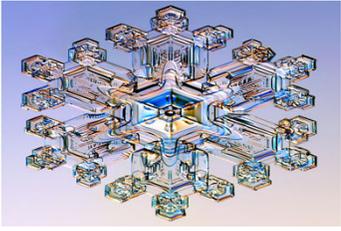
Discuss evidence-based approaches to improving cognitive, behavioral, and psychosocial outcomes following TBI

Review the evidence for cognitive rehabilitation, family problem solving, and positive parenting skills

Discuss limitations of current research and challenges of getting evidence-based interventions into consumer's/family's hands.

Cincinnati Children's

Brain Injuries are Like Snowflakes-Each one is different



Cincinnati Children's

Common Consequences

- Changes in attention, working memory, planning and organization
- Changes in behavior-some children become irritable and aggressive, others become anxious and depressed
- Changes in social relationships
- Stress for caregivers and families

Cincinnati Children's

Interventions to Improve Outcomes: Where are we?



 Cincinnati Children's

The Glass is Half Full

- Proliferation of clinical trials in the past decade
- More randomized controlled trials
- Larger sample sizes (140, 132)
- Greater emphasis on generalization and maintenance
- Greater attention to outcomes

 Cincinnati Children's

We Still Have a Ways to Go!

- 2011 review (Ross, Dorris, McMillan; 2011) identified 9 studies meeting their criteria
 - 5 focusing on cognitive retraining
 - 4 focusing on psychosocial outcomes

Only two (one cognitive, one psychosocial) met the criteria for high quality using the Consolidated Standards of Reporting Trials (CONSORT) criteria



 Cincinnati Children's

Approaches to Intervention

- Behavioral
- Cognitive-behavioral/metacognitive strategies
- Cognitive remediation/direct training
- Family-centered approaches
- School-based Identification and Management
- Pharmacological

 Cincinnati Children's

Behavioral Approaches

- Shift in who implements the intervention
- Earlier studies involved multiple case series with teacher or behavioral specialist implementing a behavior program with school-age children
- More recently, focus on parents as the individual implementing the program (Antonini et al., 2012; Braga et al., 2005; Woods, Catroppa, Giallo, Matthews, & Anderson, 2012)

 Cincinnati Children's

Cognitive-Behavioral Approaches

- Focus on self-monitoring, self-regulation and problem solving skills.
- Can be done one-on-one, in a therapeutic group, or in a classroom setting.
- Training in metacognitive skills has traditionally been viewed as compensatory in nature.
- More recent arguments contend that training in metacognitive approaches can be a form of direct training.

 Cincinnati Children's

Evidence and Issues

- Number of recent studies with inconsistent findings (see Catroppa, Anderson, & Muscara, 2009; Braga, Rossi, Moretto, Magalhaes da Silva & Cole, 2012).
- Issues regarding appropriate outcome measures and sample heterogeneity.
- No understanding of the role of timing, intensity, or method of delivery in treatment efficacy.

 Cincinnati Children's

Direct Training of Attention and EF
Direct Attention Training

- Goal of direct attention training is to improve the underlying attention deficit by targeting specific attention skills (Butler et al, 2008; Sohlberg et al, 2003).
- Attentional abilities can be improved by providing structured opportunities for exercising a particular aspect of attention (i.e. selective attention, sustained attention, inhibition, working memory, etc).

 Cincinnati Children's

Evidence for Attention Training with Pediatric TBI

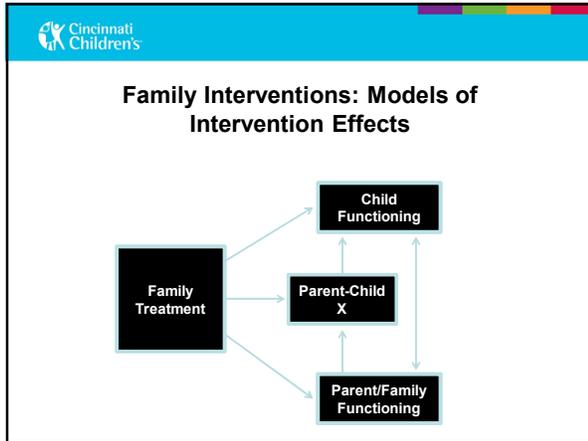
Hybrid Approaches Combining Attention and Strategy Training

- Galbiati et. al (2009) demonstrate the efficacy of integrating metacognitive strategy with direct attention training in adolescents with TBI.
 - Significant improvements on the Continuous Performance Task (CPT) Overall Index as well as reductions in impulsiveness on the task and omission errors when compared to controls.
 - Additionally, significant improvements on measures of adaptive behaviors including daily living skills, social skills, and communication at post-intervention assessment as well as at the one year follow-up assessment

 Cincinnati Children's

Issues with Attention Training

- Commercially marketed as effective but there is really limited evidence regarding maintenance and transfer of effects.
- Limited evidence that direct attention training, in the absence of training in metacognitive skills, generalizes to every day settings such as the classroom



Evidence for the Effectiveness of Family Centered Treatments

- Different models-just parents versus parents and kids
- Parents alone may be more effective in reducing caregiver distress and burden
- Interventions involving the child and caregiver have demonstrated efficacy in improving both child and caregiver functioning.
- Effects may be direct rather than mediated through changes in family interaction.

Rehabilitation Research and Training Center for Pediatric TBI Interventions

- Funded by NIDRR
- Overarching goal is to advance the field of interventions for pediatric TBI through a systematic and coordinated approach of development, replication, and dissemination of promising intervention practices to address the cognitive, behavioral, and psychosocial consequences of pediatric TBI.

 Cincinnati Children's

Three Intervention Programs: One Size Doesn't Fit All

- **A Behavioral Approach for Young Children**
 - **Internet Interacting Together Everyday: Recovery After TBI (I-InTERACT)**-web-based parenting skills for children ages 3-9 with moderate to severe TBI.
- **A Direct Attention and Strategy Training program for youth with attention problems post TBI.**
 - **Attention Intervention Management (AIM)**
- **Family versus Metacognitive Approaches.**
 - **Teen Online Problem Solving (TOPS)**-randomized trial contrasting individual versus family problem solving training relative to an Internet Resource Comparison group (IRC)

 Cincinnati Children's

I-InTERACT: An Approach for Younger Children with TBI

- Online intervention to improve parent-child interactions following TBI
- Based on parent-child interaction therapy, a form of behavior therapy implemented by the parent
- Parents learn to follow their child's lead and to provide consistent direction and follow through.

 Cincinnati Children's

I-InTERACT Structure and Content

- Web-based didactic information about positive parenting skills and the effects of TBI on child behavior.
- The program emphasizes warm responsive parenting and consistent discipline.
- Initial session in the family's home.
- All subsequent sessions are done online.
- After each didactic session, the therapist meets with the family on Skype to review and to provide live coaching on the skills.

 Cincinnati Children's

Session Content

- Positive Parenting Skills
- Antecedent Behavior Management
- Giving Good Commands
- Using Time-Out
- Positive Parenting Skills in Real Life
- Stress Management
- Anger Management
- Cognitive & Behavioral Consequences of TBI

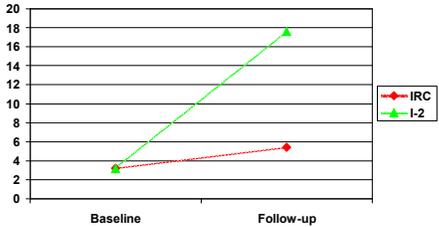
 Cincinnati Children's

Participant Characteristics

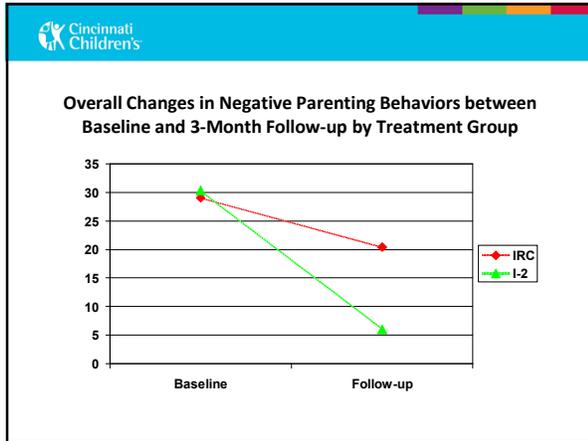
	IRC (20)	I ² (20)
Caregiver Age	32.40 (6.81)	32.80 (7.36)
ED ≤ High School	55%	45%
Married	65%	45%
Child's Race	70% white 30% AA/mixed	55% white 45% AA/mixed
# of Children	2.70 (1.17)	3.30 (2.06)

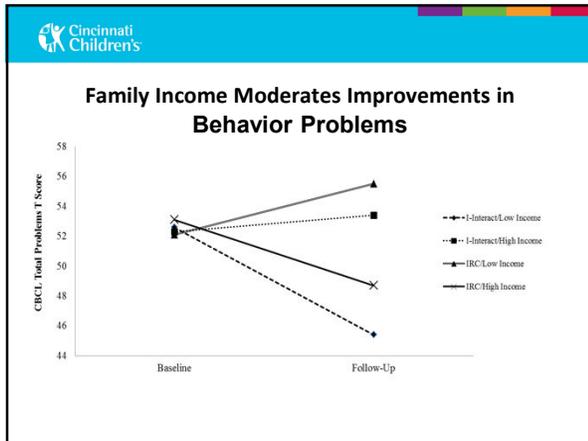
 Cincinnati Children's

Overall Changes in Positive Parenting Behaviors between Baseline and 3-Month Follow-up by Treatment Group



Treatment Group	Baseline	Follow-up
IRC	~3	~5
I-2	~3	~18





Summary and Conclusions

- Delivering a web-based parenting skills intervention to parents of children with TBI is feasible
- I-Interact results in significant increases in positive parenting behaviors and decreases in negative parenting behaviors
- Improvements in child behavior following the intervention are moderated by SES, with lower income families reporting the greatest benefits.

 Cincinnati Children's

Attention Intervention Management (AIM)

- The attention exercises are adapted from the Attention Training Program (ATP-3; Lash and Associates, 2011).
- The program provides direct attention training coupled with training in metacognitive strategies and considerations for generalization.
- 10 weeks of weekly meetings with a therapist and daily home practice 3-5 times per week.

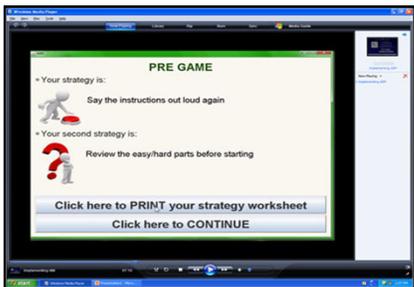
 Cincinnati Children's

Components of Each AIM Session

- Pre-Game
 - Review strategy use and homework practice
 - Predict performance
- In-the-Game
 - Do the tasks
- Post-Game
 - Review performance and strategy use
 - Plan for homework practice and strategy use

 Cincinnati Children's

Reviewing Metacognitive Strategies



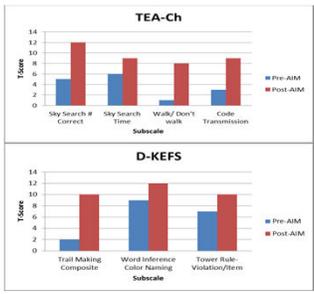
 Cincinnati Children's

In-the-Game Attention Training

- Six exercises within each AIM session
- During each exercise, students are prompted to use their strategies.
- The clinician can record participant performance (accuracy, error, pattern, distractions, etc.) in the session notes.
- Self-reflection- After each exercise the student rates his or her motivation and effort using sliders.

 Cincinnati Children's

Pre- Post Improvements following AIM: A Case Study



Subscale	Pre-AIM	Post-AIM
Sky Search # Correct	~6	~12
Sky Search Time	~6	~10
Walk/Don't walk	~1	~8
Code Transmission	~4	~10

Subscale	Pre-AIM	Post-AIM
Trail Making Composite	~2	~10
Word Inference Color Naming	~8	~12
Tower Rule Violation/Item	~6	~10

 Cincinnati Children's

Teen Online Problem Solving

- 10 sessions providing training in problem-solving skills, self-regulation/anger control, and communication/relationships.
- Each web module includes didactic information, videos of teens talking about their experiences, and exercises to practice the skills.
- After completing each web module, the teen meets with a therapist to review the skills and implement the problem-solving process around a goal identified by the teen or family.

Cincinnati Children's

Findings From Trials of Problem-Solving Therapy with Adolescents

Across 3 trials with more than 200 youth, we find consistent improvements in behavior problems and executive function skills, particularly among older adolescents and those from lower income families. Findings from our large randomized trial (n=132) suggest that improvements are maintained/continue to emerge a full year following treatment.

Parents also report reductions in depression and distress following treatment.

Cincinnati Children's

Effects of Family Problem-Solving Over Time on Internalizing Behavior Problems

High school

Time Point	CAPS (Internalizing Problems)	IRC (Internalizing Problems)
Baseline	~53	~55
6 Months	~51	~54.5
12 Months	~50	~54.5
18 Months	~49	~54

Cincinnati Children's

Family versus Individual Approaches

- Participants are randomized to one of three groups: TOPS-Family, TOPS-Teen Only, or an Internet Resource Comparison group (IRC)
- In the Family condition all sessions include the teen and at least one parent or caregiver.
- In the Teen Only group, the teen meets with the therapist alone after the initial two sessions.
- The different groups will provide information regarding models of treatment effects and who is likely to benefit from each treatment.

 Cincinnati Children's

Evidence of Acceptability and Satisfaction

- Teens in all three groups had comparable levels of satisfaction (about 80% thought it was helpful)
- Fewer numbers of parents in the Teen Only intervention thought it was helpful (80% versus 90+% in family version)
- Equal numbers of sessions completed in each group (M = 8)
- The teen only condition was prohibitively difficult for individuals with significant cognitive and communication deficits

 Cincinnati Children's

What We're Hoping to Learn

- Who benefits from differing approaches to treatment
- Need for family involvement versus one-on-one
- Intensity of treatment and relationship to pre-injury resources and/or injury severity
- Maintenance of treatment effects

 Cincinnati Children's

Remaining Challenges

- Timing of intervention relative to neural recovery
- Timing of intervention in relation to typical neural development (periods of enhanced plasticity)
- Combined or sequenced interventions
- Intensity and duration of treatment to have a meaningful effect
