Autism Spectrum Disorders:

Evidence-Based Practices and Interventions
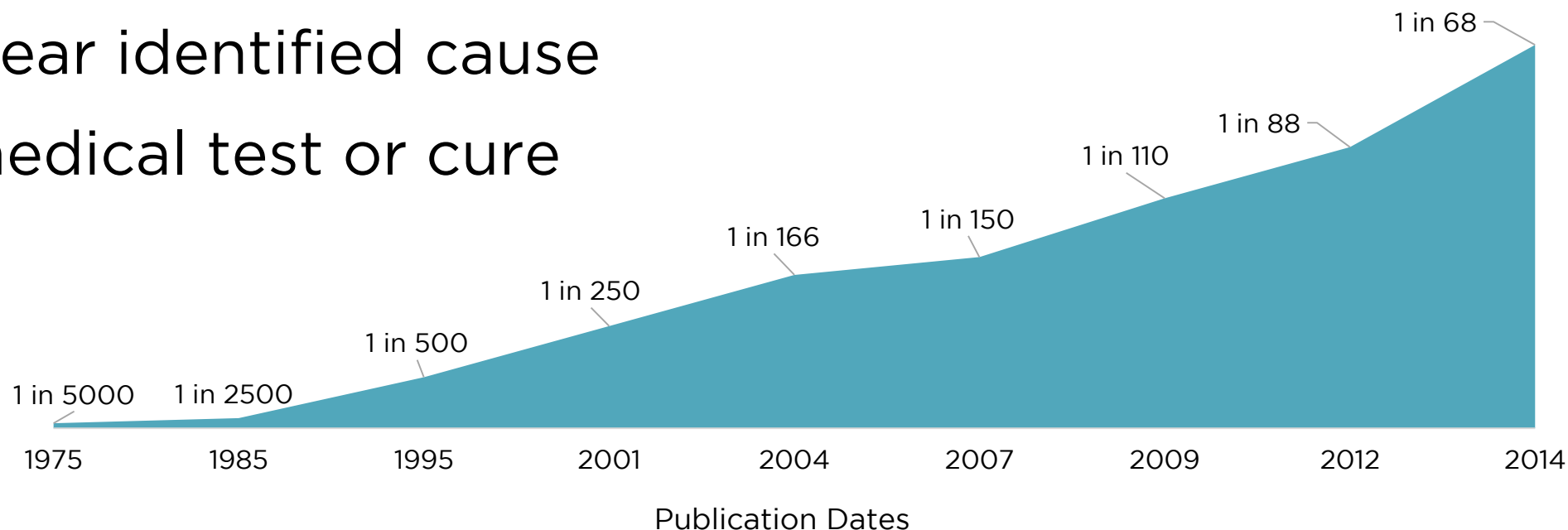
Overview

- Importance of using Evidence-Based Practices (EBPs)

- Overview of EBP

- Guidelines for Selecting, Implementing, and Monitoring

- Example Cases: Identifying EBPs

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Importance of Using Evidence-Based Practices (EBPs)

Autism Spectrum Disorders

1 in 68 children (1 in 42 boys & 1 in 189 girls)

- More common than childhood cancer, juvenile diabetes, and pediatric AIDS combined

- No clear identified cause

- No medical test or cure

Chart data points:
- 1975: 1 in 5000
- 1985: 1 in 2500
- 1995: 1 in 500
- 2001: 1 in 250
- 2004: 1 in 166
- 2007: 1 in 150
- 2009: 1 in 110
- 2012: 1 in 88
- 2014: 1 in 68

Publication Dates

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Autism Spectrum Disorder

Two main domains where individuals with ASD show persistent deficits

1. Social communication and social interaction

2. Restricted and repetitive patterns of behavior

Autism Spectrum Disorders

Measured Intelligence

Severely Impaired---Gifted

Social Interaction

Aloof--------------------------------Passive--Active

Communication

Nonverbal--Verbal

Behaviors

Intense---Mild

Sensory

Sensory-seeking--Sensory Aversions

Motor

Uncoordinated---Coordinated

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Desire for Effective Interventions

- The field of autism treatment and intervention has been exposed to many false claims and pseudoscience
  - Speculation and untested assumptions
  - Unverified reports or testimonials only
  - Unproven results and not supported by quality research

- Pseudoscience has led to:
  - Loss of time and improvement by effective practices
  - Loss of resources and money by families and agencies
  - Detrimental impact on many individuals with autism

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Evidence-Based Practices

"Evidence-based practice requires careful assessment of current research with the goal of identifying interventions that have demonstrated effectiveness"
(MAGI, 2012)

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Evidence Based Practices

- Can lead to improved outcomes for individuals with ASD
  - Can drastically impact rate of skill acquisition
  - Increase independence and overall outcomes
  - Reduce cost to families and service providers for adult care
- Begin as early as possible (shortly after diagnosis)
- Used in conjunction with best practice screening and assessment tools

Essential for Schools

- Schools are primary intervention providers

- Individuals with Disabilities Education Act (IDEA) requires educational strategies be based on "scientifically based research"

- Enrollment in schools in the autism category has quadrupled nationwide since 2000

- Collaboration is key across providers

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Evidence-Based Practices

Considerations for EBPs and IEPs:

- Parents are informed

- Need to have baseline data in IEP

- Need to have progress monitoring data

- Be prepared for parents to ask how data is collected and to have it graphed

- Be prepared to talk about what strategies you are using and decision making

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Evidence-Based Practices

- Emphasis on EBP:
  - Current standard for professionals across many fields (e.g., medicine, psychology, education)

- Scientific research used to identify effective practices
  - Identifying specific interventions for targeted needs
  - Identifying who the intervention works for

Evidence-Based Practices

Standards for research have been established and must meet criteria for quality and rigor

- Is the practice well defined to be replicable?

- Is there independent and high quality research to support efficacy

- Does the research specify who it is most beneficial for?

Evidence-Based Practices

Missouri Autism Guidelines Initiative (MAGI)

Autism Spectrum Disorders:
Guide to Evidence-Based Interventions

The content in "The Guide":

- Crosses systems of care

- Provides access to systematic reviews

- Is centered on families

- Focused on the individual

Free copies available thanks to Missouri Foundation for Health

Download online at: www.autismguidelines.dmh.mo.gov

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Evidence-Based Practices

Identified Categories of Evidence or Support:

- <u>Established</u> evidence based practices

- <u>Promising practices</u> with an emerging research

- <u>Unsupported practices</u>

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Evidence-Based Practices
Systematic Reviews

- National Professional Development Center on Autism Spectrum Disorders (NPDC) *revised 2014*

- Centers for Medicare and Medicaid Service (prepared by IMPAQ)

- National Autism Center (NSP)

- Agency for Healthcare Research and Quality (AHRQ)

- Stanford Autism Research Team (StART)

- Evaluation of Comprehensive Treatment Models for Individuals with Autism Spectrum Disorders (CTM)

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Evidence-Based Practices

Intervention Approaches

Comprehensive Treatment Models

- Set of practices to address core deficits of ASD
    - TEACCH Program (Schopler and Colleagues, 2000)
    - Denver model (Rogers and Colleagues, 2000)
    - LEAP model (Strain & Hoyson, 2000)

Focused intervention practices

- Address single skill or goal of a student with ASD
- Specifically defined and shorter period of time than CTMs

Evidence-Based Practices

- Focused Behavior Interventions:
  - Antecedent Package
  - Prompting
  - Stimulus Control
  - Environmental Modification
  - Time Delay

- Behavioral Package:
  - Differential Reinforcement
  - Discrete Trial Training
  - Extinction
  - Functional Behavior Assessment
  - Functional Communication Training
  - Reinforcement
  - Response Interruption/Redirection
  - Task Analysis and Chaining

- Cognitive Behavioral Intervention
- Joint Attention Intervention
- Modeling
- Multi-component Package
- Naturalistic Interventions
- Parent Implemented Intervention

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Evidence-Based Practices

- Peer Mediated Interventions
- Picture Exchange Communication System
- Pivotal Response Training
- Schedules
- Self-Management
- Social-Communication Interventions
- Social Narratives
- Social Skills Intervention
- Speech Generating Devices
- Structured Work Systems

- Supported Employment
- Technology- based Treatment
- Computer-Aided Instruction
- Visual Supports

Comprehensive Behavior Interventions

- Comprehensive Behavioral Intervention Programs for Young Children
- Structured Teaching

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Evidence-Based Practices

- There is **<u>not</u>** one evidence based practice that is going to meet all of your needs

- Developing an intervention plan for comprehensive programming is essential
  - Identifying goals to target
  - Matching interventions to these goals

Evidence-Based Practices
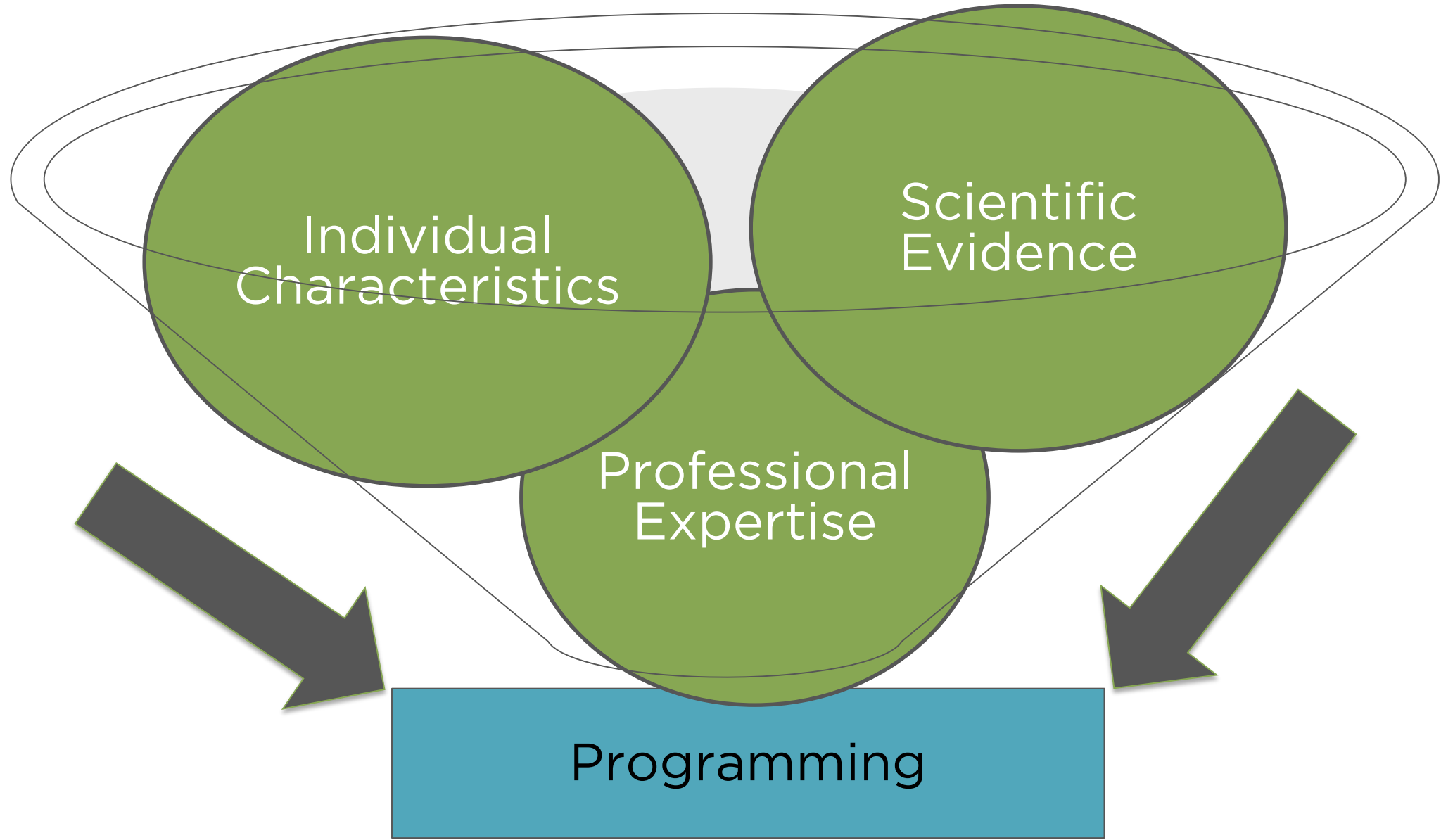
Developing an Intervention Plan

Developing an Intervention Plan

Is similar to planning a trip…

- Deciding where to go (purpose/goal)
- How you plan to get there (consider context)
- Choose a route (most direct and established)
- Pack (plan what materials you'll need)
- Be aware of and plan for potential detours or delays
- Reflect on the trip and how you can improve next time

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Developing an Intervention Plan

Step 1: Conduct Assessment

Autism Spectrum Disorders: Missouri Best Practice Guidelines for Screening, Diagnosis, and Assessment

Step 2: Develop Intervention Plan

– Identify Goals

– Select Interventions

– Determine Procedures for Monitoring Progress

Step 3: Monitor Progress

– Baseline data to compare intervention effectiveness

– Make informed decisions

Selecting EBPs

1. Using the goals outlined in the core deficit areas and priority needs for future independence
   - These goals should be based off of the student's most recent evaluation information and areas of impact
   - Determine the goal area to be targeted (e.g., language, social, academic, etc.)

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Selecting EBPs

2. Use the *Effective ASD interventions by Goal Area* table (page 72) of the MAGI guide

   – Identify possible evidence based interventions to use

Selecting EBPs

Evidence-Based Practices	Academic & Cognition	Behavior	Communication	Play	Social	Transition
Antecedent-based Interventions	■	■				
Computer Assisted Instruction	■					
Differential Reinforcement		■	■		■	
Discrete Trial Training	■	■	■		■	
Extinction		■				
Functional Behavioral Assessment		■	■			
Functional Communication Training		■	■			
Naturalistic Interventions			■		■	
Parent Implemented Interventions		■	■	■	■	
Peer Mediated Instruction/Intervention			■		■	
Picture Exchange Communication System		■	■		■	
Pivotal Response Training	■	■	■	■	■	
Prompting	■	■	■			
Reinforcement	■	■	■			
Response Interruption & Redirection	■	■				
Self-Management	■	■	■		■	■
Social Narratives	■	■	■		■	
Social Skills Groups			■		■	
Speech Generating Devices (VOCA)			■			
Structured Work Systems	■			■		■
Tasks Analysis	■	■	■		■	
Time Delay	■		■	■	■	
Video Modeling	■	■	■		■	
Visual Supports	■	■	■	■	■	■

Selecting EBPs

3. Consider the child's individual strengths and needs
   – The learner's interests and motivators
   – Age
   – Level of Cognitive Functioning
   – Level of Functional Communication
   – Nature and Extent of Social Impairment
   – Presence of Intrusive Stereotypic Behaviors
   – Co-occurring psychiatric symptoms
   – History of what has and has <u>not</u> worked

Step 4: Use Professional Expertise

Step 5: Implement the Intervention and Progress Monitor

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Guidelines for Selecting, Implementing & Monitoring

Selecting an Intervention

By Goal Target:

- Identify goals first

- Match domain area to measureable goals

- For example:
  - If the goal is to improve social skills, select an intervention found to be effective in the Social domain

Selecting an Intervention
By Goal Target:

Evidence-Based Practices	Domains					
	Academic & Cognition	Behavior	Communication	Play	Social	Transition
Antecedent-based Interventions	X	X				
Computer Assisted Instruction	X					
Differential Reinforcement		X	X		X	
Discrete Trial Training	X	X	X	X	X	
Extinction		X				
Functional Behavioral Assessment		X	X			
Functional Communication Training		X	X			
Naturalistic Interventions			X		X	
Parent Implemented Interventions		X	X	X	X	
Peer Mediated Instruction/Intervention			X		X	
Picture Exchange Communication System			X		X	
Pivotal Response Training	X	X	X	X	X	
Prompting	X	X	X			
Reinforcement	X	X	X			
Response Interruption & Redirection	X	X	X			
Self-Management	X	X	X		X	X
Social Narratives	X	X	X		X	
Social Skills Groups			X		X	
Speech Generating Devices (VOCA)			X			
Structured Work Systems	X			X		X
Tasks Analysis	X	X	X		X	
Time Delay	X		X	X	X	
Video Modeling	X		X	X	X	
Visual Supports	X	X	X	X	X	X

Selecting an Intervention

By Individual Characteristics:

- Match to age/grade level
- Match to cognitive level

Selecting an Intervention

By Age/Grade Level: Early Childhood (EC), Elementary (EL), Middle School (MS), High School (HS)

Evidence-Based Practices	Academic & Cognition			Behavior			Communication			Play			Social			Transition		
	EC	EL	MS/HS	EC	EL	MS/HS	EC	EL	MS/HS	EC	EL	MS/HS	EC	EL	MS/HS	EC	EL	MS/HS
Antecedent-based Interventions	█	█	█	█	█	█												
Computer Assisted Instruction	█	█	█															
Differential Reinforcement				█	█	█							█	█	█			
Discrete Trial Training	█	█		█	█		█	█		█	█		█	█				
Extinction				█	█	█												
Functional Behavioral Assessment				█	█	█	█	█	█									
Functional Communication Training				█	█		█	█	█									
Naturalistic Interventions							█	█	█				█	█	█			
Parent Implemented Interventions				█	█		█	█	█	█	█							
Peer Mediated Instruction/Intervention								█	█				█	█	█			
Picture Exchange Communication System				█	█	█	█	█	█				█	█				
Pivotal Response Training				█	█	█	█	█	█	█	█	█	█	█	█			
Prompting	█	█	█	█	█	█	█	█	█									
Reinforcement	█	█	█	█	█	█	█	█										
Response Interruption & Redirection	█	█	█	█	█	█												
Self-Management	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█
Social Narratives	█	█	█	█	█	█	█	█	█				█	█	█			
Social Skills Groups							█	█	█				█	█	█			
Speech Generating Devices (VOCA)							█	█	█									
Structured Work Systems	█	█	█							█	█	█				█	█	█
Tasks Analysis	█	█	█	█	█	█							█	█	█			
Time Delay		█						█			█			█				
Video Modeling	█	█	█				█	█	█	█	█	█	█	█	█			
Visual Supports	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█		█	█

Evidence-Based Practices

Antecedent-Based Interventions	Overview
Ages	3-16 years old; Early Childhood, Elementary, Middle, & High school
Skills/Goals	Self-injury, repetitive/stereotypical behaviors, promoting engagement & on-task behaviors
Settings	Clinical, 1:1 teaching sessions, general education classroom, resource room
Description	Group of strategies which modify the environment to change conditions that contribute to problem or interfering behavior
Domains	Academics & Cognition, Behavior

Evidence-Based Practices

Antecedent Based Interventions

- ## MAGI Guide:
  - – Identify age and domains

Evidence-Based Practices	Domains																	
	Academic & Cognition			Behavior			Communication			Play			Social			Transition		
	EC	EL	MS/HS	EC	EL	MS/HS	EC	EL	MS/HS	EC	EL	MS/HS	EC	EL	MS/HS	EC	EL	MS/HS
Antecedent-based Interventions																		

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Intervention Resources

Ohio Center for Autism and Low Incidence (OCALI)
http://www.ocali.org/

- Autism Training Modules

Frank Porter Graham Child Development Institute FPG-UNC, University of North Carolina at Chapel Hill

- Overview Briefs
- Fidelity Checklists
- National Professional Development Center on Autism Spectrum Disorders (NPDC)
- http://autismpdc.fpg.unc.edu

A word about fidelity…
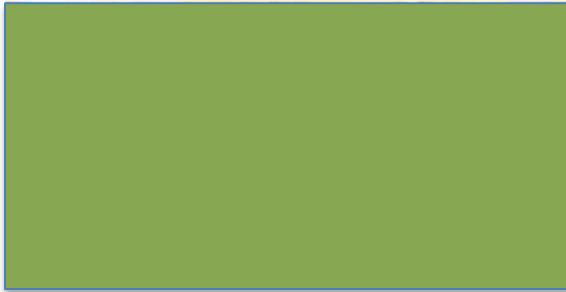
Fidelity

- Initial Training and Fidelity:
  - Fidelity collected regularly (e.g., at least weekly) until 80% fidelity established
  - Probe data collected to ensure maintenance
- Established checklists
  - National Professional Development Center (FPG-UNC)
- Modified checklists
  - Key features for support staff
  - Self-checklists

Fidelity

Implementation Checklist for Discrete Trial Training

Intervention (Steps 6-8)									
Step 6. Delivering the Trials									
1. Assist the learner to transition to the teaching location.									
2. Obtain the learner's attention and, together, select reinforcers.									
3. Provide the stimulus or instruction and wait for a response.									
4. If the learner responds appropriately, deliver a reinforcing consequence or reinforcer and mark the trial as correct.									
5. If the learner does not respond to or responds incorrectly, do one of the following: a. provide corrective feedback and begin the trial again, presenting the Sd (antecedent or cue), b. prompt the learner to respond correctly, reinforce, and record the result of the prompted trial, or c. provide another trial, with reduced or no prompting, reinforce appropriately, and record									

**Scoring Key: 2 = implemented; 1 = partially implemented; 0 = did not implement; NA = not applicable

Putting it Together: Case Examples

Case Example: Riley

- Riley, age 8, eligibility: ASD

- Language skills: basic phrased speech, below average receptive language skills, difficulty answering "wh" questions

- Social skills: will take one to two conversational turns, able to participate basic functional play (usually by herself)

- Current placement: specialized classroom

Case Example: Riley

Goal:

- Riley will improve her social communication and play skills.

Related Benchmarks:

- Within play activities, Riley will increase her mean length utterance to 4-5 words.

- Within play activities with an adult, Riley will appropriately engage in a reciprocal play interaction with at least 5 successful turn taking opportunities.

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Case Example: Riley

Selecting an EBP

- Identify what the goal is targeting:
  - Communication and Social
- Consider Individual Characteristics:
  - Age, Level of Language and Social Skills
- Identify what interventions are available:
  - Pivotal Response Training

	SOCIAL	COMMUNICATION	BEHAVIOR	ACADEMIC
Peer Mediated Interventions	✓	✓	✓	
Picture Exchange Communication System	✓	✓	✓	
Pivotal Response Training	✓	✓	✓	
Schedules	✓	✓	✓	✓
Self-management	✓	✓	✓	✓

Why Did We Select PRT?

Pivotal Response Training (PRT)	Overview
Ages	6-16 years old; Early Childhood, Elementary, Middle, & High school **Riley is within the age range for PRT (8 years old)**
Skills/Goals	Pivotal behaviors: motivation, responding to multiple cues, self-management, self-initiations, promote communication, imitation, play, joint attention, decrease challenging behavior **Will support her goals to increase utterance length and reciprocal play interactions**
Settings	School, home, community, natural settings **Can work on goals in school setting**
Description	Systematic strategy which builds on student initiative & interests, using pivotal skills as a foundation for improvements in many domains **Allows focus on her interests to target motivation, responsiveness to multiple cues, self-management, and social initiations**
Domains	Academic & Cognition, Behavior, Communication, Play, Social **Will address communication, play, and social**
Learner Characteristics	Use of social initiations, low social bids, use toy play, stereotypic language **Has basic toy play skills and basic language skills, she takes turns (not avoidant)**

Case Example: Jonah

- Jonah, age 16, eligibility: ASD

- Above average IQ

- Language skills: above average expressive and receptive language skills

- Social skills: Able to have conversations with peers however mostly one sided, initiates social interactions regularly but often not received well by peers, has difficulty regulating emotional status when upset

- Current placement: general education with supports

Case Example: Jonah

Goal:

- Jonah will improve his social abilities with peers.

Related Benchmarks:

- Jonah will increase his number of appropriate conversational turns with peers by asking questions and making comments about topics that his peers choose.
- When emotionally heightened, Jonah will access self-regulation strategies to calm himself appropriately and use appropriate tone and volume when speaking to others

Case Example: Jonah

Selecting an Evidence Based Practice

- Identify what the goal is targeting:
  - Social, communication, behavior
- Consider Individual Characteristics:
  - Age, IQ, social development, educational placement
- Identify what interventions are available:
  - Cognitive Behavior Intervention

	SOCIAL	COMMUNICATION	BEHAVIOR	ACADEMIC
Task Analysis and Chaining	✓	✓	✓	✓
Cognitive Behavioral Interventions	✓	✓	✓	✓
Joint Attention Intervention	✓	✓	✓	✓
Modeling	✓	✓	✓	✓

Why Did We Select CBI?

Cognitive Behavior Intervention	Overview
Ages	Jonah is 16, in the range for CBI
Skills/Goals	Will address his goals to increase number of appropriate conversational turns and emotional self-regulation
Settings	Will allow him to work on his goals in school with his peers
Description	Works on emotional concerns, problem-solving skills, and social skills in a group format with lots of practice and feedback
Domains	Includes all three (Social, Behavior, Communication)
Learner Characteristics	Jonah has above average language and IQ

Case Example: Chris

- Chris, age 17, eligibility: ASD

- Above average IQ

- Language skills: Average expressive and receptive language skills

- Social skills: Struggles with taking turns in conversations, staying on topic, and tends to only want to discuss his special interests

- Academic skills: On grade level, has difficulty managing materials and keeping track of due dates

- Current placement: General education with supports

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Case Example: Chris

Goals:

- Chris will improve his organization skills and turn assignments in on time.
- Chris will improve conversation skills with peers.
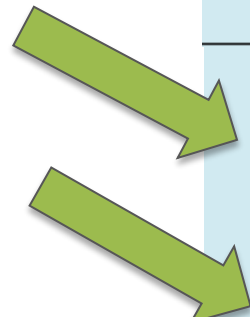
Related Benchmarks:

- Chris will monitor the materials his needs for each class and will track assignment due dates independently.
- Chris will allow conversation partner to take at least 3 turns and he will remain on topic for 5 total turns (Chris-2, partner 3).

Case Example: Chris
Selecting an Evidence Based Practice

- Identify what the goal is targeting:
  - Social, communication, academic

- Consider Individual Characteristics:
  - Age, IQ, social development, educational placement

- Identify what interventions are available:

	SOCIAL	COMMUNICATION	BEHAVIOR	ACADEMIC
Schedules	✓	✓	✓	✓
Self-management	✓	✓	✓	✓
Social Communication Intervention	✓	✓		
Social Narratives	✓	✓	✓	
Social Skills Intervention	✓	✓		
Speech Generating Devices	✓	✓		

Why Did We Select Two?

Self-Management	Overview
Ages	3-21 years old; Early Childhood, Elementary, Middle & High school **Chris fits in the age-range**
Skills/Goals	Decrease disruptive classroom behaviors, difficulty finishing work or chores, **His goals of managing due dates and materials fit within the parameters** sharing, increase engagement, initiate, thinking skills, play skills, conversation skills
Settings	Clinical, school **Can be used in the school setting**
Description	Student learns to distinguish between appropriate and inappropriate behavior, correctly monitor and record own behavior, & provide reinforcement to self for appropriate behaviors **Allows Chris to be more in charge of his own behaviors and leads to less prompting and monitoring by adults**
Domains	Academics & Cognition, Behavior, Communication, Play, Social, Transition **Covers the Academic domain**
Learner Characteristics	Mastery of skills/behaviors they are taught to monitor **Chris has complete the assignments without aide**

Why Did We Select Two?

Social Skills Groups	Overview
Ages	4-18 years old; Early Childhood, Elementary, Middle, & High school — **Chris fits within the age range**
Skills/Goals	Perspective-taking, conversation skills, friendship skills, problem-solving, social competence, emotion recognition, theory of mind, problem-solving, initiations, responding, maintaining conversations, greetings, giving compliments, turn taking, sharing, asking for help, offering assistance — **All of the conversation skills Chris needs to learn are incorporated here (taking turns, maintaining conversations, etc.)**
Settings	Clinical, school — **Can be used in the school setting**
Description	Small groups of 2-8 students with ASD and an adult facilitator; includes instruction, role-playing, practice, and feedback; teach and practice appropriate social skills — **Chris can watch models, practice, and receive feedback in a safe environment with peers he may be able to relate to**
Domains	Communication, Social — **Covers the Social and Communication domains**
Learner Characteristics	Spoken language, interest in or awareness of others, ability to work in small groups — **Chris has the language skills and interest in others**

Monitoring Progress

Why is Data Important

Informed (data-based) programming decisions

- In education, laws require data to support programming decisions
- Anecdotal data is subjective and does not give reliable information to make informed decisions

Data allows professionals to...

- Monitor fidelity
- Monitor efficacy of interventions
- Determine if an intervention should be changed or ceased
- Assess the generalization and maintenance

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Steps in Data Collection

✓ Choose and define target skill/behavior(s)

✓ Develop measureable goals

✓ Consider the different ways you can collect data

✓ Design the data collection system

✓ Collect data

✓ Graph data and monitor progress of goals

Progress Monitoring Form

Progress Monitoring -Evidence Based Practices

Goal:					
Intervention(s) Used:	**Baseline:**	**Frequency:**	**Data Review:**	**Effectiveness:** determined by progress towards goal achievement	**Data-Based Decision:**
	Date Started: Data:	☐ _____ Times/Day ☐ _____ Times/Week ☐ _____ Times/Month	Date Reviewed: Data:	☐ Effective ☐ Somewhat Effective ☐ Not Effective	☐ Continue Intervention ☐ Increase Frequency /Intensity ☐ Add additional intervention ☐ Change intervention
	Date Started: Data:	☐ _____ Times/Day ☐ _____ Times/Week ☐ _____ Times/Month	Date Reviewed: Data:	☐ Effective ☐ Somewhat Effective ☐ Not Effective	☐ Continue Intervention ☐ Increase Frequency /Intensity ☐ Add additional intervention ☐ Change intervention

Thank you!