Using Academic Progress Monitoring for Individualized Instructional Planning

Rebecca O. Zumeta, Ph.D.
NCII TA&D Coordinator
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Objectives

1. Understand how progress monitoring (PM) fits into the data based individualization (DBI) process
2. Learn important distinctions between mastery measures and general outcome measures (GOM)
3. Access resources to identify progress monitoring tools
4. Use progress monitoring data to describe present levels of performance, set goals, and decide when instructional changes are needed
Note

Today’s presentation assumes that participants have a working knowledge of progress monitoring assessment. For those who are new to progress monitoring and would like to learn more, please see the National Center on Response to Intervention’s progress monitoring resources:

AND
NCII’s Approach to Intensive Intervention: Data Based Individualization (DBI)

**Data Based Individualization** (DBI) is a systematic method for using data to determine *when and how* to provide a more intensive intervention:

- Origins in data-based program modification/experimental teaching were first developed at the University of Minnesota (Deno & Mirkin, 1977) and expanded upon by others (Fuchs, Deno, & Mirkin, 1984; Fuchs, Fuchs, & Hamlett, 1989b; Capizzi & Fuchs, 2005).
- DBI is a process, not a single intervention program or strategy.
- DBI is not a one-time fix—it is an ongoing process that consists of intervention and assessment adjusted over time.
How does progress monitoring fit into the DBI process?
Why Implement Progress Monitoring?

- PM is a standardized method of formative assessment that tells us how well students are responding to instruction.

- Data allow practitioners to:
  - Estimate rates of improvement over time.
  - Compare the efficacy of different forms of instruction.
  - Identify students who are not demonstrating adequate progress.
  - Determine when an instructional change is needed.
## Types of Assessment

<table>
<thead>
<tr>
<th>Type</th>
<th>When?</th>
<th>Why?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Summative</td>
<td>After</td>
<td>Assessment of Learning</td>
</tr>
<tr>
<td>Diagnostic</td>
<td>Before</td>
<td>Identify skill strengths and weaknesses</td>
</tr>
<tr>
<td>Formative</td>
<td>During</td>
<td>Assessment for Learning</td>
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</table>
Educational researcher Robert Stake used the following analogy to explain the difference between formative and summative assessment:

“When the cook tastes the soup, that's formative. When the guests taste the soup, that's summative.”

(Scriven, 1991, p.169)
Screening vs. Progress Monitoring

- “Close Cousins”
- Often, the same measures are used.
- It is important to differentiate between:
  - Universal Screening, which is for all students, and
  - Progress Monitoring, which is for some students who have been identified as at risk for poor academic or behavioral outcomes.
Approaches to Progress Monitoring

**Mastery Measure**

- Multidigit Addition
- Multidigit Subtraction
- Multiplication Facts

Number of problems correct in 5 minutes vs. **General Outcome Measure**

Sample Progress Monitoring Chart:
- Words Correct
- Aim Line
- Linear (Words Correct)

WEEKS
Mastery Measure

- Logical, rather than empirical, hierarchy of skills.
- Does not reflect maintenance or generalization.
- Number of objectives mastered does not relate well to overall achievement or performance on criterion measures.
Example Mastery Measure: Multi-Digit Addition Test

Name: ________________________  Date____________________

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<tr>
<th>36521 + 63758</th>
<th>53429 + 63421</th>
<th>84525 + 75632</th>
<th>67842 + 53937</th>
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| 56382 + 94742 | 36422 + 57529 | 34824 + 69426 | 32415 + 85439 | 45321 + 86274 |

*This example is for illustrative purposes only.*
Example Mastery Measure Graph

- Multidigit Addition
- Multidigit Subtraction
- Multiplication Facts

Number of problems correct in 5 minutes

Weeks
A GOM is an assessment that:

- Reflects overall competence in the annual curriculum.
- Incorporates retention and generalization.
- Describes an individual student’s growth and development over time (both “current status” and “rate of development”).
- Provides a decision-making model for designing and evaluating interventions.
<table>
<thead>
<tr>
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<th>Date:</th>
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</thead>
<tbody>
<tr>
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<td>[1 \frac{6}{7} + 3 = ]</td>
<td>[4 \div 6 = ]</td>
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<tr>
<td>[6 \times 7 = ]</td>
<td>[9 \times 0 = ]</td>
<td>[2 \frac{4}{7} \times 7 = ]</td>
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<td>[8 \times 5 = ]</td>
<td>[9 \times 1 = ]</td>
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<tr>
<td>[\frac{3}{5} + \frac{1}{8} = ]</td>
<td>[9 \times 8 = ]</td>
<td>[7 \frac{56}{7} ]</td>
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</table>
Why Bother Progress Monitoring With General Outcome Measures?

<table>
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<tr>
<th>Number of assessments/15 weeks</th>
<th>Effect Size (SD)</th>
<th>Percentile Gain</th>
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<tr>
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<td>5</td>
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<td>.60</td>
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<td>15</td>
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<td>24.5</td>
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<td>28.5</td>
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<tr>
<td>30</td>
<td>.82</td>
<td>29</td>
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</table>


Similar results found by Fuchs & Fuchs (1986)
Selecting a Progress Monitoring Tool
Considerations When Selecting or Evaluating a Tool

- Skills to be measured—age and grade appropriate
- Cost and training requirements
- Administration and scoring time
- Data management
- Technical rigor (consider population)
  - Reliability
  - Validity
  - Evidence of ability to detect change
  - Alternate/parallel forms: different versions of the assessment that are of comparable difficulty
Academic Progress Monitoring GOM

This tools chart presents information about academic progress monitoring tools. The three tabs, Psychometric Standards, Progress Monitoring Standards, and Data-based Individualization Standards include ratings from our TRC members on the technical rigor of the tool. Additional information is provided below the chart.

View the Progress Monitoring Mastery Measures »

<table>
<thead>
<tr>
<th>Title</th>
<th>Area</th>
<th>Reliability of the Performance Level Score</th>
<th>Reliability of the Slope</th>
<th>Validity of the Performance Level Score</th>
<th>Predictive Validity of the Slope of Improvement</th>
<th>Disaggregated Reliability and Validity Data</th>
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<td>R-CBM</td>
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<td>★</td>
<td>★</td>
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<td>Math Concepts and Applications</td>
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<td>★</td>
<td>★</td>
<td>★</td>
<td>★</td>
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<td>★</td>
</tr>
<tr>
<td>AIMSweb</td>
<td>Test of Early Literacy - Letter Naming Fluency</td>
<td>★</td>
<td>★</td>
<td>★</td>
<td>★</td>
<td>★</td>
</tr>
<tr>
<td>AIMSweb</td>
<td>Test of Early Literacy - Letter Sound Fluency</td>
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<td>★</td>
<td>★</td>
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<td>★</td>
</tr>
<tr>
<td>AIMSweb</td>
<td>Test of Early Literacy - Nonsense Word Fluency</td>
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<td>★</td>
<td>★</td>
<td>★</td>
</tr>
<tr>
<td>AIMSweb</td>
<td>Test of Early Literacy - Phonemic Segmentation Fluency</td>
<td>★</td>
<td>★</td>
<td>★</td>
<td>★</td>
<td>★</td>
</tr>
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</table>
Additional Considerations
Should I Ever Assess Off-Level?

Always consider the purpose of the assessment…

- **Screening:**
  - Should occur at grade level in order to assess students’ response to core instruction and performance relative to grade level expectations.

- **Progress Monitoring for Individual Planning:**
  - Should be done at grade level when possible, but must also match the student’s instructional level in order to detect change.
    - Progress monitoring level in a content area may vary by skill, but instructional grade level should always match progress monitoring grade level.
  - If a student’s performance is well below his/her peers, grade-level probes are unlikely to detect growth.
On two separate days, administer math Computation or Concepts and Applications at the grade level at which you expect the student to be functioning at year’s end. Use the correct time limit for the test at the lower grade level.

- If the student’s mean score is 10-15 digits or blanks, use this lower grade-level test.
- If <10 digits or blanks, move down one more grade level.
- If >15 digits or blanks, reconsider grade-appropriate material.

(National Center on Student Progress Monitoring)
1. Administer three reading fluency passages at the grade level at which you expect the student to be functioning by the end of the year.
   - If the student reads <10 correct words per minute (cwpm), use an early literacy measure (e.g., Word Identification Fluency).
   - If 10–50 cwpm but <85–90% correct, administer three passages at the next lower level.
   - If 10-50 cwpm and above 90% accurate, use that level.
   - If >50 cwpm, move to the highest level of text where the student reads 10-50 cwpm (but not higher than grade level).

2. Monitor progress at this level for the entire school year (unless the student meets the end-of-year benchmark).

(Fuchs & Fuchs, 2007)
How Can I Confirm or Augment Data Collected?

- In some cases—particularly when working with older students—it may be worthwhile to augment traditional progress monitoring tools.

- Brief interviews can help to corroborate PM data or gain new information.
Sample Interview Questions to Augment Math PM data

- What strategy did you use to get this answer?
- Can you explain why your strategy produced the correct response?
- What kind of problems will this strategy work for?
Sample Interview Questions to Augment Reading GOM data

Comprehension questions for GOM probes:
- What was this mostly about?
- What happened? (Prompt: Tell me more. What else happened?)

Questions for text-based inquiry activities:
- What strategy can you use to find an answer to this question?
- What section of the text supports your answer?
Making Instructional Decisions for Individual Students

Determining current status, setting goals, and evaluating growth
Step 1: Establishing a Baseline

- To begin progress monitoring, you need to know the student’s initial skill level.
- A stable baseline is important for goal setting.
- Baseline options:
  1. Use the median score of the most recent three probes if collected in one sitting.
  2. Use the mean of the most recent three probes if collected over three sittings.
Step 2: Setting Goals

Three approaches to setting goals:

1. Benchmarking
2. National norms for weekly rate of improvement
3. Intra-individual framework
Option 1: Using Benchmarks

**Benchmark**: level of performance on an assessment that is predictive of proficiency.

- Identify appropriate grade-level benchmark (if progress monitoring off-level, use benchmarks for the grade of the assessment being used).
- Mark benchmark on student graph.
- Draw goal line from baseline to benchmark.
### Option 1: Setting Goals With Benchmarking

<table>
<thead>
<tr>
<th>Grade</th>
<th>Reading Task</th>
<th>Computation</th>
<th>Concepts and Applications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kindergarten</td>
<td>40 sounds/min (Letter Sound Fluency)</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Grade 1</td>
<td>60 words/min (Word ID Fluency)</td>
<td>20 digits</td>
<td>20 points</td>
</tr>
<tr>
<td>Grade 2</td>
<td>75 words/min (Passage Reading Fluency, or PRF)</td>
<td>20 digits</td>
<td>20 points</td>
</tr>
<tr>
<td>Grade 3</td>
<td>100 words/min (PRF)</td>
<td>30 digits</td>
<td>30 points</td>
</tr>
<tr>
<td>Grade 4</td>
<td>20 replacements/2.5 min (Maze)</td>
<td>40 digits</td>
<td>30 points</td>
</tr>
<tr>
<td>Grade 5</td>
<td>25 replacements/2.5 min (Maze)</td>
<td><strong>30 digits</strong></td>
<td>15 points</td>
</tr>
<tr>
<td>Grade 6</td>
<td>30 replacements/2.5 min (Maze)</td>
<td>35 digits</td>
<td>15 points</td>
</tr>
</tbody>
</table>

Note: These figures are specific to a certain tool and may change pending further research. This example is used for illustrative purposes only. Tools vary and may provide benchmarks for the end of the year or for fall, winter, and spring.
Option 1: Setting Goals With End-of-Year Benchmarking
Advantages

- Easy to use when progress monitoring tool provides benchmarks.
- Tracks progress toward grade-level expectations.

Considerations

- Goal may not be feasible for students performing far below grade level.
Option 2: Setting Goals With Norms for Weekly Rate of Improvement (ROI)

Average growth per week (ROI) for a certain measure (e.g., 3rd grade PRF) can be used to calculate a goal:

\[
\text{GOAL} = \text{ROI} \times \# \text{ Weeks} + \text{Baseline Score}
\]

- \# Weeks = number of weeks left in instructional period (when we want the goal to be reached).
- Baseline Score is calculated using the three most recent data points.
Example: Setting Goals With National Norms for Weekly ROI

4th grade math computation

- Baseline scores: 10, 9, 11 (collected weekly)
- Timeframe: 10 weeks left in instructional period
- ROI = .7

<table>
<thead>
<tr>
<th>Grade</th>
<th>Computation—ROI for Digits Correct</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>.35</td>
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<tr>
<td>2</td>
<td>.30</td>
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<td>3</td>
<td>.30</td>
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<td>4</td>
<td>.70</td>
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<tr>
<td>5</td>
<td>.70</td>
</tr>
<tr>
<td>6</td>
<td>.40</td>
</tr>
</tbody>
</table>
Example: Setting Goals With National Norms for Weekly ROI

GOAL = ROI x # Weeks + Baseline Score

0.70 (from chart)  
10 left in instructional period

Using mean because three points collected over time:  
\[ \frac{10+9+11}{3} = \frac{30}{3} = 10 \]

GOAL = 0.70 \times 10 + 10 = 7 + 10 = 17

Target Growth  Baseline
Option 2: Setting Goals With National Norms for Weekly ROI

Considerations for using ROI for goal setting:

- If a student is behind, matching the ROI norm will maintain the same level of achievement gap.
- Some progress monitoring tools provide recommendations for “ambitious” ROI.
- How might you estimate weekly growth needed if ROI norms are not provided?
  - Use local norms
  - Estimate by dividing growth between benchmark periods by number of weeks of instruction
Option 3: Setting Goals With Intra-Individual Framework

- Often used for students performing far below grade level, or with very low skills where typical growth rates are not appropriate.
- Use 3 most recent data points to calculate baseline score.
- Calculate student’s ROI based on at least 8 data points, divided into 3 sections:
  - \[ \text{ROI} = (\text{3}^{\text{rd}} \text{ median} - \text{1}^{\text{st}} \text{ median}) \]
    # weeks of instruction
  - If data are collected weekly,
    # weeks of instruction = # data points – 1
Option 3: Setting Goals With Intra-Individual Framework

Student’s ROI × 1.5 × # Weeks

Student’s Baseline Score (mean of 3 most recent scores)

GOAL

Why 1.5?

- We know the student’s current ROI is not sufficient to close the achievement gap—we want to increase growth at least by half (x 1.5).

- A more ambitious goal may be set if appropriate (e.g., after several weeks of PM, the student’s ROI exceeds the goal).

- Never lower the goal!
Example: Setting Goals With Intra-Individual Framework

- 8 most recent scores (over 7 instructional weeks):
  - 8, 7, 9, 9, 8, 11, 10, 11, 12
- 10 weeks left in instructional period

ROI = (3rd median – 1st median) / weeks
   = (11 - 8) / 7 = 3 / 7 = .43

Baseline Score = mean of 3 most recent scores
   = (10 + 11 + 12) / 3 = 33 / 3 = 11

Goal = .43 x 1.5 x 10 + 11 = 6.45 + 11 = 17.45
Describes concrete, measurable skills that have relevance to overall competence in a domain (e.g., reading, math).

Leverages a valid and reliable assessment tool.

Focus on outcomes, not instructional setting or format.

- What outcomes are desired?
- What do present levels say about the student’s current progress toward meeting those outcomes?
- Compare to peers or proficiency standards.
Describing Present Levels and Choosing a Goal for a Student Who Requires Individualized Planning

- Andrew is a second grader with a specific learning disability with eligibility in basic reading.

- Team began weekly progress monitoring using second grade PRF, but he scored less than 10 correct words per minute (CWPM):
  - 7, 5, 9 (mean = 7)

- Team determined off-level assessment was indicated and administered first grade Word Identification Fluency weekly:
  - 9, 8, 11, 10, 12, 13, 15, 14 cwpm
Practice Setting Goals

- Use the handout to follow along as we practice setting goals for Andrew using:
  - Benchmarking
  - Weekly ROI norms
  - Intra-individual framework

- We’ll assume there are 30 weeks of instruction between now and the end of the school year.
Andrew Option #1: Goal Setting Using Benchmarks

<table>
<thead>
<tr>
<th>Grade</th>
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<tbody>
<tr>
<td>Kindergarten</td>
<td>40 sounds/min (Letter Sound Fluency)</td>
</tr>
<tr>
<td>Grade 1</td>
<td>60 words/min (Word Identification Fluency)</td>
</tr>
<tr>
<td>Grade 2</td>
<td>75 words/min (Passage Reading Fluency)</td>
</tr>
</tbody>
</table>

Which benchmark do we use for Andrew? 1<sup>st</sup> or 2<sup>nd</sup> grade?
Andrew Option #2: Weekly ROI Norms

ROI × # Weeks + Baseline Score = GOAL

- **Baseline score** (mean of last 3 scores) =
  - \((13 + 15 + 14) / 3 = 14\)
- \(1.8 \times 30 = 54\)
- \(54 + 14 = 68\)
- **Goal = 68 cwpm**

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<tr>
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<th>Reading—ROI</th>
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<td>1.0 (LSF)</td>
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<tr>
<td>1</td>
<td>1.8 (WIF)</td>
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<tr>
<td>2</td>
<td>1.5 (PRF)</td>
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<td>3</td>
<td>1.0 (PRF)</td>
</tr>
<tr>
<td>4</td>
<td>0.40 (Maze)</td>
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<td>5</td>
<td>0.40 (Maze)</td>
</tr>
<tr>
<td>6</td>
<td>0.40 (Maze)</td>
</tr>
</tbody>
</table>
Andrew Option #3: Intra-individual Framework

Andrew’s most recent scores: 9, 8, 11, 10, 12, 13, 15, 14 cwpm

**Student’s ROI × 1.5 × # Weeks**

**Student’s Baseline Score (mean of last 3 scores)**

**GOAL**

- ROI = (14 - 9) / 7 = .71
- # Weeks = 30
- Baseline = (13 + 15 + 14) / 3 = 14
- .71 x 1.5 x 30 + 14 =
- Goal = 45.95 or 46 cwpm
Choosing a Goal

The three methods resulted in different goals:

- End-of-year benchmarking: 60 cwpm
- ROI norms: 68 cwpm
- Intra-individual framework: 46 cwpm

Are national norms too ambitious for Andrew, or do we think we can increase his current ROI by more than 1.5x with a change in intervention?

- How does his current ROI compare to national or local norms for ROI?
- Do we know his history of reading growth in previous school years?
Considerations When Choosing an Option for Goal Setting

- Ideally, we want students to achieve grade-level standards. For students achieving near grade level, use benchmarks.

- ROI norms may be appropriate for students who can reasonably be expected to learn at the typical rate. However, growth at the typical rate may not close the gap.
The team may consider the intra-individual framework if:

- Achievement is too low to realistically reach benchmark by the end of the year.
- There is a history of very low student ROI.
- Cognitive delays or other characteristics indicate typical growth is not appropriate.

The team should review data regularly and raise the goal if the student’s progress surpasses the goal.
Andrew: Choosing a Goal

- Compare student’s ROI to ROI norms:
  - Andrew’s current ROI is .71
  - National norm ROI is 1.8
  - Andrew’s current ROI is less than half of the national norm

- The intra-individual framework may be appropriate for Andrew, if the team’s knowledge of his history supports this decision.

- If he exceeds his goal, it can be raised; Andrew’s teacher should watch this closely.
Step 3: Analyzing Data to Make Decisions
How Much Data Do I Need to Make a Good Decision?

- As the number of data points increase, the effects of measurement error on the trend line decrease.
- Christ & Silberglitt (2007) recommend six to nine data points.
- More frequent progress monitoring allows instructional decisions to be made sooner.
- Weekly assessment for intensive interventions is recommended.
Method #1: Four-Point Rule

If three weeks of instruction have occurred AND at least six data points have been collected, examine the four most recent data points.

- If all four are above the goal line, increase the goal.
- If all four are below the goal line, make an instructional change.
- If the four data points are both above and below the goal line, keep collecting data until the four-point rule can be applied (or consider trend analysis—coming up).
Examples of the Four-Point Rule
Method # 2: Decision Rules Based on the Trend Line

If **four weeks** of instruction have occurred AND at least **eight data points** have been collected:

- Calculate trend of current performance (by hand or with software)
- Compare to goal line
Trend Line Analysis

Weeks of Instruction

Words Read Correctly

Trend line
Goal line

Weeks of Instruction

Words Read Correctly

Goal line
Trend line
Making Decisions

- If the student’s trend line is steeper than the goal line, increase the goal.
- If the student’s trend line is flatter than the goal line, an intervention change is needed.
- If the student’s trend line and goal line are the same, no changes need to be made.
- **Never lower the goal!**
In Summary

Progress monitoring data helps us:

- Decide whether students are profiting from DBI.
- Determine a student’s response to individualized intervention.
- Write concrete, measurable present levels of performance and individualized goals.
References


References


Disclaimer

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Rebecca Zumeta. Ph,D, rzumeta@air.org

1000 Thomas Jefferson Street NW
Washington, DC 20007-3835
866-577-5787
www.intensiveintervention.org
ncii@air.org
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