"Using Progress Monitoring Data for Decision Making"

Slide 1: Welcome to the webinar, "Using Progress Monitoring Data for Decision Making." This is one of 11 webinars developed by the National Center on Response to Intervention (NCRTI). This webinar provides an in-depth look at the steps needed to effectively utilize progress monitoring data in the decision making process. If you have not done so already, you may want to print out the accompanying handouts so that you can access them during the webinar. My name is Amy Elledge, and I am the Deputy Director of the National Center on Response to Intervention.

Slide 2: NCRTI has developed a series of webinars to cover information that is important for RTI implementation. On this slide you can see the different webinars available in the series. While you can watch the webinars in any sequence, we recommend that you view the "What Is Progress Monitoring?" webinar to get an overview of progress monitoring before viewing this one.

Slide 3: In this webinar, we will go through the steps needed to use progress monitoring data for decision making. We will look at important considerations for each step and will provide examples and practice so that you will understand how the techniques can be applied.

Slide 4: The objectives for this training are:

1. To use progress monitoring to improve student outcomes;
2. To use progress monitoring data for making decisions about instruction and interventions; and
3. To develop guidance for using progress monitoring data.

Slide 5: One helpful way to check your understanding throughout the webinar is to complete the accompanying vocabulary handout. The handout provides a table with a list of key terms on the left side with columns to the right for you to track your understanding before and after viewing the webinar. Before viewing the webinar, you should make predictions of the meanings of each term. Then, throughout the webinar, you will complete the final meaning column, based on the definitions provided, along with the picture/sketch/example column, where you can add anything helpful for remembering what you have learned. You can see how in this example, I was able to clarify the meaning of primary prevention level after watching the webinar.

If you have not already made predictions for the key terms of this webinar, please go ahead and pause the webinar so that you can do so now. Press play when you are ready to continue.

Slide 7: In general, the decision making process for progress monitoring follows several basic steps:

1. Establish Data Review Team
2. Establish Baseline Data and Progress Monitoring Level
3. Establish Goal
4. Determine Frequency of Data Collection
5. Collect and Graph Frequent Data
6. Analyze Data and Make Instructional Decisions
7. Continue Progress Monitoring

We will discuss each of these in more detail.

Slide 8: The first step is to establish a data review team.

Slide 9: Including at least three people in a data review team allows focused discussion about the data with various viewpoints. Data review teams often include a general education teacher and other decision makers, such as special educators and reading specialists. At least one team member should have data interpretation skills and experience. It is important to meet regularly, such as every four to six weeks, and to follow established systematic data review procedures.

A note: The data review team looking at progress monitoring data will likely differ from the team looking at screening data. As was mentioned in the screening module, data teams looking at screening data might be formed at the district or school administrative level. This is important, as screening data help in looking at the bigger picture of program effectiveness across students, classes, or schools. In contrast, progress monitoring data teams need to meet frequently to review the data of individual students and to make decisions about responsiveness. This is particularly important for students receiving tertiary level interventions.

Slide 10: Team members should

- Ensure progress monitoring data are accurate;
- Review progress monitoring data regularly;
- Identify students in need of supplemental interventions; and
- Evaluate the efficacy of supplemental interventions.

Slide 11: It is important that there is a process in place for regularly reviewing progress monitoring data. The process should:

- Be conducted at logical, predetermined intervals;
- Be scheduled prior to the beginning of instruction;
- Involve relevant team members; and
- Use established meeting structures.

Slide 12: Articulating routines and procedures in writing helps ensure that (and assess whether) established routines and procedures are being implemented with integrity. Ongoing evaluation of the selected routines and procedures is necessary to ensure they are culturally and linguistically responsive and lead to the desired outcome.

Slide 13: Consider clarifying the following in writing:

- What are you looking for?
    - Data fishing can be fun, but may lead to problems. It can cause a delay in the use of data (especially if there are a lot of data), change the focus of the analysis, or miss important trends or issues. Identity what you are interested in knowing prior to your data analysis. If you are unclear what you are looking for, conduct an analysis of the more critical outcomes first, such as graduation or reading performance, and then focus on outcomes in other issues. It is important to prioritize.
    - Identify what you are looking for at all levels of analysis (district, school, grade, class, students) as well as levels of prevention (primary, secondary, or tertiary).
- How will you look for it?
    - Develop a plan on how you will systematically analyze your data. This can increase the efficiency of your data analysis activities. It also helps manage the output many data systems offer. Only the most critical data are needed first. This allows you to know where to delve in deeper.
- How will you know if you've found it?
    - Determine how much evidence is needed for the team to identify a problem. Once identified, the team can continue moving through the problem solving process in order to develop a plan of action.

Slide 14: Before moving forward, let's review some of the more common, and sometimes confused, terms you may see while analyzing and interpreting data. You may have seen the terms used the interchangeably, especially by publishers of screening tools. For the purposes of this presentation, we refer to these terms as follows:

- **Cut Score** – a score on a screening test that divides students who are considered potentially at risk from students who are considered not at risk.
- **Target or Benchmark** – predetermined level of performance on a screening test that is considered representative of proficiency or mastery of a certain set of skills.
- **Criterion Scores** – scores on a screening test that separate students into performance levels (for example, established, emerging, or deficient).

The target or benchmark is more often than not the same score as the cut score, especially when the cut score is predictive of the state test. However, it does not have to be. For example, schools or districts may choose to set higher benchmarks or targets that are predictive of higher standards while setting cut scores to be more predictive of who is at risk and not at risk. This is why it is essential for teams to understand how the cut scores, targets, and benchmarks were established.

The term "cut score" is sometimes used to refer to criterion scores that separate students by performance levels—commonly displayed as green (or primary), yellow (or secondary), and red (or tertiary) highlighted students. It is important to remember that the purposes of these two terms, cut score and criterion score, are very different. We will talk more about this in a bit.

Slide 15: Once the team is established, the next step is to establish baseline data and the progress monitoring levels of target students.

Slide 16:

- To begin progress monitoring, you need to know the student's initial knowledge level or baseline knowledge.
- Having a stable baseline is important for goal setting.
- To establish the baseline:
    - Use the median scores of three probes (if collected at the same point in time); or
    - Use the mean of the most recent three data points (if collected over three different points in time).

In summary, to establish the baseline:
- The median is used when three data points are collected at a single sitting (for example, three Oral Reading Fluency (ORF) probes are given to the student at benchmark), such as with oral reading fluency measures.
- Means are used when single data points are collected over time (for example, one data point each week for three weeks), such as with early literacy measures. In this case, the most recent three data points should be used to determine the baseline score. For those using data systems, the single benchmark score is typically used as the baseline, and decisions about interventions should not be made for at least 3–4 weeks to reduce issues of over-identification.

Slide 17: This slide presents one student's three benchmark scores. For Curriculum-based measurement (CBM), benchmark scores are presented as words read correct (the numerator) over errors (the denominator).

During the screening process, this student received the following scores. If we take the median score, what would the student's baseline score be?

Why do we use the median instead of the mean? Median is preferred to a measure of the mean score because means are susceptible to outliers when dealing with small number sets. Stable baselines are important in goal setting. It is used when three scores are collected at a single data collection period (not over time). The median is taken for both the numerator and the denominator.

A note: Oral reading fluency (ORF) is really the only measure in which three probes are used at benchmark and where using the median score is the norm. This is because the variability found

in reading passages requires us to find the median of three probes at a single point in time, as the standard error is much greater than in early literacy measures.

Slide 18: In this example, the performance data are collected over time, not at a single data collection point. In these cases, the mean is used to account for general performance over a larger period of time and any growth that occurred during the baseline collection period (for example, three weeks). We will use this approach in the handout examples.

This is a good approach for those students who are identified through the screening and are progress monitored to confirm or disconfirm. Through this approach, students making progress before intervention is delivered may not actually need secondary interventions. In this case, the baseline is stable and it appears unlikely that this student will make progress without an intervention.

Slide 19: Some considerations for establishing the level that the student should be progress monitored at are as follows:

- It should be based on logical practices;
- The goal should be set where you expect the student to perform at the end of the intervention period;
- Assessments that survey students' level of skill acquisition may be used with students performing below grade level.

Slide 20: Now that the team has established baseline data and the progress monitoring level for students, they can establish goals.

Slide 21: The stakeholders referred to on this slide include team members, school personnel, family members, and community members. It is important that everyone understands the basis for the goal that was set. This includes why and how the goal was set, how long the student has to achieve the goal, and what the student is expected to do when the goal is met.

Slide 22: There are three options for setting goals. The first option uses end-of-year benchmarking. The second option uses national norms for weekly rate of improvement. The third option uses an intra-individual framework. Let's look at these three options in more detail.

Slide 23: The first option is end-of-year benchmarking. For typically developing students at the grade level where the student is being monitored, identify the end-of-year CBM benchmark. This is the end-of-year performance goal. The benchmark is represented on the graph by an X at the date marking the end of the year. A goal line is then drawn between the mean or median of the three most recent CBM graphed scores and the end-of-the-year performance goal.

Remember that throughout this section CBM will be used as an example of progress monitoring measures. A similar process can be used for other progress monitoring measures.

Slide 24: Here are sample end-of-year benchmarks. Remember, the benchmarks you use depend on which tool you have selected, as well as other factors such as additional analysis conducted for your specific population.

Benchmark scores can be based on norms. In that case, the benchmark represents the number of students who have taken this CBM in fall, winter, and spring. It is important to understand that these are norm-based benchmarks based on student performance, **not** criterion-based benchmarks based on mastery of skills. There may be a discrepancy between adequate norm-based performance and adequate criterion-based performance, and educators must investigate the consistency of norm- and criterion-based assessment outputs.

Slide 25: This graph shows a sample graph for a third-grade student working on CBM computation. The end-of-year benchmark of 30 digits is marked with an X, and a goal line is drawn between the first few data points and the X.

Note: This graph shows a certain instructional period representing 14 weeks of the school year. For this example the end-of-year benchmark will occur at the 14th week. In reality the weeks of instruction would represent the total number of weeks between when progress monitoring begins and the end of the instructional period that you are setting a goal for. This may vary by school and student.

Slide 26: At this time, you will want to get out your *Practice Using Progress Monitoring Data* handout and look at the first example, Gunnar.

This is Gunnar's graph. He is a fourth-grade student using CBM computation for progress monitoring. Use the chart provided at the bottom of the page to find Gunnar's end-of-year benchmark. Then, mark the benchmark with an X and draw a goal line for Gunnar. You may wish to press pause to complete this activity and then press play when you are ready to continue.

Slide 27: Gunnar's graph should look like this. The end-of-year benchmark for fourth-grade students on CBM Computation is 40. Forty is marked with an X. The goal line should start at the end of the baseline data collection and should be drawn to the end-of-year benchmark that you marked as an X.

Slide 28: The second option for setting goals is by using national norms of improvement. For typically developing students at the grade level where the student is being monitored, identify the average rate of weekly increase from a national norm chart. No national norms are available at the kindergarten level. Here are sample national norms for weekly improvement. Remember, the national norms for weekly improvement you select will depend on which tool you have selected, as well as other factors such as additional analysis conducted for your specific population.

Slide 29: Some tools, as we saw on the NCRTI tools chart, already have established growth

rates. These growth rates can be used to set a goal by using the following calculation:

The standard formula for calculating goal using rate of improvement (ROI) is, ROI times the number of weeks plus the baseline score equals your goal.

Slide 30: For example, a fourth-grade student's average score from his most recent three CBM computation probes is 14. The norm for fourth-grade students is 0.70. To set an ambitious goal for the student, multiply the weekly rate of growth (the norm) by the number of weeks left until the end of the instructional period. If there are 16 weeks left, multiply 16 by 0.70, which equals 11.2. Add 11.2 to the baseline average of 14, which equals 25.2. This sum is the end-of-year performance goal. This sum, 25.2, would be plotted on the student's graph, and a goal line would be drawn.

Slide 31: Now look at the second example in the *Practice Using Progress Monitoring Data* handout. This is Jane's graph. Use the national norms for weekly rate of improvement table to determine Jane's end-of-year goal. You may wish to press pause to complete this activity and press play when you are ready to continue.

Baseline performance in this example is calculated by adding the baseline scores (or the first three scores) together and dividing by the number of scores. Remember, the baseline scores were collected over time, not at a single data collection period, so the average is used.

This graph shows a certain instructional period, representing 20 weeks of the school year. For this example, the end-of-year benchmark will occur at the 20th week. In reality, the weeks of instruction would represent the total number of weeks between when progress monitoring is begun and the end of the instructional period that you are setting a goal for. This may vary by school and student.

Slide 32: Here are some sample national norms for weekly improvement for math. Remember, the national norms for weekly improvement you select will depend on which tool you have selected, as well as other factors such as additional analysis conducted for your specific population.

Jane is a second-grade student using CBM computation for progress monitoring. A slope of 0.30 is the national norm for weekly rate of improvement for Jane.

Slide 33: This is how to use national norms for weekly rate of improvement to calculate Jane's end-of-year goal. First, the baseline of the most recent three scores is calculated. Jane's baseline is 11.33. Then the norm is found on a table. We just looked at this. The norm is Jane's grade level on CBM computation: 0.30. The norm is multiplied by the number of weeks until the end of year (0.30 times 17 equals 5.1). 5.1 is added to Jane's baseline score, which equals 16.43. Jane's end-of-year goal is 16.43.

Remember, the average is used to calculate the baseline in this example, as it is dealing with

CBM computation and the data were collected over three different points in time.

Slide 34: This is Jane's graph, where 16.43 is marked with an X. The goal line should start at the end of the baseline data collection and extend to the X that demonstrates the end-of-year benchmark.

Slide 35: Rates of Weekly Improvement

Three things to keep in mind when using ROI for goal setting:

1. What research says are "realistic" and "ambitious" growth rates;
2. What norms indicate about "good" growth rates; and
3. Local versus national norms.

Realistic is often considered what students would make given decent instruction. Ambitious should, at a minimum, be more than the average growth, otherwise the performance gap will be maintained, and not closed. Some progress monitoring tool publishers have recommendations for using the growth rates they provide. For example, AIMSweb recommends doubling the growth rate found at the percentile rank in which the student currently performs. Using the recommendations from AIMSweb, if the student's baseline is in the 10th to 25th percentile and the growth rate for students at that performance level is 0.6 WRC (words read correct), then the ambitious growth rate would be 1.2 WRC. If 0.6 WRC were used, the student would be likely to maintain or increase the achievement gap. It is important to contact the publisher to clarify how to best use the growth rates they offer.

Norms are established based on what is considered good growth. Growth may vary based on the domain being assessed.

In comparing local versus national norms, the benefits of local norms include correlations with state testing outcomes and comparisons within a district or state. Challenges with local norms include small sample size, norms being unavailable, and the potential to lead to lower expectations. For national norms, the benefits include a large sample size and established cut scores, but the challenges include inequities in school resources, which can lead to over- and under-identification.

Slide 36: The third option, the intra-individual framework, is typically used for setting IEP goals or for those students performing far below grade level. It is not appropriate for students performing at or near grade level. To use this option, identify the weekly rate of improvement for the target student under baseline conditions, using at least eight data points. Since the student's performance is being compared to his/her previous performance (and not a national or local norm), enough data are needed to demonstrate the existing performance level or rate. Multiply this slope by 1.5 (remember, the student needs to not only maintain that growth, but increase it by at least half). Take this product and multiply it by the number of weeks until the end of the year. Add this product to the student's baseline score. This sum is the end-of-year

goal.

Slide 37: For example, a student's first eight CBM scores were 2, 3, 5, 5, 5, 6, 7, and 4. To calculate the weekly rate of improvement (slope), find the difference between the third median point and first median point. In this instance, that's approximately 6 – 3 = 3. Since eight scores have been collected, divide the difference by the number of data points minus 1. So, 6 – 3 divided by 7 equals 0.43.
The slope (which was calculated to be 0.43) is multiplied by 1.5, giving you 0.645. Multiply the product of 0.645 by the number of weeks left until the end of the year (or instructional period). If there are 14 weeks left until the end of the year, 0.645 multiplied by 14 equals 9.03. The mean of the most recent three data points was 5.67. The sum of 9.03 and the average score is the end-of-year performance goal: 9.03 plus 5.667, which equals 14.69. Thus, the student's goal would be 14.69, rounded to 15. That goal would be plotted on the student's graph and a goal line would be drawn.

Slide 38: Turn to the next page in your *Practice Using Progress Monitoring Data* handout. This is Cecelia's graph. Use the intra-individual framework steps to calculate Cecelia's end-of-year goal. Then, mark the goal with an X and draw the goal line. Pause the webinar to allow yourself some time to complete the activity, and press play when you are ready to continue.

Since we have not yet discussed how to calculate the slope, it has been provided for you.

Note: In this example, baseline performance is calculated by adding the baseline scores (the most recent three data points) and dividing by the number of scores.

Slide 39:
This is how the intra-individual framework would be used to calculate Cecelia's end-of-year goal. First, the slope from the first eight data points is calculated. Cecelia's slope is 1.0. The slope is multiplied by 1.5, which is 1.0 times 1.5 equals 1.5. This is multiplied by the number of weeks until the end of year, which is 12: 1.5 times 12 equals 18. Eighteen is added to Cecelia's baseline score. The baseline score is the average of Cecelia's most recent three data points (15 plus 18 plus 20 divided by 3 equals 17.67), so we take 18 plus 17.67 and we get 35.67. Cecelia's end-of-year goal is 35.67, or 36.

Why did we use a 1.5 growth rate or ROI? If you were to just use one, remember, you are maintaining the previous rate of growth. Because you are attempting to close the gap through supplemental supports (or those above and beyond what was previously provided), you would expect the students to make the previous rate of growth plus additional growth.

Slide 40: This is Cecelia's graph, where 36 is marked with an X. A goal line is drawn from the first eight scores to the X.

Slide 41: Now that we have the goals set, we need to determine the frequency of data collection.

Slide 42: Ideally, the more frequently data are collected and used, the more responsive you become to students. However, given the structure of the school day, it may not be possible to collect as much data as you would like. Determine the frequency of data collection that will meet the data decision making needs.

Slide 43: By the Center's definition, progress monitoring should occur at least monthly. As the number of data points increases, the effects of measurement error on the trend line decrease. Researchers Christ & Silberglitt (2007) recommended between six and nine data points.

Slide 44: In this study (Bangert-Drowns, Kulik, & Kulik, 1991), how frequently data were collected had a direct impact on the performance of students. The authors found that progress monitoring at least once a week led to measureable positive benefit for students. Although further improvement was noted when monitoring two times per week, the added value of monitoring more than once a week may not be feasible or provide enough of a benefit to warrant the extra time spent assessing students and making data-based decisions.

Slide 45: The next step is to begin collecting and graphing progress monitoring data.

Slide 46: To monitor progress, teachers create individual student graphs so they can interpret the CBM scores of every student and see progress or lack thereof. Alternatively, teachers can use software to handle graphs and data analysis. The CBM graphs allow teachers to quantify the rate at which students improve or decrease academic performance over time. Increasing scores indicate that the student is responding to the instructional program. Flat or decreasing scores indicate that the student is not responding to the instructional program, and a change to the student's instructional program needs to take place. To reiterate, you want to see increasing scores, which mean that a student is making progress and responding to the instruction. You also want to look for flat scores to let you know that a student is not benefiting from instruction. This means that you need to alter the instruction for the student.

Slide 47: Teachers should create a master CBM graph in which the vertical axis accommodates the range from zero to the highest possible CBM score. On the horizontal axis, the number of weeks of instruction is listed. Once the teacher creates the master graph, it can be copied and used as a template for every student. An example is found in the appendix of the training manual.

Slide 48: The next step in graphing is plotting the baseline data and setting the goal for the student. This step is essential for decision making activities.

This graph shows a certain instructional period representing 14 weeks of the school year. For this example, the end-of-year benchmark will occur at the 14th week. In reality the weeks of instruction would represent the total number of weeks between when progress monitoring is begun and the end of the instructional period. This may vary by student and school.

Slide 49: Every time a CBM probe is administered, the teacher scores the probe and then records

the score on a CBM graph. A line can be drawn connecting each data point. The measure (as indicated by the axis labels), the goal line, and student data points are necessary for making decisions about students' responsiveness to instruction.

Slide 50: The next step is to use the student's data points to establish a trend line, or a line that helps us see a visual representation of the student's growth. By extending this trend line, you can predict how a student will do if the status quo is maintained. You can quantify the trend line to create the slope, commonly referred to as the rate of improvement.

Trend Line – A trend line is a line on a graph that represents a line of best fit through a student's data points. The trend line can be compared against the aim line to help measure responsiveness to intervention and to tailor a student's instructional program.

A **Slope** is a quantification of the trend line. It becomes the ROI.

Rate of Improvement (ROI) – specifies the improvement, or average weekly increases, based on a line of best fit (the trend line) through the student's scores.

Slide 51: Calculating the slope of a CBM graph is important to assist in determining student growth during primary, secondary, and tertiary prevention. First, graph the CBM scores.

Slide 52: Step 1: Draw a trend line.

First, divide the data points into three equal sections. If the points divide unevenly, try to group them approximately. Once the data points are divided into three sections, draw two vertical lines to separate the sections.

Slide 53: In the first and third sections, find the median data point and median instructional week. Locate the place on the graph where the two values intersect and mark with an "X." Draw a line through the two X's. In this example, the median data point for the first section is 34 and the median instructional week is 2. Mark where these values intersect with an X. In the third section, the median data point is 50 and the median instructional week is 7. Mark where these values intersect with an X.

Slide 54: Draw a line through the two Xs, and this is the trend line; it shows the rate of improvement.

Slide 55: Calculating Slope: Step 2 – Quantify Weekly Rate of Improvement (ROI)

The slope is calculated by first subtracting the median point (notated with an X) in the first section from the median point (notated with an X) in the third section. This is then divided by the number of weeks of instruction. For example, on this graph the score in the third section is 50, and the score in the first section is 34. The total number of data points is eight, and they are collected on a weekly basis, so the number of weeks of instruction represents the number of data

points minus 1 or 7. So, 50 minus 34 equals 16, and 16 divided by 7 equals 2.3. The slope of this graph is 2.3.

Slide 58: Let's look at a few student graphs and how decisions concerning RTI can be made using the graphs. A first-grade student, Sarah, was suspected of being at risk for reading difficulties after scoring below the CBM Word Identification Fluency (WIF) screening cut-off. Her progress in primary prevention was monitored for eight weeks. Sarah's progress on the number of words read correctly looks like it's increasing, and the slope is calculated to quantify the weekly increase and to confirm or disconfirm at-risk status. Sarah's slope is 16 minus 3 divided by 7, or 1.9. Her slope is above the first-grade cut-off of 1.8 for adequate growth in general education. Sarah is benefiting from the instruction provided in primary prevention, and she does not need secondary prevention at this time.

Slide 59: Look at Jessica's graph for primary prevention. Jessica is also a first-grade student who was suspected of being at risk for reading difficulties after scoring below the CBM Word Identification Fluency (WIF) screening cut-off point in September. After collecting eight data points on a weekly basis, it looks like Jessica's scores on the number of words read correctly are not increasing. Jessica' slope is 6 minus 6 divided by 7 equals 0. Her slope is not above the first-grade cut-off of 1.8. Jessica needs secondary prevention at this time.

Slide 60: This is Jessica's graph from primary and secondary prevention. The dotted vertical line shows the point when Jessica began secondary prevention. Twelve data points have been collected while Jessica is in secondary prevention tutoring. Her progress has been monitored weekly. Visually, it appears that Jessica's scores are increasing while she is in secondary prevention. Jessica's slope is calculated as 28 minus 6 divided by 11 equals 2.0 for secondary prevention. Her slope is above the first-grade cut-off of 1.8 for growth in secondary prevention. It is important to continue progress monitoring for Jessica to be sure that she is making adequate progress.

Eleven is used for the denominator for this calculation because there are 12 data points that were collected on a weekly basis. Therefore, the number of weeks of instruction that Jessica participated in was 12 minus 1, or 11.

Slide 61: Once enough data have been collected, team can analyze and begin to make instructional decisions.

Slide 62: We have discussed how to collect and graph data, set goals, and calculate ROI, but in order for the data collected to be valuable, you need to use the data to make instructional decisions based on explicit decision rules.

Slide 63: The decisions that can be made using progress monitoring data are numerous. You can:

- Identify students who are not making progress and need additional assessment and

instruction;
- Confirm or disconfirm screening data;
- Evaluate effectiveness of interventions and instruction;
- Allocate resources; and finally,
- Evaluate effectiveness of instruction programs for target groups (for example, English language learner or Title I students).

Slide 64: Once goals are set and individualized programs are implemented, it is important to monitor student progress. With CBM, educators can judge the adequacy of student progress and the need to change instructional programs. Standard decision rules guide decisions about the adequacy of student progress and the need to revise goals and instructional programs. Decision rules are based on the four most recent consecutive scores or on the student's trend line. Let's look at examples.

Slide 65: Decision rules based on the four-point method

- 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 goal line, increase the goal.
    - If all four are below goal line, make an instructional change.
    - If the four data points are both above and below the goal line, keep collecting data until the trend line rule or four-point rule can be applied.

Slide 66: On this graph, the four most recent scores are *above* the goal line. Therefore, the student's end-of-year performance goal needs to be adjusted. The teacher increases the desired rate (or goal) to boost the actual rate of student progress. The point of the goal increase is notated on the graph as a dotted vertical line. This allows teachers to visually note when the student's goal was changed. The teacher reevaluates the student graph after another seven to eight data points. The student can also be moved to less intensive support if he or she meets the grade-level benchmark.

Slide 67: On this graph, the four most recent scores are *below* the goal line. Therefore, the teacher needs to change the student's instructional program. The end-of-year performance goal and goal line never decrease; they can only increase. The instructional program should be modified to bring a student's scores up so they match or surpass the goal line. The teacher draws a dotted vertical line when making an instructional change. This allows teachers to visually note when changes to the student's instructional program were made. The teacher reevaluates the student graph after another seven to eight data points to determine whether the change was effective.

Slide 68: We have already talked about how to calculate a trend line, but we will now discuss how to use the trend line to make decisions.

- If **four weeks** of instruction have occurred *and* at least **eight data points** have been collected, figure trend of current performance and compare to goal line.
- Calculate by hand or by computer.

Slide 69: Calculating the slope alone can be used if there are established norms for what is an appropriate growth rate. However, rate of improvement can be better interpreted when presented in conjunction with the goal. In this case, this student's rate of improvement is unlikely to help the student reach his or her goal.

Slide 70: Here are some basic decision rules based on trend line analysis:

- If the student's trend line is steeper than the goal line, the student's end-of-year performance goal needs to be increased.
- If the student's trend line is flatter than the goal line, the teacher needs to revise the instructional program.
- If the student's trend line and goal line are the same, no changes need to be made.

Slide 71: On this graph, the trend line is steeper than the goal line. The student is showing increasing scores; therefore, the student's end-of-year goal needs to be adjusted to provide more of a challenge. The student can also be moved to less intensive support if he or she meets the grade-level benchmark.

Slide 72: Now that you know the trend line is steeper than the goal line, you need to adjust the student's end-of-year performance goal. The teacher increases the desired rate (or goal) to boost the actual rate of student progress. The new goal line can be an extension of the trend line. The point of the goal increase is notated on the graph as a dotted vertical line. This allows the teacher to visually note when the student's goal was changed. The teacher reevaluates the student graph after another seven to eight data points. The data prior to the goal change serve as a baseline for the new goal. The student can also be moved to less intensive support if he or she meets the grade-level benchmark.

Slide 73: On this graph, the trend line is flatter than the performance goal line. A trend line below the goal line indicates that student progress is inadequate to reach the end-of-year performance goal. The instructional program should be modified to bring a student's scores up. The point of the instructional change is represented on the graph as a dotted vertical line. Again, this allows the teacher to visually note when the student's instructional program was changed. The teacher reevaluates the student graph after another seven to eight data points. Again, the end-of-year performance goal and goal line are never decreased.

Slide 74: In this graph, the trend line is similar to the goal line. If the trend line matches the goal line, then no change is currently needed for the student. The teacher reevaluates the student graph after another seven to eight data points to determine whether an end-of-year performance goal or an instructional change needs to take place.

Slide 75: In summary:

- The four-point rule is easy to implement but not as sensitive.
- The trend line rule is more sensitive to changes but requires calculation to obtain.

Slide 76: Let's apply the trend line analysis in order to confirm or disconfirm screening data and assess response to secondary intervention. In this sample model, students are screened (or tested once) in the fall using CBM. Students scoring below or just above a cut score are suspected to be at risk. For these students suspected to be at risk, response to general education is monitored using CBM for 6 to 10 weeks.

Slide 77: This sample chart that shows the cut-off points for math screening at which students are considered to be at risk for math failure. Remember, the cut points you select will depend on which tool you have selected, as well as other factors such as additional analysis conducted for your specific population. In this site's model, if students fall just above or below the appropriate cut-off, they are suspected to be at risk and are then monitored for 6 to 10 weeks to confirm or disconfirm whether they are truly at risk for math failure.

Slide 78: At the end of the 6 to 10 weeks, the student's risk status is confirmed or disconfirmed by quantifying the response to primary prevention. To do this, the student's rate of improvement or slope across 6 to 10 CBM data points is calculated. Students whose slope is less than the slope provided for their grade level are confirmed to be at risk and then moved to secondary prevention. We've already discussed calculating slope. This table shows the reading and math slopes deemed inadequate as measured by CBM after 6 to 10 weeks of primary prevention. These data may change pending additional RTI research.

Slide 79: This student's graph has a CBM computation slope of 14 minus 5 divided by 7, which equals 1.29, so this fourth-grade student is exceeding the 0.50 cut-off for CBM computation. This student is progressing adequately in primary prevention in the general education classroom.

Slide 80: Look at this student's graph. The slope for this student's computation CBM is 5 minus 5 divided by 7, which equals 0. This student's slope is less than the 0.50 CBM computation cut-off for Grade 4. This student's risk status would be confirmed, and he or she would enter secondary prevention.

Slide 81: Turn to the Arthur example on the last page of your *Practice Using Progress Monitoring Data* handout. Calculate the slope for Arthur's second-grade CBM computation graph. Then, using the information in the table at the bottom of the page, determine whether Arthur is responsive or unresponsive to primary prevention. Press pause to complete this exercise, and press play when you are ready to continue.

Slide 82: Since Arthur is a second-grade student using CBM computation, his slope for demonstrating adequate progress in primary prevention should not fall below 0.20.

Slide 83: Your graph should look like this. Arthur's slope is calculated as 6 minus 6 divided by 8 equals 0.0. This slope falls below the second-grade CBM computation cut-off slope of 0.20. Arthur is not responding to primary prevention, so he should move to secondary prevention.

Slide 84: Let's review primary prevention.

All classroom students are screened (stage 1 of screening process or universal screening) in the fall to identify suspected at-risk students. These students suspected to be at risk students are identified by low performance on reading or math CBM.

Suspected at-risk students remain in the general education intervention and are monitored weekly using CBM for 6 to 10 weeks to confirm or disconfirm at-risk status (stage 2 of the screening process). CBM scores are graphed and slopes are calculated.

- Students with adequate slopes remain in primary prevention.
- Students with inadequate slopes move to secondary prevention.

Slide 85: During secondary prevention, student progress is monitored on a more frequent basis. Student reading or math scores are graphed and the slopes are calculated. After the tutoring has ended, the student response to tutoring is assessed. This table shows sample cut-off response rates to secondary prevention tutoring in reading. Unresponsiveness can be determined by an inadequate slope or end CBM level. If students fall below the appropriate cut-off, they may enter another secondary tutoring program, or be transitioned to tertiary prevention, where a special education evaluation may occur.

Again, these are sample data. Sites will need to refer to existing research or conduct their own in order to develop appropriate scores for conforming or disconfirming risk.

Slide 86: This table shows sample cut-off response rates to secondary prevention tutoring in math. Unresponsiveness can be determined by an inadequate slope or end CBM level, or a combination of both. These data may change pending additional RTI research. Remember that many times students in secondary prevention are monitored using CBM computation or concepts and applications tests that are below their actual grade level. We discussed how to find the appropriate CBM level for students a little earlier.

Slide 87: If student performance is inadequate according to either the slope or end-level tables you just saw, two courses of action can be taken.

First, in some versions of RTI, the student participates in another round of small-group tutoring either similar to or different from the tutoring that already was delivered. Student progress is monitored weekly, and the student's slope and end level are evaluated at the end of the second secondary prevention round of tutoring.

Another option is for the student to move into tertiary prevention. Some RTI frameworks then

conduct a multidisciplinary assessment to answer questions generated during primary and secondary prevention and to determine whether the student has a disability. If this is the case, tertiary prevention may be conducted under the auspices of special education.

Slide 88: While we have discussed how to graph student progress and how to calculate rates of improvement by hand, we recognize that many times computers are used to help calculate and track student progress. Both published data systems and computer applications such as Excel can be helpful.

Using Excel, you can right click on graphed data, add trend line, click on options, and add the equation.

Most progress monitoring data systems automatically establish trend lines and calculate rate of improvement.

Slide 89: One big problem with Excel is that it does not recalculate after the intervention has been changed. As you can see the trend line uses all the data points on the graph and doesn't differentiate between those before and after the intervention was adjusted.

Slide 90: As you can see in this example, the commercial graphing program AIMSweb recalculates the trend line and ROI after the intervention changes. This graph shows four separate trend lines based on four different interventions. It is important to check with the publisher to determine if the data system will recalculate trend lines after each intervention change.

Slide 91: Progress should be monitored until the team determines that the student no longer needs supplemental supports.

Slide 92: Teams should establish procedures for sharing progress monitoring data:

- Communicating the purpose of data collection and results regularly with parents, teachers, and students
- Dissemination with discussion is preferred. Encourage all school teams to talk about results, patterns, possible interpretations, and likely next steps.

Slide 93: Things to remember

- If you get good data in, you'll get good data out.
  - Know where your data came from and the validity of the data.
- Focus on the big picture for all students.
  - Are most students making progress?
- **All** instructional and curriculum decisions should be based on data.
- Finally, keep it simple and efficient.

Slide 94: It's easy to identify your framework components, but implementing can be quite difficult and can take at least two to four years to get into full implementation. We recommend that you select and implement evidence-based practices and procedures. The tools charts available through the NCRTI can help you do that.

You should also implement progress monitoring with integrity. It is important to ensure that cultural, linguistic, and socioeconomic factors are reflected in the RTI framework and its components. On the tools chart, there is a column that provides information about how each particular tool has been used with different groups. District and schools teams should continually evaluate the efficacy of the model and model components for diverse populations.

Slide 95: Thanks for taking the time to listen to Using Progress Monitoring Data for Decision Making. To find more resources on this topic or to view other webinars in the implementer series, visit www.rti4success.org. You can also find more information from the RTI Action Network and IDEA Partnership sites listed on this slide.