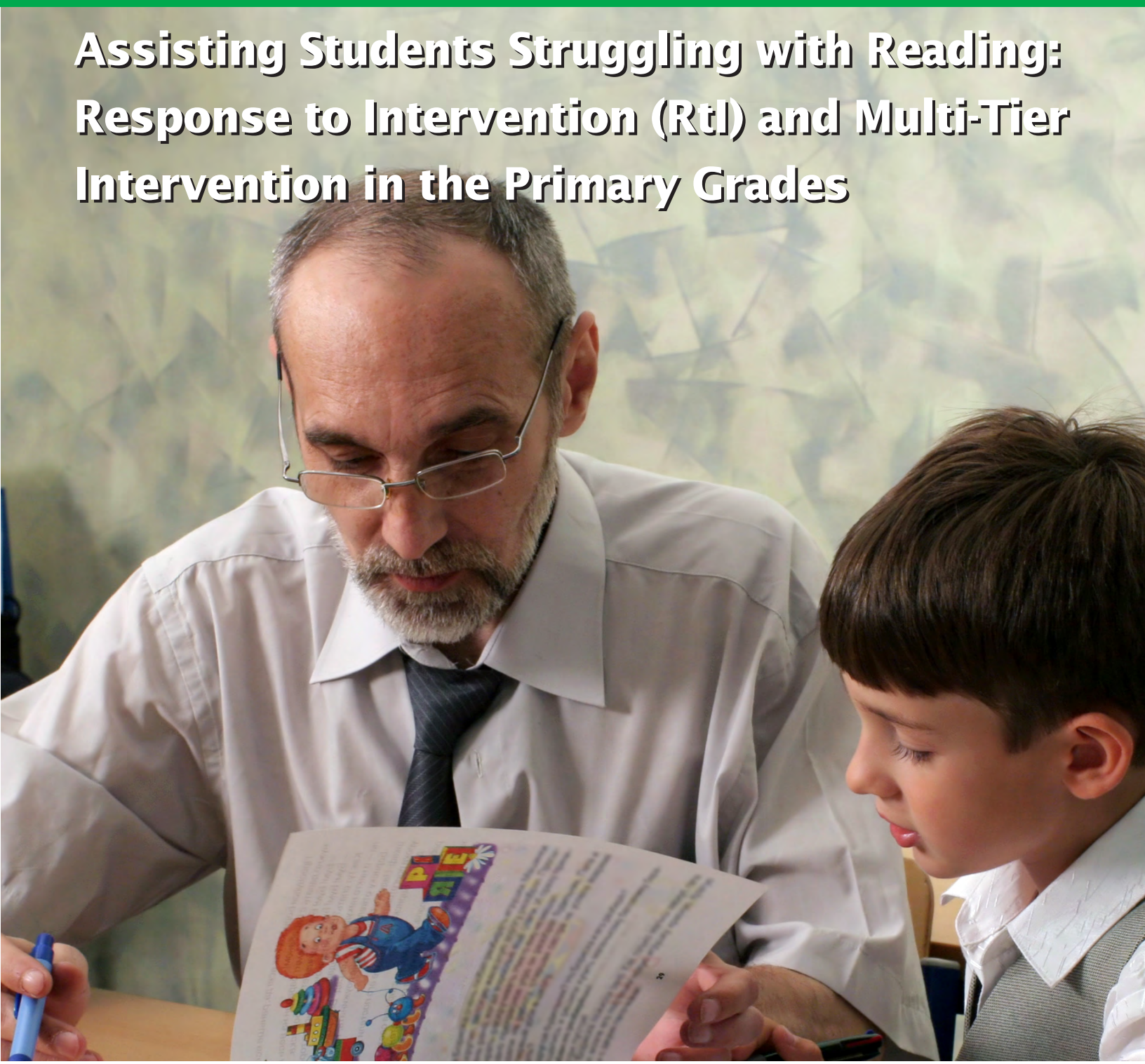
Assisting Students Struggling with Reading: Response to Intervention (RtI) and Multi-Tier Intervention in the Primary Grades



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The goal of this practice guide is to formulate specific and coherent evidence-based recommendations for use by educators addressing the challenge of reducing the number of children who fail to learn how to read proficiently by using "response to intervention" as a means of both preventing reading difficulty and identifying students who need more help. This is called Response to Intervention (RtI). The guide provides practical, clear information on critical RtI topics and is based on the best available evidence as judged by the panel. Recommendations in this guide should not be construed to imply that no further research is warranted on the effectiveness of particular RtI strategies.

IES PRACTICE GUIDE

Assisting Students Struggling with Reading: Response to Intervention and Multi-Tier Intervention in the Primary Grades

February 2009

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Assisting Students Struggling with Reading: Response to Intervention and Multi-Tier Intervention in the Primary Grades

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Introduction

In the primary grades students with reading difficulties may need intervention to prevent future reading failure. This guide offers specific recommendations to help educators identify students in need of intervention and implement evidence-based interventions to promote their reading achievement. It also describes how to carry out each recommendation, including how to address potential roadblocks in implementing them.

We, the authors, are a small group with expertise in various dimensions of this topic. Several of us are also experts in research methodology. The recommendations in this guide reflect not only our expertise and experience but the findings of rigorous studies of interventions to promote reading achievement.

Each recommendation received a rating that describes the strength of the research evidence that has shown its effectiveness. These ratings—"strong," "moderate," or "low"—are defined as:

Strong refers to consistent and generalizable evidence that a program causes better outcomes.[1]

Moderate refers to evidence from studies that allow strong causal conclusions but cannot be generalized with assurance to the population on which a recommendation is focused (perhaps because the findings have not been widely replicated) or to evidence from studies that are generalizable but have more causal ambiguity than offered by experimental designs (such as statistical models of correlational data or group comparison designs for which equivalence of the groups at pretest is uncertain).

Low refers to expert opinion based on reasonable extrapolations from research and theory on other topics and evidence from studies that do not meet the standards for moderate or strong evidence.

Table 1 details the criteria used to determine the level of evidence for each recommendation. For questions about what works best, high-quality experimental and quasi-experimental studies, such as those meeting the criteria of the What Works Clearinghouse (www.whatworks.ed.gov), have a privileged position. The evidence considered in developing and rating these recommendations included experimental research on providing differentiated instruction in a general education classroom and rigorous evaluations of intensive reading interventions. We also examined studies on the technical adequacy of batteries of screening measures.

1. Following WWC guidelines, we consider a positive, statistically significant effect, or an effect size greater than 0.25, as an indicator of positive effects.

The What Works Clearinghouse standards and their relevance to this guide

The panel relied on WWC Evidence Standards to assess the quality of evidence supporting educational programs and practices and apply a level of evidence rating to each recommendation. The WWC addresses evidence for the causal validity of instructional programs and practices using WWC Standards. Information about these standards is available at http://ies.ed.gov/ncee/wwc/references/standards/. The technical quality of each study is rated and placed into one of three categories:

- *Meets Evidence Standards* for randomized controlled trials and regression discontinuity studies that provide the strongest evidence of causal validity.

- *Meets Evidence Standards with Reservations* for all quasi-experimental studies with no design flaws and randomized controlled trials that have problems with randomization, attrition, or disruption.

- *Does Not Meet Evidence Screens* for studies that do not provide strong evidence of causal validity.

Based on the recommendations and suggestions for their implementation, appendix D presents more information on the research evidence supporting the recommendations.

The panel would like to thank Kelly Haymond for her contributions to the analysis, Mary Jo Taylor for her expert editorial assistance, the WWC reviewers for their contribution to the project, and Jo Ellen Kerr for her support of the intricate logistics of the project. We also would like to thank Scott Cody for his oversight of the analyses and the overall progress of the practice guide.

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Table 1. Institute of Education Sciences levels of evidence for practice guides

Strong	In general, characterization of the evidence for a recommendation as strong requires both studies with high internal validity (i.e., studies whose designs can support causal conclusions) and studies with high external validity (i.e., studies that in total include enough of the range of participants and settings on which the recommendation is focused to support the conclusion that the results can be generalized to those participants and settings). Strong evidence for this practice guide is operationalized as: • A systematic review of research that generally meets the What Works Clearinghouse (WWC) standards (see http://ies.ed.gov/ncee/wwc/) and supports the effectiveness of a program, practice, or approach, with no contradictory evidence of similar quality; OR • Several well designed, randomized controlled trials or well designed quasi-experiments that generally meet WWC standards and support the effectiveness of a program, practice, or approach, with no contradictory evidence of similar quality; OR • One large, well designed, randomized controlled, multisite trial that meets WWC standards and supports the effectiveness of a program, practice, or approach, with no contradictory evidence of similar quality; OR • For assessments, evidence of reliability and validity that meets the Standards for Educational and Psychological Testing.[a]
Moderate	In general, characterization of the evidence for a recommendation as moderate requires studies with high internal validity but moderate external validity, or studies with high external validity but moderate internal validity. In other words, moderate evidence is derived from studies that support strong causal conclusions, but where generalization is uncertain, or studies that support the generality of a relationship, but where the causality is uncertain. Moderate evidence for this practice guide is operationalized as: • Experiments or quasi-experiments generally meeting WWC standards and supporting the effectiveness of a program, practice, or approach with small sample sizes and/or other conditions of implementation or analysis that limit generalizability and no contrary evidence; OR • Comparison group studies that do not demonstrate equivalence of groups at pretest and therefore do not meet WWC standards but that (a) consistently show enhanced outcomes for participants experiencing a particular program, practice, or approach and (b) have no major flaws related to internal validity other than lack of demonstrated equivalence at pretest (e.g., only one teacher or one class per condition, unequal amounts of instructional time, highly biased outcome measures); OR • Correlational research with strong statistical controls for selection bias and for discerning influence of endogenous factors and no contrary evidence; OR • For assessments, evidence of reliability that meets the Standards for Educational and Psychological Testing[b] but with evidence of validity from samples not adequately representative of the population on which the recommendation is focused.
Low	In general, characterization of the evidence for a recommendation as low means that the recommendation is based on expert opinion derived from strong findings or theories in related areas or expert opinion buttressed by direct evidence that does not rise to the moderate or strong levels. Low evidence is operationalized as evidence not meeting the standards for the moderate or high levels.

a. American Educational Research Association, American Psychological Association, and National Council on Measurement in Education (1999).

b. Ibid.

Assisting Students Struggling with Reading: Response to Intervention and Multi-Tier Intervention for Reading in the Primary Grades

Overview

Response to Intervention (RtI) is a comprehensive early detection and prevention strategy that identifies struggling students and assists them before they fall behind. RtI systems combine universal screening and high-quality instruction for all students with interventions targeted at struggling students.

RtI strategies are used in both reading and math instruction. For reading instruction in the primary grades (K–2), schools screen students at least once a year to identify students at risk for future reading failure.[2] Students whose screening scores indicate potential difficulties with learning to read are provided with more intensive reading interventions. Student responses to the interventions are then measured to determine whether they have made adequate progress and either (1) no longer need the intervention, (2) continue to need some intervention, or (3) need even more intensive intervention.

In RtI, the levels of interventions are conventionally referred to as "tiers." RtI is typically thought of as having three tiers, with the first tier encompassing general classroom instruction.[3] Some states and school districts, however, have implemented multi-tier intervention systems with more than three tiers. Within a three-tier RtI model, each tier is defined by specific characteristics:

- Tier 1 instruction is generally defined as reading instruction provided to all students in a class. Beyond this general definition, there is no clear consensus on the meaning of the term tier 1. Instead, it is variously referred to as "evidence-based reading instruction,"[4] "high quality reading instruction,"[5] or "an instructional program…with balanced, explicit, and systematic reading instruction that fosters both code-based and text-based strategies for word identification and comprehension."[6]

- Tier 2 interventions are provided only to students who demonstrate problems based on screening measures or weak progress from regular classroom instruction. In addition to general classroom instruction, tier 2 students receive supplemental, small group reading instruction aimed at building foundational reading skills.

- Tier 3 interventions are provided to students who do not progress after a reasonable amount of time with the tier 2 intervention and require more intensive assistance. Tier 3 (or, in districts with more than three tiers, tiers 3 and above) usually entails one-on-one tutoring with a mix of instructional interventions. Ongoing analysis of student performance data is critical in tier 3. Systematically collected data are used to identify successes and failures in instruction for individual students. If students still experience difficulty after receiving intensive services, they are evaluated for possible special education services.

Though a relatively new concept, RtI and multi-tier interventions are becoming increasingly common. This is attributed in

2. Johnson, Jenkins, Petscher, and Catts (in press, pp. 3–4).

3. Fuchs, Fuchs, and Vaughn (2008) make the case for a three-tier RtI model.

4. Vaughn and Fuchs (2006).

5. Division for Learning Disabilities (2007).

6. Vellutino, Scanlon, Small, Fanuele, and Sweeney (2007).

part to the 2004 reauthorization of the Individuals with Disabilities Education Act (IDEA), which encourages states to use RtI to help prevent reading difficulties and to identify students with learning disabilities.

RtI's inclusion in the 2004 reauthorization can be traced to two key reports released in 2002. First, the *President's Commission on Excellence in Special Education* (2002) report revealed that special education put too much emphasis on paperwork and too little on instruction.[7] It recommended that educators put more energy into monitoring student progress in academic areas and less into monitoring paperwork and compliance with regulations.

Second, a 2002 report from the National Academy of Sciences examined the overrepresentation of students from minority subgroups in special education.[8] This report proposed ideas for making the referral process for learning disabilities more meaningful to classroom teachers, arguing that special education "eligibility ensue when a student exhibits large differences from typical levels of performance in…[reading] *and with evidence of insufficient response to high-quality interventions…in school settings.*"[9] This encouraged schools to provide services to students struggling in reading within general education in the early grades before considering special education. Special education would be considered only for students who failed to respond to evidence-based interventions or interventions using what the field considers best practice.

There are two potential advantages of RtI and multi-tier intervention. Struggling students are provided with help in learning how to read early in their school careers. In the past many students were not provided with additional assistance in reading until they were officially diagnosed with a specific learning disability, often not until grade 2 or 3.[10] This was the practice even though longitudinal research consistently showed that students who were weak readers at the early elementary grades tended to stay weak readers in the higher grades.[11]

RtI also urges schools to use evidence-based practices in all tiers and to provide intensive services only to students who fail to benefit from a well designed, evidence-based intervention. This helps to accurately determine which students possess learning disabilities in reading since only students who do not respond to high-quality reading instruction in their general education classrooms would be considered for special education. Thus, there is the possibility—and certainly the hope—that RtI will reduce inappropriate referrals to special education, especially of ethnic minority students, low-income students, and students who received weak reading instruction.[12]

The panel also believes that RtI holds the most potential for serious ongoing collaboration between the special education community and that of general education—largely because the collaboration is based on objective data and shared understandings of the evidence.

Summary of the Recommendations

This practice guide offers five concrete recommendations for helping elementary schools implement an RtI framework to ensure that all students in the primary grades learn to read. These recommendations

7. Haager, Klingner, and Vaughn (2007).

8. Donovan and Cross (2002).

9. Cited in Haager et al. (2007, p. 5, emphasis added).

10. Donovan and Cross (2002); Heller, Holtzman, and Messick (1982).

11. See Cunningham and Stanovich (1997); Felton and Pepper (1995); Phillips, Norris, Osmond, and Maynard (2002); Francis, Shaywitz, Stuebing, Shaywitz, and Fletcher (1996); Juel (1988); Torgesen and Burgess (1998); Torgesen, Rashotte, and Alexander (2001).

12. Donovan and Cross (2002); Heller, Holtzman, and Messick (1982).

appear in table 2. There are many ways to orchestrate this process, and implementing this system entails involvement of school personnel at many levels: classroom teachers, special educators, school psychologists, paraprofessionals, reading coaches, specialists, and the principal. This guide provides concrete guidance on how to implement RtI; it does not describe which individuals on the team provide which services.

Table 2. Recommendations and corresponding levels of evidence

Recommendation	Level of evidence
1. *Screen all students for potential reading problems at the beginning of the year and again in the middle of the year.* Regularly monitor the progress of students at risk for developing reading disabilities.	**Moderate**
Tier 1 intervention/general education	
2. *Provide time for differentiated reading instruction for all students based on assessments of students' current reading level.*	**Low**
Tier 2 intervention	
3. *Provide intensive, systematic instruction on up to three foundational reading skills in small groups to students who score below the benchmark score on universal screening.* Typically, these groups meet between three and five times a week, for 20 to 40 minutes.	**Strong**
4. *Monitor the progress of tier 2 students at least once a month.* Use these data to determine whether students still require intervention. For those students still making insufficient progress, schoolwide teams should design a tier 3 intervention plan.	**Low**
Tier 3 intervention	
5. *Provide intensive instruction on a daily basis that promotes the development of the various components of reading proficiency to students who show minimal progress after reasonable time in tier 2 small group instruction (tier 3).*	**Low**

Source: Authors' compilation based on text.

We begin with specific methods for setting up a universal screening system (recommendation 1). We note the specific reading and reading-related skills that should be assessed in screening and progress-monitoring measures at each grade level. We assume most educators possess some knowledge of universal screening. Therefore, we provide specific suggestions on how to ensure that the screening measures used are effective.

As part of recommendation 1, we address the problem of false positives—students whose screening scores suggest that they need additional assistance, but who would do fine without it. This is a particular problem for measures given at the beginning of kindergarten; we explain why and what is recommended. We urge that schools seriously investigate both the degree to which a screening measure correctly identifies students at risk for reading difficulties and identifies students at low risk for such difficulties.

The second recommendation addresses how educators can use assessment data to differentiate reading instruction in tier 1. For example, classroom teachers can use assessment data to determine which students require additional instruction in decoding and vocabulary and which require additional assistance only with decoding instruction. While the concept of tier 1 instruction is amorphous, based on conventional definitions, differentiated instruction is often mentioned as a critical component of tier 1.[13]

Recommendations 3 and 4 address tier 2 interventions. In recommendation 3 we suggest that tier 2 students receive small group instruction in homogeneous groups for 20 to 40 minutes, three to five days a week. This recommendation has the most research and, most importantly, a clear convergence in findings. It is not important whether a certified teacher or a paraprofessional provides the instruction. But instruction should be systematic, highly explicit, and highly interactive. We note that interventions must not focus only on phonemic awareness, decoding, and fluent reading (depending on student proficiency level) but should also include vocabulary and comprehension components.

Recommendation 4 addresses using data to monitor progress for students in tier 2 interventions. Although no studies have experimentally tested the impact of progress monitoring on outcomes in reading, we still encourage schools to monitor the progress of these students so that personnel possess information on how a student is doing in general reading proficiency and improving in specific skills. It is important to use progress-monitoring data to regroup students after six weeks. Tier 2 students who demonstrate improvement and return to tier 1 should be carefully monitored to ensure that general classroom instruction is adequate.

Recommendation 5 addresses tier 3 interventions, and we are candid about the paucity of research on effective tier 3 intervention. Tier 3 intervention is the most ambiguous component of RtI, and we did not find research on valid programs or processes. Based on the content of small-scale intervention studies and the expert opinion of the panel, we suggest, as Vellutino et al. (2007) suggest, that tier 3 reading instruction be even more intensive than tier 2. Although student reading programs should be individualized, they should be viewed as more than one-on-one instruction. In particular, in listening and reading comprehension and vocabulary development small group instruction makes sense. We also note that districts should carefully monitor the success or failure of tier 3 programs, given the paucity of available evidence.

13. Connor, Morrison, Fishman, Schatschneider, and Underwood (2007).

Scope of the practice guide

Our goal is to provide evidence-based suggestions for implementing multi-tier interventions that are feasible and based on evidence from rigorous research. RtI and multi-tier interventions transgress the borders of special and general education and demand schoolwide collaboration. Thus, our target audience includes classroom teachers in the primary grades, special educators, school psychologists and counselors, as well as administrators.

This practice guide provides recommendations to schools and school districts on using RtI for primary grade students struggling with learning how to read. It is designed to guide educators on how to identify struggling students using RtI and implement interventions to improve these students' reading ability. The guide focuses on screening and interventions for struggling readers; it does not provide recommendations for general classroom reading instruction.

We limit the focus of the guide to the primary grades because the bulk of the current research has focused on these grade levels. The majority of the research on intervention and screening of students with reading difficulties was conducted in early grade levels. In addition, for the past 15 years, the country has seen a large push for early intervention to prevent reading difficulties later.[14]

Multi-tier instruction efforts like RtI can potentially prevent many struggling beginning readers from falling behind in ways that will harm their future academic success. Some aspects of RtI, however, (such as tier 1 instruction) are still poorly defined, and there is little evidence that some practices of targeted instruction will be effective. But a coordinated multi-tier instruction program that screens and monitors students accurately and addresses the core components of reading instruction can prevent struggling beginning readers from becoming struggling adolescent readers and reduce unnecessary referrals to special education.

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14. Burns, Snow and Griffin (1996).

Checklist for carrying out the recommendations

Recommendation 1.
Screen all students for potential reading problems at the beginning of the year and again in the middle of the year. Regularly monitor the progress of students who are at elevated risk for developing reading disabilities.

☐ Create a building-level team to facilitate the implementation of universal screening and progress monitoring.

☐ Select a set of efficient screening measures that identify children at risk for poor reading outcomes with reasonable degrees of accuracy.

☐ Use benchmarks or growth rates (or a combination of the two) to identify children at low, moderate, or high risk for developing reading difficulties.[15]

Recommendation 2.
Provide differentiated reading instruction for all students based on assessments of students' current reading levels (tier 1).

☐ Provide training for teachers on how to collect and interpret student data on reading efficiently and reliably.

☐ Develop data-driven decision rules for providing differentiated instruction to students at varied reading proficiency levels for part of the day.

☐ Differentiate instruction—including varying time, content, and degree of support and scaffolding—based on students' assessed skills.

15. Schatschneider (2006).

Recommendation 3.
Provide intensive, systematic instruction on up to three foundational reading skills in small groups to students who score below the benchmark score on universal screening. Typically, these groups meet between three and five times a week for 20 to 40 minutes (tier 2).

☐ Use a curriculum that addresses the components of reading instruction (comprehension, fluency, phonemic awareness, phonics, and vocabulary) and relates to students' needs and developmental levels.

☐ Implement this program three to five times a week, for approximately 20 to 40 minutes.

☐ Build skills gradually and provide a high level of teacher-student interaction with opportunities for practice and feedback.

Recommendation 4.
Monitor the progress of tier 2 students at least once a month. Use these data to determine whether students still require intervention. For those students still making insufficient progress, schoolwide teams should design a tier 3 intervention plan.

☐ Monitor progress of tier 2 students on a regular basis using grade appropriate measures. Progress monitoring should occur at least eight times during the school year.

☐ While providing tier 2 instruction, use progress monitoring data to identify students needing additional instruction.

☐ Consider using progress monitoring data to regroup tier 2 students approximately every six weeks.

Recommendation 5. Provide intensive instruction on a daily basis that promotes the development of the various components of reading proficiency to students who show minimal progress after reasonable time in tier 2 small group instruction (tier 3).

☐ Implement concentrated instruction that is focused on a small but targeted set of reading skills.

☐ Adjust the overall lesson pace.

☐ Schedule multiple and extended instructional sessions daily.

☐ Include opportunities for extensive practice and high-quality feedback with one-on-one instruction.

☐ Plan and individualize tier 3 instruction using input from a school-based RtI team.

☐ Ensure that tier 3 students master a reading skill or strategy before moving on.

Recommendation 1. Screen all students for potential reading problems at the beginning of the year and again in the middle of the year. Regularly monitor the progress of students who are at elevated risk for developing reading disabilities.

Universal screening is a critical first step in identifying students who are at risk for experiencing reading difficulties and who might need more instruction. Screening should take place at the beginning of each school year in kindergarten through grade 2. Schools should use measures that are efficient, reliable, and reasonably valid. For students who are at risk for reading difficulties, progress in reading and reading related-skills should be monitored on a monthly or even a weekly basis to determine whether students are making adequate progress or need additional support (see recommendation 4 for further detail). Because available screening measures, especially in kindergarten and grade 1, are imperfect, schools are encouraged to conduct a second screening mid-year.

Level of evidence: Moderate

The panel judged the level of evidence for recommendation 1 to be *moderate*. This recommendation is based on a series of high-quality correlational studies with replicated findings that show the ability of measures of reading proficiency administered in grades 1 and 2 to predict students' reading performance in subsequent years.[16] However, it should be cautioned that few of the samples used for validation adequately represent the U.S. population as required by the Standards for Educational and Psychological Testing.[17] The evidence base in kindergarten is weaker, especially for measures administered early in the school year.[18] Thus, our recommendation for kindergarten and for grade 1 is to conduct a second screening mid-year when results tend to be more valid.[19]

Brief summary of evidence

The panel recommends a series of screening measures be employed to assess proficiency in several key areas (see Table 3). Five correlational studies have demonstrated that certain types of measures can be used to accurately predict future student performance.[20] Tests conducted by the Assessment Committee (2002) demonstrate that these measures meet the standards for educational and psychological testing[21] in terms of internal consistency and temporal

16. Compton, Fuchs, Fuchs, and Bryant (2006); McCardle, Scarborough, and Catts (2001); O'Connor and Jenkins (1999); Scarborough (1998a); Fuchs, Fuchs, and Compton (2004); Speece, Mills, Ritchey, and Hillman (2003b).

17. American Education Research Association, American Psychological Association, and National Council on Measurement in Education (1999).

18. Jenkins and O'Connor (2002); O'Connor and Jenkins (1999); Scarborough (1998a); Torgesen (2002); Badian (1994); Catts (1991); Felton (1992).

19. Compton et al. (2006); Jenkins, Hudson, and Johnson (2007).

20. Compton et al. (2006); McCardle, Scarborough, and Catts (2001); O'Connor and Jenkins (1999); Scarborough (1998a); Fuchs, Fuchs, and Compton (2004); Speece et al. (2003b).

21. American Education Research Association, American Psychological Association, and National Council on Measurement in Education (1999).

stability.[22] While the panel is not recommending which specific measure should be adopted in each school, the panel does recommend that students are screened with measures that have properties similar to those examined in these studies.

In our review of evidence, we detected problems with commonly used measures in terms of their ability to correctly identify children at low risk for experiencing problems (known as specificity). That is, the measures tend to consistently overidentify students as needing assistance.[23] We also noted a paucity of cross-validation studies.[24] Nonetheless, the extensive body of replicated correlational research supports our conclusion that these are reasonable batteries of measures to use for early screening, particularly in grades 1 and 2.

How to carry out this recommendation

1. Create a building-level team to facilitate the implementation of universal screening and progress monitoring.

In the opinion of the panel, a building-level RtI team should focus on the logistics of implementing school-wide screening and subsequent progress monitoring, such as who administers the assessments, scheduling, and make-up testing, as well as substantive issues, such as determining the guidelines the school will use to determine which students require intervention and when students have demonstrated a successful response to tier 2 or tier 3 intervention. Although each school can develop its own benchmarks, it is more feasible, especially during the early phases of implementation, for schools to use guidelines from national databases (often available from publishers, from research literature, or on the Office of Special Education Programs (OSEP) Progress Monitoring and RtI websites[25]).

2. Select a set of efficient screening measures that identify children at risk for poor reading outcomes with reasonable accuracy.

As children develop, different aspects of reading or reading-related skills become most appropriate to use as screening measures. Table 3 highlights the skills most appropriate for each grade level. Some controversy remains about precisely which one skill is best to assess at each grade level. For that reason, we recommend the use of two screening measures at each juncture.

Table 3 also outlines some commonly used screening measures for kindergarten through grade 2 highlighting their focus, purpose, and limitations. The limitations are based on the opinion of the panel.

22. Coefficient alpha estimates are .84 for grade 1 letter sound knowledge, .80 for grade 1 phoneme blending, and .85 and .83 for grade 1 and 2 word reading on the Texas Primary Reading Inventory (1999). Coefficient alpha estimates are .92 and .91 for 6 and 7 year old children on the elision measure and .89 and .86 for 6 and 7 year old children on the sound matching measure on the Comprehensive Test of Phonological Processing (Wagner, Torgeson, and Rashotte 1999). Alternate test-form and stability coefficients exceed .90 in grade 1 for the word identification fluency task (Compton et al. 2006). For the DIBELS measures alternative-form reliability estimate for grade 1 letter naming fluency, .86 for grade 1 non-word fluency it is .83, and .90 for grade 2 oral reading fluency (Good and Kaminski 2003).

23. Foorman, Fletcher, Francis, Schatschneider, and Mehta (1998); O'Connor and Jenkins (1999); Jenkins and O'Connor (2002); McCardle, Scarborough, and Catts (2001).

24. Compton et al. (2006); O'Connor and Jenkins (1999); Foorman et al. (1998).

25. See http://www.rti4success.org/ or http://www.studentprogress.org/.

Table 3. Recommended target areas for early screening and progress monitoring

Measures	Recommended grade levels	Proficiencies assessed	Purpose	Limitations
Letter naming fluency	K–1	Letter name identification and the ability to rapidly retrieve abstract information	Screening	This measure is poor for progress monitoring since students begin to learn to associate letters with sounds. It is not valid for English learners in kindergarten, but seems valid for grade 1.
Phoneme Segmentation	K-1	Phonemic awareness	Screening and progress monitoring	This measure is problematic for measuring progress in the second semester of grade 1. As students learn to read, they seem to focus less on phonemic skills and more on decoding strategies.
Nonsense word fluency	1	Proficiency and automaticity with basic phonics rule	Screening and progress monitoring	This measure is limited to only very simple words and does not tap the ability to read irregular words or multi-syllabic words.
Word identification[26]	1–2	Word reading	Screening and progress monitoring	This measure addresses many of the limitations of nonsense word fluency by including multisyllabic and irregular words.
Oral reading fluency (also called passage reading fluency)	1–2	Reading connected text accurately and fluently	Screening and progress monitoring	Although the measure has moderately strong criterion-related validity, it cannot give a full picture of students' reading proficiency. Many students will score close to zero at the beginning of grade 1. The measure still is a reasonable predictor of end of year reading performance.

Source: Authors' compilation based on Fuchs, Fuchs, Thompson, Al Otaiba, Yen, Yang, Braun, and O'Connor (2001b), Speece et al. (2003b); Schatschneider (2006); O'Connor and Jenkins (1999); and Baker and Baker (2008) for letter naming fluency. For phoneme segmentation, O'Connor and Jenkins (1999). For nonsense word fluency, Speece et al. (2003b); Good, Simmons, and Kame'enui (2001). For word identification, Fuchs, Fuchs, and Compton (2004); Compton et al. (2006). For oral reading fluency, Fuchs, Fuchs, Hosp, and Jenkins (2001a); Fuchs, Fuchs, and Maxwell (1988); Schatschneider (2006); Speece and Case (2001); Gersten, Dimino, and Jayanthi (2008); Baker, Gersten, Haager, and Dingle (2006).

26. Fuchs et al. (2004); Compton et al. (2006)

Kindergarten screening batteries should include measures assessing letter knowledge, phonemic awareness, and expressive and receptive vocabulary.[27] Unfortunately, efficient screening measures for expressive and receptive vocabulary are in their infancy.

As children move into grade 1, screening batteries should include measures assessing phonemic awareness, decoding, word identification, and text reading.[28] By the second semester of grade 1 the decoding, word identification, and text reading should include speed as an outcome.[29] Grade 2 batteries should include measures involving word reading and passage reading. These measures are typically timed.

Despite the importance of vocabulary, language, and comprehension development in kindergarten through grade 2, very few research-validated measures are available for efficient screening purposes. But diagnostic measures can be administered to students who appear to demonstrate problems in this area.

Technical characteristics to consider

The panel believes that three characteristics of screening measures should be examined when selecting which measures (and how many) will be used.

Reliability of screening measures (usually reported as internal consistency reliability or Cronbach's alpha) should be at least 0.70.[30] This information is available from the publishers' manual or website for the measure. Soon this information will be posted on the websites for National Center on Progress Monitoring and Response to Intervention.[31]

Predictive validity is an index of how well the measure provides accurate information on future reading performance of students—and thus is critical. In the opinion of the panel, predictive validity should reach an index of 0.60 or higher.

Reducing the number of false positives identified—students with scores below the cutoff who would eventually become good readers even without any additional help—is a serious concern. False positives lead to schools providing services to students who do not need them. In the view of the panel, schools should collect information on the sensitivity of screening measures and adjust benchmarks that produce too many false positives. There is a tradeoff, however, with the specificity of the measure and its ability to correctly identify 90 percent or more of students who really do require assistance.[32] Using at least two screening measures can enhance the accuracy of the screening process; however, decision rules then become more complex.

Costs in both time and personnel should also be considered when selecting screening measures. Administering additional measures requires additional staff time and may displace instruction. Moreover, interpreting multiple indices can be a complex and time-consuming task. Schools should consider these factors when selecting the number and type of screening measures.

27. Jenkins and O'Connor (2002); McCardle, Scarborough, and Catts (2001); O'Connor and Jenkins (1999); Scarborough (1998a); Torgesen (2002).

28. Foorman et al. (1998).

29. Compton et al. (2006); Fuchs et al. (2004).

30. Nunnally (1978).

31. See http://www.rti4success.org/ or http://www.studentprogress.org/.

32. Jenkins (2003).

3. Use benchmarks or growth rates (or a combination of the two) to identify children at low, moderate, or high risk for developing reading difficulties.33

Use cut-points to distinguish between students likely to obtain satisfactory and unsatisfactory reading proficiency at the end of the year without additional assistance. Excellent sources for cut-points are any predictive validity studies conducted by test developers or researchers based on normative samples. Although each school district can develop its own benchmarks or cut-points, guidelines from national databases (often available from publishers, from research literature, or on the OSEP, Progress Monitoring, and RtI websites[34]) may be easier to adopt, particularly in the early phases of implementation.

As schools become more sophisticated in their use of screening measures, many will want to go beyond using benchmark assessments two or three times a year and use a progress monitoring system.

Roadblocks and suggested approaches

Roadblock 1.1. *It is too hard to establish district-specific benchmarks.*

Suggested Approach. National benchmarks can assist with this process. It often takes a significant amount of time to establish district-specific benchmarks or standards. By the time district-specific benchmarks are established, a year could pass before at-risk readers are identified and appropriate instructional interventions begin. National standards are a reasonable alternative to establishing district-specific benchmarks.

Roadblock 1.2. *Universal screening falsely identifies too many students.*

Suggested Approach. Selecting cut-points that accurately identify 100 percent of the children at risk casts a wide net—also identifying a sizeable group of children who will develop normal reading skills. We recommend using universal screening measures to liberally identify a pool of children that, through progress monitoring methods, can be further refined to those most at risk.[35] Information on universal screening and progress monitoring measures can be found at the National Center on Student Progress Monitoring or the Iris Center at Vanderbilt University.[36]

Roadblock 1.3. *Some students might get "stuck" in a particular tier.*

Suggested Approach. If schools are responding to student performance data using decision rules, students should not get stuck. A student may stay in one tier because the instructional match and learning trajectory is appropriate. To ensure students are receiving the correct amount of instruction, schools should frequently reassess—allowing fluid movement across tiers. Response to each tier of instruction will vary by student, requiring students to move across tiers as a function of their response to instruction. The tiers are not standard, lock-step groupings of students. Decision rules should allow students showing adequate response to instruction at tier 2 or tier 3 to transition back into lower tiers with the support they need for continued success.

33. Schatschneider (2006).

34. See http://www.rti4success.org/ or http://www.studentprogress.org/.

35. Compton et al. (2006).

36. See http://www.studentprogress.org/ or http://iris.peabody.vanderbilt.edu/.

Roadblock 1.4. *Some teachers place students in tutoring when they are only one point below the benchmark.*

Suggested Approach. No measure is perfectly reliable. Keep this in mind when students' scores fall slightly below or above a cutoff score on a benchmark test. The panel recommends that districts and schools review the assessment's technical manual to determine the confidence interval for each benchmark score. If a students' score falls within the confidence interval, either conduct an additional assessment of those students or monitor their progress for a period of six weeks to determine whether the student does, in fact, require additional assistance.[37]

37. Francis et al. (2005).

Recommendation 2. Provide differentiated reading instruction for all students based on assessments of students' current reading levels (tier 1).

Ideally, classroom reading instruction would be evidence based. However, research that might provide a clear, comprehensive model of how to teach reading to students in the primary grades is lacking.[38] The purpose of this recommendation is to discuss classroom reading instruction as it relates to RtI and effective tier 1 instruction. In particular, we focus on the use of assessment data to guide differentiated reading instruction. Tier 1 provides the foundation for successful RtI overall, without which too many students would fall below benchmarks.

The panel recommends differentiating instruction in tier 1. For example, during independent work time, students weak in vocabulary can practice vocabulary with a partner or in small groups, while other students form teams to brainstorm character traits and motivations for the main characters in the story they are reading that week. Data from the various screening and progress monitoring measures in recommendation 1 should also serve a role in orchestrating differentiated instruction.

Because differentiated instruction under tier 1 requires identifying and grouping students to work on targeted skills, readers may wonder where differentiated instruction ends and tier 2 intervention begins. Differentiated instruction applies to all students, while tier 2 instruction applies only to those at risk in key areas. The panel believes that, to be effective, a multi-tier approach can blur the lines between tier 1 and tier 2, and that sensible data-driven instruction should permeate all of the tiers of reading instruction.

Level of evidence: Low

The panel judged the level of evidence for this recommendation as *low*. A correlational study demonstrated that the more teachers used assessment information, the greater their students' reading skill growth in grade 1.[39]

Brief summary of evidence

One descriptive-correlational study examined how student reading growth varied by the degree to which teachers employed a specific differentiation program. This differentiation program relied on assessments to group students. Student reading growth was higher for teachers who implemented the program with greater fidelity.

How to carry out this recommendation

1. Provide training for teachers on how to collect and interpret student data on reading efficiently and reliably.

Provide training on how to use diagnostic measures, especially measures for those students experiencing difficulty. Informal assessments can help educators make better informed decisions. For example, listening to how a student reads a text that is slightly too difficult can yield

38. National Reading Panel (2000).

39. Connor, Piasta, Fishman, Glasney, Schatschneider, Crowe, Underwood, and Morrison (2009).

useful information and is easily embedded within lessons. Teachers can ask a student to summarize a story they just read. This exercise will reveal how well the student comprehends what they read. Listening to the student's summary of the story can also reveal other information—for example about the student's own life or what they know of other books.[40]

2. Develop data-driven decision rules for providing differentiated instruction to students at varied reading proficiency levels for part of the day.

According to the panel, independent silent reading activities should be gradually increased as reading skills improve. Data on student performance (a measure of word identification fluency or fluency in reading connected text) should inform this decision. For many grade 1 students, independent silent reading time would be minimal during the first few months of the year. Student-managed activities should be introduced gradually and should focus only on skills students have mastered.

3. Differentiate instruction—including varying time, content, and degree of support and scaffolding—based on students' assessed skills.

The panel believes that as students fall below grade expectations, more time in explicit instruction provided by the teacher in small groups is critical to bring their skills to grade level. The panel suggests independent or group work, such as independent silent reading or buddy reading, are more effective when they are gradually increased as student reading skills improve.

Roadblocks and suggested approaches

Roadblock 2.1. *It is difficult for teachers to interpret assessment results and subsequently use the information for instruction.*

Suggested Approach. The panel recommends providing professional development focused on how to administer assessments, interpret the results, and use the information. This should be ongoing. With proper training, teachers' instruction may be more effective.

Roadblock 2.2. *Using multiple small groups is difficult when some children have difficulty paying attention, working independently, and interacting with peers.*

Suggested Approach. Classroom management procedures should be firmly in place during reading instruction. To facilitate effective reading instruction, administrators should provide teachers with supportive efforts and motivational strategies, especially in managing independent and small group work.

40. Snow (2001).

Recommendation 3. Provide intensive, systematic instruction on up to three foundational reading skills in small groups to students who score below the benchmark on universal screening. Typically, these groups meet between three and five times a week for 20 to 40 minutes (tier 2).

Tier 2 instruction should take place in small homogenous groups ranging from three to four students using curricula that address the major components of reading instruction (comprehension, fluency, phonemic awareness, phonics, and vocabulary). The areas of instruction are based on the results of students' scores on universal screening. Instruction should be systematic—building skills gradually and introducing skills first in isolation and then integrating them with other skills. Explicit instruction involves more teacher-student interaction, including frequent opportunities for student practice and comprehensible and specific feedback. Intensive instruction should occur three to five times per week for 20 to 40 minutes.

Level of evidence: Strong

The panel judged the evidence supporting this recommendation as *strong* based on 11 studies that met WWC standards or that met WWC standards with reservations.[41] These studies on supplemental instruction in reading support tier 2 intervention as a way to improve reading performance in decoding. Six studies showed positive effects on decoding,[42] and four showed effects on both decoding and reading comprehension.[43] Six studies involved one-on-one instruction,[44] and the remainder used small groups ranging from two to five students. Given that effect sizes were not significantly higher for the one-on-one approach, small group work could be considered more practical for implementation.

Brief summary of evidence

The 11 studies that met WWC standards or that met WWC standards with reservations suggest that educators should emphasize the critical reading skills of phonemic awareness, decoding, reading comprehension, and fluency at appropriate grade levels. Two of five studies that measured phonemic awareness demonstrated significant effects.[45] Five of nine studies that measured decoding demonstrated significant effects, and students showed positive

41. Ebaugh (2000); Gunn, Biglan, Smolkowski, and Ary (2000); Mathes, Denton, Fletcher, Anthony, Francis, and Schatschneider (2005); Jenkins, Peyton, Sanders, and Vadasy (2004); Lennon and Slesinski (1999); Vaughn, Mathes, Linan-Thompson, Cirino, Carlson, Pollard-Durodola, Cardenas-Hagan, and Francis (2006); Vadasy, Sanders, and Peyton (2005); Ehri, Dreyer, Flugman, and Gross (2007); Gibbs (2001); McMaster, Fuchs, Fuchs, and Compton (2005); Vadasy, Jenkins, Antil, Wayne, and O'Connor (1997).

42. Ebaugh (2000); Gunn et al. (2000); Jenkins et al. (2004); Lennon and Slesinski (1999); Vadasy, Sanders, and Peyton (2005); Vaughn et al. (2006).

43. Gunn et al. (2000); Jenkins et al. (2004); Vadasy, Sanders, and Peyton (2005); Vaughn et al. (2006).

44. Gunn et al. (2000); McMaster et al. (2005); Vadasy et al. (1997); Vadasy, Sanders, and Peyton (2005); Jenkins et al. (2004); Gibbs (2001).

45. Ehri et al. (2007); Lennon and Sleskinski (1999).

effects in five of seven studies[46] that measured reading comprehension. Only one study found significant effects in reading fluency. Vocabulary was the least examined outcome of the 11 studies, with only 1 study measuring and finding effects on vocabulary knowledge.[47]

Since 7 of the 11 studies that met WWC standards or that met standards with reservations produced a significant effect on at least one reading outcome, and all seven studies used explicit instruction, we concluded that explicit instruction is an effective approach to use in tier 2 intervention.[48]

How to carry out this recommendation

1. Use a curriculum that addresses the components of reading instruction (phonemic awareness, phonics, vocabulary, comprehension, and fluency) and relates to students' needs and developmental level.

Tier 2 intervention curricula are sometimes called *standard protocols.* Standard protocols are tutoring programs taught to all students scoring below benchmark.[49] These "one size fits all" programs address foundational skills and strategies that are essential to learning to read. The panel suggests that schools should use intervention programs to provide tier 2 instruction for all students scoring below benchmark for at least five weeks to discern which students may need further intervention. After five weeks, some students may have caught up.

In choosing an intervention program for tier 2, administrators should look for programs—either commercially available intervention curricula, commercially developed supplemental curricula, or intervention programs—that are compatible with their school's core reading program and that provide intensive small group instruction in three to four foundational skills. Ideally, the intervention program has demonstrated its effectiveness through independent evaluations using rigorous experimental or quasi-experimental designs.

The intervention curriculum should teach and build foundational skills to mastery and incorporate some complex reading skills. Specific components vary by grade level and reflect the changing developmental emphasis at different stages in reading. Table 4 highlights the foundational reading skills students should develop in kindergarten through grade 2. Skills validated by research are indicated by table notes. The remaining skill areas are considered critical by the panel.

The critical skill for *kindergarteners* to master is the ability to segment phonemes, a key indicator of future success or failure in reading.[50] Also important are letter-sound identification, the alphabetic principle (the recognition of the relationship between spoken sounds and letters), and beginning decoding skills (blending written letters into words). Students who can perform these tasks understand the phonemic elements in words leading to accurate and fluent decoding.[51]

In general, during the first semester, grade 1 students who participate in tier 2

46. Vadasy, Sanders, and Peyton (2005); Jenkins et al. (2004); Vaughn et al. (2006); Ehri et al. (2007).

47. Gunn et al. (2000).

48. Gunn et al. (2000); Jenkins et al. (2004); Ehri et al. (2007); Ebaugh (2000); Vadasy, Sanders, and Peyton (2005); Vaughn et al. (2006).

49. There are some obvious exceptions, such as students already identified as students with significant cognitive disabilities, students who already have Individualized Education Programs in reading or language involving a much more basic curriculum.

50. Lennon and Slesinski (1999).

51. Gunn et al. (2000).

Table 4. Foundational reading skills in grades K–2

Grade	Skill
Kindergarten	Phonemic awareness[a] Letter sounds[b] Listening comprehension Vocabulary development
Grade 1	Phonemic awareness[c] Phonics[d] Fluency (high frequency words) Fluency with connected text (second half of the year)[e] Vocabulary[f] Comprehension[g]
Grade 2	Phonics[h] Fluency with connected text Vocabulary[i] Comprehension

a. Lennon and Slesinski (1999).
b. Lennon and Slesinski (1999).
c. Ehri et al. (2007).
d. Gunn et al. (2000); Jenkins et al. (2004); Ehri et al. (2007); Mathes et al. (2005); Vadasy, Sanders, and Peyton (2005).
e. Ehri et al. (2007).
f. Gunn et al. (2000).
g. Jenkins et al. (2004); Ehri et al. (2007); Mathes et al. (2005); Vadasy, Sanders, and Peyton (2005); Vaughn et al. (2006).
h. Gunn et al. (2000).
i. Gunn et al. (2000).
Source: Authors' compilation based on information described in the text.

interventions will need instruction in phonics (decoding one and then two syllable words) and fluency. Since these are beginning readers, fluency instruction during the first semester is taught by first focusing on fluently and accurately reading short lists of high frequency words. During the second semester, as students move into reading connected text, interventions focusing on reading accurately, fluently, and with prosody (proper expression) should be added. Some grade 1 students will still need intensive and usually more accelerated instruction in phonemic awareness (blending and segmenting sounds) and basic phonics (letter sound correspondence) interventions to increase their understanding of the alphabetic principle.[52]

Phonics interventions for grade 2 students concentrate on learning more difficult skills, such as digraphs (*oa* as in boat and *ch* as in child), diphthongs (*ew* as in stew, *oi* as in soil), and controlled R (*ar* as in car, *ur* as in fur). These interventions address structural analysis skills that focus on prefixes, suffixes, forming plurals, and adding *-ed* and *-ing* to form past and progressive tenses. Students also apply phonetic skills to words with more than one syllable. Fluency should continue to be emphasized.[53]

Some intervention curricula will include what the panel believes are important activities: literal comprehension (questions whose answers are stated in the text), more sophisticated comprehension strategies (summarizing a portion of text), listening comprehension strategies, spelling, ex-

52. Gunn et al. (2000); McMaster et al. (2005); Jenkins et al. (2004); Vaughn et al. (2006); Ehri et al. (2007).

53. Gunn et al. (2000).

pressive writing, and read-alouds. Literal comprehension and some rudimentary comprehension instruction occur in many of the successful interventions, and so are recommended.[54] Other elements, such as inferential comprehension and vocabulary development, may be better developed with more heterogeneous groups during the reading language arts block. It is the opinion of the panel that an intervention curriculum that covers five to six skills per day may not provide the intensity necessary to improve reading achievement.

2. Implement this program three to five times a week, for approximately 20 to 40 minutes.

Tier 2 instruction should be implemented for 20 to 40 minutes, three to five times per week in small groups of three to four students. Student grade level and needs should determine the duration.

An intervention session can range from 20 to 30 minutes for kindergarten students to 40 to 50 minutes for grade 2 students, depending on student needs. Providing kindergarten students with 20 minutes of daily instruction has been demonstrated to have a positive impact on their acquisition of early reading skills, such as phonemic awareness and letter-sound correspondence.[55] As students move into grades 1 and 2, the time needed for interventions usually increases as the skills they need to catch up to their peers without reading difficulties broaden.

A small body of descriptive evidence suggests that the time spent on each area of instruction might be more important than the total instructional time. How time is spent and proportioned appears critical. For example, merely doubling instructional time—providing double doses of the same intervention—is not effective.[56] But according to Harn, Linan-Thompson, and Roberts (2008), doubling instructional time while changing the percentage of time allotted to each instructional area in response to students' changing needs resulted in better outcomes on timed oral reading fluency and word reading measures for students.

3. Build skills gradually and provide a high level of teacher-student interaction with opportunities for practice and feedback.

Reading instruction should be systematic—building skills gradually and introducing skills first in isolation and then by integrating them with other skills to provide students practice and to build generalization.[57] Students should be given clear, corrective feedback, and cumulative review to ensure understanding and mastery. For example, in phonics, a critical area in grade 1 tier 2 interventions, a systematic curriculum might begin by introducing a few of the most frequently used consonants sounds (m, s, t, b) followed by a vowel, usually the short a. This allows students to integrate these newly learned sounds by blending sounds into words.

Reading instruction should also be explicit. Explicit instruction involves a high level of teacher-student interaction that includes frequent opportunities for students to practice the skill and clear, specific corrective feedback. It begins with overt and unambiguous explanations and models. An important feature of explicit instruction is making the thinking process public. Thinking aloud should occur during all instructional components of tier 2 interventions ranging from systematic skill building in phonics to teaching more

54. Vaughn et al. (2006); Gunn et al. (2000).

55. Gunn et al. (2000); Gunn, Smolkowski, Biglan, and Black (2002); Lennon and Slesinski (1999).

56. Wanzek and Vaughn (2007).

57. Gunn et al. (2002); Vadasy, Sanders, and Peyton (2005); Vaughn et al. (2006); Mathes et al. (2005); Jenkins et al. (2004); McMaster et al. (2005).

complex and intricate comprehension strategies (such as summarizing or making inferences). When thinking aloud, teachers should stop, reflect, and formulate an explanation of their thinking processes.

Roadblocks and suggested approaches

Roadblock 3.1. *Some teachers or reading specialists might worry about aligning the tier 2 intervention program with the core program.*

Suggested Approach. Since tier 2 instruction relies on foundational (and sometimes prerequisite) skills that are determined by the students' rate of progress, it is unlikely that the same skill will be addressed in the core reading instruction at the same time. Alignment is not as critical as ensuring that instruction is systematic and explicit and focuses on the high priority reading components.

Roadblock 3.2. *Finding an additional 15 to 50 minutes a day for additional reading instruction can be a daunting task.*

Suggested Approach. Schools should first determine who will provide the intervention. If the classroom teacher will provide the intervention, then small group instruction could occur when students are working independently at classroom learning centers. In grade 2 classrooms, where there is non-direct instructional time, intervention lessons can occur at times that do not conflict with other critical content areas, such as mathematics, particularly if a person other than the classroom teacher is providing the intervention. There may be situations in schools with reading blocks of two to two and a half hours where it is appropriate for students to work at learning stations or complete assignments while the classroom teacher is conducting tier 2 interventions, especially if tier 2 students are unable to complete these assignments.

Recommendation 4. Monitor the progress of tier 2 students at least once a month. Use these data to determine whether students still require intervention. For those students still making insufficient progress, school-wide teams should design a tier 3 intervention plan.

Schools should establish a schedule to assess tier 2 students at least monthly—reassigning students who have met benchmarks, graphing students' progress in reading in a reliable fashion, and regrouping students who need continued instructional support.[58]

Level of evidence: Low

Of the 11 randomized controlled trials and quasi-experimental design studies that evaluated effects of tier 2 interventions and that met WWC standards or that met WWC standards with reservations, only 3 reported using mastery checks or progress monitoring in instructional decision-making.[59] None of the studies demonstrate that progress monitoring is essential in tier 2 instruction. However, in the opinion of the panel, awareness of tier 2 student progress is essential for understanding whether tier 2 is helping the students and whether modifications are needed.

Brief summary of evidence

One study shows that progress monitoring in reading (oral reading fluency or word identification fluency in grades 1 and 2) increases teachers' awareness of students' current level of reading proficiency and has a positive effect on the instructional decisions teachers make.[60] Collecting and using progress monitoring data is sometimes a component of tier 2 instruction.

How to carry out this recommendation

1. Monitor progress of tier 2 students on a regular basis using grade appropriate measures. Monitoring of progress should occur at least eight times during the school year.

Some researchers recommend more frequent weekly assessments for monitoring student progress.[61] However, little evidence demonstrates that weekly measures are superior to monthly ones.[62] Many tier 2 intervention programs (commercially developed, researcher developed, or district developed) contain weekly mastery tests that educators can use to guide instruction (to know which skills need to be reviewed and re-taught).

If a tier 2 program does not include mastery checks, monitor students' progress weekly, if possible, but no less than once a month. The measures should be efficient, reliable, and valid. Many progress monitoring measures are also useful as screening measures (see recommendation 1). Progress monitoring measures are the best way to assess students' retention of material taught and thus their path to reading proficiency. Table 5 indicates appropriate progress monitoring measures for kindergarten through grade 2.

58. Vaughn, Linan-Thompson, and Hickman (2003).

59. McMaster et al. (2005); Vaughn et al. (2006); Mathes et al. (2005).

60. Fuchs, Deno, and Mirkin (1984).

61. Fuchs, Deno, and Mirkin (1984).

62. Johnson et al. (in press).

Table 5. Progress monitoring measures in grades K–2

Grade	Measure
Kindergarten	Phonemic awareness measures (especially measures of phoneme segmentation)
Grade 1	Fluent word recognition Nonword (pseudo word reading) Oral reading fluency (connected text)
Grade 2	Fluent word recognition Oral reading fluency

Source: Authors' compilation based on information described in text.

2. While providing tier 2 instruction, use progress monitoring data to identify students needing additional instruction.

It is important that tier 2 instruction advances at a good pace. At the same time, teaching to mastery is paramount since the skills are foundational for future success in reading. If three students are making progress and one student is lagging behind, an option to consider is to provide this student with 10 minutes of review, practice, and additional focused instruction on material previously taught. If none of the students are making progress, take a careful look at the tier 2 intervention—it may be missing critical components or moving too fast for the students in tier 2 to master the target skills.

3. Consider using progress monitoring data to regroup tier 2 students approximately every six weeks.

Since students' skill level changes over time and in varying degrees, use progress monitoring data to regroup students so that the groups are as homogeneous as possible. Ideally, groups may cut across more than one class, if schedules permit.

Roadblocks and suggested approaches

Roadblock 4.1. *Students within classes are at very different levels for tier 2 intervention.*

Suggested Approach. If students within a class are at such diverse levels as to necessitate more than two tier 2 groups, consider grouping students across classes. This will facilitate clustering children with similar needs. In such a case a reading specialist, paraprofessional, or other school personnel who have received training can conduct the intervention.

Roadblock 4.2. *There is insufficient time for teachers to implement progress monitoring.*

Suggested Approach. If teachers are too busy to assess students' progress with progress monitoring measures, consider using paraprofessionals or other school staff. Train them how to administer such measures.

Recommendation 5. Provide intensive instruction on a daily basis that promotes the development of the various components of reading proficiency to students who show minimal progress after reasonable time in tier 2 small group instruction (tier 3).

Instruction should be intensified by focusing on fewer high priority reading skills during lessons and scheduling multiple and extended instructional sessions. One-on-one or small group instruction also provides intensity as students have more opportunities to practice and respond. One-on-one instruction includes giving students feedback based on their individual responses, teaching students to mastery based on individual learning progress, and planning instruction with materials and an instructional sequence that meets individual student needs.

There is no reason to believe that a tier 3 program should consist primarily of one-on-one instruction—though such instruction should be part of a student's daily program. Student progress should be monitored regularly using progress monitoring measures to assess whether the program is on course and to determine whether a team of professionals needs to refine the instructional program to enhance achievement growth.

Level of evidence: Low

The level of evidence for this recommendation is *low*. Although the panel found five studies on this recommendation that met the WWC standards (or met standards with reservations), no studies reported statistically significant impacts on reading outcomes.[63]

Brief summary of evidence

Despite over 50 years of research on special education and remedial instruction, major gaps persist in the knowledge of how to teach reading to the 3 to 5 percent of students with the most severe reading difficulties.[64] The research reveals little about students whose response to typically effective interventions is low. Therefore, the material below represents the opinion of the panel.

How to carry out this recommendation

1. Implement concentrated instruction that is focused on a small but targeted set of reading skills.

Focusing on a small set of reading or reading-related skills is essential to tier 3 in kindergarten through grade 2 because having too many instructional objectives for struggling readers makes it more difficult to learn the skills well enough for proficient reading. [65] In the opinion of the panel, too many instructional objectives can overwhelm students. Achieving proficiency is also difficult for students when instruction is scattered across different aspects of reading.

63. McMaster et al. (2005); Foorman et al. (1998); Blumsack (1996); Gillon (2000); O'Connor and Jenkins (1995).

64. Torgesen, Wagner, and Rashotte (1997).

65. Blumsack (1996); Foorman et al. (1998); Gillon (2000).

Diagnostic assessments can help determine why a reading problem is occurring and which reading skills or performance deficits need to be addressed to improve reading performance. Specifically, educators can ask: what aspects of reading are blocking the student from achieving reading proficiency? When these obstacles are determined, high priority skills are identified as the focus of tier 3 instruction.

For example, the panel believes that if a student is struggling with decoding, it does not make sense to use tier 3 instructional time for summary writing, comprehension monitoring instruction, or clarification strategies because the primary reading obstacle for the student is sounding out and reading words accurately. Here, decoding is considered a high priority skill because it underlies the student's overall reading difficulty.

Additionally, the panel believes that there should be depth in modeling and practice with feedback in tier 3 instruction—perhaps requiring limited breadth. Such focus provides opportunities to review, practice, and reinforce newly learned proficiencies so that students can demonstrate sustained and consistent levels of proficiency across lessons. Often a sustained 90 percent or higher criterion of correct responses on taught material is considered mastery.

Tier 3 instruction often focuses on phonemic awareness and decoding, especially for younger students or those with very limited reading proficiency. However, comprehension and vocabulary are also critical.[66] For a student receiving tier 3 instruction, several sessions each week might focus on phonemic awareness and decoding in depth. The other sessions might focus on comprehension and vocabulary in depth. To date, there are no clear-cut empirical guidelines to determine how to balance competing demands for instructional time.

2. Adjust the overall lesson pace.

To provide greater focus to tier 3 instruction, teachers can adjust the overall lesson pace so that it is slow and deliberate (that is, more intensive). Teachers implementing tier 3 instruction can focus the pace of lessons by focusing on a single component of a lesson. For example, teachers might focus only on introducing the new skill rather than implementing a full lesson that includes introduction, extended practice, and application. Subsequent tier 3 instruction might review the new skills (with modified or shortened instruction from the lesson's introduction) and practice the new skills. Instructional pace is slowed and focused by implementing a series of lessons concentrating only on a variety of review and practice activities. Rather than practicing how to identify the main idea in one lesson, several lessons would practice identifying the main idea.

3. Schedule multiple and extended instructional sessions daily.

While research does not suggest a specific number of intervention sessions or duration of instructional intervention (such as weeks, months, or years) for tier 3, studies do suggest that students needing tier 3 intervention require more reading instructional time than their peers without reading difficulties. On average, students participating in tier 3 interventions receive an additional 75 minutes of instruction per week. Additional instructional time ranges from about 45 minutes per week[67] to 120 minutes per week.[68]

In the opinion of the panel, schools could provide an additional 30 minutes of instruction by creating a "double dose" of

66. National Reading Panel (2000).

67. Blumsack (1996).

68. Gillon (2000).

reading time for struggling readers. Rather than more of the same, a double dose of instruction means a teacher might introduce skills during the first session and then re-teach with added practice during the second.

Duration, or extended implementation of tier 3 intervention, also intensifies instruction. Further research is required to examine the total hours of instruction needed and relative impact of tier 3 duration.

4. Include opportunities for extensive practice and high quality feedback with one-on-one instruction.

To become proficient in the application of newly acquired skills and strategies, students with the most intensive instructional needs will need multiple opportunities to practice with immediate high-quality feedback. According to panel opinion, tier 3 students might require 10 or 30 times as many practice opportunities as their peers. An example considered by the panel includes the use of technology for aspects of the reading program. Technology can be a good means for students to receive the practice they need, such as practice in letter sound recognition.[69]

One-on-one instruction is an effective way to maximize practice during tier 3 instruction. If scheduling one-on-one instructional sessions is not possible, the panel suggests students be organized in small groups of homogenous reading needs. One-on-one or small-group instruction provides the greatest opportunity for continuous and active learning. For example, in whole-class instruction, individual students have few opportunities to respond, practice, and interact with the teacher. Meanwhile in one-on-one instruction, a student has many occasions to respond and practice. When working with small groups, educators can increase opportunities to respond and practice by encouraging unison group responses.

With one-on-one and small-group instruction, teachers can also provide immediate and individualized feedback.[70] A key feature of instructional feedback is error correction. By correcting student errors when they are first made, it is much less likely that errors will become internalized and therefore repeated. For example, if a student incorrectly segmented a word, the teacher could model the accurate response, give the student another opportunity to segment the word, and return to the missed word later in the lesson to reinforce the correct application of the skill. This type of ongoing, guided practice provides students with the support and feedback they need to become fluent with critical reading skills and strategies.

5. Plan and individualize tier 3 instruction using input from a school-based RtI team.

In the opinion of the panel, tier 3 instructional planning requires an increased level of detail because of the individualized nature of the instruction and particular student reading needs. Students with intensive reading needs require substantial supports during the initial stages of learning. As students progress in their understanding and knowledge, these supports are gradually withdrawn so that students can begin to apply skills and strategies independently.[71] For students with learning disabilities, instruction that is carefully scaffolded is essential to successful learning.[72] Teachers should introduce concepts and skills beginning with easier tasks and progressing to more difficult

69. Barker and Torgesen (1995); Chambless and Chambless (1994); National Reading Panel (2000).

70. Blumsack (1996); Gillon (2000); McMaster et al. (2005); O'Connor and Jenkins (1995).

71. Blumsack (1996); Foorman et al. (1998); Gillon (2000); O'Connor and Jenkins (1995).

72. Swanson, Hoskyn, and Lee (1999).

tasks.[73] When teaching oral segmenting, for example, it is easier for students to isolate the first sound than to completely segment the word.

Material supports also play a role in individualizing student learning. Graphic organizers, procedural facilitators (like color-coded question cards representing questions to ask before, during, and after reading), and concrete manipulatives are all visual prompts or reminders that provide support to struggling readers as they internalize skills and strategies. For example, a story map can be used to teach students how to identify a story's critical components. As students become more adept at applying segmentation skills or using a story map to aid retelling, these material prompts are progressively faded out.

Teachers can optimize limited instructional time and instruction by teaching skills or strategies that reinforce each other. For example, emerging research suggests that teaching spelling promotes reading for struggling readers.[74] Students see spellings as maps of phonemic content rather than an arbitrary sequence of letters. Practice in using the alphabetic strategy to spell words seems to transfer to reading words.

6. Ensure that tier 3 students master a reading skill or strategy before moving on.

Emerging research on tier 3 instruction focuses on individualizing instruction by teaching students to mastery. Before a student moves to the next lesson, skill, or activity, they must demonstrate that a reading skill or strategy is mastered. When teaching a series of phonemic awareness activities,[75] teachers should discontinue activities when a student reaches 100 percent accuracy on all of the items in the activity. Teachers can keep notes or records about how students perform on different reading tasks. For example, a teacher could record the exact words that a student practices reading, the student's word reading accuracy, and the number of times it takes for students to practice a word before reading it accurately.[76]

Roadblocks and suggested approaches

Roadblock 5.1. *The distinction between tier 2 and tier 3 instructional interventions can often be blurry.*

Suggested Approach. Teachers should not be too concerned about tier 2 and tier 3 differences; the tiers are merely a way to continually vary resources to match the nature and intensity of instructional need. Remember that at present, distinctions between tier 2 and tier 3 are not clear or well documented. The terms are conveniences for school personnel.

Many tier 3 students will also have tier 1 and tier 2 instruction as part of their reading program. A student receiving tier 3 instruction focused on decoding and fluency might also participate in a tier 2 heterogeneous group focused on vocabulary and comprehension. One limitation with individualized, one-on-one tier 3 instruction is that there are few opportunities for students to engage in comprehension-building discourse. Increasing comprehension through discourse requires different levels of student language, vocabulary, and comprehension skills. Small, heterogeneous groups are optimal for building student language and vocabulary because students have opportunities to hear different language examples, new vocabulary words, and content that helps connect understanding. Discourse-based vocabulary

73. Blumsack (1996); Foorman et al. (1998); Gillon (2000); McMaster et al. (2005); O'Connor and Jenkins (1995).

74. O'Connor and Jenkins (1995).

75. Gillon (2000).

76. O'Connor and Jenkins (1995).

and comprehension activities are often included in tier 2 interventions.

Roadblock 5.2. *Because most tier 3 students have problems with decoding and fluently reading connected text, some may have tier 3 interventions that only highlight these areas.*

Suggested Approach. Targeting important comprehension proficiencies (summarizing, use of story grammar elements, vocabulary development, listening comprehension development) need to be part of any solid tier 3 intervention.

Roadblock 5.3. *School and staff resources are often too limited to support individualized instruction for tier 3 students.*

Suggested Approach. Consider creative alternatives for school and staff resources. For example, use community resources, such as parent or senior citizen volunteers, to help reinforce tier 3 instruction. While an experienced teacher or interventionist should teach new skills, volunteers can help reinforce and practice reading in focused one-on-one sessions. Community tutoring programs are also options. Technology is another resource to consider, and remember many individualized instruction activities work well with small, homogeneous group instruction.

Roadblock 5.4. *Schools tend to give the least experienced teachers the toughest-to-teach students.*

Suggested Approach. Reevaluate school schedules to ensure that the more experienced teachers or specialists are teaching tier 3 instruction. This may require some professional development and ongoing mentoring even for skilled veteran teachers.

Many teachers do not have the training to teach students with intensive reading difficulties. Given the importance of carefully planning and individualizing instruction, scaffolding skill introduction, enhancing one reading skill or strategy with another (such as adding spelling to reading instruction), structuring multiple practice opportunities, and providing high quality feedback with consistent error corrections, professional development plans and ongoing mentoring should focus on the details of instructional design and planning.

Roadblock 5.5. *Adding multiple and extended instructional sessions to a daily schedule can be overwhelming for some students and a challenge for schools in terms of scheduling.*

Suggested Approach. If a student requires an additional hour of instruction per day, teachers should consider breaking that hour into smaller instructional sessions or using several short activities to help maintain student motivation and engagement.[77] One session could focus on decoding, and the follow-up on comprehension and vocabulary. The morning session could introduce new word reading skills, and the afternoon session practice and review.

Early reading provides critical foundational skills; such skills and strategies need to be proficient before students enter the upper elementary grades. Thus, if critical decisions need to be made about adding tier 3 instruction to a student's reading program, using time typically allocated to social studies or science may be necessary. Other less intrusive scheduling options include providing tier 3 instruction to struggling readers while other students are participating in center activities, independent projects, or the tier 1 "add-on" enrichment activities. Tier 3 instruction could also be provided during whole-class spelling instruction.

77. Gillon (2000).

Roadblock 5.6. *Some students who require tier 3 instruction do not catch-up despite intensive, one-on-one instruction.*

Suggested Approach. Remind school staff that a school's goal is to help each student reach proficient reading levels if at all possible. Obtaining significant progress toward reading proficiency should be the primary goal. Emphasize that the teaching process should involve more than merely providing students with an opportunity to demonstrate the reading skills that they already know. It must involve the integration of new knowledge with previously learned knowledge.

Appendix A. Postscript from the Institute of Education Sciences

What is a practice guide?

The health care professions have embraced a mechanism for assembling and communicating evidence-based advice to practitioners about care for specific clinical conditions. Variously called practice guidelines, treatment protocols, critical pathways, best practice guides, or simply practice guides, these documents are systematically developed recommendations about the course of care for frequently encountered problems, ranging from physical conditions, such as foot ulcers, to psychosocial conditions, such as adolescent development.[78]

Practice guides are similar to the products of typical expert consensus panels in reflecting the views of those serving on the panel and the social decisions that come into play as the positions of individual panel members are forged into statements that all panel members are willing to endorse. Practice guides, however, are generated under three constraints that do not typically apply to consensus panels. The first is that a practice guide consists of a list of discrete recommendations that are actionable. The second is that those recommendations taken together are intended to be a coherent approach to a multifaceted problem. The third, which is most important, is that each recommendation is explicitly connected to the level of evidence supporting it, with the level represented by a grade (high, moderate, or low).

The levels of evidence, or grades, are usually constructed around the value of particular types of studies for drawing causal conclusions about what works. Thus, one typically finds that a high level of evidence is drawn from a body of randomized controlled trials, the moderate level from well designed studies that do not involve randomization, and the low level from the opinions of respected authorities (see table 1). Levels of evidence also can be constructed around the value of particular types of studies for other goals, such as the reliability and validity of assessments.

Practice guides also can be distinguished from systematic reviews or meta-analyses such as What Works Clearinghouse (WWC) intervention reviews or statistical meta-analyses, which employ statistical methods to summarize the results of studies obtained from a rule-based search of the literature. Authors of practice guides seldom conduct the types of systematic literature searches that are the backbone of a meta-analysis, although they take advantage of such work when it is already published. Instead, authors use their expertise to identify the most important research with respect to their recommendations, augmented by a search of recent publications to ensure that the research citations are up-to-date. Furthermore, the characterization of the quality and direction of the evidence underlying a recommendation in a practice guide relies less on a tight set of rules and statistical algorithms and more on the judgment of the authors than would be the case in a high-quality meta-analysis. Another distinction is that a practice guide, because it aims for a comprehensive and coherent approach, operates with more numerous and more contextualized statements of what works than does a typical meta-analysis.

Thus, practice guides sit somewhere between consensus reports and meta-analyses in the degree to which systematic processes are used for locating relevant research and characterizing its meaning.

78. Field and Lohr (1990).

Practice guides are more like consensus panel reports than meta-analyses in the breadth and complexity of the topic that is addressed. Practice guides are different from both consensus reports and meta-analyses in providing advice at the level of specific action steps along a pathway that represents a more-or-less coherent and comprehensive approach to a multifaceted problem.

Practice guides in education at the Institute of Education Sciences

The Institute of Education Sciences (IES) publishes practice guides in education to bring the best available evidence and expertise to bear on the types of systemic challenges that cannot currently be addressed by single interventions or programs. Although IES has taken advantage of the history of practice guides in health care to provide models of how to proceed in education, education is different from health care in ways that may require a somewhat different design for practice guides in education have. Even within health care, where practice guides now number in the thousands, there is no single template in use. Rather, one finds descriptions of general design features that permit substantial variation in the realization of practice guides across subspecialties and panels of experts.[79] Accordingly, the templates for IES practice guides may vary across practice guides and change over time and with experience.

The steps involved in producing an IES–sponsored practice guide are first to select a topic, which is informed by formal surveys of practitioners and requests. Next, a panel chair is recruited who has a national reputation and up-to-date expertise in the topic. Third, the chair, working in collaboration with IES, selects a small number of panelists to coauthor the practice guide. These are people the chair believes can work well together and have the requisite expertise to be a convincing source of recommendations. IES recommends that at least one of the panelists be a practitioner with experience relevant to the topic being addressed. The chair and the panelists are provided a general template for a practice guide along the lines of the information provided in this postscript. They are also provided with examples of practice guides. The practice guide panel works under a short deadline of six to nine months to produce a draft document. The expert panel interacts with and receives feedback from staff at IES during the development of the practice guide, but they understand that they are the authors and, thus, responsible for the final product.

One unique feature of IES-sponsored practice guides is that they are subjected to rigorous external peer review through the same office that is responsible for independent review of other IES publications. Critical tasks of the peer reviewers of a practice guide are to determine whether the evidence cited in support of particular recommendations is up-to-date and that studies of similar or better quality that point in a different direction have not been ignored. Peer reviewers also are asked to evaluate whether the evidence grade assigned to particular recommendations by the practice guide authors is appropriate. A practice guide is revised as necessary to meet the concerns of external peer reviews and gain the approval of the standards and review staff at IES. The process of external peer review is carried out independent of the office and staff within IES that instigated the practice guide.

Because practice guides depend on the expertise of their authors and their group decision-making, the content of a practice guide is not and should not be viewed as a set of recommendations that in every case depends on and flows inevitably from scientific research. It is not only possible but

79. American Psychological Association (2002).

also likely that two teams of recognized experts working independently to produce a practice guide on the same topic would generate products that differ in important respects. Thus, consumers of practice guides need to understand that they are, in effect, getting the advice of consultants. These consultants should, on average, provide substantially better advice than an individual school district might obtain on its own because the authors are national authorities who have to reach agreement among themselves, justify their recommendations in terms of supporting evidence, and undergo rigorous independent peer review of their product.

Institute of Education Sciences

Appendix B. About the authors

Panel

Russell Gersten, Ph.D., is President of RG Research Group and Executive Director of Instructional Research Group in Long Beach, California, as well as professor emeritus in the College for Education at the University of Oregon. Dr. Gersten is a nationally recognized expert on effective instructional practices to improve reading comprehension (both for narrative and expository text) and has extensive experience with the process of translating research into classroom practice. He has led the teams responsible for developing observational measures for reading comprehension and vocabulary instruction for several large-scale randomized control trials on the impact of observed practices in reading instruction on growth in reading. He is an expert in instructional strategies for improving reading comprehension, adaptations of the reading research-base for English language learner students, and longitudinal evaluation of reading programs. He has directed numerous implementation studies, large-scale evaluation projects, and randomized trial studies in the field of reading, with a focus on low-income students and English learners. Additionally, he chaired a panel of expert researchers for the National Center for Learning Disabilities in June 2005 to synthesize knowledge of best practices in early screening and intervention for students with difficulties in mathematics.

Donald L. Compton, Ph.D., is an associate professor of Special Education at Peabody College, Vanderbilt University. Before joining the faculty at Vanderbilt, Dr. Compton taught at the University of Arkansas-Fayetteville and spent a year as a postdoctoral research fellow at the Institute for Behavior Genetics at the University of Colorado-Boulder, where he worked with Dick Olson to analyze data from the twin sample of the Colorado Learning Disabilities Research Center. Dr. Compton teaches undergraduate and graduate courses in instructional principles and procedures in reading and writing for students with disabilities. His research involves modeling individual differences in the development of reading skills in children. He is currently the primary investigator on an Institute of Education Sciences (IES) project addressing the key measurement issues associated with the Response-to-Intervention (RtI) approach to identifying learning difficulties.

Carol McDonald Connor, Ph.D., is an associate professor at Florida State University and a research faculty member of the Florida Center for Reading Research. She completed her Ph.D. in Education and was an assistant research scientist in Psychology at University of Michigan prior to coming to Florida State. Dr. Connor's research interests focus on children's learning in the classroom from preschool through grade 3 and the complex relationships between children's language and literacy skills. She was recently awarded the 2006 President's Early Career Award for Scientists and Engineers and the 2007 APA Richard Snow Award. She is the principal investigator of two studies funded by the Institute of Education Sciences and the National Institute of Child Health and Human Development examining the causal effects of individualizing language arts instruction for students in grades 1–3 based on their language and reading skills.

Joseph A. Dimino, Ph.D., is a research associate at the Instructional Research Group in Long Beach, California where he is the coordinator of a national research project investigating the impact of Teacher Study Groups as a means to enhance the quality of reading instruction for first graders in high poverty schools and co-principal investigator for a study assessing the impact of collaborative strategic reading on

the comprehension and vocabulary skills of English language learner and English-speaking fifth graders. Dr. Dimino has 36 years of experience as a general education teacher, special education teacher, administrator, behavior specialist, and researcher. He has extensive experience working with teachers, parents, administrators, and instructional assistants in the areas of instruction and early literacy, reading comprehension strategies, and classroom and behavior management in urban, suburban, and rural communities. He has published in numerous scholarly journals and coauthored books in reading comprehension and early reading intervention. Dr. Dimino has delivered papers at various state, national, and international conferences, including the American Educational Research Association, the National Reading Conference, and the Council for Exceptional Children and Association for Supervision and Curriculum Development. He consults nationally in the areas of early literacy and reading comprehension instruction.

Lana Edwards Santoro, Ph.D., is a research associate with the Instructional Research Group/RG Research Group and the Pacific Institutes for Research. She is a principal investigator on a series of IES–funded research on teaching reading comprehension to grade 1 students during classroom read-alouds. Of particular focus is her work to develop supplemental interventions for students at risk of early reading difficulties, students with vocabulary and language deficits, and English-language learners. She also serves as principal investigator on an IES–funded study investigating the impact of enhanced core reading instruction (tier 1) on the early literacy achievement of Spanish-speaking English language learners in transitional bilingual programs. Dr. Santoro consults with state, local, and private agencies on a variety of projects, including training presentations on effective instructional strategies, program development related to RtI and school improvement, and reading program evaluation. She has published extensively on the effects of research-based strategies on student reading. Her research has been recognized with awards from the Council for Exceptional Children and the American Educational Research Association.

Sylvia Linan-Thompson, Ph.D., is an associate professor at The University of Texas in Austin. Her research interests include development of reading interventions for struggling readers who are monolingual English speakers, English language learner and bilingual students acquiring Spanish literacy. She is co-principal investigator of several longitudinal studies funded by IES and the National Institute of Child Health and Human Development examining the language and literacy development in English and Spanish for Spanish-speaking children and the efficacy of a three-tier model of reading intervention in general education classrooms and in bilingual classrooms. She has authored curricular programs, book chapters, journal articles, and a book on reading instruction.

W. David Tilly III, Ph.D., is the Coordinator of Assessment Services at Heartland Area Education Agency. He has worked as a practicing school psychologist, a university trainer, a state department of education consultant and as an administrator in Iowa. He participated in the leadership of Iowa's transformation to using RtI practices and has extensive experience working with districts, intermediate agencies, states, and professional organizations on the implementation of RtI. His research interests include implementing system change, instructional interventions, formative assessment, and translating research into practice. He coauthored a widely used publication on RtI for the National Association of State Directors of Special Education.

Staff

Rebecca A. Newman-Gonchar, Ph.D., is a research associate with the Instructional Research Group/RG Research Group. She has experience in project management, study design and implementation, and quantitative and qualitative analysis. Dr. Newman-Gonchar has worked extensively on the development of observational measures for beginning and expository reading instruction for two major IES–funded studies of reading interventions for Title I students. She currently serves as a reviewer for the What Works Clearinghouse for reading and mathematics interventions and Response to Intervention. Her scholarly contributions include conceptual, descriptive, and quantitative publications on a range of topics. Her current interests include Response to Intervention, observation measure development for reading and mathematics instruction, and Teacher Study Groups. She has served as the technical editor for several publications and is a reviewer for *Learning Disabilities Quarterly*.

Kristin Hallgren is a research analyst at Mathematica Policy Research and a former classroom educator. She has provided research support for several IES–sponsored practice guides, including the dropout prevention practice guide, this Response to Intervention reading and multi-tier interventions practice guide, and other forthcoming practice guides. She has conducted classroom observations and data analysis for IES–sponsored projects related to teacher quality and professional development including rigorous evaluations of teacher preparation routes and high-intensity teacher induction programs. She has also been responsible for communicating complex research design methodologies to district and school-level administrators for rigorous evaluations of supplemental educational services and mathematics curricula. Ms. Hallgren's expertise in classroom practices and background in research methodology has provided the panel with support for translating research principles into practitioner friendly text.

Appendix C. Disclosure of potential conflicts of interest

Practice guide panels are composed of individuals who are nationally recognized experts on the topics about which they are rendering recommendations. The Institute of Education Sciences (IES) expects that such experts will be involved professionally in a variety of matters that relate to their work as a panel. Panel members are asked to disclose their professional involvements and to institute deliberative processes that encourage critical examination of the views of panel members as they relate to the content of the practice guide. The potential influence of panel members' professional engagements is further muted by the requirement that they ground their recommendations in evidence that is documented in the practice guide. In addition, the practice guide undergoes independent external peer review prior to publication, with particular focus on whether the evidence related to the recommendations in the practice guide has been appropriately presented.

The professional engagements reported by each panel member that appear most closely associated with the panel recommendations are noted below.

Russell Gersten has no financial stake in any program or practice that is mentioned in the practice guide. He is a royalty author for what may become the Texas or national edition of the forthcoming (2010/11) Houghton Mifflin reading series, *Journeys*. At the time of publication, Houghton Mifflin has not determined whether or not they will ever release this series. Dr. Gersten provided guidance on the product as it relates to struggling and English language learner students. He excused himself from any sessions where Houghton Mifflin or any of its products were discussed. The panel never discussed the Houghton Mifflin series. Dr. Gersten also occasionally consults with universities, research agencies, and state and local education agencies on teaching English language learner students, mathematics instruction for struggling students, and various issues on bringing research findings into classroom practice.

Joseph Dimino coauthored *Interventions for Reading Success* (2007). This is not a published curriculum but a series of suggested activities for tier 2 interventions for students in the primary grades. He receives royalties from Brookes Publishing. Dr. Dimino excused himself from all discussions, reviews, and writing related to this program. This book is not referenced in this practice guide.

Lana Santoro received royalties as a consulting author for Scott Foresman Early Reading Intervention (2003). Dr. Santoro excused herself from all discussions, reviews, and writing related to this program or any other Scott Foresman products. The practice guide does not reference particular intervention or core curricula programs. It merely discusses topics that should be covered in tier 2 interventions and uses research (analyzed independently by What Works Clearinghouse) as a basis for these decisions. No specific discussion of the particular intervention program took place in panel deliberations.

Sylvia Linan-Thompson was a co-principal investigator on the research project that tested the proactive reading curriculum that is published under the name SRA's Early Interventions in Reading. Dr. Linan-Thompson was primarily responsible for the development of the English language learner component of the curriculum. While she is not an author on the program, SRA is considering integrating the English language learner component into some of their curricula. The proactive reading intervention was discussed in the context of two research studies, one of which met standards. However, the panel did not address specific issues in adjusting the curriculum for English learners, which is the focus of Dr. Linan-Thompson's work.

Appendix D. Technical information on the studies

Recommendation 1. Screen all students for potential reading problems at the beginning of the year and again in the middle of the year. Regularly monitor the progress of students who are at elevated risk for developing reading disabilities.

Level of evidence: Moderate

The panel judged the level of evidence for recommendation 1 to be *moderate*. While a growing number of screening studies are appearing in the research literature, a majority of studies relies on correlational designs, lack cross-validation, and fail to use representative samples. In this appendix, we discuss the limited evidence base in terms of sensitivity and specificity of the measures.

Sensitivity is the degree to which a measure correctly identifies children at risk for experiencing difficulties in learning to read. In contrast, specificity is the degree to which a measure correctly identifies children at low risk for experiencing problems. These false positives refer to students who eventually become good readers but score below the cut-score on the predictive instrument and are thus falsely identified as at risk. Providing these students with extra tutoring stresses school resources, providing intervention to an inflated percentage of the population.[80]

To date, researchers have placed a premium on identification and early treatment of children at risk of future reading failure, and therefore high sensitivity rather than specificity is favored. The overall effect of demanding high sensitivity is to over-identify the risk pool of children needing tier 2 intervention. Studies predicting risk in kindergarten children have reported sensitivity rates approaching minimally acceptable level of 90 percent with specificity ranging from 56 percent to 86 percent,[81] which means that often far too many students are identified as at-risk for reading difficulties.[82]

Results are more promising for grades 1 and 2. Several studies have demonstrated sensitivity in grade 1 above 90 percent with acceptable specificity.[83] For example, Compton et al. (2006) reports sensitivity rates approaching 100 percent with specificity of 93 percent using a combination of a one-time screening battery (containing measures of word identification, phonemic awareness, and rapid naming skill) in combination with six weeks on progress monitoring. However, these results have not been cross-validated and were not obtained with a representative sample. Similar results have been reported for screening grade 2 students.[84]

Recommendation 2. Provide differentiated reading instruction for all students based on assessments of students' current reading levels (tier 1).

Level of evidence: Low

The panel rated the level of evidence for this recommendation as *low* based on one descriptive-correlational study with first and second graders that met standards with reservations and the opinion of the

80. Jenkins and O'Connor (2002).

81. Foorman et al. (1998); O'Connor and Jenkins (1999).

82. See Jenkins and O'Connor (2002) for a discussion of the issue and for designing a manageable and acceptable risk pool for use within an RtI framework.

83. Compton et al. (2006); O'Connor and Jenkins (1999).

84. Foorman et al. (1998).

panel. The correlational study—Connor et al. (2008)—examines how student reading growth varied by the degree to which teachers employed a specific differentiation program. This differentiation program relied on assessments to group students. Student reading growth was higher for teachers who implemented the program with greater fidelity.

Recommendation 3. Provide intensive, systematic reading instruction on up to three foundational reading skills in small groups to students who score below the benchmark on universal screening. Typically, these groups meet between three and five times a week for 20 to 40 minutes (tier 2).

Level of evidence: Strong

The panel judged the level of evidence supporting the recommendation to be *strong*. The panel found 11 studies conducted with students in the primary grades that met WWC standards or met standards with reservations. Table D1 provides an overview of each study's outcomes in each of the five critical aspects of beginning reading instruction as articulated in the 11 studies. The table provides an overview of the reading domains taught in each tier 2 intervention and any significant outcomes found for each of the five domains. Group size for tier 2 instruction, typical session length, and duration are also indicated. Note that many in the field consider frequency and duration as gauges of *intensity* of the intervention.[85] One study is excluded from the table but included in the accompanying text because it was a follow-up study of an intervention that produced strong effects in many reading domains.[86]

Because of the large number of high quality randomized controlled trials and quasi-experimental design studies conducted using systematic instruction in several of the critical domains of beginning reading instruction, the frequency of significant effects, and the fact that numerous research teams independently produced similar findings, the panel concluded that there is *strong* evidence to support the recommendation to provide intensive, explicit, and systematic instruction in critical reading skills stressed in National Reading Panel for tier 2 interventions.[87]

85. National Association of State Directors of Special Education (2005).

86. Gunn et al. (2002).

87. National Reading Panel (2000).

Table D1. Studies of tier 2 interventions in grades K–2 reading that met What Works Clearinghouse standards

Study	Grade level	Intervention	Reading domain assessed					Intensity		Group size
			Phonemic awareness	Decoding	Reading comprehension	Vocabulary	Fluency	Frequency	Duration	
Ebaugh, 2000	1	PA, D, E, W		ns				30 min./day Daily	32 weeks	5–6 students
Ehri et al. 2007	1	PA, D, E, F, C, V	*	*	*		*	30 min./day Daily	24 weeks	one-on-one
Gibbs, 2001	1	PA	ns	ns				10 min./day Daily	8 weeks	one-on-one
Gunn et al. 2000	K–3	PA, D, C, F		*	^	*	^	≥25 min./day Daily	56 weeks (over two years)	2–3 (Some one-on-one)
Jenkins et al. 2004	1	D, E		*	*		^	30 min. four times a week	25 weeks	one-on-one
Lennon and Slesinski, 1999	K	PA, D, C	*	*				30 min./day Daily	10 weeks	2 students
Mathes et al. 2005	1	Both: PA, D, C Respon-sive: E, F, V, W		*	* (responsive intervention) ^ (proactive intervention)		ns	40 min./day Daily	32 weeks	3 students
McMaster et al. 2005	1	PA, D	ns	ns	ns	ns	ns	35 min./day three times a week	7 months	one-on-one
Vadasy et al., 1997	1	PA, D, E	ns	ns				30 min/day four times a week	28 weeks	one-on-one
Vadasy et al., 2005	1	PA, D, E		*	*		ns	30 min./day four times a week	32 weeks	one-on-one
Vaughn et al., 2006	1	PA, D, E, C, F, V		*	*		ns	50 min./day Daily	28 weeks	3–5 students

Note: Studies in bold showed statistically significant effects in at least one domain of reading instruction.
PA = phonemic awareness, D = decoding, E = encoding (Spelling related to phonics instruction), C = Comprehension, V=Vocabulary, F=Fluency, W = writing
ns = not statistically significant ($p > .10$).
^ = approached significance ($p = .05$-$.10$).
* = statistically significant ($p < .05$).
Source: Authors' analysis based on studies in table.

Evidence supporting explicit, systematic instruction as the key instructional delivery method for tier 2 tutoring on foundational reading skills.

All 11 studies used programs that systematically taught reading skills,[88] with seven of these studies demonstrating a positive effect on one or more reading outcomes.[89] For example, Gunn et al. (2000) conducted a randomized controlled trial involving supplementary instruction for students in kindergarten through grade 3 in phonemic awareness, sound-letter correspondence, and decoding. Instruction was highly explicit, students received many opportunities to practice each skill, and feedback was immediate and clear. Reading material consisted of decodable texts based on current reading levels. Although the emphasis was on decoding and fluency, the researchers also found an effect on reading vocabulary.

Jenkins et al. (2004) and Vadasy et al. (2005) used a virtually identical approach. Content of the intervention was similar except more time was spent on sight words and spelling. Here effects were found not only in decoding but also in comprehension. The findings suggested that, at least in kindergarten and grade 1, students with strong systematic instruction in small groups in phonemic awareness and decoding and fluent reading may also show growth in comprehension or vocabulary.

Both Ehri et al. (2007) and Vaughn et al. (2006) offered the widest menu of reading domains, including comprehension and vocabulary instruction along with the core foundational skills for learning how to read. Vaughn et al. found effects in comprehension as well as decoding, whereas Ebaugh's effects were limited to decoding. Ehri included phonemic awareness, decoding, reading comprehension, and fluency.

In summary, this highly explicit, highly systematic mode of small group instruction consistently produces positive effects, often significant effects in the area of decoding and often in comprehension and vocabulary as well. What remains uncertain is the balance of "learning to read" skills and comprehension, vocabulary, and language development in tier 2 interventions. Most important, the field needs to systematically study which domain areas make the most sense for students at various levels of reading proficiency. Our hypothesis is that the balance increases to more complex reading comprehension activities once students learn to read. However, for those still struggling to learn to read, it is unclear how much instruction in vocabulary and listening comprehension is necessary.

In understanding the nature of this body of evidence, the reader should keep in mind that instruction was often one-on-one (6 out of 11 of the WWC-rated studies) or in very small groups of two to three students.

In the remainder of the section, we review impacts on specific domains of tier 2 reading instruction.

Evidence supporting instruction of critical reading skills

Phonemic awareness. Five studies measured phonemic awareness—a student's understanding that words consist of individual phonemes. Phonemic awareness is a potent predictor of future success in reading and a critical foundational skill for

88. Gunn et al. (2000); McMaster et al. (2005); Vadasy et al. (1997); Vadasy, Sanders, and Peyton (2005); Jenkins et al. (2004); Gibbs (2001); Vaughn et al. (2006); Ebaugh (2000); Ehri et al. (2007); Mathes et al. (2005).

89. Gunn et al. (2000); Jenkins et al. (2004); Ehri et al. (2007); Ebaugh (2000); Vadasy, Sanders, and Peyton (2005); Vaughn et al. (2006).

becoming a reader.[90] Significant outcomes were found for only two studies although most of the tier 2 interventions did have a phonemic awareness component.[91]

Three of the five studies showed no significant effects for phonemic awareness. In some cases, ceiling effects may have played a role in the lack of significant findings. Meanwhile, lack of significant effects in the Gibbs (2001) study may be due to the short intensity and duration of the intervention. In this investigation students received 10 minutes of phonemic awareness instruction five times per week for only eight weeks. In addition, it is common for students' phonological skills to decrease as they begin to understand letter-sound correspondence. In other words, by the time students were post-tested their understanding of the relationship between letters and the sounds they make may have influenced their performance on the phonemic awareness assessments.

Decoding. Students' ability to read real words and individual sentences (not connected text), was measured in all nine studies.[92] Significant effects were reported in five of these studies.[93] The fact that this finding is replicated frequently indicates that the various approaches to systematic explicit instruction all seem to produce growth in this domain.

Reading comprehension. Reading comprehension assessments were used as outcome measures in 7 of the 11 studies,[94] and significant outcomes were reported in five studies.[95] This also is a sizeable proportion and indicates that one can expect effects in this domain. This is especially interesting because of the five studies that demonstrated significant effects; only three had a comprehension component. For example, Vadasy et al. (2005) and Jenkins et al. (2004) included a good deal of oral reading of decodable texts[96] but no explicit comprehension instruction. Yet effects on comprehension were significant. The reader should keep in mind that although this is an important finding, the level of comprehension tapped in most of these measures for grade 1 and 2 students is usually not very complex.

Vaughn et al's (2006) intervention included a good deal of work with oral reading of connected text but also small group instruction in a variety of comprehension strategies (using K-W-L, summarization, and retelling). This intervention led to significant effects.

Vocabulary. Students' vocabulary knowledge was rarely assessed. Of the three studies that assessed this domain,[97] significance was reported in only one.[98] Reading vocabulary is thus unlikely to improve unless the intervention contains a vocabulary component. But the small number of studies that assessed this phenomenon means that results are simply inconclusive.

90. Vaughn et al. (2006); Gunn et al. (2000); Vadasy, Sanders, and Peyton (2005); Ebaugh (2000); Lennon and Slesinski (1999).

91. Vadasy, Sanders, and Peyton (2005); Lennon and Slesinksi (1999).

92. Gunn et al. (2000); McMaster et al. (2005); Vadasy et al. (1997); Vadasy, Sanders, and Peyton (2005); Jenkins et al. (2004); Gibbs (2001); Lennon and Slesinski (1999); Ebaugh, (2000); Ehri et al. (2007).

93. Ehri et al. (2007); Gunn et al. (2000); Jenkins et al. (2004); Lennon and Slesinski (1999); Vadasy, Sanders, and Peyton (2005).

94. Gunn et al. (2000); McMaster et al. (2005); Vadasy, Sanders, and Peyton (2005); Jenkins et al. (2004); Vaughn et al. (2006); Ehri et al. (2007); Mathes et al. (2005).

95. Vadasy, Sanders, and Peyton (2005); Jenkins et al. (2004); Vaughn et al. (2006); Ehri et al. (2007); Mathes et al. (2005).

96. Jenkins et al. (2004) also contained a condition where students read books that were not necessarily decodable. This condition, too, led to significant effects in comprehension.

97. Gunn et al. (2000); Gunn et al. (2002); McMaster et al. (2005).

98. Gunn et al. (2000).

Fluency. Students' ability to read connected text fluently and accurately was assessed in 7 of the 11 studies,[99] and treatment students performed significantly better in one study and approached significance (p was between .5 and .10) in two studies.[100] Students' performance on these measures resulted in a few intriguing findings. In the follow up study conducted a year after the supplemental tier 2 intervention, Gunn et al. (2002) found that fluency outcomes were significant, but the original study (Gunn et al. 2000) did not demonstrate significant fluency outcomes. In other words, it may take time before a fluency intervention demonstrates impact.

As primary grade students practice reading fluently, they seem to improve their word reading accuracy. When considered together, results suggest that fluency interventions are a promising practice, as opposed to a clear evidence-based practice for tier 2 interventions at this point in time.

Research supporting intensity: frequency and duration of sessions and group size

Tier 2 instruction varied from three to five times a week. Six of the studies with significant outcomes on decoding, reading comprehension, or fluency provided daily instruction.[101] But data suggesting that daily interventions lead to better effects than those administered four days a week or even three is insufficient.

In terms of length of intervention sessions, nine studies provided at least 25 minutes of instruction,[102] with one study reporting 50 minutes of instruction per session:[103] the seven studies that had an effect on decoding, reading comprehension, or fluency provided instruction for at least 25 minutes,[104] while the three studies that had no significant effects varied in the length of sessions from 10 to 35 minutes.[105]

It is not possible to determine the role the number of days of intervention played in the studies in which no significant findings were found despite the intensity of the intervention. Although one study provided intervention five times a week, it did so for only ten minutes a day,[106] and one study provided instruction for 35 minutes but only three times a week.[107] Based on the evidence from these studies, it would be advisable to provide intervention four to five times a week and for at least 30 minutes.

In 6 of the 11 studies students were instructed on one-on-one.[108] Configurations for the remaining studies[109] consisted of small groups ranging from two to six students. The panel suggests that the combination of intensity (the amount of time per session) and duration (number of weeks) rather than the grouping configuration may be the critical variable contributing to

99. Gunn et al. (2000); Mathes et al. (2005); Jenkins et al. (2004); Ehri et al. (2007); McMaster et al. (2005); Vadasy, Sanders, and Peyton (2005); Vaughn et al. (2006).

100. Gunn et al. (2002); Vadasy, Sanders, and Peyton (2005); Ehri et al. (2007).

101. Ebaugh (2000); Gibbs (2001); Gunn et al. (2000); Lennon and Slesinski (1999); Vaughn et al. (2006); Mathes et al. (2005).

102. Ebaugh (2000); Gibbs (2001); Gunn et al. (2000); Mathes et al. (2005); Jenkins et al. (2004); Lennon and Slesinski (1999); McMaster et al. (2005); Vadasy et al. (1997); Vadasy, Sanders, and Peyton (2005).

103. Vaughn et al. (2006).

104. Ebaugh (2000); Gunn et al. (2000); Gunn et al. (2002); Jenkins et al. (2004); Lennon and Slesinski (1999); Vadasy, Sanders, and Peyton (2005); Vaughn et al. (2006).

105. McMaster et al. (2005); Vadasy et al. (1997); Gibbs (2001).

106. Gibbs (2001).

107. McMaster et al. (2005).

108. McMaster et al. (2005); Vadasy et al. (1997); Vadasy, Sanders, and Peyton (2005); Jenkins et al. (2004); Gibbs (2001); Erhi et al. (2007).

109. Lennon and Slesinski (1999); Ebaugh (2000); Gunn et al. (2000); Vaughn et al. (2006).

positive outcomes for students. However, this is only speculative at this point.

The only inference that can be clearly drawn is that the 10-minute phonemic awareness lessons conducted daily for eight weeks were not intense enough to produce significant effects in reading-related skills. The one-on-one sessions tended to be reasonably lengthy (30 minutes) and of long duration. Three of the four produced significant effects.[110]

In the four investigations where students were taught in small groups[111] significant outcomes were reported for interventions that ranged between 10 weeks and 1.5 years and were conducted for 25 to 50 minutes daily. Only Mathes et al. (2005) and Vaughn et al. (2006) reported significant effects in reading comprehension. Significant outcomes in decoding and fluency were reported by Gunn (2000), while Lennon and Slesinski (1999) reported significant effects in phonemic awareness and decoding. Decoding was the only outcome measure in the Ebaugh (2000). Unfortunately, after 30 minutes of instruction per day for 32 weeks, there were no significant effects.

A study of intensive, explicit, and systematic small group instruction—Vaughn, Mathes, Linan-Thompson, Cirino, Carlson, Pollard-Durodola, et al. 2006

This intervention study was conducted in two sites in Texas that were selected because they were representative of the population areas where large numbers of bilingual students go to school and because students were receiving reading instruction in English. Four schools within these districts that were considered effective for bilingual students were selected using a priori criteria: schools were providing English intervention for reading to at least two classes of grade 1 English language learner students, at least 60 percent of the student population was Latino, and schools' state-level reading achievement tests at grade 3 indicated that 80 percent or more of students passed the test.

The research team screened all students in 14 bilingual, grade 1 classrooms in the four schools. Criteria for selecting students for the intervention were determined as being those who scored below the 25th percentile in grade 1 on the Letter Word Identification subtest in both Spanish and English, and who were unable to read more than one word from the simple word list. Two-hundred sixteen students were administered both the Spanish and English screen at the four target schools. One-hundred eleven students (51 percent) met the Spanish intervention inclusion criteria, 69 students (32 percent) met the English intervention inclusion criteria, and 58 students (27 percent) met both criteria. Eleven students met the English cutoff but not the Spanish cutoff, and these students were not eligible for the intervention.

The study was initiated with 24 intervention students and 24 contrast students and due to ordinary attrition (students' families moving or students transferring to other schools), the study ended with 22 intervention and 19 contrast students (8 percent attrition for intervention and 21 percent attrition for contrast); data were not obtainable on one student (contrast) at either testing time point. The mean age of the 47 students with pretest data was 6.59 years (SD = 0.54). All students were Hispanic, and female students comprised 50 percent of the sample (n = 23).

Eligible students received daily supplemental instruction from October to April. Each session was 50 minutes long. Forty minutes were spent on literacy instruction.

110. Vadasy, Sanders, and Peyton (2005); Jenkins et al. (2004); Ehri et al. (2007).

111. Lennon and Slesinski (1999); Ebaugh (2000); Gunn et al. (2000); Vaughn et al. (2006).

The literacy strands varied in time from 5 to 12 minutes. More time was dedicated to a strand when new elements were introduced, and less time when it was review. The read aloud was always 10 minutes.

Daily lesson plans were comprised of six to ten short activities representing five content strands: phonemic awareness, letter knowledge, word recognition, connected text fluency, and comprehension strategies. Daily lessons were fully specified and provided exact wording to ensure teachers' language was clear and kept to a minimum. To ensure student engagement, there was constant interaction between the instructor and students. The lesson cycle included modeling, group response, and individual turns. Pacing was another characteristic of the intervention. A rapid pace was maintained both in the exchange in each strand and in moving from activity to activity within each lesson. Tutors also consistently monitored students' responses, provided positive praise for correct responses, and scaffolded errors as they occurred. Finally, mastery checks were conducted after every five lessons.

Given that students were assigned to intervention and contrast groups randomly, there were no significant group mean differences in performance on either of the skills (Woodcock Language Proficiency Battery-Revised (WLPB-R), letter word identification, and experimental word reading list) used in the intervention screen, in English[112] or Spanish.[113] Furthermore, mean comparison of skill performance on the larger battery administered prior to the onset of treatment indicated that students in the intervention and contrast groups performed at comparable levels on all English and Spanish skills assessed, with no significant differences between students on any measure. Reading and language performances were approximately 1 to 3 standard deviations below normative levels for both groups, with performances nearing the average range only for English Word Attack scores (for both groups).

Intervention students' performance on English measures indicate that they outperformed control students on measures that ranged from rapid letter naming to reading comprehension as measured by WLPB-R passage comprehension subtest. Intervention students' were able to match sounds, blend sounds to form words, segment words into phonemes, and delete sounds better than control students. They also outperformed intervention students on the WLPB-R Word Attack subtest, indicating that intervention students demonstrated a greater ability to apply phonic and structural analysis skills to pronounce phonetically regular nonsense words in English.

Recommendation 4. Monitor the progress of tier 2 students at least once a month. Use these data to determine whether students still require intervention. For those students still making insufficient progress, school-wide teams should design a tier 3 intervention plan.

Level of evidence: Low

The panel rated the level of evidence as *low.* Only three studies[114] of tier 2 interventions that met WWC standards or that met standards with reservations included a weekly progress monitoring or unit mastery component. However, neither of the studies evaluated progress monitoring as an independent variable. Thus, no inferences can be drawn about its effectiveness based on the research reviewed.

In the Mathes et al. (2005) study, teachers used data from student assessments to identify needs and strengths, and planned

112. Woodcock (1991).

113. Woodcock and Muñoz-Sandoval (1995).

114. Mathes et al. (2005); McMaster et al. (2005); Gibbs (2001).

instruction from that analysis. In the Gibbs (2001) study, tutors collected data weekly using mastery tests. After each mastery test, tutors were directed to proceed to the next lesson or to repeat lessons based on number of correct responses.[115]

A few studies of tier 2 interventions that met WWC standards or that met standards with reservations reported using data at certain points during the intervention, but did not report on how often data was collected or if students were regrouped based on progress. Two studies used data to inform student pairings for practice within tier 2 instruction.[116] Pairs were rearranged when one participant was making more progress than the other.[117] Three additional studies used data on student progress to determine the type of instruction that students received, such as echo, partner, or independent reading.[118]

Despite the lack of evidence supporting use of progress monitoring, the panel decided to recommend this practice for students in tier 2 interventions. In our experience, progress monitoring data are used to determine students' response to tier 2 instruction and to inform instructional decisions in two ways.[119] First, data are used to identify students who need additional instruction to benefit from tier 2 instruction. This additional support, usually an additional 10 to 15 minutes, is provided to accelerate the learning of a student who is lagging behind the other students in the group.[120] It also identifies students who no longer require tier 2 instruction. It can be used to regroup students who continue to need tier 2 instruction so that tier 2 groups remain homogenous.[121] An advantage of using progress monitoring measures for these decisions (as opposed to daily or weekly mastery tests) is that they provide a more valid picture of overall growth in reading proficiency.

Recommendation 5. Provide intensive instruction on a daily basis that promotes the development of the various components of reading proficiency to students who show minimal progress after reasonable time in tier 2 small group instruction (tier 3).

Level of evidence: Low

The level of evidence for this recommendation is rated as *low.* Although the panel found five studies that met the What Works Clearinghouse standards (or met standards with reservations) relating to this recommendation, no studies reported statistically significant impacts on reading outcomes.[122]

For the purposes of this document, tier 3 is defined as a layer of instructional intervention for any student in kindergarten through grade 2 who requires something substantially more intensive or substantially different than tier 2 instruction. However, tier 2 instruction is not the same as special education for students with learning disabilities. Thus, we did not include the literature base for special education for students with learning disabilities in our review, though undoubtedly some ideas about promising practice might be gleaned from this body of research.

Distinctions between tier 2 and tier 3 interventions are far from clear. In our search

115. Gibbs (2001).

116. Lennon and Slesinski (1999); Gunn et al. (2000).

117. Lennon and Slesinski (1999).

118. Jenkins et al. (2004); Vadasy, Sanders, and Peyton (2005); Ehri et al. (2007).

119. McMaster et al. (2005).

120. Vaughn, Linan-Thompson, and Hickman (2003).

121. Vaughn, Linan-Thompson, and Hickman (2003).

122. McMaster et al. (2005); Foorman et al. (1998); Blumsack (1996); Gillon (2000); O'Connor and Jenkins (1995).

of the literature, we found two studies[123] on interventions that *simultaneously* targeted tier 2 and tier 3 students.[124] We, therefore, included these two studies since they provided adequate information to draw inferences about the impact on tier 3 students; three studies clearly addressed a tier 3 population.[125]

Although we found no evidence of significant effects, we believe that several of the studies suggest promising practices for tier 3 intervention. The reader should keep in mind, though, that these are merely potentially promising practices.

Although all five studies focused on a small number of high priority reading-related skills, only one included actual work on reading of words or pseudowords.[126] A trend across interventions was the use of multiple and extended instructional sessions ranging from a month[127] to a full school year.[128]

A key trait of all five studies was the use of extensive practice on the targeted reading-related skills. In all but one (Foorman et al. 1998), if a student made an error, the teaching guide or script provided explicit procedures for teachers to correct student responses. Another key trait of all but Foorman et al. (1998) was to use mastery criteria. Before a student could progress to the next skill level or new activity, they had to perform a task correctly. For example, Blumsack (1996) required that students master segmenting three phoneme items and letter-sound associations before moving forward to the next activity level.

All five studies included instruction that was designed to systematically move from easy to more difficult skills. Three of the five studies included specific material supports and manipulatives to make student learning more concrete.[129] In summary, all involved systematic instruction with extensive practice, clear feedback, teaching to mastery, and carefully thought out progression from easy to hard learning activities—all elements of direct instruction.[130]

A study of carefully planned individualized instruction—O'Connor and Jenkins, 1995

O'Connor and Jenkins (1995) wanted to know whether teaching spelling to kindergarteners experiencing extreme difficulty learning to read would accelerate their reading growth. The intervention included ten students who had been identified as developmentally delayed and eligible for special education services while in kindergarten. The students had previously participated in 60 hours of code-emphasis, decoding-based reading instruction as part of SRA's *Reading Mastery I* series,[131] which explicitly teaches phonics and blending of phonemes.

Ten students were paired and then randomly assigned to experimental and control conditions. Students in the experimental group received 20 minutes of daily individual spelling instruction during May of their kindergarten year in addition to their daily small group code-emphasis reading instruction provided in small

123. Foorman et al. (1998); McMaster et al. (2005).

124. Both tier 2 and tier 3 studies were conducted with students in the primary grades with reading difficulties or significant delays in reading (for example, students were considered "nonresponders" due to reading performance and growth rates substantially below average achieving peers).

125. Blumsack (1996); Gillon (2000); O'Connor and Jenkins (1995).

126. Foorman et al. (1998).

127. O'Connor and Jenkins (1995).

128. McMaster et al. (2005); Foorman et al. (1998).

129. Blumsack (1996); Gillon (2000); O'Connor and Jenkins (1996).

130. Engelmann and Carnine (1981).

131. Engelmann and Bruner (1988).

groups. In their spelling lessons, students pointed to and wrote letters that made a particular sound, started a particular word, or ended a particular word. Lessons at the end of the instructional sequence required students to use magnetic letters to spell words from a selected word list, as well as write two or three of the same words on paper. As students mastered words on a particular word list, new words were introduced. The teacher tracked the exact words presented during a session, the student's accuracy, and the number of times the student practiced the word before mastering the word's spelling.

Spelling instruction included systematic routines. For example, a teacher would ask students to show (point to) a letter that makes a particular sound, then write the letter that makes that particular sound. Next, students would show a letter that starts a word and then write the letter that starts the word. These routines were repeated across lessons. Instruction was also scaffolded from easier tasks to more difficult tasks. Instruction began with an individual letter and sound, then moved to first sounds, and then last sounds. Student feedback was also individualized. If a student had difficulty with a word, teachers would first ask the child to orally segment the word (a scaffold or support strategy to help the student identify the sounds in the word) and then present earlier tasks as prompts to help guide the student's response. Students in the control group received no spelling instruction at all. They spent their time practicing reading words.

Results from O'Connor and Jenkins indicate that the intensive spelling instruction component resulted in promising, although non-significant, effects in many aspects of reading and spelling. A measure of decoding approached significance with a p level of .09. Despite outcomes on spelling and word reading measures, there were no differences between groups on a phonemic segmentation task.

In addition to careful instructional planning that included individualized student feedback and error correction, mastery criteria, and lessons that moved systematically from easier tasks for more difficult tasks, O'Connor and Jenkins' results may suggest a promising practice for students who require tier 3 intervention. Specifically, the students who received spelling had a clearer and more direct presentation of how the alphabetic principle (words include letters and letters are linked to sounds) works in reading. Spelling may be a more accessible way to apply phonological skills to reading. Potentially, spelling could help demonstrate how word reading works.

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