

Improving Adherence to the AAP Clinical Practice Guideline for the Diagnosis, Evaluation, and Treatment of ADHD in Children and Adolescents: A Quality Improvement Initiative in Rush Pediatric Primary Care

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The RUMC Primary Care Pediatrics Center (RPCPC) and Rush Lifetime Medical Associates (LMA) are two high-volume, well-established pediatric outpatient clinics serving roughly 19,000 patients each year. To date, these outpatient clinics have no formal or systematic methods for the diagnosis, evaluation, and treatment of Attention Deficit Hyperactivity Disorder (ADHD). Furthermore, the prevalence of ADHD within these clinics is roughly 2%, well below the accepted national prevalence for this condition (~11%). The discrepancy between these rates could be attributed to practice/physician factors and/or to patient/family factors. The current project aims to improve the practice/physician factors: diagnosis, evaluation, and treatment services provided to patients within these clinics between 4 and 18 years of age presenting with ADHD symptomatology and/or behavioral and academic concerns. The current project will achieve this aim by 1) implementing a Diagnostic Evaluation Protocol and ADHD Management Protocol 2) creating and implementing “smartphrase” templates within the computer information systems, 4) dedicate behavioral therapy services to families of children diagnosed with ADHD, and 5) provide specialized consultative services by a developmental-behavioral pediatrician to the participating clinicians. A Model of Improvement framework will be used to assess improvements and outcomes. In collaboration with the Illinois Chapter of the American Academy of Pediatrics (ICAAP), the leadership team will disseminate the protocol, methodology, and outcomes of the proposed initiative to pediatric primary care practices across the state of Illinois.

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Goals and Objectives

The goal of this project is to increase the access of children and adolescents in Chicago to systematic and quality care in the diagnosis, evaluation, and treatment of ADHD in a large pediatric primary care setting. We will use the AAP Clinical Practice Guideline for the Diagnosis, Evaluation, and Treatment of ADHD in Children and Adolescents¹ (“ADHD Guideline”) as a platform to develop a protocol for the diagnosis, evaluation, and treatment of ADHD to be implemented by clinician participants at Rush University Medical Center, our target population. Our innovative approach to improving the care of children with ADHD includes 1) implementing a Diagnostic Evaluation Protocol and ADHD Management Protocol, 2) creation and implementation of “smart phrase” templates for traceable documentation of ADHD visits, 3) education of the ADHD Guideline with applied didactics to clinician participants 4) development of dedicated behavioral therapy services to families of children with ADHD cared for by clinician participants, and 5) dedicated specialized (diagnostic, pharmacological, and behavioral) consultative services by a board certified developmental-behavioral pediatrician. The partnership of the Rush University Medical Center and the Illinois Chapter of the American Academy of Pediatrics in this project provides the foundation for implementation of more expansive quality improvement initiatives in the state of Illinois in the near future.

Objective 1: Our first objective is to improve the quality of ADHD diagnostic evaluation and ADHD management provided to patients between 4 and 18 years of age presenting with ADHD symptomatology and/or behavioral and academic concerns. The following objectives will be met:

- The project team will develop a Diagnostic Evaluation Protocol by July 20, 2017.
- The project team will develop an ADHD Management Protocol by July 20, 2017.

Upon completion of the quality improvement project in July 2018:

- 75% of charts for children newly diagnosed with ADHD have DSM-V diagnostic criteria for ADHD documented using the smart phrase template in their EMR.
- 100% of children between the ages of 4 and 18 years of age newly diagnosed with ADHD will have standardized rating scales from their caregiver and teacher documented in their EMR.
- 75% of charts for children newly diagnosed with ADHD will have a documented management plan.
- 100% of charts for children newly diagnosed with ADHD who are being prescribed medication treatment will have their medication treatment (e.g., side effects, titration) documented using the smart phrase template in their EMR.
- 100% of charts for children 4 to 18 years of age newly diagnosed with ADHD will have a documented ADHD follow-up visit within 45 days of ADHD diagnosis.
- 100% of charts of children newly diagnosed with ADHD being treated with medication and/or behavioral therapy will have caregiver and teacher rating scales documented for each ADHD visit as a way to monitor treatment response.

The inclusion of a Diagnostic Evaluation Protocol and ADHD Management Protocol adheres to several of the key action statements of the ADHD Guideline. Specifically, key action statement 3 of the ADHD Guideline, which calls for the assessment of other conditions that might coexist with ADHD, key action statement 2 of the ADHD Guideline, which states that information be obtained primarily from reports made by parents, teachers, and mental health clinicians involved in the child’s care, and key action statement 4 of the ADHD Guideline, which recommends that the management of children and youth with special health care needs, like ADHD, should follow the principles of the medical home model. Additionally, the inclusion of the measure of functional impairment addresses AAP’s call for the

identification of a reliable instrument suitable to use in primary care to assess the nature and degree of functional impairment in children and adolescents with ADHD.

Objective 2: Our second objective is to improve the documentation of clinician participants for ADHD visits during clinical encounters. To achieve this objective, the project proposes to design and implement “smart phrase” templates to be used by clinician participants within the computer information system. The following objectives will be met:

- The project team will develop a Diagnostic Evaluation Protocol “smart phrase” template by July 24, 2017.
- The project team will develop an ADHD Management Protocol “smart phrase” template by July 24, 2017.
- The Diagnostic Evaluation Protocol “smart phrase” template will be available for use in EPIC by August 21, 2017.
- The ADHD Management Protocol “smart phrase” template will be available for use in EPIC by August 21, 2017.

Upon completion of the quality improvement project in July 2018:

- 100% of patients seen for an ADHD diagnostic evaluation visit, will have care documented using the Diagnostic Evaluation Protocol “smart phrase” template.
- 100% of newly diagnosed and returning patients seen for an ADHD Management visit, will have care documented using the ADHD Management Protocol “smart phrase” template.

This objective adheres to key action statement 2 of the ADHD Guideline, which emphasizes the need for primary care clinicians to determine that the diagnostic criteria outlined in the *Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-V)*² has been met for a diagnosis of ADHD. This objective also adheres to key action statement 6 of the ADHD Guideline, which recommends that primary care clinicians properly and closely monitor medication side effects and titrations.

Objective 3: Our third objective aims to provide decision support through clinical education training to clinician participants. To achieve this objective, leaders of the proposed project, specifically the ADHD content expert, lead clinician, and clinical psychologist, will co-facilitate clinical education training. The following objectives will be met:

- A comprehensive clinical participant education session will be developed by August 1, 2017.
- 100% of clinician participants will attend one education session.

Upon completion of the training session:

- 100% of clinician participants will identify (by survey) that education session objectives were met.
- 100% of clinician participants will identify (by survey) that they will use knowledge gained from the education session to inform their practice.

Objective 4: Our fourth objective is to improve access to behavioral therapy services to caregivers of patients seen by clinician participants. The project proposes to dedicate 8-hours of clinical psychologists' time in the Section of Pediatric Psychology at RUMC to implementing an evidence-based, manualized group-based behavioral parent training program to meet the needs of the high volume of families of children with ADHD referred for behavioral therapy services. There are several advantages to implementing a group-based model as it has been shown to meet the needs of a large number of families, constitute a cost-effective and continuous source of treatment, and diminish the stigma of seeking psychological services. The main goal of the group-based behavioral parenting program will be to train caregivers in specific strategies and techniques that will improve their ability to modify and shape their

child's behavior, and improve the child's ability to regulate their own behavior. The following objectives will be met

- 100% of families of children 4 to 11 years of age presenting to the Rush General Pediatrics Clinic with ADHD symptomatology and/or behavioral and academic concerns will be referred for behavioral therapy services.
- 100% of families referred to the behavioral parent training program will complete a brief phone intake.
- 75% of families referred will be enrolled in the parent training session.
- 75% of families enrolled in the parent training session will attend six sessions.

Upon completion of the six-week session:

- 100% of parents will complete the Vanderbilt ADHD Diagnostic Rating Scale (VADRS)³ and the ADHD-FX Scale⁴.
- 75% of parents completing the VADRS and ADHD-FX Scale will report improvement in their child's ADHD symptomatology and functional impairment.

This objective adheres to key action statement 5(a), 5(b), and 5(c) of the ADHD Guideline, which strongly recommends primary care clinicians prescribe evidence-based parent-administered behavioral therapy for preschool-aged children as the first line of treatment. Furthermore, it is recommended that primary care clinicians prescribe evidence-based parent-administered behavioral therapy concurrently upon prescribing pharmacological treatment for school-aged children and adolescents.

Objective 5: Our fifth objective is to increase clinician participant's access to specialized consultative services. To achieve this objective, the project proposes to dedicate 4-hours of a board certified developmental-behavioral pediatrician's time in the Section of Developmental-Behavioral Pediatrics at RUMC for diagnostic, pharmacological, and behavioral consultative services from clinician participants. The following objective will be met:

- The Clinical Leaders will notify the Project Manager of clinical "office hours" times and dates by August 21, 2017.
- The consultative service will log the "topic" of the consult and length of time spent on the consult.

This objective adheres to key action statement 4 of the ADHD Guideline, which recommends that primary care clinicians recognize that children with ADHD have special health care needs and should be managed with a chronic care and/or medical home model. Inclusion of a developmental-behavioral pediatrician will expand the team of providers caring for the patient and will provide a comprehensive and well-rounded understanding of each child's unique medical and psychosocial functioning. This objective also adheres to key action statement 6 of the ADHD Guideline, which recommends primary care clinicians to titrate medication based on parent and patient-report of symptomatology and side effects. Providing additional access to specialized consultation assures that clinician participants have appropriate support for management and pharmacological treatment of complex patients with ADHD.

Current Assessment of Need

The Rush Primary Care Pediatrics Center (RPCPC) and Rush Lifetime Medical Associates (LMA) together have 22 board certified pediatricians and 47 residents providing medical care to children and adolescents. There were a total of 47,142 visits completed across 18,676 patients in the last 12 months by these clinics. Consistent with RUMC as a larger institution, patients cared for by RPCPC and LMA represent an ethnically and socioeconomically diverse group. Of the 18,676 patients cared for by RPCPC and LMA, 359 carried a diagnosis of ADHD. Consequently, the prevalence of ADHD at RPCPC and LMA is 1.9%, which is well below

the expected national prevalence for this condition⁵. Considering this discrepancy, a systematic assessment of need was conducted to identify inconsistencies between the current quality of healthcare and desired quality of healthcare provided to patients with ADHD. Research on practice patterns of primary care clinicians suggests that many face significant barriers in adopting the published AAP's Clinical Practice Guideline for the Diagnosis, Evaluation, and Treatment of ADHD in Children and Adolescents⁶. Therefore, a chart audit of 40 patients with ADHD across 12 clinicians was used to determine baseline metrics of assessment, diagnostic and management practices of RPCPC and LMA clinicians.

The rate of documented caregiver and teacher rating scales at the time of the ADHD diagnosis was reported in 75%-80% of patient charts. These findings are relatively consistent with the literature and allow for minor improvements⁷. In contrast, the rate of documented caregiver and teacher rating scales for follow-up visits was reported in 27.5% of patient charts. This rate is above rates commonly reported in the literature but in contrast with the ADHD Guideline⁸. Next, the rate of documented DSM-V diagnostic criteria at the time of the ADHD diagnosis was reported in 5% of patient charts. Although this rate is significantly below the rates presented in the literature⁹, we suspect that this finding reflects poor documentation of use rather than not considering the diagnostic criteria when assessing patients. Nonetheless, improving the use and documentation of DSM-V diagnostic criteria is warranted. Next, the rate of a documented management plan at the time of ADHD diagnosis was reported in 12.5% percent of patient charts and documented follow-up within 45 days of the ADHD diagnosis was reported in 55% of patient charts. These rates are well below rates presented in the literature¹⁰. Lastly, the rate of documented behavioral therapy recommendations to patients younger than 6 years of age was not reported in the two audited charts meeting the age-based criteria. Given the recommendation that behavioral therapy be the first line of treatment for preschool children, our current findings support the need for improvement. Overall, the baseline metrics demonstrated a deviation from the ADHD Guideline recommendations and indicate a significant need for practice/clinician level change, as well as system-level change.

Targeted Participants and Recruitment

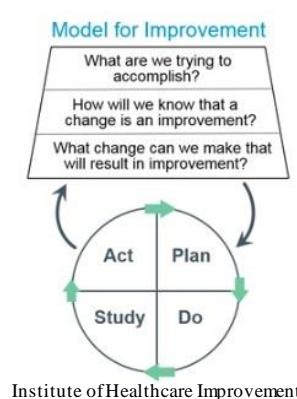
The targeted participants in our intervention are the Rush primary care clinicians: 22 primary care pediatricians, 1 pediatric nurse practitioner, and 47 pediatric residents. In addition to the project leadership, clinician participants will be recruited with assistance from the director of the Section of General Pediatrics in the Department of Pediatrics. Given the time constraints and work documentation load currently encountered by primary care clinicians, the project team aims to minimize the burden placed on clinicians in order to decrease barriers to participation. In order to be mindful of clinician participant's time, we will poll the best times to conduct the clinical education trainings and provide multiple times to attend. As a method of attracting participants, the project leadership will inform clinicians of the physician and patient benefits that accompany the project. Specifically, the specialized consultation services by a developmental-behavioral pediatrician to clinician participants and caregivers access to behavioral therapy services following a patient diagnosis of ADHD. We believe the best approach to ensure the sustainability of this project is to collaborate with the director of the Section of General Pediatrics and the ADHD expert when developing the "smart phrase" templates for the Diagnostic Evaluation Protocol and ADHD Management Protocol. Ongoing assistance from these individuals will allow for provider "buy in" and aid in dissemination of the system-level change.

Project Design and Measurement Strategy

The **Model for Improvement** is the basis for the design, implementation and evaluation of this quality improvement project. The Model for Improvement is a well-established model to accelerate

organizational change (Figure 1). The project team started the planning process by answering the three guiding questions set forth by the model. This allowed for intentional development of aims, measures and specific systems level changes while ensuring a quality improvement perspective in the earliest stages of the project.

Figure 1. Model for Improvement



What are we trying to accomplish?

Rush General Pediatric Clinics aims to increase the access of children and adolescents in Chicago to systematic and quality care in the diagnosis, evaluation, and treatment of ADHD in the primary care setting. More specifically, we aim to improve the assessment, diagnostic, management, and treatment services provided to patients between 4 and 18 years of age presenting to our clinic with ADHD symptomatology and/or behavioral and academic concerns. We aim to demonstrate improvements by July 2018. See the Goals and Objectives section for specific process and outcome measures that demonstrate the full breadth of what we hope to accomplish.

How will we know that a change is an improvement?

We will measure change by comparison of pre-implementation and post-implementation data, collected via chart audit. We will collect and compare data to determine if improvements are seen in the evaluation of patients presenting with symptom, correct diagnosis of those who fit diagnostics criteria and clinician adherence to the six recommendations in the ADHD Guideline newly diagnosed with ADHD by clinician participants. An increase of the rate of use of recommended diagnostic tools, appropriate diagnosis and documented adherence to the ADHD Guideline will demonstrate improvement, working toward our overall aim of improving access to quality ADHD care for this population.

What changes can we make that will result in improvement?

The overarching change that will result in improvement is the creation and implementation of a protocol, based on the ADHD Guideline. The project team explored a wide variety of facilitators for change, taking into consideration the needs of clinicians and patients, as well as available resources. After conducting a full needs assessment (See Needs Assessment Section), gaining input from the clinician team, and consulting the Illinois Chapter of the American Academy of Pediatrics, we identified the following changes as priorities:

- 1) To improve decision support for clinician participants diagnosing, evaluating, and treating ADHD, we will develop a comprehensive protocol based on the ADHD Guideline.
- 2) To improve documentation and act as further decision support, we will create and implement "smart phrase" templates to guide clinicians in following the protocol and thoroughly documenting care.
- 3) To ensure clinician participant knowledge and provide decision support, we will create a sustainable clinical education plan to include training sessions focused on the ADHD Guideline, the new protocol and "smart phrase" template.
- 4) To improve access to behavioral therapy services to patients and families cared for by clinician participants, eight hours per week of behavioral therapy services will be provided to parents of patients by a licensed clinical psychologist.
- 5) To improve ADHD management and pharmacological treatment for patients with ADHD who are seen by clinician participants, four hours per week of consultative services will be provided by a developmental-behavioral pediatrician with extensive experience treating children and adolescence with medication.

For each of these changes, the project team will employ the “Plan, Do, Study, Act” practice established by the model.

Objective 1: *Improve the quality of ADHD diagnostic evaluation and ADHD management provided to patients between 4 and 18 years of age presenting with ADHD symptomatology and/or behavioral and academic concerns.*

Plan: With guidance from ILAAP Chapter, the team will develop protocols in alignment with the ADHD guidelines. Based on our protocol, a data collection tool will be created to use in the plan and study phases of the project. In order to establish baseline metrics we will conduct a pre-implementation chart audit to measure the assessment, diagnostic and management practices of clinician participants in comparison to practices guided by our protocol.

Do: The Diagnostic Evaluation Protocol will be used by clinician participants for patients receiving a diagnostic evaluation for ADHD. In alignment with the ADHD Guideline, the protocol will use parent and teacher-report measures and the DSM-V diagnostic criteria for ADHD to provide decision support to clinician participants. The caregiver and teacher-report measures will include 1) The VADRS, which assesses ADHD symptomatology and common comorbid disorders, and 2) The ADHD-FX Scale, which assesses functional impairment in the academic, familial, and social domains. Retrieving hardcopy parent and teacher-report measures has been well-documented as a labor-intensive and a relatively unsuccessful task; nonetheless, necessary to the credibility of a thorough diagnostic assessment¹. Therefore, this project proposes to collect the assessment protocol primarily through Research Electronic Data Capture (REDCap) in order to minimize the barriers to obtaining the ratings scales from parents and, particularly, teachers. Completing hardcopy forms will continue to be available; however, parents and teachers will have the option of using their own electronic device to complete the measures on a secure online platform prior to the patient’s visit. Caregivers and teachers will be provided access to the online platform upon confirmation of the scheduled visit. Caregivers who have not completed the measures prior to the visit will be provided an electronic device at the visit to complete the measures. As part of the diagnostic evaluation protocol, clinician participants will have access to a “smart phrase” template, designed for ADHD diagnostic evaluations, that populates the DSM-V diagnostic criteria for ADHD. Use of the DSM-V diagnostic criteria for ADHD during the diagnostic evaluation will guide provider decision support.

The ADHD Management Protocol reflects a delivery system redesign and will be used for patients who have been newly diagnosed with ADHD. The protocol will involve the caregiver completion of the Vanderbilt measure of ADHD symptomatology at each follow-up appointment and the ADHD-FX Scale at 6 month and 12 month follow-up. Teachers will complete the Vanderbilt and ADHD-FX Scale at 6 month and 12 month follow-up. The ADHD Management Protocol will also require that all patients newly diagnosed with ADHD be scheduled within 45 days of the diagnostic evaluation for an ADHD follow-up appointment. To achieve this part of the protocol, the project leader will collaborate closely with the Department of Population Health and the Medical Home Network at RUMC. These services dedicate two triads, comprised of a social worker, nurse, and patient navigator, to the pediatric primary care clinics. These professional triads use a patient-centered medical home model in order to provide comprehensive quality healthcare to patients. The involvement of the Department of Population Health and the Medical Home Network in the project will allow for our target population to be more easily identified and serviced by this team-based model of care. After protocol development and training, implementation will occur.

Study: The data collection tool will be used to measure the presence or absence of documentation of all practices included in the protocol. Data collection and preliminary analysis will be conducted monthly. A

chi-square analysis will be conducted to measure the difference between pre- and post-implementation documentation of diagnostic criteria, and management recommendations.

Act: During monthly meetings, the project team will review data, and identify opportunities for further change. The team will specifically look to identify changes needed in the protocol, and therefore will also examine the “smart phrase” template and clinical education needs. This PDSA cycle will continue, taking into consideration any additional changes.

Objective 2: *Improve the documentation of participating clinicians for ADHD clinical encounters.*

Plan: Based on the established protocol and in consultation with clinician participants, the project team will create two “smart phrase” templates; one for the Diagnostic Evaluation Protocol, and another for the ADHD Management Protocol. These templates will not only assist clinician participants in uniform documentation of services provided to patients present for ADHD evaluation or management, they will also act as a prompt for following the protocol and allow for efficient data storage and collection.

Do: The Diagnostic Evaluation Protocol “smart phrase” template will populate a predetermined documentation template of the DSM-V diagnostic criteria to act as decision support for providers assessing fulfillment of criteria, including 1) six (or more) symptoms of inattention, hyperactivity, and/or impulsivity that have persisted for at least 6 months to a degree that is inconsistent with developmental level and that negatively impacts directly on social and academic/occupational activities, 2) several symptoms were present prior to age 12 years, 3) several symptoms are present in two or more settings, 4) clear evidence that the symptoms interfere with, or reduce the quality of, social, academic, or occupational functioning, and 5) symptoms do not occur exclusively during the course of schizophrenia or another psychotic disorder and are not better explained by another mental disorder.

The ADHD Management Protocol “smart phrase” template will reflect a multimodal method of management, such as 1) status of ADHD symptomatology and functional impairment based on caregiver and teacher-report measures, 2) current treatment modals being used, 3) recommendations for medication treatment, 4) recommendations for behavioral therapy, 5) if currently prescribed medication, medication side effects, and 6) if currently prescribed medication, titrations of medications. Using a multimodal method will provide decision support for treatment recommendations and maximize treatment outcomes.

Once education (see objective #3) is provided, working with our information technology team, our “smart phrase” templates will “go live”.

Study: Frequency of the use of the “smart phrase” templates will be measured, examining the number of ADHD evaluation and management visits that include documentation of use of the appropriate template. Data collection and preliminary analysis will be conducted monthly. In addition, the Program Coordinator will consistently communicate with clinician participants via e-mail to ask for feedback on opportunities for template improvement.

Act: During monthly meetings, the project team will review data, and identify opportunities for further change. The team will specifically look to identify changes needed in the “smart phrase” templates and clinical education needs. This PDSA cycle will continue, taking into consideration any additional changes.

Objective 3: *Provide decision support through clinical education training to participating clinician.*

Plan: The team will work with clinician participants to disseminate educational training using the curriculum developed during phase 1 of the CQN ADHD pilot project, as well as information related to current ADHD guidelines and protocol implementation. Based on educational needs, an education session will be developed

Do: The Clinical Leader, Program Coordinator, and ADHD Content Experts, will create and co-facilitate one, 2-hour session. All clinician participants will be required to attend. In addition to participating clinician attendance, the family representative for the project will attend the training. The framework will be based around the curriculum developed and tested during phase 1 of the CQN ADHD project. Clinician participants will be trained on the protocols and use of the “smartphrase” templates, will be informed of the access to behavior therapy services for families of children with ADHD and availability of consultative services. To effectively change the practice of the clinician participants, the trainings will involve interactive activities that engage participants in identifying gaps between their current practice and the ADHD Guideline.

Study: Clinical participants’ attendance at educational sessions will be recorded. Additionally, participants will complete an evaluation of the sessions identifying whether or not session objective were met. The intuitions standard continuing education unit feedback scale will be used. Feedback from the family representative will serve as parental insight into how the training can be altered to best serve clinicians once the project concludes.

Act: During monthly meetings, the project team will review data and family representative feedback to determine if changes to future education sessions are needed. Once this is determined, the PDSA cycle will continue by creating a sustainability plan for training new clinicians.

Objective 4: Improve access to behavioral therapy services to caregivers of patients seen by clinician participants.

Plan: In order to establish baseline metrics we will use our data collection tool to conduct a pre-implementation chart audit to assess the percentage of caregivers actively receiving behavioral therapy at time of ADHD diagnostic evaluation. Caregiver enrollment in behavioral therapy will be built into the template so that clinician participants are prompted to collect this data at the time of diagnosis. In order to meet the needs of the high volume of families of children with ADHD referred for behavioral therapy services, a group-based behavioral training program will be established. The template will prompt referral to this program.

Do: The current project will redesign the system of behavioral therapy services offered at RUMC. Caregivers of newly diagnosed patients will be referred to the proposed on-going, open enrollment group-based behavioral parent training program. The project proposes to dedicate 8-hours of clinical psychologists’ time in the Section of Pediatric Psychology at RUMC to implementing this program. Upon referral to the program by the clinician participants, families will complete a brief phone intake and will then be enrolled in the program. The group-based behavioral parent training program will use an evidence-based, manualized, parent-training intervention consisting of six, 90-minute, sessions. To reduce the wait time for enrollment, the program will have rolling enrollment, with two groups running simultaneously. The program is projected to serve, on average, 16-20 families every 6-weeks.

Study: The data collection tool will be used to compare pre- and post-implementation caregiver behavior therapy utilization. The percentage of caregivers referred to the proposed group will be measured. The total and unique number of caregivers served will be collected. The percentage of caregivers receiving behavioral parent training since their children were diagnosed with ADHD will be collected. When caregivers have completed attended group session discussing all 6 of the identified core behavioral principals, they will be asked to complete the VADRS and the ADHD-FX Scale to assess change in patient’s symptom severity before and after behavioral therapy.

Act: During monthly meetings, the project team will review collected metrics and discuss opportunities for further change. This PDSA cycle will continue, taking into consideration any additional changes.

Objective 5: Increase participating clinician's access to specialized consultative services.

Plan: In order to establish baseline metrics we will use our data collection tool to conduct a pre-implementation chart audit to assess the percentage of clinical participants who consult with another professional regarding the diagnosis, management, and pharmacological treatment of ADHD. This will be built into the template so clinician participants are prompted to collect this data at the time of diagnosis.

Do: The Clinical Leader will have "office hours" for a four hour block of time once weekly to respond to phone and email consults. This consultative service will prioritize consults related to 1) titration of medication, 2) medication side effects, and 3) treatment recommendations. This service will supplement an existing service of medication consultation currently being provided by a child psychiatrist within the Collaborative Care Team at RUMC. Providing an additional consultative service will offer a gateway to continuous advising to clinician participants on the broad services and special needs for and available to children with ADHD. The Clinical Leader will use the "Consult Tracking Sheet" to track the time spent on and topic of each consultation. Clinician participants will be made aware of the consultative service during the clinical education training.

Study: Pre- and post-implementation data will be compared to determine the change in the number of clinician participants who seek specialized consultation. Further, the amount (number of hours) of consultation will be measured and the topics of consultation will be aggregated.

Act: During monthly meetings, the project team will review data to determine if changes to the consultation process are needed. Once this is determined, the PSDA cycle will continue.

Existing Projects

Quality Improvement Initiatives and Related Projects at RUMC: A collection of existing quality improvement initiatives and research projects highlights 1) the ability of the proposal's pediatric practices to successfully and systematically embrace organizational change and 2) the relevant experience of the research team.

A quality improvement initiative focused on adherence to the AAP and National Association of Pediatric Nurse Associates and Practitioners recommendations for the assessment, prevention, and treatment of childhood overweight and obesity was successfully executed through Rush University College of Nursing¹¹. Similar to the proposed project, the investigators developed a "smart phrase" template to be used in the computer-information system to improve clinical guideline adherence. The investigators used comprehensive pre- and post-implementation chart audits of patients cared for in a pediatric outpatient setting to track improvements.

The Section of Population Behavioral Health in collaboration with Rush Population Health and Rush Health & Aging has jointly launched a new depression screening that will cover all practices under the Rush Health system. This initiative, modeled after other successful initiatives around the country, makes use of state-of-art screening tools, advanced builds in RUMC's electronic health records system, and a dedicated clinical team of social workers and psychiatrists to support primary care practices in the network as they move into this area of practice. The methodology makes use of evidence-based self-management tools, brief cognitive behavioral therapy, and, if indicated, medication to provide patients with an opportunity to get care in a manner that is appropriate to their symptoms.

The College of Nursing has focused on the development of an innovative delivery method to overcome time and logistic barriers to in-person participation in evidence-based parent training (PT) programs. The project systematically adapted an evidence-based group PT program (the Chicago Parent Program) to a tablet-based delivery format¹². In a preliminary study to establish feasibility, low-income parents of young

children aged 2 to 5 years recruited from a primary care practice completed an average of 5 of 6 modules and reported high satisfaction with the program¹³. Currently, the study team is rigorously evaluating the implementation of the tablet-based intervention in multiple primary care settings serving low-income urban families and establishing the efficacy and suitability of for wide-scale implementation and dissemination into primary care practice.

Anticipated Project Timeline

7/10/2017	Start weekly project leadership meetings
7/17/2017	90' call with the national quality improvement coach
7/17/2017	Send doodle pools to primary care clinicians to determine best training session dates
7/20/2017	Protocol development complete
7/24/2017	Set dates for the training sessions and send invitations to primary care clinicians
7/24/2017	Smart phrase template completed
8/1/2017	Training modules and training sessions planning completed
8/4/2017	Kickoff training
8/4/2017	Grantee learning community monthly conference calls start
8/7/2017	First clinician participant educational training group
8/14/2017	Second clinician participant educational training group
8/21/2017	Smart phrase templates are accessible in Epic Vanderbilt and ADHD-FX Scale questionnaires are available on REDCap
9/5/2017	Implement quality improvement methodology
Every month	Rush Bioinformatics Core provides chart audit of ADHD patients for clinician participants
July 2018	Project close-out

Dissemination of Results

Disseminating the results of the proposed projects is imperative to the sustainability of the initiative at RUMC as well as acceptance of the methodology and process across neighboring primary care settings. Therefore, our goals for dissemination of our findings are two-fold. Our first priority of dissemination will focus on incorporating dissemination strategies throughout the implementation of the initiative to our clinician participants. In an effort to acknowledge the clinician participant's central contribution to the initiative, project leadership will clearly and concisely summarize the results of the monthly data extraction and provide a quarterly newsletter to the clinician participants. Our second prior of dissemination will be employed at the conclusion of the initiative. In partnership with the Illinois Chapter of American Academy of Pediatrics, the project leadership will begin disseminating our findings at the national, region, and local level. In particular, project leadership will present results of the initiative at ICAAP's well-attended state-wide conferences and related training/coaching and CME efforts. The main objective of local dissemination is to provide project leadership with a platform for dissemination of the project's quality improvement design, methodology and process. Project leadership, with the support of ICAAP, have committed to presenting the initiative at a minimum of 2 ICAAP sponsored conferences or lectures over the course of year following the conclusion of the study. We feel that this state-wide dissemination is a critical first step for expansive systemic-level change in pediatric primary care practice as it relates to ADHD. We will also publish this project methodology and findings in the Illinois Pediatrician, a publication that is mailed to all the chapter members twice a year. The focus of regional and national dissemination will be accomplished through submissions of poster presentations and paper presentations to relevant conferences, such as Quality and Safety in Children's Health, Advancing Quality Improvement Science for Children's Healthcare Research, and The American Professional Society of ADHD and Related Disorders.

References

1. ATTENTION-DEFICIT, S. O. (2011). ADHD: clinical practice guideline for the diagnosis, evaluation, and treatment of attention-deficit/hyperactivity disorder in children and adolescents. *Pediatrics*, peds-2011.
2. American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders (DSM-5®)*. American Psychiatric Pub.
3. Wolraich, M. L., Feurer, I. D., Hannah, J. N., & Baumgaertel, A. (2003). Vanderbilt ADHD teacher rating scale (VADTRS) and the Vanderbilt ADHD parent rating scale (VADPRS). *Oklahoma City, OK: University of Oklahoma Health Sciences Center*.
4. Haack, L. M., Gerdes, A. C., Lawton, K. E., & Schneider, B. W. (2016). Understanding and measuring functional impairment in diverse children with ADHD: Development of the ADHD-FX scale with an at-risk, community sample. *Journal of attention disorders*, 20(6), 487-500.
5. Thomas, R., Sanders, S., Doust, J., Beller, E., & Glasziou, P. (2015). Prevalence of attention-deficit/hyperactivity disorder: a systematic review and meta-analysis. *Pediatrics*, 135(4), e994-e1001.
6. Epstein JN, Kelleher KJ, Baum R, et al. Variability in ADHD care in community-based pediatrics. *Pediatrics*. 2014;134(6): 1136-1143
7. Rushton JL, Fant KE, Clark SJ. Use of practice guidelines in the primary care of children with attention-deficit/hyperactivity disorder. *Pediatrics*. 2004; 5(4): 201- 208.
8. Epstein JN, Langberg JM, Lichtenstein PK, Kolb R, Altaye M, Simon JO. Use of an internet portal to improve community-based pediatric ADHD care: a cluster randomized trial. *Pediatrics*. 2011; 128(5).
9. Wasserman R, Kelleher K, Bocian ABA, et al. Identification of attentional and hyperactivity problems in primary care: a report from Pediatric Research in Office Settings and the Ambulatory Sentinel Practice Network. *Pediatrics*. 1999; 103(3).
10. Zima, B. T., Bussing, R., Tang, L., Zhang, L., Ettner, S., Belin, T. R., & Wells, K. B. (2010). Quality of care for childhood attention-deficit/hyperactivity disorder in a managed care Medicaid program. *Journal of the American Academy of Child & Adolescent Psychiatry*, 49(12), 1225-1237.
11. Cygan, H. R., Baldwin, K., Chehab, L. G., Rodriguez, N. A., & Zenk, S. N. (2014). Six to success: improving primary care management of pediatric overweight and obesity. *Journal of Pediatric Health Care*, 28(5), 429-437.
12. Breitenstein, S. M., Shane, J., Julion, W., & Gross, D. (2015). Developing the eCPP: Adapting an Evidence-Based Parent Training Program for Digital Delivery in Primary Care Settings. *Worldviews on Evidence-Based Nursing*, 12(1), 31-40.
13. Breitenstein, S. M., & Gross, D. (2013). Web-Based Delivery of a Preventive Parent Training Intervention: A Feasibility Study. *Journal of Child and Adolescent Psychiatric Nursing*, 26(2), 149-157.
14. <http://www.ihi.org/resources/Pages/HowtoImprove/default.aspx>

Appendix

ADHD-FX



Marquette University

Child's Birthdate:	/	/	/	Today's Date:	
Month	Day	Year	Month	Day	Year
Child's name:	Child's ethnicity:			Child's Gender:	
Child's School Grade:	Your Name:			Your relation to child:	

IMPORTANT NOTE! If this child is currently receiving medication for treatment of inattention and/or hyperactivity (e.g. Ritalin), please complete this measure about this child's behavior when he/she is NOT receiving medication. Thus, consider what your child behaved like before being placed on medication, when he/she does not receive the medication, or when the medication has worn off.

	These ratings reflect the child's behavior when he/she has NOT received medication.
	These ratings reflect the child's behavior when he/she HAS received medication.
	The child does not receive medication.

Please describe things about this child's behavior that you like:

At home:	At School:	With peers:

Please describe things about this child's behavior that you would like to see change:

At home:	At School:	With peers:

Below are behaviors that some children may display or experience. For each behavior, please consider how much that behavior affects this child in his/her everyday life AT SCHOOL.

For example, consider #3. If this child *does* respect peers' personal space, and thus this behavior does not affect this child at all, circle a "0." If your child *does not* respect peers' personal space at school and this behavior affects this child a little, circle "1." If the behavior affects this child quite a bit at school, circle "2." If the behavior affects this child a lot at school, circle "3." If this question is not relevant or applicable, or you do not know the answer, circle "DK" for "don't know." Please try to answer all items.

School	How much does the behavior affect this child at school?				
Behavior:	Not at all	A Little	Quite a Bit	A Lot	Don't Know
1. Doesn't listen and/or pay attention during class instruction.	0	1	2	3	DK
2. Has a disorganized or messy desk.	0	1	2	3	DK
3. Doesn't respect peers' personal space.	0	1	2	3	DK
4. Doesn't understand, follow, and/or respect the rules of the classroom and/or society.	0	1	2	3	DK
5. Is ignored, rejected, and/or teased by peers.	0	1	2	3	DK
6. Doesn't effectively complete seatwork.	0	1	2	3	DK
7. Doesn't participate in his/her surroundings, appears as if is in his/her own world.	0	1	2	3	DK
8. Is distracting, disruptive, and/or bothersome to peers.	0	1	2	3	DK
9. Doesn't respect/treat his/her things and/or materials well.	0	1	2	3	DK
10. Needs more help and/or attention than other children.	0	1	2	3	DK
11. Doesn't pay attention to, follow, and/or obey teacher instructions.	0	1	2	3	DK
12. Doesn't respect others around him/her (e.g., teacher and/or classmates).	0	1	2	3	DK
13. Frequently gets into trouble.	0	1	2	3	DK
14. Doesn't effectively work with peers in a group.	0	1	2	3	DK
15. Doesn't express and/or show his/her feelings in an appropriate way.	0	1	2	3	DK
16. Doesn't get along with teacher.	0	1	2	3	DK
17. Doesn't have good social skills; has a lack of social understanding.	0	1	2	3	DK
18. Doesn't turn in completed schoolwork.	0	1	2	3	DK
19. Doesn't appropriately play with peers.	0	1	2	3	DK

Below are behaviors that some children may display or experience. For each behavior, please consider how much that behavior affects this child in his/her everyday life AT HOME.

Specifically, if the behavior does not affect this child at home, circle a "0." If the behavior affects this child a little at home, circle "1." If the behavior affects this child quite a bit at home, circle "2." If the behavior affects this child a lot at home, circle "3." If this question is not relevant or applicable, or you do not know the answer, circle "DK" for "don't know." Please try to answer all items.

Home	How much does the behavior affect this child at home?				
Behavior:	Not at all	A Little	Quite a Bit	A Lot	Don't Know
20. Doesn't pay attention to, follow, and/or obey parental instructions.	0	1	2	3	DK
21. Doesn't effectively complete homework.	0	1	2	3	DK
22. Doesn't respect/treat his/her things and/or materials well.	0	1	2	3	DK
23. Is distracting, disruptive, and/or bothersome to siblings.	0	1	2	3	DK
24. Doesn't participate in his/her surroundings; appears as if is in his/her own world.	0	1	2	3	DK
25. Doesn't understand, follow, and/or respect the rules of the house and/or society.	0	1	2	3	DK
26. Creates stress for parents.	0	1	2	3	DK
27. Needs more help and/or attention than other children.	0	1	2	3	DK
28. Doesn't get along with and/or fights with siblings.	0	1	2	3	DK
29. Doesn't have good social skills; has a lack of social understanding.	0	1	2	3	DK
30. Doesn't effectively complete home routines/tasks (e.g., the morning routine, chores, etc).	0	1	2	3	DK
31. Doesn't respect others around him/her (e.g., parents, siblings, and/or other family members).	0	1	2	3	DK
32. Doesn't express and/or show his/her feelings in an appropriate way.	0	1	2	3	DK

Preliminary Scoring Guidelines

Calculating Overall Scale and Subscale Severity		
Overall functioning	Mean of items 1-32	
School functioning	Mean of items 1-19	
Peer functioning	Mean of items 3, 4, 5, 7, 8, 12, 14, 15, 17, & 19	
Home functioning	Mean of items 20-32	
Overall Scale and Subscale Severity Reliable Change Indices (RCI)		
	2-tailed prediction	1-tailed prediction
Overall functioning	. +/- 0.27	. 0.23
School functioning	. +/- 0.24	. 0.20
Peer functioning	. +/- 0.10	. 0.08
Home functioning	. +/- 0.33	. 0.28

The RCI is utilized to determine reliable change pre to post treatment.

For a 2 tailed prediction (i.e., examining reliable improvement or deterioration), Change score > +RCI = improvement; Change score < -RCI = deterioration.

For a 1-tailed prediction (i.e., examining only reliable improvement), Change score > RCI = improvement

Guidelines for Clinical Significant Impairment Based on Number of Items Endorsed (i.e., rated 2 or 3, affecting the child 'quite a bit' or 'a lot')				
	Functional Range	Clinically Significant Range		
		Mild	Moderate	Severe
Overall functioning (32 items)	0 – 2	3 - 7	8 – 12	13 or more

Subscale Guidelines for Evidence of Interference with Functioning Based on Number of Items Endorsed (i.e., rated 2 or 3, affecting the child 'quite a bit' or 'a lot')				
Parent Report Domains		Mild	Moderate	Severe
School functioning (19 items)		0-3	4-6	7 or more
Peer functioning (10 items)		0-1	2	3 or more
Home functioning (12 items)		0-2	3-6	7 or more
Teacher Report Domains		Mild	Moderate	Severe
School functioning (19 items)		0-2	3-7	8 or more
Peer functioning (12 items)		0-1	2-3	4 or more