RESEARCH ARTICLE

Achievement of age-friendly health systems committed to care excellence designation in a convenient care health care system

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Abstract

Objective: To describe the implementation of the age-friendly health systems (AFHS) 4Ms Framework, an evidence-based framework to assess and act on "What Matters, Medication, Mentation and Mobility to deliver Age-Friendly health care for patients 65 and older", to achieve the Institute for Health care Improvement (IHI) *Committed to Care Excellence* recognition in a convenient care health system and test two novel implementation strategies.

Setting: The study was conducted in over 1100 convenient care clinics in 35 states and DC. MinuteClinics are located in community-based retail pharmacies in rural, suburban, and urban areas and staffed with approximately 3300 nurse practitioners and physician associates.

Design: In Year 1, the project used a quality improvement design, and in Year 2, a quasi-experimental implementation research design to pilot two strategies at the provider level (Virtual Clinic and Plan-Do-Study-Act (PDSA)). Statistical process control charts were used to assess changes in 4Ms documentation over time. Mixed-effects Poisson regression was used to assess the effectiveness of the pilot studies.

Data Collection: The electronic health record (EHR) was enhanced to capture documentation of the AFHS 4Ms assessments and actions. A learning platform was created to teach and evaluate provider 4Ms competency, and the two data sources were merged into a registry. A formative evaluation was conducted using Tableau and reporting dashboards.

Findings: After 18 months and the implementation of 20 strategies to improve the uptake of the 4Ms, MinuteClinic achieved the IHI *Committed to Care Excellence* recognition. A significant increase over time in the reliable delivery of all 4Ms and each M component individually was found. For the research, there were significant

improvements in the mean number of Ms delivered per visit (M-Score) in the Virtual Clinic (Incident Rate Ratio [IRR]: 2.47, $p = 0.001$) and PDSA (IRR: 3.08, $p = 0.002$) strategy intervention groups when compared to controls.

Conclusions: Application of quality improvement and implementation methodologies contributed to the success of implementing age-friendly 4Ms evidence-based practice.

KEYWORDS

age-friendly, convenient care, evidence-based practice, implementation, older adult, quality improvement, reliability

What is known on this topic?

- There is little evidence that older adults receive age-friendly care in community-based convenience care clinics despite the prevalent use of services.

What does the study add?

- The integration of age-friendly 4Ms "What Matters, Medication, Mentation, Mobility" in convenient care clinic settings highlights the unique opportunity to provide health promotion and spread evidence-based geriatric care.
- The use of quality improvement and implementation science methods and implementation strategies contributes to the reliable integration of age-friendly health systems and evidence-based 4Ms care.

1 | INTRODUCTION

By 2034, there will be over 77 million adults in the United States over the age of 65,[1,2] and with this unprecedented aging of the population, there is a need for better systems and processes for the delivery of evidence-based age-friendly care in all health care settings, including convenient care or retail health clinics. Age-friendly health systems (AFHS) (Institute for health care improvement (IHI)) is defined using an evidence-based framework, the "4Ms"—the assessment and acting on, What Matters, Medication, Mentation, and Mobility—critical components of health for older adults that do no harm and improve outcomes when incorporated across settings of care.[3] Health care organizations are designated "Committed to Care Excellence" by IHI when they implement the 4Ms into practice and then demonstrate reliable assessment and acting on the 4Ms as a set and by submitting data to IHI on the number of older adults who received 4Ms care over at least a 3-month period. The AFHS movement started in hospitals and outpatient care settings and is swiftly moving into community-based convenient care clinics.

Convenient care clinics are relatively newcomers to the ambulatory care space. Health care services delivered in places that are convenient to the patient, such as where they shop, became what is known as a disruptive innovation in the early 2000s.[4] While convenient care clinics have clinical guidelines for individual services, there is no specific framework in use for an evidence-based approach to the care of older adults. Hundreds of thousands of patients aged 65 years and older seek care at convenient care clinics each year in retail pharmacies in rural, suburban, and urban areas. As convenient care clinics mature and add services, particularly in monitoring and treatment of

chronic conditions, nurse practitioners (NPs) and physician associates (PAs) staffing the clinics are likely to see older adults at different points on the health spectrum. Equipping NPs working in convenient care settings with an evidence-based framework for caring for older adults supports improved clinical quality. The opportunity to disseminate the 4Ms Framework among older adult patients visiting convenient care clinics supports the age-friendly health systems movement at the community level.

In 2018, MinuteClinic, the largest and convenient care organization, made the decision to implement the evidence-based AFHS 4Ms Framework in over 1200 clinics located in 35 states and DC with an aim to achieve the IHI Committed to Care Excellence designation. In 2021, over 20% of all patients seen in MinuteClinics were over age 65, including over 809,000 patients aged 65–74 (18.8% of all patients), over 129,000 patients 75–84 years (3% of all patients) and over 10,700 patients 85 years and older (0.23% of all patients). Types of services for which older adults sought care at MinuteClinic in 2021 included but were not limited to COVID-19 vaccines and testing along with other minor illnesses, such as respiratory and urinary tract infections, dermatitis, impacted cerumen, and chronic conditions such as hypertension and diabetes. The implementation required educating their 3300 NPs and PAs, providing practice-based strategies to increase uptake, and providing an infrastructure to support the improvement. An academic-practice partnership was formed to enhance the existing quality structure to include improvement and implementation of scientific methods to ensure that all older adults visiting a MinuteClinic for an eligible visit (excluding visits for vaccines or other express services) would reliably receive age-friendly 4Ms care.

Implementing and sustaining evidence-based practice requires both quality improvement and implementation of scientific methods. Along with the current use of quality improvement methods using the Model for Improvement (e.g., aim, measure, and cycles of iterative testing of change strategies or PDSA cycles), the MinuteClinic leaders embraced implementation science frameworks (i.e., determinants, process, and evaluation) and evidence-based strategies (e.g., audit and feedback, cues to action, informatics interfaces) to strategically improve the implementation of the 4Ms.[5,6] As MinuteClinic was aspiring to evolve into a learning health care system, the combination of improvement and implementation science was thought to expand their current approach to enhance the effectiveness and sustainability of the 4Ms integration.

2 | OBJECTIVE

The objective of the paper is to describe the use and evaluation of improvement and implementation science methods to provide reliable delivery of the age-friendly health system 4Ms Framework in the MinuteClinics. We will include a review of the multiple improvements and implementation strategies used and a report on the evaluation of two novel provider-focused implementation strategies.

3 | BACKGROUND

Implementation of evidence-based geriatric care models is prevalent in the literature, pointing to important approaches to consider. The implementation of a geriatric home-based falls prevention care model incorporated the identification of perceived benefits and barriers in order to develop tailored implementation strategies.[7] Another program incorporated falls prevention guidelines, motivational interviewing, and other behavioral techniques to aid clinicians in adapting to fall prevention strategies to best fit their clinical workflow.[8] A "10 Keys" to Healthy Aging Demonstration Program focused on a set of specific interventions for effectiveness that targeted older patients with multiple chronic diseases.[9] Adding patient priorities in routine geriatrics care was found to be feasible and associated with a perception of more goal-directed and less burdensome care.[10,11] These implementation approaches (identifying barriers and facilitators, integration of the evidence-based intervention into the workflow, and using a "set" of strategies) reported in the literature highlight key components for the integration of evidence-based interventions such as age-friendly 4Ms care.

There are reported key implementation strategies and theories that advance our understanding of effective approaches to implementation. For example, Chipps et al. describe the use of Electronic Health Records (EHRs), to uncover facilitators and barriers,[12] and Bunce and colleagues demonstrated the effective use of champions as an effective implementation strategy.[13] There is not a strong presence of the use of theories to guide implementation in community-based settings. Although there are prominent nursing implementation models, such

as the advancing research and clinical practice through close collaboration (ARCC) model, this model was not found to be used to guide implementation in the community.[14] Mathieson, Grande and Luker performed a review of the use of implementation theory within the context of community and found that only 25% of studies used an implementation theory such as the consolidated framework for implementation research (CFIR).[15,16] The review of the literature guided our decisions during our preimplementation phase of this work, and we focused on using the EHR and champions as early implementation strategies and the CFIR to understand barriers and facilitators, and the RE-AIM Framework to guide evaluation.[17,18] Through our preliminary work, barriers included the extra time to provide age-friendly care, documentation, and the lack of confidence in addressing mentation. Facilitators included the commitment of the leadership to integrate age-friendly evidence-based care and the quality department infrastructure that include data analytics and quality champions.

The inclusion of both improvement and implementation was influenced by the academic-practice partnership formed by MinuteClinic and the Case Western Reserve University (CWRU) School of Nursing. Although traditional quality improvement methods were currently being used at MinuteClinic, other more contemporary solutions were of interest. Mitchell and Chambers published a model to display the components of improvement and implementation science (Figure S1).[19] The inclusion of quality improvement outside the health services research model and quality improvement science within the research model demonstrates that frontline provider improvement activities can include both.[19] We expected that using both traditional quality improvement methods, such as iterative PDSA cycles, and the innovative theories and strategies of implementation science, such as the CFIR and audit and feedback, would advance the success of the project.

4 | METHODS

The study was conducted in approximately 1100 MinuteClinics located in 35 states and DC. The MinuteClinics are staffed with approximately 3300 NPs in clinical practice teams in community-based retail pharmacies in rural, suburban, and urban areas. Internal to MinuteClinic, the project was led by the Quality Team, with senior clinical leadership support from the office of the President, the Chief Nurse Practitioner Officer, and the Associate Chief Practitioner Officer in collaboration with the education team. Additionally, the project team engaged resources from marketing, corporate communications, information technology, and the data analytics teams.

The project to implement AFHS went through preimplementation planning while MinuteClinic was simultaneously launching new service initiatives related to chronic disease services, and it was critical to consider how the 4Ms would be incorporated into new services.[16] When the initial strategy for implementation had the 4Ms launching in June 2020, it was clear that during the SARS-CoV-2 (COVID-19)

TABLE 1 Twenty strategies implemented to improve uptake of the 4Ms

Category	Name of strategy	Strategy type[a]	Description
Professional development	Orientation, grand rounds, video vignettes, virtual clinic	Develop effective educational materials; Conduct ongoing training	30-min online interactive module and supplemental educational opportunities on a learning management system
	Regional champions	Identify early adopters; Identify and prepare champions	Frontline Nurse Practitioners committed to the initiative who support communications and coaching of colleagues
	Role model video	Make training dynamic	Video to role model the process of 4Ms integration
	Myth buster communication	Use advisory boards and work groups	Information from frontline feedback turned into communication of myths and facts
Practice-based tools	Workflow process map	Tailor strategies to overcome barriers and honor preferences	Process map that indicates where 4Ms care is suggested
	Electronic health record documentation tip sheet		Narrative description with pictures on accurate documentation
	Confident conversations		Narrative tip sheet on how to confidently communicate with patients with difficult dialogue
	Action decision tree		Decision tree to demonstrate what actions can be taken as a result of assessments
	Pocket card	Prepare patients/consumers to be active participants	Laminated card to show the patient that explains AFHS
	Chart review directions	Develop tools for quality monitoring	Provider resource for self-improvement/Plan-do-study-act (PDSA)
Infrastructure	Performance evaluations	Mandate change	Include percent of 4Ms completed in patient encounters in provider goals for performance
	Alignment with data analytics	Develop tools for quality monitoring	Weekly meetings to discuss data reporting needs and review reports
	Senior practice manager (SPM) virtual huddles	Organize clinician implementation team meetings	Virtual debrief sessions to review updates with clinical care teams
	Intranet resource	Make training dynamic	Just in time communication
	Best practice advisory	Cue to action	Reminder in EHR to complete 4Ms assessment and actions
	Internal practice newsletter (weekly)	Model and simulate change	Internal communication to provide updates to practice changes and recognize providers implementing the 4Ms
	Enterprise newsletter	External facilitation	External communication
	Electronic message board	External facilitation	Consumer facing communication at the Kiosk when signing in
	Clinical dashboard	Facilitate relay of clinical data to providers	Front line and manager access to monthly performance on 4Ms

[a]Strategy type determined from the Expert Recommendations for Implementing Change. Powell et al. A refined compilation of implementation strategies: results from the Expert Recommendations for Implementing Change (ERIC) project. Implementation Science (2015) 10:21.

pandemic additional challenges would occur. MinuteClinic played a key role in the CVS health strategy for COVID-19 testing, and resources were shifted to support evolving testing platforms. The team demonstrated agility, making the decision to forge ahead to launch the 4Ms Framework even while ramping up testing. Given the disproportionate impact on older adults, it seemed more important than ever to deliver age-friendly health care during the pandemic and not delay the project launch.

5 | IMPLEMENTATION STRATEGIES

The project focused on the implementation of three core approaches: professional development, practice-based tools, and infrastructure. Each core approach included evidence-based implementation strategies generated from the dimensions of the CFIR and aligned with the expert recommendations for implementing change recommendations (Table 1).[5]

With the June 2020 launch of the AFHS implementation, Minute-Clinic NPs began professional development training in the 4Ms, including an orientation module; monthly grand rounds of case studies; a series of video vignettes with an expert being interviewed about each of the 4Ms; a "Virtual Clinic" simulation training environment with older patient scenarios to practice, including the 4Ms in the clinical workflow; and a cascade of communications that highlighted the initiative and progress. The Virtual Clinic consisted of three learning scenarios in which the NPs could practice integrating the 4Ms and a competency and connections scenario in which the NPs had to make connections among the 4Ms and demonstrate competency integrating the 4Ms into a clinic visit. The effectiveness of the Virtual Clinic was later tested in selected Regions using a quasi-experimental research design.

Practice-based tools included documentation tip sheets to assist NPs in the detail of charting the 4Ms, talking points for engaging patients in confident conversation about the 4Ms (Figure S2), and a clinical workflow process map (Figure 1). All these materials instructed the NP on how to provide AFHS 4Ms care. Consumer-facing, practice-based materials included an implementation "toolkit" with a welcome letter, a "pocket card" to explain the "4Ms" to patients (Figure S3), and information brochures. As the year progressed, other practice-based tools were added as barriers, such as lack of confidence with documentation, were identified, and solutions were shared. These included a video role-modeling a visit integrating the 4Ms with documentation, an orientation case study for practicing documentation in the EHR training site, a resource document communicating "myth busters" about the 4Ms, and directions on how to review charts for self-auditing performance of 4Ms.

Infrastructure strategies included leadership support, informatics alignment, and a communications plan. Leadership support included sponsorship and resources from the Chief Nurse Practitioner Officer and other senior clinical leaders to engage in the project. The informatics alignment included integrating the AFHS 4Ms fields into the EHR (Epic), a clinical documentation workflow that had been designed and built with individual NP feedback on preferred documentation processes. A system prompt or best practice advisory to remind NPs to complete the 4Ms was also added. Additionally, the project team added an "Age-Friendly 4Ms dashboard" that included metrics for clinical quality, patient experience, and growth. In this dashboard, NPs monitor their progress in effectively delivering 4Ms care. Nurse managers have a similar dashboard in Tableau, a data analytics application, where they can identify early adopters who might support colleagues in incorporating the 4Ms in their clinical workflow. Internal messaging included weekly email messages to all NPs and an internal resource portal with frequently asked questions. External messaging included direct-to-consumer emails, social media, and press releases.

The leadership identified the importance of evaluating and communicating with the NPs about the 4Ms Quality Metrics as a part of the annual performance review discussions. The initial plan was to identify and define the 4Ms, and the implementation of all 4Ms as a set, as an expectation for clinical quality. The inclusion of the 4Ms,
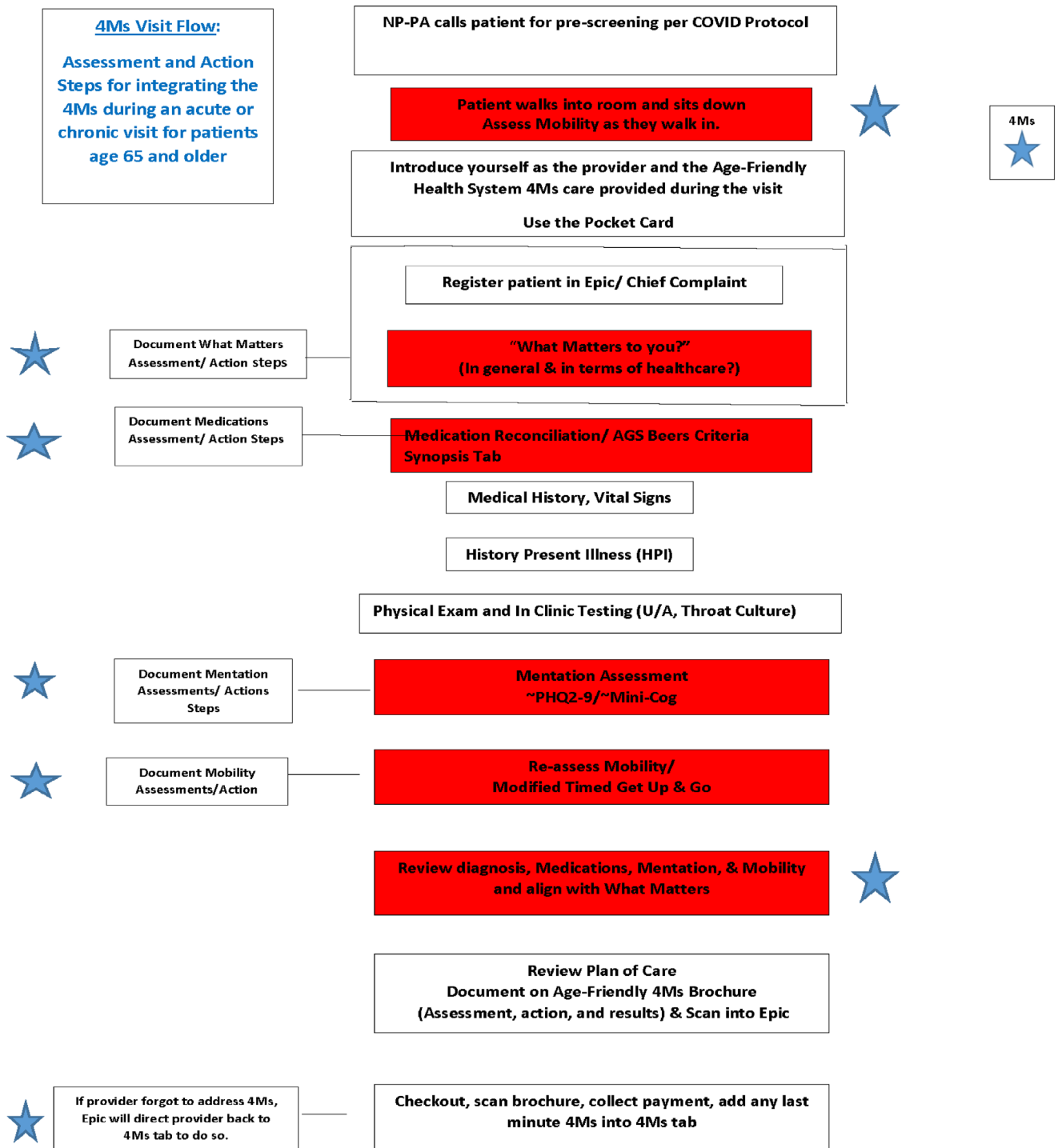
and recognition of NPs who had successfully implemented them in the first year, supported the subsequent evolution of seeking and achieving Committed to Care Excellence status in all 74 MinuteClinic geographic regions effective December 2021.

Although Committed to Care Excellence was achieved, there was more opportunity to ensure spread and sustainability. After a year of executing the quality improvement processes integrating the three core approaches previously mentioned, it became clear that an understanding of other factors to increase AFHS 4Ms uptake was needed. The leadership team reviewed existing focus group data and current use of educational materials and determined that the NPs needed to learn to create intentional change for their practice and to have more opportunities to practice the 4Ms outside of their work. Two strategies to increase AFHS 4Ms were proposed. The PDSA strategy, modeled from improvement science, included teaching frontline NPs, the model for improvement to inspire individual intentional change, and the Virtual Clinic strategy was created to provide an opportunity to practice the 4Ms in a simulated virtual environment. The PDSA strategy intervention group included 26 providers who were randomly selected to participate from a list of 65 identified regional champions, while the Virtual Clinic strategy intervention group included 70 providers using a convenience sample from three specified regions. For comparison, a random selection of 279 (3:1 ratio to intervention groups) providers not involved in the interventions were chosen from the system.

6 | MEASUREMENT

The project was designed to include both quality improvement and implementation science approaches, so measurement included process and outcome measures taking into consideration the dimensions of the RE-AIM framework: Reach, Effectiveness, Acceptability, Intervention, and Maintenance (RE-AIM).[17] The EHR was enhanced to capture the documentation of the assessments and actions taken for all AFHS 4Ms. A learning platform was created to capture provider 4Ms competency, and the learning platform and the EHR data were merged into a registry for analysis. The learning platform data included summaries of completed educational modules, and the EHR data included quantification of the 4Ms delivered (e.g., each 4 M individually and as a set). Formative evaluations were aided by Tableau, provider, and manager reporting dashboards, interviews, and focus groups.

The main process measures were the number of NPs who completed the orientation module and the percent of eligible visits where 4Ms care was delivered and documented in the EHR. Each of the 4Ms components was looked at separately and in total (completing all 4Ms), but in order to receive credit for completion, NPs had to complete both the assessment and act-on section for each of the 4Ms. To assess the impact of the Year 2 intervention strategies, we used the count of "Ms" delivered at each visit (range 0–4) divided by the number of eligible visits, which we refer to as the "M-Score" (mean number of Ms delivered per visit).

4Ms Visit Flow:

Assessment and Action Steps for integrating the 4Ms during an acute or chronic visit for patients age 65 and older

NP-PA calls patient for pre-screening per COVID Protocol

Patient walks into room and sits down
Assess Mobility as they walk in.

4Ms

Introduce yourself as the provider and the Age-Friendly Health System 4Ms care provided during the visit

Use the Pocket Card

Register patient in Epic/ Chief Complaint

Document What Matters Assessment/ Action steps

"What Matters to you?"
(In general & in terms of healthcare?)

Document Medications Assessment/ Action Steps

Medication Reconciliation/ AGS Beers Criteria Synopsis Tab

Medical History, Vital Signs

History Present Illness (HPI)

Physical Exam and In Clinic Testing (U/A, Throat Culture)

Document Mentation Assessments/ Actions Steps

Mentation Assessment
~PHQ2-9/~Mini-Cog

Document Mobility Assessments/Action

Re-assess Mobility/
Modified Timed Get Up & Go

Review diagnosis, Medications, Mentation, & Mobility and align with What Matters

Review Plan of Care
Document on Age-Friendly 4Ms Brochure
(Assessment, action, and results) & Scan into Epic

If provider forgot to address 4Ms, Epic will direct provider back to 4Ms tab to do so.

Checkout, scan brochure, collect payment, add any last minute 4Ms into 4Ms tab

Version: 5/25/20

Age-Friendly Health Systems 4Ms Flow Map

FIGURE 1 Age-friendly health systems 4Ms process map [Color figure can be viewed at wileyonlinelibrary.com]

To assess outcomes, the CollaboRATE, a brief, validated, and reliable patient-reported questionnaire to ensure that "what matters" is incorporated into the clinic visit, was added for adults aged 65 and older to the existing patient experience survey used by MinuteClinic.[20] The CollaboRATE questions are as follows: (a) How much effort was made to help you understand your health issues? (b) How much effort was made to listen to what matters most to you about your health issues? and (c) How much effort was made to include what matters most to you in choosing what to do next? All patients age 65 and over had the opportunity to respond to the CollaboRATE

questions about whether they had 4Ms incorporated into their visit or not. The surveys were anonymous, so there was no technical way to link the CollaboRATE to the specific patients who received 4Ms care.

7 | ANALYSIS

Both qualitative and quantitative methods were used to inform the implementation. Qualitative methods were used for periodic focus and interviews with NPs to understand barriers and facilitators. Statistical process control (SPC)[21] methods were used to assess performance variation in aggregate ($n = 324,245$) for core outcome measures, including the proportion of eligible patients meeting each of the 4Ms criteria (Matters, Mobility, Medication, Mentation), the proportion meeting all four criteria (4Ms), and a composite score for 4Ms completion (M-Score, mean number of Ms delivered per visit). Proportions SPC analyses (p-charts) were conducted for each of the proportion measures and the M-Score. Variation was assessed using IHI special cause detection rules for identifying nonrandom variation in performance, including *shifts* (8 or more consecutive points above or below the mean), *trends* (6 or more points consecutively increasing or decreasing), and points outside of the three-sigma upper or lower control limits.[22]

Generalized linear mixed-effects models using a Poisson distribution were used to test for differences in 4Ms completion rate before and after the Year 2 intervention strategies. Tests for overdispersion and zero inflation, along with visualization via histogram plots, indicated the Poisson distribution was appropriate. The dependent variable was the count of Ms performed over each time period by each provider. The offset term was the total possible Ms that could have been delivered for each provider in that period (i.e., number of eligible visits multiplied by 4). Models were fit incrementally starting with a null (random intercept) model, and then adding time period, the Virtual Clinic and PDSA interventions, and finally, intervention multiplied by time interaction terms. Models were compared using ANOVA tests, and the version with interaction terms was chosen as the final model. The coefficients of the final model were exponentiated to calculate incident rate ratios (IRR) and 95% confidence intervals. Analysis was conducted using Tableau, Microsoft Excel 2019, and R version 4.1.2.

8 | ETHICAL CONSIDERATIONS

The study was deemed by CWRU as nonhuman subjects research for the overall quality improvement aspects of the project. For the testing of the effectiveness of the Year 2 booster strategies, IRB approval was obtained.

9 | RESULTS

After 18 months and the implementation of over 20 strategies (Table 1) to improve uptake of the 4Ms, MinuteClinic achieved the IHI Regional *Committed to Care Excellence* recognition in 74 out of 74 regions (100%). A total of 2901 (66%) of providers completed the orientation introducing providers to 4Ms care as of February 2022.

Proportions SPC analyses (p-charts) were conducted for each of the proportion measures (Figures 2 and 3), and a mean and moving range analysis (XmR) was conducted for the M-Score (Figure 4). Improvement was observed across all core measures compared to baseline in 2020, with initial improvements observed in February 2020[1]: "What Matters" improved from 3.4% to 24%[2]; "Mobility" improved from 2% to 12.5%[3]; "Medication" improved from 3.1% to 21.9%[4]; "Mentation" improved from 0.8% to 9%; and[5] "4 M" improved from 0.8% to 5.8%. M-Score performance also steadily improved from 0.11 at baseline to 0.73 in 2022. Overall, we observed sequential performance improvements occurring for all measures from 2020 to 2022 that have not yet settled into a statistically stable (common cause variation) pattern. Three measures (Mentation, Medication, and M-Score) demonstrated a short period of worsening in performance between November 2021 and January 2022, but this was not sustained and was followed by subsequent improvement in performance in February 2022 (Figures S2–S5).

Completion of all 4Ms was less than 1% for the first 8 months of the project. Following the implementation of a best practice alert embedded into the EHR at the point-of-care, there was a significant increase in the proportion of eligible visits where all 4Ms were completed. Increases continued steadily over the course of the project, including following the Year 2 intervention strategies in July 2021 to their current average of 5.84% as of February 2022.

The largest increases occurred in the completion of the "What Matters" component, which jumped from a mean of 3.4% in the first 8 months, to 18.2% following the best practice alert (Figure 2). "What Matters" completion increased to an average of 24.1% of eligible visits following the implementation of the Year 2 intervention strategies. The next largest increase occurred in the Medication component (3.1% to 21.9%), followed by Mobility (2.0% to 12.5%) and Mentation (<1% to 9%).

A comparison of the Year 2 intervention strategies to controls is shown in Figure 4. The median M-Score was 0 for the control group, and slightly above 0 for the intervention groups prior to the strategy launch. After the launch, the median M-Score increased for both PDSA and Virtual Clinic groups while remaining mostly unchanged in the control group. Incidence rate ratios from the mixed-effects Poisson regression model show the Virtual Clinic intervention strategy participants delivered 2.47 (95% CI: [1.42–4.28]) times more Ms over the study period compared to controls, while PDSA intervention strategy participants delivered 3.08 (95% CI: [1.19–7.94]) times more 4Ms compared to controls (Table 1). There were significant interaction effects with both intervention groups and time, indicating there were increases over time during the study period. The intraclass correlation coefficient was 0.55, indicating that a large proportion of the variation in 4Ms care delivery can be explained by differences between providers.

CollaboRATE patient-reported outcome scores of respondents age 65 and older that received care in the system in 2021 were mostly positive. The percent of respondents giving the highest score was
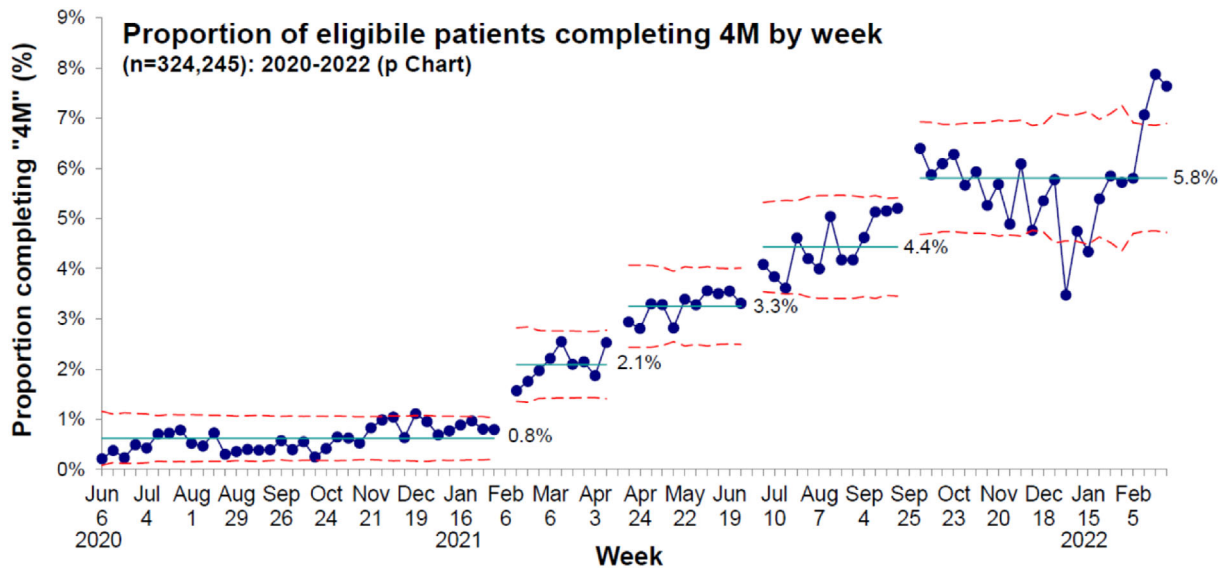
FIGURE 2 Proportion statistical process control analysis (p Chart) for the weekly proportion of eligible patients meeting "4Ms" criteria from 2020 to 2022 (*n* = 324,245). Data points (dark blue dots and lines) represent the proportion of eligible patients meeting criteria each week. The light blue line represents the overall average proportion. The red dashed lines show the upper and lower control limits, which are three-sigma deviations (approximately 2.67 standard deviations) above and below the overall average proportion line (light blue line). The analysis was split with new overall averages (light blue lines) and control limits (red dashed lines) calculated when sustained nonrandom variations (sustained special cause signals meeting Shift or Trend criteria via IHI detection rules) were observed to assess for new performance characteristics following each split. [Color figure can be viewed at wileyonlinelibrary.com]
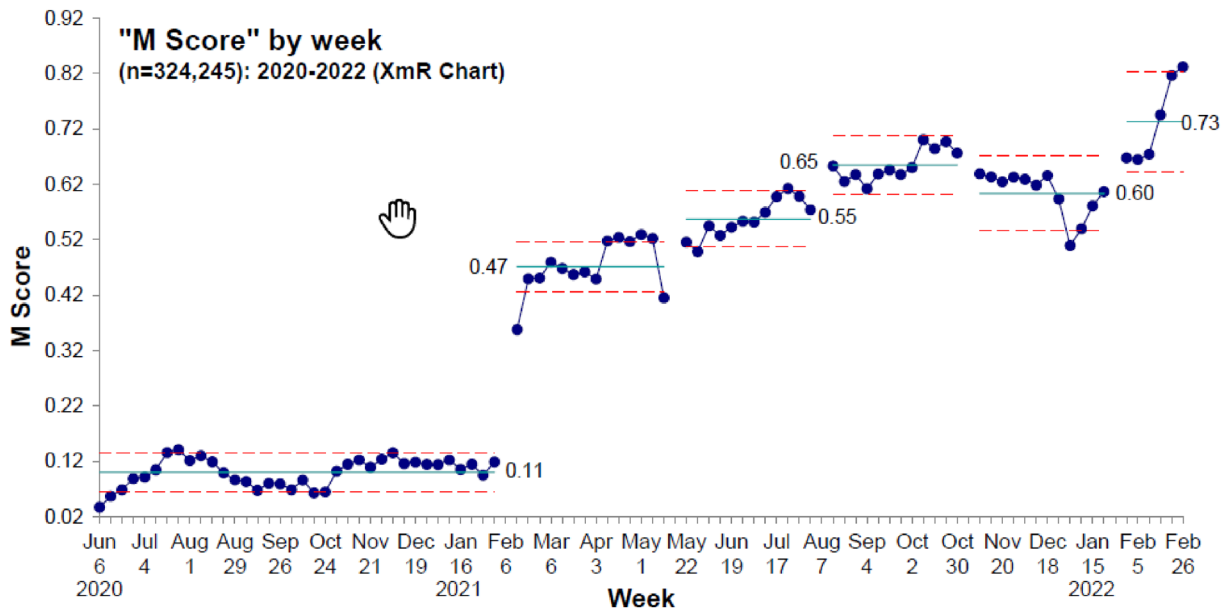
FIGURE 3 Mean and moving range statistical process control analysis (XmR) for the weekly "M Score" for eligible patients seen from 2020 to 2022 (*n* = 324,245). Data points (dark blue dots and lines) represent the M Score for eligible patients seen each week. The light blue line represents the overall average M Score (mean). The red dashed lines show the upper and lower control limits, which are three-sigma deviations (approximately 2.67 standard deviations) above and below the overall average proportion line (light blue lines). The analysis was split with new overall averages (light blue lines) and control limits (red dashed lines) calculated when sustained nonrandom variations (sustained special cause signals meeting Shift or Trend criteria via IHI detection rules) were observed to assess for new performance characteristics following each split. [Color figure can be viewed at wileyonlinelibrary.com]

75.6% for "How much effort was made to help you understand your health issues?", 77.6% for "How much effort was made to listen to what matters most to you about your health issues?", and 76.2% for "How much effort was made to include what matters most to you in choosing what to do next?" The mean for all three questions was 3.6 on a 4-point scale.
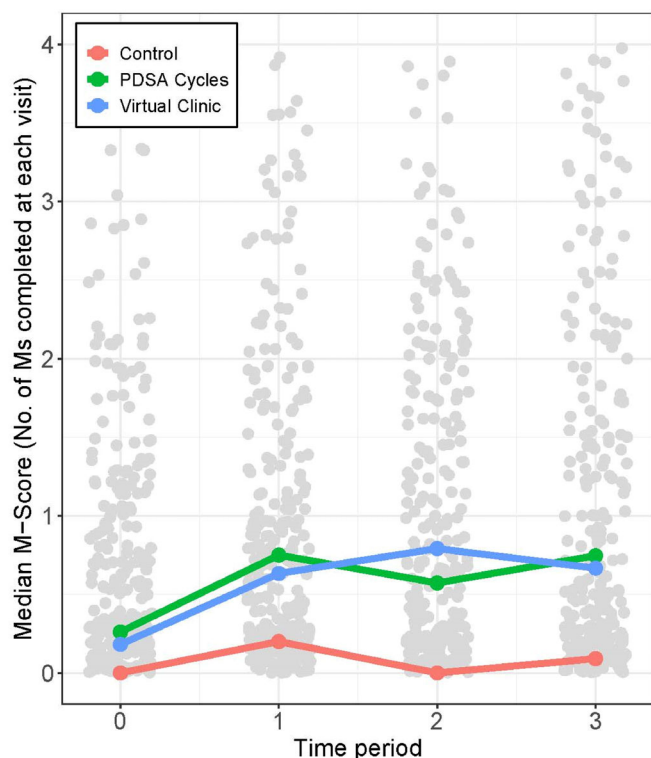
FIGURE 4 Change in 4Ms completion among Year 2 intervention(PDSA and Virtual Clinic strategies) participants. The gray dots show the median M-Score (number of Ms completed divided by all eligible visits) for each provider at each time period. Colored lines show the median of all providers for each time period for the PDSA, Virtual Clinic, and control groups. Time periods are four-week intervals. T0 is the 4 weeks before the start of the intervention, T1 is the first 4 weeks of the intervention, T2 is the second 4 weeks, and T3 is a 4-week follow-up period after the intervention ends. [Color figure can be viewed at wileyonlinelibrary.com]

10 | DISCUSSION

The application of both improvement and implementation science methods facilitated the initial success of integrating the AFHS 4Ms into the workflow of the MinuteClinic. The providers increased delivery of the 4Ms as a set from 0.3% in the first month to 9.3% in the 21st month. As NPs documented the assessment and actions for each of the 4Ms individually, over 161,500 Ms were addressed with patients over the implementation period. Although there was an improvement, it must be noted that the improvement was small, especially with Mentation (1% to 9%). Qualitative research to understand barriers and facilitators to deliver and document the assessments and act-ons of each of the 4Ms. Additional implementation strategies are in progress and include adding allocated time to every AFHS visit to allow for the NP to incorporate all the 4Ms and targeted orientation to ensure that all new NPs have 4Ms knowledge. Future research on testing the strategies using a larger sample and enhancements to the strategies will provide insight into the efficacy of providing opportunities to practice the 4Ms in the Virtual Clinic and intentional change using a PDSA approach.

We found CollaboRATE scores were consistent quarter to quarter, with over 75% of older adults rating that their MinuteClinic visit included "What Matters" a 4 on a scale of 0–4. The MinuteClinic has a robust infrastructure for quality improvement using the Model for Improvement and continuous monitoring of data with Tableau and Epic dashboards. The addition of implementation science assisted with the identification of barriers and facilitators and potential strategies at five levels of the CFIR, including inner setting, outer setting, patient level, provider level, and intervention.[16]

The academic-clinical partnership helped expand the current quality improvement approach to include implementation science frameworks and evidence-based implementation strategies. Over 20 implementation strategies using professional development, practice-based tools, and infrastructure approaches contributed to the 4Ms uptake as a set and individually. It was clear that for implementing evidence into practice, a multistrategy approach was needed. In addition, the strategies implemented need monitoring and adjusting over time. For example, our expectation was that the orientation module would be completed by 100% of the NPs. Monitoring the completion data and talking with stakeholders revealed that we needed a new process for integrating the module into orientation and that "Champions" of this process were needed. Many of the strategies were identified during our preimplementation year using focus groups and existing literature, but we learned that additional focus groups during implementation were needed to identify facilitators and barriers.[12–16] Understanding the definitions of the 4Ms facilitated the way most NPs would reliably document in the EHR the 4Ms assessment and each of the actions included in the treatment plan.

The most important strategies were leadership, informatics, and communication. The leadership provided resources and established a learning culture that supported the agile core team working through tests of change. The informatics design that included 4Ms documentation at a level of sophistication well beyond a simple "yes/no" checkbox enabled enhanced reporting to understand changes that needed to be made. In addition, the system-based prompt reminding NPs to conduct the 4Ms, was critical to the implementation success. Finally, regular communication about the "why" of the implementation, the educational resources, the progress toward goals, the celebration of high-performing NPs, the storytelling of 4Ms narratives, and performance review conversations kept the implementation project moving forward on the frontlines.

Although there was not strong evidence of using implementation science theories for evidence-based practice implementation in community care settings, we found the CFIR, and other reported implementation strategies, such as the best-practice alert, patient brochure, confident conversations, and pocket card (Figures S6 and S7), facilitated our success.[12–16] NPs in convenient care clinics have the opportunity to close gaps in care, identify issues with mentation, mobility, and high-risk medications, provide treatment plans incorporating what matters to the patient, and implement geriatric care frameworks that can be effective as in other care settings described in the literature.[9–11]

The shift from the use of quality improvement and implementation science knowledge to actual testing strategies in a research framework added to the discovery of new knowledge and a path for

future research. Preliminary efficacy was found for both PDSA and Virtual Clinic strategies, indicating that additional strategies are needed to achieve reliable delivery of AFHS 4Ms care. We learned in the PDSA strategy that NPs at the frontline need a way to understand their performance so that they can implement tests of change to improve their performance. During the Virtual Clinic strategy, we learned that providing simulated practice increases AFHS 4Ms adoption. Further research is needed to build on this pilot work.

The value of implementing the age-friendly health systems 4Ms Framework in a large convenient care clinical practice is in supporting the reliable and rapid spread of the age-friendly movement, improving the patient experience and health promotion for older adults and their caregivers by assessing and acting on evidence-based components of healthy aging. The reach to older adults is vast, as nearly 60% of the US population lives within 10 miles of a MinuteClinic. Every older adult who receives care at a MinuteClinic will benefit from AFHS care as the intervention is based on health promotion and raising awareness of what evidence-based 4Ms care older adults should expect.

There were some unanticipated findings that are important to note. Documenting each of the 4Ms assessments and act-ons beyond a simple checkbox to say all 4Ms were included in the visit meant that the documentation workflow was more complex. Therefore, data analysis was more complex, and it was critical to monitor the data carefully to ensure reliability and validity. Limitations to work include the inability to generalize the findings outside of the MinuteClinic, as the project was focused on the implementation of the AFHS 4Ms in a specific practice environment using quality improvement and implementation of science practice. Future generalizable knowledge can be generated by continued research on the two intervention strategies, as these demonstrated some preliminary value.

11 | CONCLUSION

The AFHS 4Ms implementation in a convenient care setting shows promise for evidence-based care for older adults, reaching beyond traditional acute care and outpatient settings. The use of improvement and implementation science methods contributed to the overall initial success in obtaining designation as an IHI Committed to Care Excellence organization. Future work includes the continual monitoring of processes and outcomes, implementing strategies to address barriers and facilitators, and attention to the sustainability of the progress achieved. Expanding improvement and implementation practice to include research is an important component to advance our understanding of the mechanisms for change within organizations.

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SUPPORTING INFORMATION

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