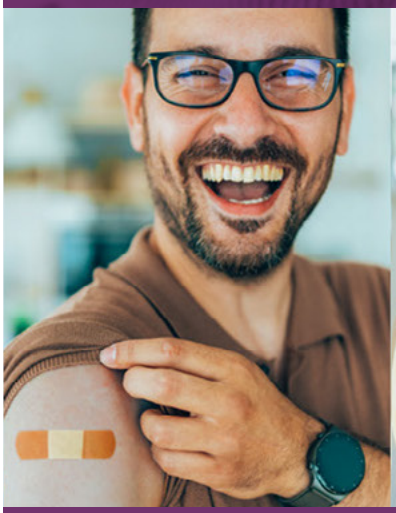
ATS
American Thoracic Society

Vaccine Implementation Toolkit






A Roadmap of Strategies, Interventions and Practice-Based Insights for Health Systems

About the Toolkit & Supporters

About

This toolkit is a culmination of the work of the ATS Vaccine Initiative.

The ATS Vaccine Initiative was established through an award from the Council of Medical Specialty Societies (CMSS) and the Centers for Disease Control and Prevention (CDC) to increase COVID-19, influenza, and routine vaccination rates among high-risk adult patients nationally. Over the course of the award, the American Thoracic Society (ATS) partnered with eight health systems across the United States to test and implement strategies to improve vaccine uptake using a quality improvement approach.

The health systems that participated in the initiative were:

- Grady Health
- Meharry Medical College
- University of Arizona/Banner Health
- University of California San Francisco/San Francisco Health Network
- University of Colorado
- St. Luke's Health System
- Wayne Health
- West Virginia University Hospitals, Inc.

Supporters:

The development of this toolkit was also supported in part by Pfizer, Inc., Moderna, Inc., GSK, and Sanofi.

▶ TABLE OF CONTENTS

ATS

Table of Contents

CLICK THE TOPIC BELOW TO VIEW

Overview of the Toolkit 4

Purpose and Intended Users 4

Target Audience 5

Using this Toolkit 5

Your Implementation Journey 6

Step 1: Plan 7

Organizational Readiness Assessment 7

Readiness Assessment 9

Step 2: Prepare 15

Intervention Selection Guidance 15

Intervention Alignment 16

Domain 1: Care Team Interventions 16

Standardized Reconciliation with State Registry 17
HEAR Communication Training for Staff 18
Other Structured Communication Training for Staff 20
Standard Order Entry Workflow (provider level) 21
Audit and Feedback Based on Vaccine Administration Data (provider level) 22
Standardizing Vaccine Eligible Screening and Vaccine Administration Workflow in the Clinic 24
Adding Staff or Staff Roles in the Clinic 25
Shifting Tasks Among Clinical Staff Members 26

Domain 2: Patient-Centered Interventions 27

Patient Education (posters/flyers) 27
Stocking Vaccines for In-Clinic Access 29
Automated Patient Reminders 30
Active Patient Education 31
Patient Engagement and Co-Design 33
Use of a Patient Advisory Board 34
Roving Nurse Team 36
Opt Out Vaccine Consent 37
Pop Up Clinics 39

Domain 3: Electronic Health Records (EHRs) Interventions 40

Vaccine Counseling Dot-Phrase 40
Vaccine Documentation Dot-Phrase 41
Provider-Level Reporting of Vaccine Administration 42
Automated Integration of State Registry Data with Health System Data 43
Clinic-Level Vaccine Administration Reporting 45

Step 3: Clinic Context 46

Conduct Clinic Workflow and Outline a Desired State Along the Workflow 46

Map Workflows 46

Pulmonary Medicine Clinic Workflow Mapping Worksheet 47

High Readiness: 4.0–5.0 49

Moderate Readiness: 3.0–3.9 50

Low Readiness: 2.0–2.9 50

Not Ready: Below 2.0 51

Build the Intervention Bundle 52

Step 4: Prioritize 54

Influencing Factors to Inform Prioritization 54

Step 5: Execute 56

Step 6: Evaluate and Monitor 57

Implementation Measures 57

Outcome Measures 59

Process Measures 60

Sustainability Measures 61

Modification and Adaptations 61

Adaptation Log 62

Overview of the Toolkit

Purpose and Intended Users

Vaccines are an important health intervention for individuals with lung disease. Vaccination can protect from or mitigate complications related to infections; especially critical for the health of individuals with chronic lung conditions. Despite these benefits, vaccination rates in those with lung disease remain poor.

Sub-specialty providers, such as pulmonologists, are trusted members of the health care delivery team for individuals with complex lung conditions and may have remarkable ability to impact uptake of vaccination.

Despite the benefits of vaccination, historically vaccine administration has been in the purview of primary care. While there is recognized benefit to pulmonary clinics offering vaccinations, implementing processes to offer vaccination in sub-specialty clinics requires methodic approaches to influence changes in clinic structure and function.

The aim of this toolkit is to provide insight on effective implementation strategies and approaches that were tested by eight health systems nationwide. Using this toolkit, health care systems will select, design, implement, and sustain interventions that improve vaccine counseling, documentation, administration, and follow-up in pulmonary medicine settings.

▶ RETURN TO THE TABLE OF CONTENTS

Target Audience

The audience for this toolkit is any stakeholder, or stakeholder team, who seeks to influence the implementation of new processes and procedures to improve vaccine uptake in pulmonary medicine. There are relevant roles outlined for health system leaders, clinic managers, pulmonary medicine doctors, nurses, medical assistants, as well as the supportive infrastructure workforce that may include quality improvement teams, implementation science researchers, informatics/EMR teams, patient experience leaders, and implementation teams.

Using this Toolkit

This toolkit combines recommended approaches that were tested by health systems in the initial cohort of the ATS Vaccine Initiative. The toolkit is intended to be a guide that supports a health care clinic or quality improvement team. Users may navigate through the roadmap and select portions of the toolkit to guide their work. While the toolkit can be used in its entirety, the structure is designed so that users can connect to the insights and information most relevant to their interests and clinical context. The toolkit is intended to be flexible and should be adapted based on what is most suitable and useful for your organization.

The toolkit includes elements of both Quality Improvement (QI) best practices alongside Implementation Science (IS) approaches. While it is ideal to use structured methodology to implement change in clinical practice, this needs to be balanced with the pragmatic capabilities and understanding of what can happen in the clinic. Throughout the journey along the implementation roadmap, you will find additional resources to link to, templates for tracking and documentation, guides, videos, and more to help support you and your team in this effort.

▶ RETURN TO THE TABLE OF CONTENTS

Your Implementation Journey

Step 1: Plan:

Assess gaps to understand the barriers and facilitators to implementing interventions for uptake of vaccines. (Exploring readiness of the clinic, identifying influencing factors, map clinic resources to identify where opportunities exist to intersect new interventions.)

Step 2: Prepare:

Review the Interventions in this toolkit to understand what has worked in pulmonary medicine across various health system partners. Match the findings from your planning exercises to the interventions that most align to what your clinic is capable of, will accept, and can execute with existing or minimal resources.

Step 3: Clinic Context:

Assess the behaviors, steps, resources, processes and decision points to determine a pathway to implementation of your ideal interventions. (Workflow mapping considering multilevel influencing factors.)

Step 4: Prioritization:

Identify the interventions that are most aligned with the available resources and capabilities. Outline dominant barriers that will challenge the implementation and identify strategies that can help you overcome those barriers.

Step 5: Execute:

Activate your plan to implement the intervention. Outline who needs to do what, when, and how to make the intervention happen. Outline metrics to track and measures of success.

Step 6: Evaluate and Monitor:

Conduct routine monitoring and collect ongoing interval data on your intervention. Use these findings to make recommended adaptations or changes.

Step 7: Sustain:

Maintain your efforts through robust reporting, documentation of value across multiple stakeholder groups, track effectiveness of the interventions and their influence on the endpoint of getting more patients vaccinated.

▶ RETURN TO THE TABLE OF CONTENTS

Step 1: Plan

Assess gaps to understand the barriers and facilitators to implementing interventions for uptake of vaccines. This step may include elements such as conducting a readiness assessment, identifying multi-level influencing factors, and mapping clinic resources to identify where support exists for new interventions. The readiness and resource planning is critical to the selection of key implementation interventions.

Organizational Readiness Assessment: Help the health system determine whether it is prepared to implement vaccine-related interventions across care teams, patient-facing workflows, and EMR infrastructure.

Organizational Readiness Assessment

This QI-oriented organizational readiness assessment uses the Consolidated Framework for Implementation Research (CFIR) 2.0 domains to help a health system determine whether it is ready to implement the toolkit interventions across care teams, patient-centered strategies, and EMR-enabled workflows.

CFIR 2.0 organizes your work to help you and your team assess implementation determinants across five domains: Innovation, Outer Setting, Inner Setting, Individuals (Roles & Characteristics), and (Implementation) Process. It is designed to identify barriers and facilitators that exist in your clinical setting right now that can be used to shape implementation success.

The QI structure aligns with the Model for Improvement, which asks what the team is trying to accomplish, how improvement will be measured, and what changes should be tested using PDSA cycles.

This assessment helps a health care system determine its readiness to implement interventions that improve vaccine screening, counseling, administration, documentation, reporting, and follow-up.

The assessment should be completed before launching the project and repeated after early PDSA cycles to guide adaptation.

Who Should Complete It

- Pulmonary medicine provider
- Nurse or medical assistant
- Clinic manager
- Quality improvement lead
- EMR/informatics representative
- Population health or registry/data representative
- Patient education or patient experience representative
- Pharmacy or vaccine operations representative, if vaccines will be stocked onsite

▶ RETURN TO THE TABLE OF CONTENTS

When to Use It

- Pre-implementation planning
- Before selecting priority interventions
- Before scale-up to additional clinics or teams

Outputs

- Clinic readiness scorecard
- Priority implementation barriers
- Domain-specific intervention recommendations
- Site-specific implementation plan

Scoring Method

- Use a 1–5 rating scale for each item.

Score	Interpretation
1	Not ready / major barrier
2	Limited readiness / substantial barrier
3	Moderate readiness / workable with support
4	Ready / minor barriers
5	Highly ready / strong facilitator

RETURN TO THE TABLE OF CONTENTS

Readiness Assessment

Innovation: This domain assesses whether the selected interventions are sufficiently well defined and usable in the local clinical setting.

Readiness Question: Are the proposed interventions clear, evidence-informed, operationally feasible, adaptable, and compatible with the health system's vaccine improvement goals?

Assessment Items:

Item	Readiness Statement	Range	Score
1.1	The purpose of the vaccine improvement intervention is clearly understood by our clinic leaders and care team members.	1–5	
1.2	The intervention addresses a clearly identified gap in our clinic regarding vaccine screening, Counseling, administration, documentation, or follow-up.	1–5	
1.3	The intervention is practical enough to test within routine pulmonary clinic work-flows.	1–5	
1.4	The intervention can be adapted to different clinic roles, staffing models, and patient populations.	1–5	
1.5	The intervention has a clear operational owner.	1–5	
1.6	The intervention does not add excessive complexity or documentation burden.	1–5	
1.7	The intervention has a clear expected outcome, such as increased vaccine Counseling, improved documentation, or higher vaccination rates.	1–5	
1.8	The intervention can be tested through small PDSA cycles before broader rollout.	1–5	

Interpretation: A high Innovation score means the intervention is well packaged, understandable, and testable. A low score means the intervention needs redesign before implementation.

Outer Setting: This domain assesses external pressures and opportunities that influence whether the intervention is necessary, supported, and sustainable.

Readiness Question: Do external expectations, patient needs, community context, payer requirements, public health priorities, and registry infrastructure support implementation?

▶ RETURN TO THE TABLE OF CONTENTS

Assessment Items:

Item	Readiness Statement	Range	Score
2.1	Vaccine improvement is aligned with external stakeholder (public health, payer, or accreditation) priorities.	1–5	
2.2	The health system has identified patient populations with unmet vaccine needs.	1–5	
2.3	Patient barriers to vaccination are understood, including access, trust, transportation, cost, literacy, and hesitancy.	1–5	
2.4	The health system has access to reliable external vaccine data, such as state immunization registry data.	1–5	
2.5	There is a clear process for reconciling vaccine status with external registries.	1–5	
2.6	The health system understands payer, billing, and reimbursement implications for vaccine administration.	1–5	
2.7	Community or public health partners can support vaccine education, outreach, or referral when needed.	1–5	
2.8	The proposed intervention is responsive to the needs of pulmonary patients and caregivers.	1–5	

Interpretation: A high Outer Setting score suggests the project is externally aligned and patient-relevant. A low score suggests the team should better define patient barriers, registry access, reimbursement issues, or public health alignment before implementation.

Inner Setting: This domain assesses internal clinic-level pressures and opportunities that influence whether the intervention is necessary, supported, and sustainable. The inner setting is where most interventions will take place and is likely the most important domain for determining whether the toolkit can be implemented as a successful QI project.

Readiness Question: Does the clinic or health system have the internal infrastructure, culture, workflow compatibility, leadership support, data systems, and resources needed to implement and sustain the intervention?

▶ RETURN TO THE TABLE OF CONTENTS

Assessment items:

Item	Readiness Statement	Range	Score
3.1	Clinic leadership views vaccine improvement as a priority.	1–5	
3.2	The project aligns with existing health system quality goals.	1–5	
3.3	Current work-flows in the clinic can accommodate vaccine screening and Counseling without major disruption.	1–5	
3.4	Current staffing is sufficient to support the proposed intervention.	1–5	
3.5	Care team members understand their roles in vaccine screening, Counseling, ordering, administration, and documentation.	1–5	
3.6	The EMR can support the proposed intervention through dot-phrases, reminders, documentation fields, or reporting.	1–5	
3.7	Vaccine data can be extracted and reviewed for QI purposes.	1–5	
3.8	The clinic has a regular forum for reviewing QI data, such as huddles, staff meetings, or quality meetings.	1–5	
3.9	There is sufficient operational support for vaccine storage, handling, ordering, and inventory if vaccines are stocked onsite.	1–5	
3.10	The clinic has a process for identifying and addressing workflow problems during implementation.	1–5	
3.11	The intervention is compatible with existing care team routines and tasks.	1–5	
3.12	The intervention is likely to be sustained after the initial QI project period.	1–5	

Interpretation: A high Inner Setting score means the clinic has sufficient infrastructure and workflow alignment. Implementing processes for vaccination would fit easily into the clinic as-is. A low score indicates that the project should begin with workflow redesign, leadership engagement, EMR build, or role clarification before launching patient-facing interventions.

Individuals, Roles & Characteristics: This domain focuses on the people who deliver and receive the intervention, including clinicians, staff, leaders, EMR teams, and patients.

▶ RETURN TO THE TABLE OF CONTENTS

Readiness Question: Do the people responsible for implementation have the knowledge, skills, motivation, role clarity, authority, and opportunity to deliver the intervention?

Assessment Items:

Item	Readiness Statement	Range	Score
4.1	Providers understand why vaccine improvement is important for pulmonary patients.	1–5	
4.2	Nurses, medical assistants, and other staff understand their role in vaccine work-flows.	1–5	
4.3	Staff feel capable of discussing vaccines with patients.	1–5	
4.4	Staff have access to brief scripts or tools for addressing vaccine questions or hesitancy.	1–5	
4.5	Providers and staff believe the intervention is acceptable and worth implementing.	1–5	
4.6	Care team members have time and opportunity to complete the assigned workflow steps.	1–5	
4.7	EMR or informatics staff are available to support dot-phrases, reporting, reminders, or registry integration.	1–5	
4.8	Clinic leaders are willing to reinforce expectations and remove barriers.	1–5	
4.9	Patients are likely to find the proposed intervention understandable, respectful, and useful.	1–5	
4.10	Staff have a mechanism to provide feedback during implementation.	1–5	

Interpretation: A high Individuals score means people are prepared and motivated to implement the intervention. A low score suggests the need for training, role clarification, communication tools, staff engagement, or patient-centered adaptation.

Implementation Process:

This domain assesses whether implementation will be managed deliberately and holistically rather than simply introduced as a new task.

▶ RETURN TO THE TABLE OF CONTENTS

Readiness Question: Is there a clear QI process for planning, testing, measuring, adapting, and sustaining the intervention?

Assessment Items:

Item	Readiness Statement	Range	Score
5.1	A project sponsor has been identified.	1–5	
5.2	A day-to-day implementation lead has been identified.	1–5	
5.3	A multidisciplinary implementation team has been formed.	1–5	
5.4	The project has a clear aim statement.	1–5	
5.5	The team has selected process, outcome, and sustainability measures.	1–5	
5.6	The team has defined the initial intervention bundle to test.	1–5	
5.7	The team has a plan for conducting PDSA cycles.	1–5	
5.8	The team has a plan for collecting baseline data.	1–5	
5.9	The team has a plan for reviewing data at regular intervals.	1–5	
5.10	The team has a process for documenting adaptations.	1–5	
5.11	The team has a plan for communicating progress to care teams and leaders.	1–5	
5.12	The team has a sustainability plan for maintaining the intervention after initial testing.	1–5	

Interpretation: A high Implementation Process score means the project is ready to function as a QI initiative. A low score means the team should pause and build a clearer project charter, measurement plan, PDSA plan, and governance structure.

▶ RETURN TO THE TABLE OF CONTENTS

Readiness Score:

Average Score	Readiness Level	Recommended Action
4.0–5.0	High readiness	Proceed with implementation and scale planning
3.0–3.9	Moderate readiness	Proceed with focused supports and PDSA testing
2.0–2.9	Low readiness	Address readiness gaps before broader implementation
<2.0	Not ready	Redesign intervention or delay implementation

▶ RETURN TO THE TABLE OF CONTENTS

ATS

Step 2: Prepare

Role of context-specific guidance to select and implement interventions.

Use the readiness assessment to align possible interventions of interest, this should be comprehensive in nature.

Intervention Selection Guidance

This assessment is intended to serve as a companion to the list of interventions provided in the toolkit. The actual implementation plan should include interventions that are ranked as feasible, relevant, acceptable, sustainable, and most of all a good fit for the clinic based on the Readiness Assessment.

Readiness-to-Action Matrix

After scoring each domain, use this matrix to determine next steps.

CFIR Pattern	Interpretation to Guide Intervention Selection
High Innovation + High Inner Setting	Interventions well matched to alter clinic structure and functions. Administrative support is high, staff are flexible and innovative.
High Innovation + Low Inner Setting	Workflow/infrastructure is weak, consider low burden interventions, absorbed into workflow rather than significant changes. Work to develop culture to expand to larger scale change in the future.
High Outer Setting + Low Inner Setting	External resources are present, community or public buy-in may be high, but internal capacity is limited. Encourage patient-facing interventions, leveraging the patient voice to support initiatives.
Low Individuals + High Inner Setting	Infrastructure exists but staff are not prepared/willing. Interventions can be initiated to alter workflow or technical infrastructure as long as champions are able to actively encourage culture change and buy-in.
High Individuals + Low Inner Setting	Staff are motivated but systems are weak. Consider staff role shifting, enabling greater flexibility in roles to support data collection, and enabling new staff roles to support the infrastructure.
High Individuals + Low Implementation Process	Consider interventions that are highly acceptable to staff and aim to build the structure through champions and deliberate improvements in process, policies, and procedures.

▶ RETURN TO THE TABLE OF CONTENTS

Intervention Alignment

If Readiness is High Across Most CFIR Domains

If Readiness is High Across Most CFIR Domains	If Readiness is Moderate	If Readiness is Low
Complex interventions: • Stocking vaccines in clinic • Pop up clinics • Vaccine Counseling and documentation dot-phrases • State registry reconciliation or integration • Structured communication training • Audit and feedback reviews	**Recommend complex and simple interventions in a bundle:** • Static patient education posters/flyers • Initiate clinic-level reporting on vaccinations among providers • Standardized vaccine screening workflow • Staff education training • Patient engaged design	**Recommended first steps:** • Map current workflow • Clarify care team roles • Identify EMR limitations • Develop basic patient education materials • Create a manual tracking process • Conduct one small PDSA test with one provider or one clinic session • Delay more complex interventions such as automated reminders, registry integration, vaccine stocking, or pop-up clinics

Domain 1: Care Team Interventions

Care team interventions are activities that strengthen team-based workflows, provider/staff communication, data reconciliation processes, and performance feedback mechanisms to support vaccine implementation.

These interventions are intended to target providers, pulmonary medicine clinics, and health systems.

Overview of the Impact of Care Team Interventions

The ATS Vaccine Initiative findings suggest that workflow assessment and design be explored before initiating interventions that impact the care team. This is especially critical when changing elements of the daily clinic tasks or adding staff members.

A sustainable model appears to be one that standardizes the workflow, defines the task, and aligns the task to a role rather than an individual. Dedicated staff can be highly effective, but staff-dependent programs are vulnerable to turnover and loss of champions.

When a task is assigned to a specific role within the clinic, training and reinforcement of the task and EHR capabilities were supporting functions of the role.

▶ RETURN TO THE TABLE OF CONTENTS

Standardized Reconciliation with State Registry

Description: Establishing an electronic connection between the health system EHR and the state vaccine registry for automated updates of individual vaccine status.

Implementation consideration	Ranking (0-10)
Relevance to practice setting	8.4
Feasibility to implement in routine practice	5.82
Fit with existing clinic work-flows	7.71
Acceptability to staff	8.96
Sustainability in practice	8.59

Prerequisites/Readiness:

- Does your health system have an existing agreement with your state Immunization Information System (IIS) for data exchange?
  - *If yes:*
    Is the data timely? (How frequently are updates done with the system?)
    Do you have access to the data? (Are role-based access changes needed to pull the data into the pulmonary clinic?)
    Does the process happen automatically or is it a manual exchange?
  - If *no*:
    Is there an opportunity to build or connect data with the state registry?
    This will be dictated by your specific state IIS regulations. You can find your state's IIS contact information here: https://www.cdc.gov/iis/contacts-locate-records/index.html

Implementation Tactics:

Strong direct evidence was found to support this intervention. Health systems used a variety of tactical approaches including:

- Use of medical assistants to conduct pre-visit chart review and conduct manual reconciliation
- Engagement with your health system registry coordination team
- Review of EHR monitoring and reconciliation status
- Development of EHR-based best practices for reconciliation and implement as clinical workflow tasks
- Create role-based access for providers to see the vaccine status in charts for every patient

Overall, having automated state registry updates was a strong facilitator. However, in settings where the automated updates are not routine or if the EHR information was incorrect, this risked physician trust in the process. Health care systems that have automated reconciliation in place sometimes needed to work with IT to enable role-based access for pulmonary medicine providers to view these data in the patient's chart.

▶ RETURN TO THE TABLE OF CONTENTS

Establishing new, system-level reconciliation with the state-based registry required EHR/IT involvement and was a significant investment in the implementation team's time and effort, requiring policy changes at the health system level. However, once this was established, reconciliation was durable over time.

This should be considered as a longer-term intervention and will rely on the state-based regulations regarding data sharing and the health system's engagement with the state.

Tools Used:

EHR/IIS interface, EPIC reconciliation processes, a data safety team with monitoring roles, reconciliation checklist, role assignment, outline of reconciliation temporal factors (frequency) documentation workflow, reconciliation quality metrics.

Factors Influencing Implementation:

At the clinic level: Role delineation for ownership of reconciliation, MA or other support staff capacity, timing of pre-visit review, seasonal data gaps (depending on reconciliation frequency), clinician confidence in data accuracy.

At the health system level: IT resources to support the data exchange and change EHR, interoperability capabilities of EHR, data governance standards and regulations, executive support.

At the community level: State IIS policies/data availability; interstate data exchange; pharmacy/primary-care vaccination records.

Metrics:

- Percent of eligible pulmonary medicine patients with registry status reconciled
- Percent of completed in-clinic documentation of registry updates

HEAR Communication Training for Staff

Description: A unique workforce training curriculum, designed to improve communication skills among health care professionals.

Implementation consideration	Ranking (0-10)
Relevance to practice setting	8.13
Feasibility to implement in routine practice	6.62
Fit with existing clinic work-flows	5.85
Acceptability to our staff	8.00
Sustainability in practice	6.57

RETURN TO THE TABLE OF CONTENTS

Prerequisites/Readiness:

- Do you have leadership support to give staff protected time for communication training?
- Do you have dedicated staff with interest in learning and applying communication strategies to their clinical engagement?
- Do you have support for sustained training for new staff?
- Do you have a funding source to support multiple staff participating in this training curriculum?
- Do you have resources and tools to reinforce the training and apply it to the clinic population?
- Are your providers and staff comfortable having conversations about vaccine hesitancy?

Implementation Tactics:

Strong Direct Evidence was generated among the health system partners that undertook the HEAR training. This was among the most impactful interventions to support provider and clinic-level change. Dedicated staff were identified to participate. The implementation teams developed opportunities to support the communication tactics in the clinic workflow by supporting staff and providers.

Repeated education/retraining emerged as important for sustainability in light of staff role changes and staff turnover.

Tools Used:

HEAR has a specific training agenda, provides counseling scripts, teaches motivational interviewing prompts, provides talking points to address common concerns of vaccine hesitancy, trains through role-play scenarios, and provides a competency checklist.

Factors Influencing Implementation:

Provider level: clinician confidence, communication competence, “not my job” attitudes, competing priorities.

Clinic level: Clinical culture of communication expectations, reinforcement by champions.

Health system: Providing training resources and protected time.

Community: Misinformation, social norms, trust and health literacy.

Metrics:

- **Number of providers trained**
- **Number of documented patient engagements using HEAR tools**
- **Provider acceptability of the training**

RETURN TO THE TABLE OF CONTENTS

Other Structured Communication Training for Staff

Description: Specific efforts undertaken at the clinic level to improve communication skills among health care professionals. These included other interventions, outside of HEAR training, that were designed to give staff talking points to improve engagement with patients about the importance of vaccination.

Implementation consideration	Ranking (0-10)
Relevance to practice setting	8.33
Feasibility to implement in routine practice	7.42
Fit with existing clinic work-flows	6.69
Acceptability to our staff	7.36
Sustainability in practice	6.57

Prerequisites/Readiness:

- Do you have leadership support to give staff protected time for communication training?
- Do you have dedicated staff with interest in learning and applying communication strategies to their clinical engagement?
- Do you have support for sustained training for new staff?
- Do you have a funding source to support multiple staff participating in a training curriculum?
- Do you have resources and tools to reinforce the training and apply it to the clinic population?
- Are your providers and staff comfortable having conversations about vaccine hesitancy?

Implementation Tactics:

Direct but nonspecific with strong evidence. Sites used various types and formats of staff education to address vaccine hesitancy and to improve confidence in discussing the importance of vaccination in pulmonary medicine. These tactics included staff focus groups, training to address staff hesitancy around vaccines, and training to help staff respond to patient hesitancy. Most of these tactics were informally conducted within staff stand-up meetings, reminders in staff rooms, and in-service-like engagements in meetings to provide talking points to staff. Education had to be repeated as staff changed.

Tools:

No distinct tool set is specified for this intervention. The evidence suggests reusable scripts, discussion guides, role-play exercises, short training modules. Reinforcement materials could serve the function, but those were generally reported rather than a separately developed tool by any one health system. Tools that could be helpful, developed to suit your clinical site and culture include developing a training agenda and specific competencies, developing vaccine counseling scripts, identifying leading conversation prompts, and developing a list of frequently encountered patient concerns with generalized responses.

▶ RETURN TO THE TABLE OF CONTENTS

Factors Influencing Implementation:

Clinic-level: Staff turnover, availability of protected time, consistency of messaging and multidisciplinary participation.

Health system-level: Ability to provide recurring training, support for clinical interventions.

Community-level: Local misinformation, norms, language and health literacy.

Metrics:

- **Number of clinical staff engaged in training**
- **Documented engagement with patients using communication strategies**
- **Acceptability of training among staff and providers**

Standard Order Entry Workflow (Provider Level)

Description: Creating a defined clinic process or workflow to standardize an order entry for vaccinations.

Implementation consideration	Ranking (0-10)
Relevance to practice setting	9.00
Feasibility to implement in routine practice	6.29
Fit with existing clinic work-flows	7.86
Acceptability to our staff	7.00
Sustainability in practice	7.29

Prerequisites/Readiness:

- Do your health system policies allow clinic-level changes/additions to order sets?
- Are there approvals needed from a clinic administrator to create order set changes?
- Are the order sets agreed upon by all providers in the clinic?
- Are the order sets aligned with the availability of vaccine product/pharmacy processes for administering vaccines?
- Will the order sets trigger unintended downstream consequences? (Conflict with documentation records, coding conflicts, insurance conflicts)
- Are the order sets accurate and precise? (Consider different order sets for each vaccine product, consider different order sets for internal vs. external referrals)

Implementation Tactics:

Moderate direct evidence. Standing orders were most successfully implemented when paired with the ability to offer same-day vaccination (whether in clinic or on-site).

▶ RETURN TO THE TABLE OF CONTENTS

Successful improvement of in-clinic vaccination was realized when policy changes plus workflow changes occurred alongside provider support. The order set was essentially the tool that enabled the completion of a clinic process. Order sets were viewed favorably by providers as they offered standardized language and process for them to complete the patient encounter.

Standing order sets were also a factor that enabled ease of tracking and reporting vaccine recommendations and referrals by providers.

Tools:

Standing-order template, order-entry decision tree, staff protocol, provider sign-off pathway and contraindication checklist.

Factors Influencing Implementation:

Clinic: Role clarity about who screens, orders and administers; EHR integration using standard language; time pressure and competing priorities, provider education/reminders to use order sets.

Health system: Standing-order policy, scope-of-practice rules, vaccine availability.

Community: State/federal vaccine guidance.

Metrics:

- **Order set compliance: number of eligible patients for whom an order set was created**
- **Volume: number of orders placed for each vaccine type**
- **Reach: number of orders placed by provider, based on eligible patients**

Audit and Feedback Based on Vaccine Administration Data (Provider Level)

Description: Collecting information about the volume of vaccines being administered and providing that data as feedback to providers with a goal of improving performance.

Implementation consideration	Ranking (0-10)
Relevance to practice setting	8.33
Feasibility to implement in routine practice	6.50
Fit with existing clinic work-flows	6.17
Acceptability to our staff	7.67
Sustainability in practice	6.83

RETURN TO THE TABLE OF CONTENTS

Prerequisites/Readiness:

- Do you have mechanisms in place to accurately report number of vaccines being ordered/administered?
- Does your EHR offer reporting capabilities based on provider actions?
- Do you have a clinic staff who has capacity to run reports on vaccine administration data?
- Are there reports that you can standardize through your EHR?
- Can you create a clinic policy for reporting cadence?
- Does your clinic have a culture of providing and receiving feedback to improve quality outcomes?
- Do you have standing mechanisms to provide feedback to providers in a meaningful way?

Implementation Tactics:

Strong evidence. Identify which metrics are to be tracked and reported; this can offer a broader perspective on outcomes. Volume of vaccine administration may not be enough. Our systems tracked offer rate versus vaccination rates, some developed a benchmarking dashboard. Benchmarking across providers or at the clinic level provided incentives for providers to improve. When providers were aware of their metrics through audit/feedback, they tended to report positive inclination towards improvements.

High impact. Creating a QI/QC process for measuring, auditing, and providing feedback supported by a data scientist, or other specified staff member had significant impact on changing provider behavior.

*Audit and feedback should be positioned as a supportive strategy rather than a standalone intervention. This is a complimentary intervention to support provider insights and learning.

Tools:

EHR-based tools (e.g. EPIC SlicerDicer, Report Workbench), creation of benchmarking dashboards. Create a standardized approach to reporting, using a standardized tool to report; monthly dashboard, provider/clinic measures, feedback guide, peer comparison and action-planning worksheet, feedback meeting guide.

Factors Influencing Implementation:

Clinic: Feedback should be developmental and supportive rather than punitive; clinician trust in the data, champions and incentives influence response, co-designing opportunities for improvement, high performing providers sharing their approaches

Health system: Reliable data extraction/cleaning, analyst support and IT resources, policies and procedures to document process and roles

Community: Completeness of IIS data and accuracy of clinical documentation affects denominator/numerator credibility.

Metrics:

- **Clinic rate of vaccinations pre/post use of audit feedback**
- **Provider rate of vaccinations pre/post use of audit feedback**
- **Dashboard accuracy**
- **Compliance with action planning worksheets**

▶ RETURN TO THE TABLE OF CONTENTS

Standardizing Vaccine Eligible Screening and Vaccine Administration Workflow in the Clinic

Description: Creating a standardized workflow map and outlining the specific steps for identification and management of patients who were eligible for vaccination.

Implementation consideration	Ranking (0-10)
Relevance to practice setting	8.71
Feasibility to implement in routine practice	6.57
Fit with existing clinic work-flows	6.86
Acceptability to our staff	6.43
Sustainability in practice	6.71

Prerequisites/Readiness:

- Have you conducted a full clinical workflow map?
- Have you used your workflow map to identify where there are opportunities to intersect with the patient to screen and introduce vaccinations?
- Do you have the capability to offer vaccines in your clinic?
- Do you have staff capacity to conduct chart reviews to identify eligible patients?
- Does your EHR interface with your state IIS to help you verify vaccine eligibility in your patients?

Implementation Tactics:

Strong evidence. Mapping clinic workflow is one of the most important first steps to successful implementation of any intervention, but none more than to support identifying and screening patients for eligibility. This can be done automatically, using an EHR-based report, or manually using a process with a staff member, such as an MA in a pre-visit reconciliation. Other options for additional staff roles included using an embedded care coordinator to identify eligible patients and alert physicians.

Tools:

Clinic workflow map, EHR screening triggers, staff process for chart reviews pre-visit, allocation of time for staff to conduct pre-visit chart reviews and screening, and action-planning worksheet.

Factors Influencing Implementation:

Clinic: Role clarity among staff, exact workflow process for screening, space/storage for vaccine product in clinic, patient visit length and competing clinical priorities.

Health System: Policy and IT must enable the workflow, pharmacy policy for vaccine product.

Community: External vaccination records and coordination with primary care affect screening accuracy.

RETURN TO THE TABLE OF CONTENTS

Metrics:

- **Capacity: Number of patient charts screened vs. those through clinic**
- **Accuracy: Screening accuracy upon review vs reconciliation in patient discussion**
- **Volume: number of screened charts eligible for vaccination**
- **Completion: number of eligible screens that translated into vaccinations**

Adding Staff or Staff Roles in the Clinic

Description: Creating a new FTE or adding job roles to an existing FTE to manage vaccine administration and documentation in the clinic workflow.

Implementation consideration	Ranking (0-10)
Relevance to practice setting	7.29
Feasibility to implement in routine practice	4.14
Fit with existing clinic work-flows	7.14
Acceptability to our staff	8.43
Sustainability in practice	5.29

Prerequisites/Readiness:

- Are job roles currently defined to conduct vaccination eligibility screening?
- Is there a process for pre-visit chart review and who conducts that review?
- Is there interest among staff members to take on this role?
- Is there financial support for an additional staff member?
- Is their administrative support for additional staff?
- Have you conducted a clinic workflow mapping activity to identify who does what when through the patient journey in your clinic?

Implementation Tactics:

Very strong, direct evidence: Several health systems embedded new staff members ranging from a support coordinator, a vaccine navigator, a QI coordinator, data analyst and even a champion team or a safety team. Dedicated personnel had both direct and indirect effects because their presence kept vaccination salient to clinicians, kept the issue of vaccination top of mind and was a key enabler for vaccination volume in clinics. However, the feasibility of new staff and new roles needs to be weighted in balance with sustainability. Also, consideration for staff turnover and detailing new staff with the appropriate roles.

Tools:

Map and plot workflow opportunities first, define key tasks explicitly putting them into the job roles and responsibilities, and securing leadership buy-in for new FTEs.

▶ RETURN TO THE TABLE OF CONTENTS

Factors Influencing Implementation:

Clinic: Visibility of the role and tasks, workload of the staff member, turnover and retraining considerations.

Health system: FTE funding, leadership commitment and sustainability of specialized positions. Our health systems specifically identified loss of QI/QC or data-science roles as a sustainability risk.

Metrics:

- **Number of patient charts screened**
- **Number of patients engaged for screening/education**
- **Number of hours spent on tasks related to vaccine screening and administration**

Shifting Tasks Among Clinical Staff Members

Description: Identifying tasks associated with vaccine administration in the pulmonary medicine clinic and shifting those to another staff member to centralize roles.

Implementation consideration	Ranking (0-10)
Relevance to practice setting	6.29
Feasibility to implement in routine practice	4.71
Fit with existing clinic work-flows	4.86
Acceptability to our staff	4.86
Sustainability in practice	5.14

Prerequisites/Readiness:

- Is your clinic staff supportive of change in workflows and staff tasks?
- Are your administrative staff supportive of changing staff roles?
- Are there designated staff members amenable to change and taking on new tasks?
- Is there capability among staff members to take on roles?
- Is there a culture of enabling staff to work at the top of their license/capabilities?

Implementation Tactics:

Strong direct evidence: Sites described a variety of tasks and engagement activities that were moved from physicians to nurses and from nurses to medical assistants. Nurses conducting education and initiating conversations about vaccine importance, training nurses in motivational interview discussion points and supporting nurses with additional time and training supported the shift in these tasks. Further, task related to vaccine screening, IIS reconciliation, verification of chart data to MA responsibilities. Additionally, some tasks were moved to pre-visit and some elements of documentation were shifted to MAs or nurses.

▶ RETURN TO THE TABLE OF CONTENTS

Tools:

Conducting a role-burden analysis can help to identify which staff members can take on what tasks, suggestions for clinics to pilot before scale-up and monitor accuracy of documentation, appropriateness of workload, and staff satisfaction.

Factors Influencing Implementation:

Clinic: MA/RN capacity, role clarity, workload, turnover, training and whether task shifting actually reduces physician burden rather than merely relocating it.

Health System: Scope-of-practice and staffing policies, acceptability of nursing or ancillary staff leadership to task transitions.

Community: Potential external coordination requirements with IIS or external pharmacy.

Metrics:

- **Staff satisfaction**
- **Accuracy of task completion**
- **Volume of work burden reported by staff**

Domain 2: Patient-Centered Interventions

The interventions in this domain aim to improve patient awareness, access, education, and engagement to increase vaccine uptake while aligning with clinic workflow and patient preferences.

The targeted implementation levels are the patient/caregiver and provider.

The patient centered findings strongly suggest that convenience and trust work hand in hand for patients to not be burdened and to receive support from a provider they trust. Patient engagement without provider engagement however is not a “silver bullet”; multidisciplinary contact with consistent messaging across the workflow, destigmatization and making vaccination “easy to say yes” were recurring themes. The critical need with any patient-centered intervention is to meet patients where they are, understanding concerns and framing vaccination as routine standard-of-care practice while honoring their lived experience, listening to concerns, and engaging in a non-derogatory manner.

Patient Education (Posters/Flyers)

Description: Promoting patient awareness and education through the use of print or digital posters or flyers placed in patient care areas.

▶ RETURN TO THE TABLE OF CONTENTS

Implementation consideration	Ranking (0-10)
Relevance to practice setting	6.57
Feasibility to implement in routine practice	9.43
Fit with existing clinic work-flows	8.29
Acceptability to our staff	9.57
Sustainability in practice	8.86

Prerequisites/Readiness:

- Do you have opportunities to post or display messaging print or digital posters in your clinic?
- Do you have health communication resources to help with messaging?
- Is your clinic staff amenable to supporting and reinforcing a messaging campaign?
- Do you have the capability to print/issue posters or flyers or add to digital screens?

Implementation Tactics:

Very strong direct evidence: Nearly all health systems used some type of patient-facing posters or flyers targeting patient education. Unexpectedly, the posters also acted as provider reminders. Some paired the poster message with a QR code to direct patients to credible educational materials.

Effective strategies that went beyond static education through posters were to pair the messaging with patient surveys or focus groups. This led to deeper conversations with patients and providers. The implication is that static material works best as a conversation trigger rather than a stand-alone education intervention. Consider complimenting the flyers with purposeful engagement and direction to credible educational materials of various mediums.

Implementation Guidance:

- Place materials in high-visibility areas.
- Use consistent messaging across clinic touchpoints.
- Refresh materials periodically.
- Pair static education with provider or staff reinforcement.
- Conduct patient surveys or interviews to determine effectiveness/impact.

Tools:

Posters in lobby and waiting areas, exam-room flyers, handouts, plain-language FAQs, literacy-tailored and multilingual materials and QR codes

▶ RETURN TO THE TABLE OF CONTENTS

Factors Influencing Implementation:

Clinic: Visibility/placement, message consistency and provider reinforcement. The material should prompt an action during the encounter.

Health System: Messaging approval, resources to print, align to health system standards.

Community: Trust, language, health literacy, misinformation.

Metrics:

- **Patient engagement survey to account for awareness**
- **Provider engagement tracking**

Stocking Vaccines for In-Clinic Access

Description: Obtaining vaccines and making them available in the pulmonary medicine clinic.

Implementation consideration	Ranking (0-10)
Relevance to practice setting	9.29
Feasibility to implement in routine practice	6.14
Fit with existing clinic work-flows	8.00
Acceptability to our staff	9.43
Sustainability in practice	8.71

Prerequisites/Readiness:

- Do you have health system approval to stock pharmacy medications off site?
- What type of physical space is needed? Temperature controlled?
- What safety measures must be in place to provide in-clinic vaccines? (E.g. cold storage, sharps containers)
- What education and training do staff need to process the order sets to provide vaccines?
- What training do staff need to administer vaccines?
- What legal or compliance issues should be managed before offering vaccines in pulmonary medicine?
- **Key design question:**
  Can the patient be screened, counseled, offered, and vaccinated during the same clinic encounter? This is both a capacity and a capability issue.

Implementation Tactics:

One of the strongest interventions. While pulmonary medicine clinic leadership and staff were amenable to having vaccine product in clinic, all sites that placed product in clinics had to revise health system policy for vaccine stock. Sites identified barriers such as staff comfort level with administering vaccines, refrigerator/space constraints, and policy barriers in moving vaccine stock away from pharmacy. New policies for training

▶ RETURN TO THE TABLE OF CONTENTS

and education of staff to account for product, as well as to administer and document vaccination were identified. Even when vaccines were physically present, staff could remain unaware.

The success of this intervention relied on multilevel considerations that included health-system policy changes, clinic workflow changes, and provider engagement. Detailed order sets, documentation templates, and EHR prompts were facilitators to support implementation.

Tools:

Inventory checklist, storage/handling requirements, responsibility matrix, same-day workflow, billing/coding checklist and off-site referral pathway.

Factors Influencing Implementation:

Clinic: Refrigerator/space, inventory ownership, staff awareness, visit flow and ability to complete screening, counseling and vaccination in one visit.

Health System: Purchasing, formulary/policy, reimbursement, administrative process and storage requirements.

Community: Referral relationships with pharmacies/primary care when onsite vaccination is documented and shared in medical records.

Metrics:

- **Number of vaccines administered/day and/week.**
- **Staff compliance with policy for documentation, reconciliation of inventory.**
- **Patient acceptability of on-site vaccination**

Automated Patient Reminders

Description: Leveraging pre-visit patient communications to automate messages encouraging vaccination at an upcoming pulmonary medicine visit.

Implementation consideration	Ranking (0-10)
Relevance to practice setting	7.43
Feasibility to implement in routine practice	5.86
Fit with existing clinic work-flows	7.00
Acceptability to our staff	8.43
Sustainability in practice	8.00

Prerequisites/Readiness:

- Does your health system allow for adaptations to pre-visit appointment reminders?
- Who manages the pre-visit patient outreach and reminders?

▶ RETURN TO THE TABLE OF CONTENTS

- Are there mechanisms through the EHR to send pre-visit reminders or messages?
- Are there policies that govern the use of pre-visit reminders?
- Who will take responsibility for identifying vaccine eligible patients?

Implementation Tactics:

Limited Direct Evidence: While health systems leveraged patient reminder systems it was difficult to characterize the effect of these reminders, it was difficult to verify that patients had received the reminder and had noticed the vaccine message. Most health system policies were not favorable to tailoring automated pre-visit reminders.

Systems questioned if low-priority reminders, such as texts, are easily ignored if responsibility and action are unclear. An ideal approach was to couple the vaccine message/reminder to EHR eligibility identification and care-team follow-up as a pathway for the provider to follow.

Tools:

Reminder templates; pre-/post-visit and seasonal timing; patient portal, SMS and phone workflows; opt-out language; tracking measures.

Factors Influencing Implementation:

Clinic: Someone must own follow-up; otherwise, reminders risk becoming passive information rather than an implementation mechanism

Health System: Messaging/EHR capability, policies around adapting pre-visit automated messaging, privacy and accurate eligibility data.

Community: Language, digital access, and seasonal/social influences.

Metrics:

- **Number of automated messages sent**
- **Number of vaccine EHR messages opened/accessed**

Active Patient Education

Description: Providing education about vaccination through direct, active engagement with patients.

Implementation consideration	Ranking (0-10)
Relevance to practice setting	9.00
Feasibility to implement in routine practice	6.86
Fit with existing clinic work-flows	7.14
Acceptability to our staff	5.86
Sustainability in practice	5.57

RETURN TO THE TABLE OF CONTENTS

Prerequisites/Readiness:

- Do your providers and staff have the appropriate training and materials for education engagements?
- Do your providers and staff have the time to include active engagement strategies into their clinical encounters?
- Are there materials that can augment the active engagement dialogue?
- Are there specific documentation and billing codes for educational engagement?
- Does your clinic culture support added efforts towards active engagement?
- Are there workflow concerns with added time and effort for patients to stay in the clinic for educational engagements?

Implementation Tactics:

Strong evidence: Provider preparation for education was noted across all systems. Assuring that providers had the materials and resources to provide to patients after an educational engagement was a noted facilitator across all systems along with specific provider training for motivational engagement and education strategies.

Additional facilitators included pre-appointment discussion, using an MA or RN to initiate the conversation before the provider encounters.

Specific educational topics included; the importance of vaccination in individuals with pulmonary conditions, addressing misconceptions and misinformation, recognition of societal norms was identified as impactful.

Tools:

Brief scripts embedded into visits, static education, EHR dot-phrases, EHR decision support prompts and tools, and team-based counseling rather than relying exclusively on physicians.

Factors Influencing Implementation:

Clinic: Sufficient time, provider preparation, multidisciplinary staff participation, multidisciplinary reinforcement and ability to make vaccination an easy next action.

Health System: Staff training.

Community: Trust, misinformation, sociocultural context, and literacy.

Metrics:

- **Provider acceptability of scripts and tools for engagement**
- **Patient conversion from hesitancy to acceptance (change over time)**
- **Provider utilization of education tools and strategies for engagement**

RETURN TO THE TABLE OF CONTENTS

Patient Engagement and Co-Design

Description: Engaging patients to understand their perspectives and preferences regarding vaccination and using this information to improve implementation efforts in pulmonary medicine clinics.

Implementation consideration	Ranking (0-10)
Relevance to practice setting	8.71
Feasibility to implement in routine practice	7.14
Fit with existing clinic work-flows	5.00
Acceptability to our staff	6.71
Sustainability in practice	4.71

Prerequisites/Readiness:

- Do you have a pulmonary medicine/vaccine patient advocate on your implementation team?
- Do you have a staff member, or access to someone, with qualitative research or facilitation skills?
- Do you have options for various clinical interventions that you can present for feedback?
- Is your clinic culture open to patient feedback to change workflow, process, or design?

Implementation Tactics:

Strong direct evidence: Health systems that purposefully worked with patients or a patient advisory board for feedback and insights were more able to adapt their interventions and improve engagement with the patient population in their clinics.

Engagement tactics included; select patient feedback about patient perceptions of vaccines, trust in vaccines, and hesitancy in vaccination. Surveys for patients to evaluate the messaging that they heard or saw during their visits about vaccines were used and contributed to understanding how to guide staff to approach discussions and introduce vaccine concepts.

Patient reported opt-out was also collected from patients who received provider recommendations but refused vaccination. These insights were used to provide feedback to the implementation team and led to tailored messaging, and changes in staff roles to approach patients with a vaccine conversation.

One health system used Geospatial Information Systems (GIS) to explore local social determinants and social vulnerability to help guide targeted discussions and to tailor tools for implementation that would best meet the needs of pulmonary patients in their clinics.

Tools:

Patient survey, semi-structured interview guide, patient preference assessment, equity barriers checklist, FRAME-IS template to track adaptations, and community advisory template.

▶ RETURN TO THE TABLE OF CONTENTS

Factors Influencing Implementation:

- **Clinic:** Willingness to adapt workflows/messages based on findings, purposeful effort to avoid stigma/stereotyping, dedicated time to engage with patients or advisory board members to problem solve.
- **Health system:** Infrastructure to collect/analyze feedback, privacy, protection of patient advisory board time/engagement.
- **Community:** Local trust, social determinants of health, health-seeking behavior, social norms.

Metrics:

- **Adaptations made to interventions based on feedback from patients (FRAME-IS template) and resulting changes in vaccination volume in clinics**
- **Patient satisfaction**
- **Provider acceptability of clinic workflow changes**
- **Implementation team adherence to patient recommendations**

Use of a Patient Advisory Board

Description: Leveraging an existing patient advisory board, or convening one, to gain input and feedback about implementation efforts for vaccination in pulmonary medicine.

Implementation consideration	Ranking (0-10)
Relevance to practice setting	7.57
Feasibility to implement in routine practice	5.00
Fit with existing clinic work-flows	3.71
Acceptability to our staff	8.00
Sustainability in practice	4.86

Prerequisites/Readiness

- Do you have a standing patient advisory board or patient advocates in your health system?
- Is there a mechanism to engage with an existing patient advisory board for discussion/focus groups?
- Can you work with the advisory board over time for repeated engagements?
- Do you have a staff member, or access to someone, with qualitative research or facilitation skills?
- Do you have options for various clinical interventions that you can present for feedback?
- Is your clinic culture open to patient feedback to change workflow, process, or design?

Implementation Tactics:

Limited direct evidence. No site formally engaged a patient advisory board in their implementation work. However, several used the component functions of one, including focus groups, interviews, structured feedback and iterative adaptation based on feedback.

▶ RETURN TO THE TABLE OF CONTENTS

Review of implementation interventions across health systems that used patient feedback/insights led to the recommendation that the use of a patient advisory board would provide a consistent group of individuals to return to at repeated intervals to learn from as changes and adaptations were implemented. This was recommended as a potential opportunity for longitudinal engagement and improvement based on patient input than cross-sectional surveys or focus groups.

Tools:

Leveraging an existing patient advisory board within the health system or convening one. Patient feedback survey, interview guide, patient preference assessment. Outline of interventions and FRAME-IS template to track intervention adaptations and rationale.

*Choosing to stand up an advisory board would need to consider the broader benefits of such a group to obtain leadership and administrative buy in. Systems suggested that an advisory board established solely for this project may be impractical, but if there is a larger interest in pulmonary medicine, or adjacent research programs or clinics, it may be feasible. Charter for the group and working principles, a coordinator for the advisory board, a clear charge and expected engagement with the group, health system policies to stand up the board.

Influencing Factors:

Clinic: Ability to translate advice into concrete workflow or communication adaptations, dedicated staff to engage with board members, commitment to work overtime and iterate on change.

Health System: Access to an existing patient/family advisory board, governance processes, coordination between board and clinic staff.

Community: Representativeness and inclusion of populations with lower trust/access.

Metrics:

- **Adaptations made to interventions based on feedback from patients (FRAME-IS template) and resulting changes in vaccination volume in clinics**
- **Patient satisfaction**
- **Provider acceptability of clinic workflow changes**
- **Implementation team adherence to patient recommendations**

RETURN TO THE TABLE OF CONTENTS

Roving Nurse Team

Description: A specific nursing team established as a mobile unit within the hospital system to provide vaccination at the point of care in pulmonary medicine clinics.

Implementation consideration	Ranking (0-10)
Relevance to practice setting	7.43
Feasibility to implement in routine practice	3.29
Fit with existing clinic work-flows	4.71
Acceptability to our staff	8.14
Sustainability in practice	3.50

Prerequisites/Readiness:

- Do you have a relationship with pharmacy to establish teams that can take vaccine product on a mobile unit?
- Are there nurses in pulmonary medicine that could serve on a mobile unit?
- Do patients find convenience in having co-located services, such as a mobile unit, available for point-of-care vaccination?
- Are providers amenable to point of care vaccination from a team outside of pulmonary medicine?
- Is there space in the pulmonary medicine clinic to have dedicated scheduled times for a mobile unit?
- Is the mobile unit available during all pulmonary medicine clinic hours? Or only during select days/times?
- Are there system policies that support or inhibit the mobile unit?
- Are documentation and coding/billing workflows set up that can support a referral to a mobile clinic?

Implementation Tactics:

Limited direct evidence for a formal roving team. By task shifting vaccine administration to a roving nurse team, point-of-care administration was promoted. The roving team was the endpoint for the patient to receive vaccination and therefore relied on the upstream clinical engagement to discuss, educate, and ultimately get the patient to agree to vaccination.

This is likely a combined intervention to promote availability of vaccines in or near pulmonary medicine clinics when vaccine product cannot be consistently obtained or stored in the clinic. Combining these interventions with patient education interventions, provider workflow changes, and health system policy changes are needed.

Relationship with pharmacy is needed to estimate volume of vaccine product needed based on clinical estimates, dedicated staff roles to communicate and engage with roving team, and patient hand-offs from clinic to roving team; both via charting and coding are components to consider in implementing this intervention.

▶ RETURN TO THE TABLE OF CONTENTS

Tools:

Operationalizing requires larger health system commitment to a roving team as it is likely staffed beyond pulmonary medicine staff. Creating an implementation team, checklists for routine engagement, volume estimators, clearly scheduled days, times, and location for roving unit.

Factors Influencing Implementation:

Provider: Awareness of locations and availability of roving clinic, provider acceptability of handing off patient, burden of workflow to document, educate, and transition patient to roving team.

Clinic: Coordination with clinic schedules, scripts and processes for hand-offs, physical space and avoiding disruption to pulmonary workflow, clear process for guiding patients to roving clinics.

Health System: Nursing resources, scope, funding, documentation, billing/coding, and vaccine storage/transport.

Metrics:

- **Number of patients recommended for roving clinic engagement vs. number vaccinated.**
- **Provider acceptability of handoff to roving clinic.**
- **Provider adherence to upstream education and patient engagement.**
- **Patient acceptability to handoff from pulmonary medicine to roving team.**
- **Staff acceptability to workflows supporting the roving clinic.**

Opt-Out Vaccine Consent

Description: Established a clinic policy whereby every patient would receive the vaccines they were due unless they specifically chose to opt-out.

Implementation consideration	Ranking (0-10)
Relevance to practice setting	6.29
Feasibility to implement in routine practice	5.29
Fit with existing clinic work-flows	4.14
Acceptability to our staff	4.86
Sustainability in practice	4.14

Prerequisites/Readiness:

- Is your health system amenable to a policy shift to opt all patients into vaccination?
- Is there agreement among provider teams about the vaccination schedules?
- Is there templated language or scripts that can help providers and staff have informative conversations with patients about their opt-out options?

RETURN TO THE TABLE OF CONTENTS

- Are there legal concerns about requiring the opt-out consent?
- Who is responsible for obtaining opt out consent? And how will it be documented?
- Is the opt out approach policy one that re-engages patients to reconsider over time?

Implementation Tactics:

Direct evidence for patient-level opt-out policy. Health systems that approached the opt-in for all patients reported an important shift in clinic culture, needing to develop documentation for providers, reviews by legal teams, and developing education and scripts for physicians. Processes developed to enable the conversation for patient informed decision making and documentation support were developed for opt-out.

Provider hesitation was met with ease when the documentation and educational material were in place before the clinic fully-implemented. Having a pre-populated list of reasons for opt-out in the EHR documentation workflow was a supportive tactic that helped provider burden.

Tools:

Refusal/decline documentation and opt-out language. EHR reconciliation with state IIS for accuracy in vaccination status, EHR decision prompts for providers to know which vaccines are due at visit, and decision prompts to engage patients in shared decision making.

Factors Influencing Implementation:

Clinic: Provider acceptability, default recommendation language and ability to document why patients decline, shared decision-making prompts.

Health system: Policy for opt-in, consent requirements, and EHR configuration for prompts and documentation of opt-out and of physician interventions.

Community: Trust and perceptions of autonomy.

Metrics:

- **Rate of patient opt out**
- **Characterization of reason for opt-out, as documented.**
- **Provider acceptability of opt-out procedures.**
- **Time burden for shared decision-making discussions and opt-out discussions.**

▶ RETURN TO THE TABLE OF CONTENTS

Pop-up Clinics

Description: Setting up vaccine clinic outposts within pulmonary medicine to offer vaccinations. In these instances, health system policies were not flexible to enable on-site vaccine to be stored and administered in pulmonary medicine, rather the clinic was able to collaborate with pharmacy to set up an outpost clinic.

Implementation consideration	Ranking (0-10)
Relevance to practice setting	8.04
Feasibility to implement in routine practice	4.94
Fit with existing clinic work-flows	5.97
Acceptability to our staff	7.38
Sustainability in practice	3.79

Prerequisites/Readiness:

- Does your health system have a strategic goal that aligns with vaccine uptake?
- Are there vaccine champions outside of pulmonary medicine that can be leveraged for collaboration?
- Do patients find convenience in having on-demand services available for point of care vaccination?
- Are providers amenable to hand off patients for a point-of-care vaccination outside of pulmonary medicine?
- Is the pop-up clinic available during all pulmonary medicine clinic hours? Or only during select days/times?
- Are there system policies that can support or will inhibit a pop-up clinic?
- Are documentation and coding/billing workflows set up that can support a referral to a pop-up clinic?

Implementation Tactics:

Direct evidence. Health systems that created pop up clinics did so as part of larger health system initiatives. A drop-in/drive-by vaccine clinic immediately adjacent to the waiting room. It increased patient control and convenience but collaboration with primary care proved more difficult than anticipated.

Tools:

Workflow guides for documentation and patient hand off to pop-up sites, creating an implementation team, checklists for routine engagement, volume estimators, clearly scheduled days, times, and location for roving unit.

Factors Influencing Implementation:

Clinic: Proximity of pop-up to pulmonary clinic, space, waiting time, handoff process and ability to vaccinate without adding substantial visit burden.

Health system: Vaccine supply, staffing, policy and administrative process.

Community: Coordination with PCPs, IIS, and other vaccination locations.

▶ RETURN TO THE TABLE OF CONTENTS

Domain 3: Electronic Health Records (EHRs) Interventions

Electronic Health Records were key enablers of many interventions across health systems. Various uses were identified for enabling reminders, enhancing order sets, providing documentation capabilities, and are a critical tool in enabling registry integration.

There are several specific interventions, however, that created specific EHR enhancements, designed to specifically facilitate improved provider engagement regarding vaccination. The goal of these interventions was to leverage EHR capabilities, tailored to vaccination, to reduce friction for providers to engage, document, and track vaccine-related encounters

These interventions specifically targeted the provider, clinic, and health system level and required a high implementation effort to address the technical infrastructure. It is notable that each system that developed EHR enhancements required additional implementation of team members from IT and the EHR development teams within their systems.

It is further necessary to recognize that while the main objective of these interventions was to improve provider capabilities in clinic, there are a number of tactics that needed to be considered prior to enabling a new EHR capability; mainly health system policy changes and cross functional team engagements to obtain the appropriate approvals and move forward with enhancements.

Vaccine Counseling Dot-Phrase

Description: Established a specific EHR tool to simplify and standardize physician documentation when vaccine counseling was performed.

Implementation consideration	Ranking (0-10)
Relevance to practice setting	9.00
Feasibility to implement in routine practice	7.67
Fit with existing clinic work-flows	7.67
Acceptability to our staff	8.17
Sustainability in practice	8.00

Prerequisites/Readiness:

- Do you have an EHR or IT support team that can help to develop EHR capabilities?
- Are there health system policies that guide the development of EHR tools?
- Are providers amenable to using EHR tools for documentation?

RETURN TO THE TABLE OF CONTENTS

Implementation Tactics:

Strong evidence. Embedding smart phrases, prompts, and note-template changes was a major driver of improving physician awareness regarding vaccine discussions, prompting discussions with patients, and served as a sustainability mechanism for the initiative.

- Standardize counseling language.
- Reduce documentation burden.
- Support consistent messaging across providers.
- Reminder for providers.
- Creates searchable documentation fields for future tracking/query.

Tools:

Counseling dot-phrase, hesitant-patient language, shared decision-making language, refusal documentation and follow-up recommendations.

Factors Influencing Implementation:

Clinic: Clinician buy-in, reminder salience, documentation burden and continuous adaptation based on user feedback

Health system: IT support/EHR governance.

Community: Accurate vaccine status and local patient concerns.

Vaccine Documentation Dot-Phrase

Description: Established a specific EHR tool to simplify and standardize physician documentation for offering vaccinations in clinic.

Implementation consideration	Ranking (0-10)
Relevance to practice setting	7.29
Feasibility to implement in routine practice	6.14
Fit with existing clinic work-flows	6.43
Acceptability to our staff	7.67
Sustainability in practice	8.00

Prerequisites/Readiness:

- Do you have an EHR or IT support team that can help to develop EHR capabilities?
- Are there health-system policies that guide the development of EHR tools?
- Are providers amenable to using EHR tools for documentation?

RETURN TO THE TABLE OF CONTENTS

Implementation Tactics:

Strong evidence. Health care systems that implementation the documentation dot-phrase and adapted it based on provider feedback saw improved vaccination rates. Overtime, continuous engagement with providers was needed to adapt and improve the utility of the dot-phrase. Provider education and visual reminders on workstations to use the dot-phrase improved provider-use consistently. EHR documentation changes were among the most impactful interventions and required IT change plus clinic documentation change plus provider support/training.

- Assess whether current EMR documentation fields already capture required data.
- Avoid duplicative documentation.
- Use structured fields where possible rather than free text.
- Pair documentation dot-phrases with reporting requirements.

Tools:

Structured fields, smart phrases/note templates, refusal reason, and linkages to reporting.

Factors Influencing Implementation:

Clinic: Documentation burden, STAFF ROLES REGARDING DOCUMENTATION, MA/provider capacity and confidence that displayed vaccine status is correct.

Health system: EHR architecture, competing EHR transitions and IT resources.

Community: Registry accuracy.

Provider-Level Reporting of Vaccine Administration

Description: Established a dashboard that reported individual physician-level volume of patients vaccinated.

Implementation consideration	Ranking (0-10)
Relevance to practice setting	8.43
Feasibility to implement in routine practice	6.71
Fit with existing clinic work-flows	7.29
Acceptability to our staff	8.71
Sustainability in practice	7.86

Prerequisites/Readiness:

- Will the dashboard provide clinic level or individual provider level insights on performance?
- Does the clinic have a culture of constructive feedback?
- Are there IT resources available to support reporting and tracking to keep the dashboard up-to-date?
- Is there agreement on data accuracy and source?
- Are there mechanisms in place to provide actionable guidance to providers in light of dashboard reports?

RETURN TO THE TABLE OF CONTENTS

Implementation Tactics:

Strong evidence. Several EHR tools were available to help health systems obtain accurate reports of vaccination rates. These reports were useful in creating a consistent linkage to an established EHR-based dashboard. Health systems used provider benchmarking and incentives and explicitly endorsed provider audit/feedback as constructive mechanisms to guide improvements.

Tools:

Provider dashboard, monthly report, peer comparison, data definitions/metric glossary, and feedback guide.

Factors Influencing Implementation:

Clinic: Feedback culture, clinician trust, whether comparison is perceived as support vs. punishment, and linkage to actionable improvement.

Health system: Data infrastructure and analyst/IT support.

Community: IIS completeness influences validity.

Metrics:

- **Percentage of eligible patients screened**
- **Percentage counseled**
- **Percentage vaccinated**
- **Percentage declining vaccination**
- **Missed opportunity rate**
- **Documentation completion rate**

Automated Integration of State Registry Data with Health System Data

Description: Established an automated workflow to integrate state registry into the health system EMR.

Implementation consideration	Ranking (0-10)
Relevance to practice setting	9.29
Feasibility to implement in routine practice	6.43
Fit with existing clinic work-flows	7.43
Acceptability to our staff	7.29
Sustainability in practice	7.29

Prerequisites/Readiness:

- Is there EHR capability available for an automated data exchange?
- Are interoperability standards used that enable automation of data exchange?

▶ RETURN TO THE TABLE OF CONTENTS

- Does your state enable an automated interface with health system EHRs?
- Are there legal agreements that need to be put in place to enable automated data exchange?
- Is there an IT team that can offer technical support for standing up and ongoing maintenance of the automated workflow?

Implementation Tactics:

Among the most important enabling interventions. Automated registry updates facilitated several health systems in improving vaccination rates. Caution was identified as registry discrepancies that can reduce physician trust. State immunization and public health department engagement is critical to the success of an automated workflow.

Barriers exist when data exchange is needed across states. Determine if IIS data exchange requires manual reconciliation or is automated. (Provider burden consideration).

State level policies about data sharing vary considerably, and health system integration of data is variable.

Tools:

- Informatics requirements checklist
  - Understand level of integration into EHR
  - Understand reconciliation (manual vs. automated)
  - Role based access for pulmonary providers to access data in EHR
  - Pull and push requirements
- Registry data field mapping
- Data governance checklist
  - Governance structure and security
  - Role based access policies (level of provider access- RN, MAs)
- Privacy/security review
  - State level privacy and data release policies
  - Individual rights, approvals/authorizations for release
- Testing workflow
- Error reconciliation process
- Sustainability plan

Influencing Factors:

Clinic: Clinicians must trust the record before they will reliably act on prompts or recommendations; manual reconciliation requires provider engagement (multiple clicks).

Health system: Substantial IT effort, governance and executive prioritization, agreements (DUAs) and privacy considerations.

Community: IIS structure, state policy, cross-state exchange.

Implementation Note:

This may require more technical resources than dot-phrases or reporting but should be prioritized because it supports both workflow efficiency and data accuracy.

RETURN TO THE TABLE OF CONTENTS

Clinic-Level Vaccine Administration Reporting

Description: Processes to provide feedback to providers about clinic-level rates of vaccination among eligible patients.

Clinic-level reporting should complement provider-level reporting.

Implementation consideration	Ranking (0-10)
Relevance to practice setting	8.14
Feasibility to implement in routine practice	7.00
Fit with existing clinic work-flows	7.14
Acceptability to our staff	8.00
Sustainability in practice	7.71

Prerequisites/Readiness:

- Does the clinic have a culture of constructive feedback?
- Are there IT resources available to support reporting and tracking to keep reports up to date?
- Is there agreement on where the data will source from and agreement on data accuracy?
- Are there mechanisms in place to provide actionable guidance to providers in light of reports?

Implementation Tactics:

Strong evidence. Reports are data driven tools that promoted improved engagement by providers and overall improved awareness of vaccination rates. Implementation across staff members varied across health systems, some used a safety team to monitor vaccine status and documentation, others used a single staff to develop a monthly benchmarked performance report.

Tools:

Clinic dashboard, trend reports, team-huddle template, monthly QI agenda, and intervention-tracking tool.

Influencing Factors:

Clinic: Use of data during huddles/QI meetings, connecting measures to workflow changes, and maintaining a learning rather than punitive culture.

Health System: Data/IT and analytic staffing.

Community: External registry data quality.

RETURN TO THE TABLE OF CONTENTS

Step 3: Clinic Context

Conduct Clinic Workflow and Outline a Desired State along the Workflow

Include tools for defining who screens, counsels, orders, administers, documents, and reconciles vaccines.

Recommended Activities:

- Map current workflow, identifying intersection points with care team and staff roles/activities.
- Identify duplication, handoff failures, and missed opportunities.
- Create a standardized vaccine workflow by role.
- Define escalation pathways when patients have questions or concerns.

Understand the clinical context and influencing factors for each of the possible interventions. Implementation outcomes that should be considered regarding each intervention include:

1. **Relevance:** Importance to the practice setting.
2. **Feasibility:** Likelihood of implementation in routine care.
3. **Fit:** Alignment with existing workflows.
4. **Acceptability:** Perceived support from staff.
5. **Sustainability:** Likelihood the intervention can be maintained over time.

Map Workflows

The implementation plan should be driven by a workflow map that connects:

- Patient identification.
- Vaccine eligibility screening.
- Patient education.
- Counseling.
- Ordering.

RETURN TO THE TABLE OF CONTENTS

- Administration.
- Documentation.
- Registry reconciliation.
- Reporting and feedback.

Include tools for defining staff roles to outline who screens, counsels, orders, administers, documents, and reconciles vaccines.

Outline Current Workflow

Follow the path of the patient from the time they schedule their appointment through the clinic and document:

- Where they go.
- Who interacts with them.
- What each staff member does.
- What information is collected.
- What information is entered into the EHR.
- What decisions are made.
- What orders or referrals are generated.
- Where waiting occurs.
- Where staff leave the examination room to obtain information or resources.
- Where tasks are duplicated.
- Where workarounds occur.

Do not assume that all providers or clinic sessions operate identically.

A typical outpatient pulmonary medicine workflow might include the following phases:

Appointment Scheduled → Pre-Visit Preparation → Patient Arrival → Registration → Rooming → Clinical Assessment → Provider Visit → Orders/Referrals → Patient Education → Checkout → Follow-Up

During each of these phases there may be opportunities to position awareness efforts, discussions, or education about vaccination.

Pulmonary Medicine Clinic Workflow Mapping Worksheet

Purpose

Use this worksheet to understand how vaccine-related care currently occurs within a pulmonary medicine clinic and determine **where and how implementation interventions should be introduced**.

The worksheet connects three components of implementation planning:

1. Workflow Mapping

Where does the activity occur, who performs it, and where are gaps or opportunities?

▶ RETURN TO THE TABLE OF CONTENTS

2. CFIR 2.0 Organizational Readiness

What contextual factors explain why the current process succeeds or fails?

3. Intervention Prioritization

Which interventions offer the strongest combination of relevance, feasibility, fit, acceptability, and sustainability for this clinic?

DEFINE THE WORKFLOW

Define the Workflow Boundaries

Where does the workflow begin?

Examples: scheduling, pre-visit planning, patient arrival

Where does the workflow end?

Examples: checkout, vaccination, referral to pharmacy, follow-up

MAP THE CURRENT-STATE WORKFLOW

Walk through what happens with an actual patient.

Document what currently happens rather than what clinic policy says should happen.

Workflow Stage	What Happens Now?	Who Does It?	Tool/EHR Function Used	Decision or Handoff?
Pre-visit Planning				
Scheduling				
Patient Check-In				
Rooming				
Medication/History Review				
Vaccine Status Assessment				
Clinical Assessment				
Vaccine Recommendation				
Vaccine Counseling				
Vaccine Order				
Vaccine Administration				
External referral, if needed.				
Documentation				
Checkout				
Follow-Up				
Other				

Within each workflow step, define WHO? Does WHAT? WHEN? HOW?

▶ RETURN TO THE TABLE OF CONTENTS

Outline the information needed to implement vaccination:

- EHR Record
- State Immunization Registry
- Medication List
- Diagnosis/Problem List
- Provider Assessment
- External Medical Record
- Other: _____

What decision support exists for the staff member to execute the task?

- EHR Alert
- Standing Order
- Standard Workflow
- Checklist
- Verbal Instruction
- Patient Request
- Individual Clinician Memory
- Other: _____

Identify Workflow Opportunities to Implement Interventions for Vaccine Uptake

What is the preferred intervention based on clinical readiness

Do not select an intervention based solely on its overall ranking.

A highly rated intervention may perform poorly if the clinic does not have the conditions necessary to implement it.

Based on readiness scores the following matrix could offer considerations for implementation interventions: High Readiness: 4.0–5.0

The clinic has strong implementation capacity.

Consider:

- More complex intervention bundles.
- EHR automation.
- Registry integration.
- Standing-order protocols.
- Vaccine stocking and administration.

▶ RETURN TO THE TABLE OF CONTENTS

- Automated patient outreach.
- Performance dashboards.
- Broader clinic rollout.

Implementation Approach:

Workflow redesign and testing.

Moderate Readiness: 3.0–3.9

The clinic can implement change, but important barriers remain.

Consider:

- Combining simple and moderately complex interventions.
- Small-scale workflow redesign.
- Staff training plus decision support.
- Standardized screening plus counseling tools.
- Limited EHR modifications.
- Targeted PDSA cycles.

Implementation Approach:

Address major barriers while testing the intervention.

Low Readiness: 2.0–2.9

Foundational barriers may limit intervention success.

Prioritize:

- Workflow mapping.
- Role clarification.
- Basic staff education.
- Standard operating processes.
- Identifying EHR limitations.
- Simple patient education.
- Manual tracking.
- One small PDSA cycle.

▶ RETURN TO THE TABLE OF CONTENTS

Implementation Approach:

Build implementation capacity before introducing resource-intensive solutions.

Not Ready: Below 2.0

Major structural or contextual barriers exist.

Prioritize:

- Leadership engagement.
- Clarifying responsibility.
- Securing necessary resources.
- Resolving policy barriers.
- Building essential infrastructure.
- Establishing data capability.

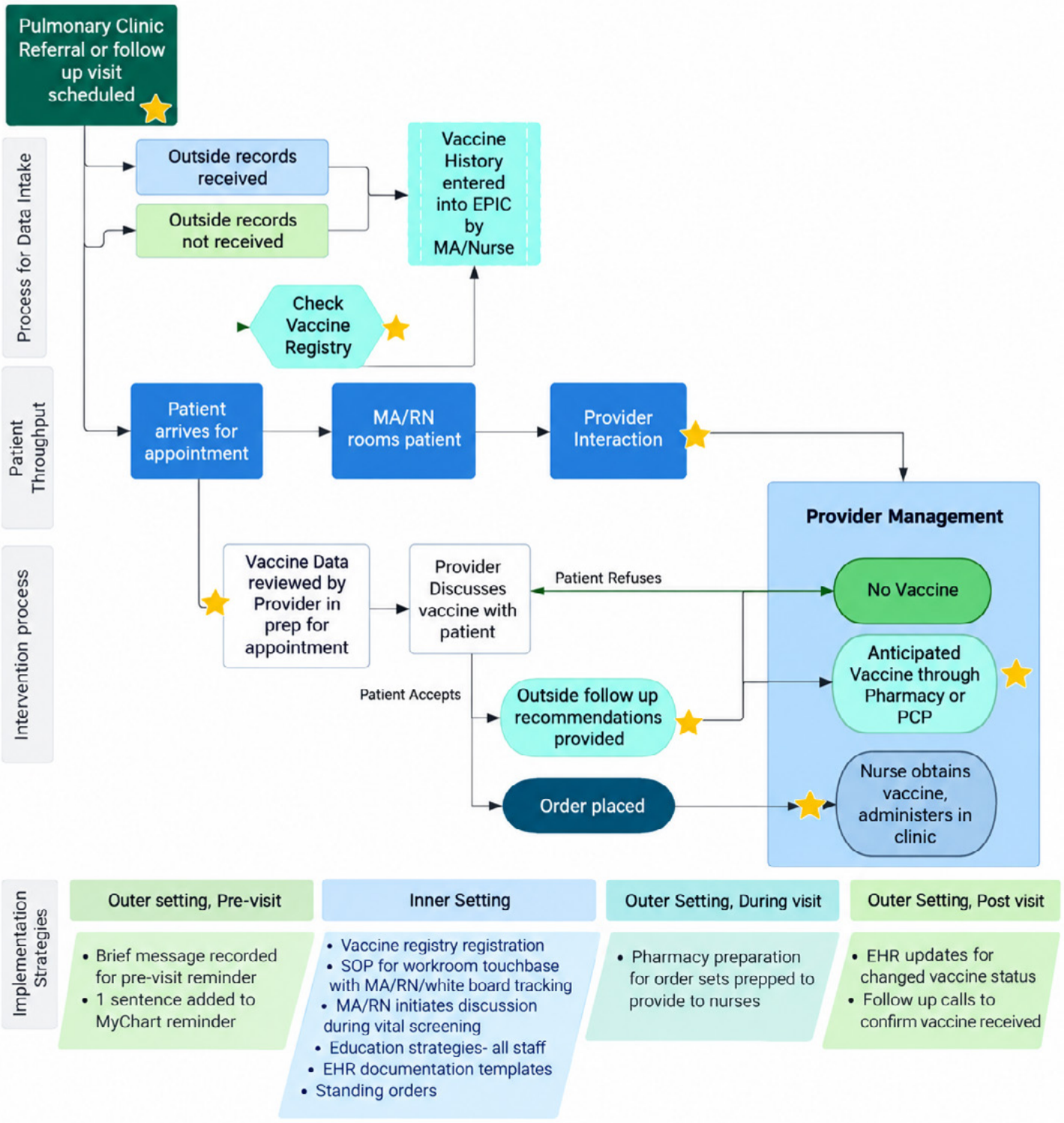
Implementation Approach:

Address enabling conditions before attempting full implementation.

Workflow mapping examples are on the next two pages.

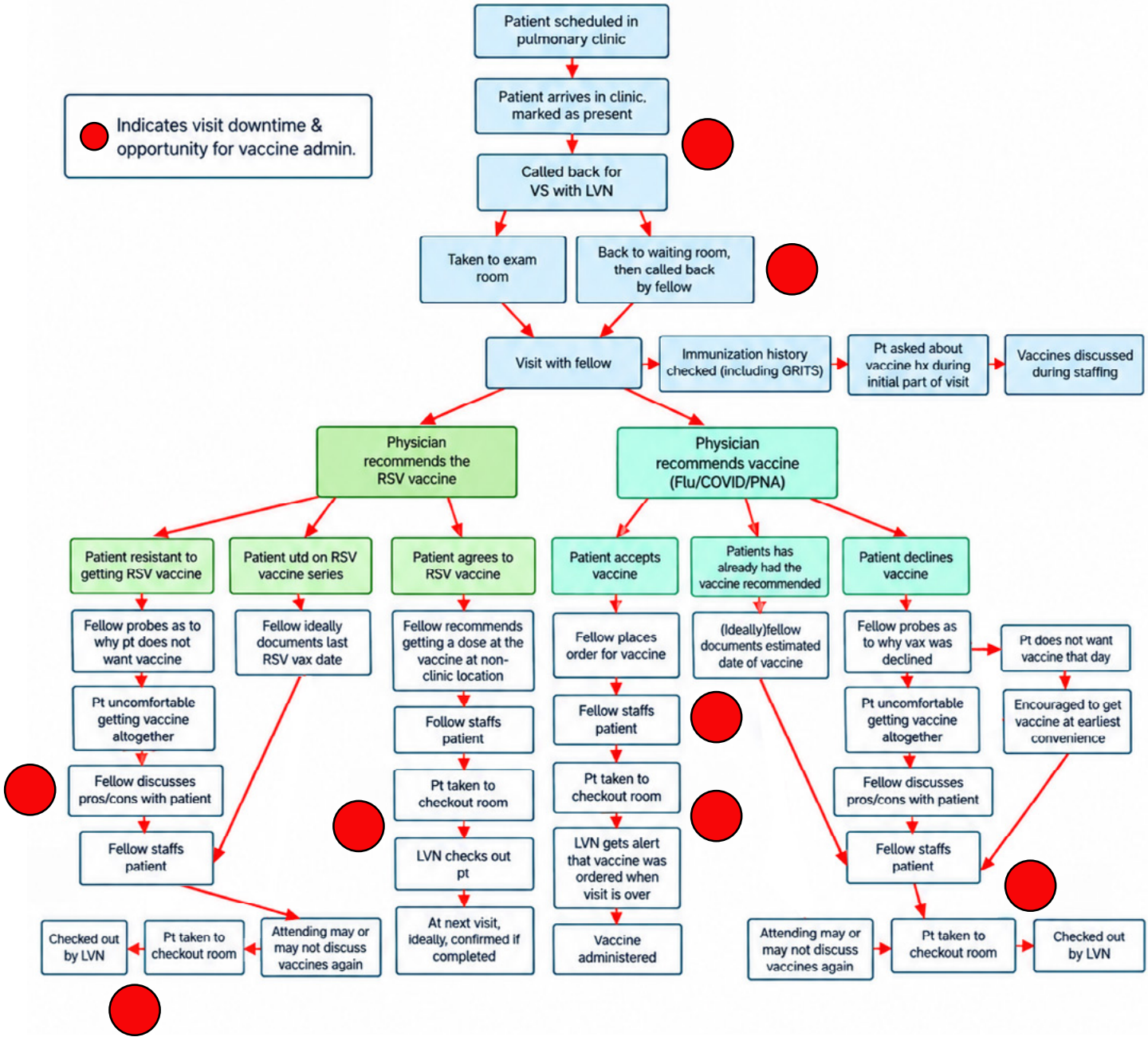
▶ RETURN TO THE TABLE OF CONTENTS

WVU's Vaccine Workflow



RETURN TO THE TABLE OF CONTENTS

Grady Health's Vaccine Workflow



RETURN TO THE TABLE OF CONTENTS

Step 4: Prioritize

A central finding from the vaccine implementation initiative health systems was that these interventions should not be viewed as isolated tactics. In fact, participating health systems used an average of three implementation strategies across different levels to enable the success of an intervention.

The strongest influencing factors that supported the success of an intervention were workflow/staffing infrastructure, having clinician support, building an IT infrastructure, creating or driving policy change, and promoting consumer engagement. Further, these were highly connected implementation strategies.

Implementation strongly depended on provider culture, staffing, IT/data infrastructure, leadership, state registry connectivity, patient trust, and clinic workflow rather than on the intervention alone.

Prioritizing interventions should be informed by the identified influencing factors.

Influencing Factors to Inform Prioritization

Level	Factors That Repeatedly Influenced Implementation
Health System	Executive/Administrative Sponsorship IT Capacity EHR Governance Vaccine Stocking/Access Policies Purchasing and Storage Reimbursement/Payment Staffing/FTE Resources Competing Organizational Priorities Ability to institutionalize the intervention rather than depend on grant-funded personnel. **Primary Barriers:** Administrative Barriers, Technical Barriers, Competing Clinical Priorities

▶ RETURN TO THE TABLE OF CONTENTS

Level	Factors That Repeatedly Influenced Implementation
Community / Outer Setting	State IIS Availability and Interoperability State/Federal Guidance Pharmacy and Primary-Care Relationships Community Practice Norms Patient Trust Social Norms and Misinformation Health-Seeking Behavior Language/Literacy Payer Sentiment
Pulmonary Clinic / Inner Setting	Exact workflow location of the intervention. Role Ownership Provider belief that vaccination is part of pulmonary practice. MA/RN Capacity Champions Repeated Education Time and Competing Priorities Physical Space Ease of Documentation Quality of Vaccine-Status Data Patient Visit Burden Ability to vaccinate same day. **Primary Barrier:** Culture among providers and perception of vaccination as part of the role in pulmonary medicine.
Sustainability	Embed the intervention into EHRs, note templates, nursing workflow, policies, and routine QI rather than treating it as a project. Sites also used annual/repeat training, champions, and visual reminders. Internal risks included turnover, reimbursement uncertainty, loss of specialized staff, leadership disengagement, and dependence on external funding.

The evidence points toward a core intervention that is informed by an implementation strategy bundled approach.

For example, *stock vaccines in clinic* is not really one intervention operationally, it requires policy authorization, purchasing/storage, a screening workflow, role assignment, provider engagement, EHR documentation and often patient education. Likewise, a dot-phrase as an EHR tool will have little effect if clinicians do not view vaccination as part of their role or do not trust the underlying vaccine-status data.

Sustainability findings from the health systems suggest that durable programs embed vaccine work into routine EHR documentation, clinic workflows, standardize procedures and workforce expectations.

▶ RETURN TO THE TABLE OF CONTENTS

Step 5: Execute

Pilot in one clinic, provider group, or patient population before scaling. Establish metrics and cadence for review, identify process for evaluation and adaptations. Track refinements and process for changes or adaptations

Consider tools to support the execution and tracking:

- Pilot Planning Worksheet
- 30/60/90-Day Implementation Checklist
- Barrier Tracking Log
- Staff Feedback Survey
- Patient Feedback Survey
- Adaptation Tracking Table

▶ RETURN TO THE TABLE OF CONTENTS

ATS

Step 6: Evaluate and Monitor

Implementation Measures

Re-AIM Framework

Re-AIM is a common framework used for program planners and evaluators to consider outcomes of relevance to an implementation effort. It provides a framework to broadly assess the essential elements related to program implementation.

Framework Component	Measure and Definitions in Vaccine Implementation
Reach *Is the intervention penetrating into its intended audience?*	• Vaccine Eligibility (#patients assessed for eligibility / total patients encountered) • Uptake Among Clinics and Providers • Characteristics of Participants Compared to Non-Participants or to Target Population
Effectiveness *Impact of the project on important clinical outcomes*	• Administered Onsite • Administered Offsite • Declinations • Recent Flu Vaccination • COVID-19 Vaccination Adherence
Adoption *Proportion and representativeness of settings and service providers willing to engage in the project*	• Eligible Patients Counseled • Vaccination Recommendations • Referrals (eligible patients referred to another site) • Characteristics of Settings or Staff Participating, Understanding Perceptions of Participation • Assess barriers and facilitators and how they were used to inform facilitation and adaptability of intervention.
Implementation *Service provider and stakeholders' fidelity to the various project elements*	• Immunization Record Access • Vaccination Documentation Completion • Feasibility – understanding time/effort to implement. • Cost – understanding direct and indirect costs. • Acceptability • Fidelity of implementing intervention across staff and settings.
Maintenance *Extent to which the project becomes a part of routine operational practices*	• Immunization Record Access • Ability to maintain the intervention workflow within clinical practice at designated time points beyond initial implementation. • What type of resources allocations have been developed to solidify intervention within system? • Robustness of policies/procedures developed to continue intervention. • Alignment to organizational mission. • Assessment of program sustainability

▶ RETURN TO THE TABLE OF CONTENTS

Implementation Assessment Tools

Acceptability of Intervention Measure (AIM)

	Completely disagree	Disagree	Neither agree nor disagree	Agree	Completely agree
1. (INSERT INTERVENTION) meets my approval.	☐	☐	☐	☐	☐
2. (INSERT INTERVENTION) is appealing to me.	☐	☐	☐	☐	☐
3. I like (INSERT INTERVENTION).	☐	☐	☐	☐	☐
4. I welcome (INSERT INTERVENTION).	☐	☐	☐	☐	☐

Intervention Appropriateness Measure (IAM)

	Completely disagree	Disagree	Neither agree nor disagree	Agree	Completely agree
1. (INSERT INTERVENTION) seems fitting.	☐	☐	☐	☐	☐
2. (INSERT INTERVENTION) seems suitable.	☐	☐	☐	☐	☐
3. (INSERT INTERVENTION) seems applicable.	☐	☐	☐	☐	☐
4. (INSERT INTERVENTION) seems like a good match.	☐	☐	☐	☐	☐

Feasibility of Intervention Measure (FIM)

	Completely disagree	Disagree	Neither agree nor disagree	Agree	Completely agree
1. (INSERT INTERVENTION) seems implementable.	☐	☐	☐	☐	☐
2. (INSERT INTERVENTION) seems possible.	☐	☐	☐	☐	☐
3. (INSERT INTERVENTION) seems doable.	☐	☐	☐	☐	☐
4. (INSERT INTERVENTION) seems easy to use.	☐	☐	☐	☐	☐

▶ RETURN TO THE TABLE OF CONTENTS

Outcome Measures

Measure	Example
Vaccine Uptake	Percentage of eligible patients receiving recommended vaccine.
Counseling Completion	Percentage of eligible patients with documented vaccine Counseling.
Administration Rate	Percentage of eligible patients vaccinated onsite or referred.
Missed Opportunity Rate	Percentage of eligible patients seen without Counseling, ordering, or referral.
Patient Understanding	Percentage of patients reporting they received clear vaccine information.

Measure Definitions

Measure Name	Measure Frequency	Measure Definition	
		Numerator	Denominator
Immunization Record Access	Monthly	Number of patients who have access to their own immunization records.	Total number of patients encountered.
Vaccine Eligibility	Monthly	Number of patients assessed for vaccine eligibility.	Total number of patients encountered.
Eligible Patients Counseled	Monthly	Number of eligible patients counseled by clinical team.	Total number of eligible patients encountered.
Referrals	Monthly	Number of eligible patients referred to another site for vaccination.	Total number of eligible patients encountered.
Administered Onsite	Monthly	Number of immunizations administered onsite.	Total number of eligible patients encountered.
Administered Offsite	Monthly	Number of immunizations administered at another site.	Total number of eligible patients encountered.
Declinations	Monthly	Number of eligible patients refusing vaccination.	Total number of eligible patients encountered.
Vaccination Recommendations	Monthly	Number of patients who received vaccination recommendations.	Total number of eligible patients encountered.
Vaccination Documentation	Monthly	Number of patients where vaccine records were documented.	Total number of eligible patients encountered.

▶ RETURN TO THE TABLE OF CONTENTS

Measure Definitions			
Measure Name	**Measure Frequency**	**Measure Definition**	
		Numerator	**Denominator**
Recent Flu Vaccination	Monthly	Total count of patients aged 18 years and older who received an influenza immunization OR who reported previous receipt of an influenza immunization between Aug. 1 and April 30 (baseline period for recent vaccines).	Total number of eligible patients encountered.
Number of Patients by COVID-19 Vaccination Count	Monthly	Number of patients by COVID-19 Vaccination Count (1, 2, 3, 4 and more).	N/A
COVID-19 Vaccination Compliance	Monthly	Number of patients that are up to date on their COVID vaccinations.	Total number of eligible patients encountered.

Process Measures

Measure	**Example**
Screening Completion	Percentage of eligible patients screened for vaccine status.
Dot-Phrase Use	Percentage of eligible encounters using counseling dot-phrase.
Registry Reconciliation	Achieved reconciliation.
Reminder Delivery	Percentage of eligible patients receiving portal/SMS/phone reminder.
Education Material Exposure	Percentage of exam rooms or visit work-flows including patient education materials.
Audit-Feedback Completion	Number of monthly feedback sessions completed with [target pulmonary population: physician/nurse/etc].

▶ RETURN TO THE TABLE OF CONTENTS

Sustainability Measures

Measure	Why It Matters
Visit Length	Ensures the intervention does not substantially slow clinic flow.
Staff Burden	Detects unintended workload increases.
Provider Satisfaction	Assesses acceptability.
Patient Complaints or Confusion	Identifies communication problems.
Documentation Duplication	Ensures EMR changes do not create unnecessary burden
Vaccine Wastage	Important if vaccines are stocked onsite.

Modification and Adaptations

Implementation projects in medical clinics rarely proceed exactly as originally designed. Changes in staffing, patient volume, clinical workflow, leadership priorities, electronic health record functionality, reimbursement requirements, and available resources may require implementation teams to modify how an intervention is introduced, supported, or sustained. These changes are not necessarily implementation failures. Thoughtful adaptations may improve feasibility, acceptability, equity, and fit within the local clinical context. However, when modifications are not systematically tracked, it becomes difficult to determine what was actually implemented, why outcomes varied, or whether the approach can be replicated in another setting.

The **Framework for Reporting Adaptations and Modifications to Implementation Strategies, or FRAME-IS**, provides a structured method for documenting changes made to the strategies used to implement a clinical intervention. It complements the original FRAME, which was designed primarily to characterize modifications to evidence-based interventions. FRAME-IS focuses specifically on implementation strategies, such as clinician education, workflow redesign, audit and feedback, facilitation, reminders, implementation team meetings, and patient-engagement processes.

Governance for tracking modifications: Clinics should adopt a principle of **"flexibility in form, fidelity to function."** Local adaptation should be encouraged when it improves clinical fit, access, equity, or sustainability, provided that the team understands and protects the essential function of the intervention and its implementation strategies. FRAME-IS provides the structure needed to make these decisions transparent, evidence-informed, and reproducible.

Using FRAME-IS creates an auditable record of how implementation evolved over time. This record strengthens interpretation of implementation outcomes, distinguishes intentional adaptation from unplanned drift, supports organizational learning, and improves the transferability of findings to other clinics. It can also help teams determine whether an observed outcome reflects the clinical intervention itself, the implementation strategy, the local context, or a modification made during implementation.

▶ RETURN TO THE TABLE OF CONTENTS

Adaptation review should be treated as a continuous learning process rather than a single end-of-project activity. FRAME-IS documentation is most useful when the original intervention and implementation strategies are clearly specified before implementation begins and changes are recorded close to the time they occur.

Adaptation Log

Tracks changes made during implementation and whether they improve feasibility, fit, acceptability, or sustainability. Leverage FRAME-IS matrix here.

Implementation Strategy and Intervention	Date Initiated	Date Changed	What was modified?	What was the rationale for initiating a change?	Who initiated the change?	What is the goal for the modification?

▶ RETURN TO THE TABLE OF CONTENTS

Appendices and References

Appendix: Patient Education Materials

Editable poster, flyer, and handout templates.

Appendix: Vaccine Counseling Scripts

Brief scripts for routine counseling, hesitancy, refusal, contraindications, and follow-up.

Appendix: EMR Dot-Phrase Library

Standardized dot-phrases for counseling, documentation, refusal, follow-up, and care coordination.

Appendix: Reporting Dashboard Template

Provider-level and clinic-level reporting examples.

References:

▶ RETURN TO THE TABLE OF CONTENTS