WORKFLOW DETERMINATION TOOL FOR VACCINE ADMINISTRATION

Vaccine 2D Barcode Scanning Implementation Toolkit

National Center for Immunization and Respiratory Diseases (NCIRD)
Centers for Disease Control and Prevention (CDC)

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Introduction

The Workflow Determination Tool is intended for site-level administrators and staff members who may be responsible for the vaccine administration workflow. The Tool provides suggested steps and supporting resources for revising the vaccine administration workflow to incorporate two-dimensional (2D) barcode scanning.

This Tool is part of the Vaccine 2D Barcode Scanning Implementation Toolkit, which contains a series of resources and tools to support different aspects and phases of vaccine 2D barcode scanning implementation in ambulatory clinics, health care facilities, or health systems.

Redesigning the Vaccine Administration Workflow for 2D Barcode Scanning

Thoughtful incorporation of 2D barcode scanning into the vaccine administration workflow is key for high staff engagement and consistent scanning rates. Follow the steps below to determine how to best incorporate scanning into your clinic's workflow. Further details on the steps can be found throughout this Tool.

1 **Communicate plans for 2D barcode scanning implementation to staff.**

Educate staff on 2D barcode scanning, communicate changes that they should anticipate, and request participation and cooperation.

2 **Prepare for and conduct workflow redesign session.**

Review the floorplan and current vaccine administration workflow in order to brainstorm potential 2D barcode scanner locations. Collaborate and negotiate within the team to agree on scanner locations and determine additional technology needs based on the redesigned workflow.

3 **Adjust protocol/standard operating procedure (SOP) and update training materials to match redesigned workflow.**

Prepare for the roll-out of the redesigned workflow to all staff and other stakeholders.

1 Communicate Plans for Implementation

Once your site has decided to implement vaccine 2D barcode scanning, ensure that the leadership and staff are aware of, and educated about, the initiative. Staff members' daily activities may be affected by the implementation, so it is important that they are on board and included in the planning process.

> **🔑 Key for success:** Engage leaders and staff in scanner implementation discussions—their expertise is valuable and their buy-in is critical.

▸ Review the other materials in the Toolkit, including the one-pager, that can assist with raising awareness and educating staff members about the project.

▸ Consider stakeholders and staff affected by workflow changes.

- Determine the appropriate venue for information-sharing with each stakeholder group. Venues may include weekly meetings, daily huddles, email announcements, fliers in the breakroom, or the workflow redesign session.

- Provide a forum for questions and answers and provide contact information so that stakeholders can ask questions later.

▸ Include answers to the following questions when communicating with stakeholders:

- **WHAT** is 2D barcode scanning?

- **WHY** implement 2D barcode scanning rather than continue with the existing workflow?

- **WHEN** will 2D barcode scanning be implemented?

- **WHO** will 2D barcode scanning benefit?

- **HOW** can stakeholders participate in the implementation of 2D barcode scanning and prepare for a workflow redesign session?

2 Workflow Redesign Session: Gather Stakeholders

Key stakeholders will need to collaborate for a productive redesign session. The introduction of 2D barcode scanning into the vaccine administration workflow will require brainstorming and, potentially, iterations with the staff's input. It is important that the appropriate stakeholder groups and decision-makers are present. Inviting the key stakeholders will enable open discussion about the feasibility of the redesigned workflow.

Potential Attendees

- Project lead
- Project champion
- Electronic medical record (EMR) personnel
- IT personnel
- Office manager
- Vaccine coordinator
- Head nurse
- Medical assistant(s)

Considerations

- Include health care providers in workflow redesign discussions so they can voice their preferences, contribute their day-to-day expertise with the workflow, and identify any concerns from the start.

- Consider who may need to be consulted regarding:
  · The purchase of scanners.
  · The installation of scanners.
  · The procurement of additional tools (e.g., computer, stands, mobile workstation).
  · The location of the scanners and additional tools to easily integrate the process into current workflow.

- Think of key decision points, opportunities, and barriers that are best discussed in person.

- Determine which levels of leadership, if applicable, should be engaged in the session and which may be updated later.

② Workflow Redesign Session: Understand the Current Workflow

Before diving into a redesigned workflow, consider taking the time to draw and visualize the current workflow. Starting discussions with the existing process may help the team incorporate 2D barcode scanning seamlessly into the current workflow.

Activity

1. Start by drawing out the floorplan of the site using available materials (e.g., whiteboard, paper) to help with visualization of the current vaccine administration workflow.

2. List each step of the current workflow, using the sample process map to the right as an example. Determine what level of detail may be needed. Revisit your process map throughout the discussions to edit as needed.

   - Consider writing the steps on sticky notes so they can be moved around and reordered.

   - Keep in mind the resources (e.g., computer) and physical location (e.g., medication refrigerator, patient room) required for each step.

3. Assign the steps in the process map to the respective locations on the floorplan using sticky notes. Include arrows to show the order of events.

4. Review the process map for feasibility and the floorplan for accuracy and ensure the health care providers validate the information.

Sample Process Map of Current Workflow

Receive patient vaccine order
↓
Collect ordered vaccine
↓
Prepare vaccine
↓
Manually enter National Drug Code (NDC), lot number, and expiration date into the EMR
↓
Provide patient with Vaccine Information Statement (VIS)
↓
Administer vaccine
↓
Properly dispose of waste
↓
Complete vaccine record manually (e.g., time, site of vaccination)
↓
Save vaccine administration record

2 Workflow Redesign Session: Identify Potential Scanner Locations

Activity

Discuss options for where the step "Scan 2D barcode on vaccine" could be incorporated into the current vaccine administration workflow. Discuss the location of scanners, if the location aligns with the redesigned workflow, and if the scanner location encourages scanning prior to administration. The goal is to make scanning second nature so that it seamlessly fits into the redesigned workflow.

The scanner location should:

✓ Be convenient or in the line of sight for health care providers' workflows (e.g., near vaccine refrigerator, draw stations, verification locations, or other obvious locations).

✓ Minimize extra steps to seamlessly blend scanning into the vaccine administration workflow.

✓ Support scanning prior to administration of vaccines to maximize benefits, including:

- **Pop-up alerts,** as available, to warn staff of incorrect or expired vaccines
- **Immediate disposal of used products** (e.g., syringes or vials), so that staff do not need to retain them for data entry

Benefits and challenges of two common scanner locations are identified in the table below.

Location	Benefits Identified	Challenges Identified
Refrigerator/ Draw Area	• Pulling/preparing vaccine already occurs in this area. • Single or fewer computers/ scanners needed, even for greater staff and vaccine volume.	• May require new computer, if not already there. • Back up scanner suggested, during busy times or if the primary scanner has problems.
Individual Desks	• Enough computers may already be in place. • Familiar location for previous entry/workflow process.	• May add steps (worse for some layouts) if not part of vaccine administration path. • Requires as many scanners as individual work stations.

② Workflow Redesign Session: Discuss Logistics

Once ideal locations for scanners have been identified, discuss the logistics for installing the scanners in the identified locations. It is possible that some barriers to adherence may be anticipated during logistics discussions and can be prevented with new equipment, rearranging of rooms, or other creative solutions.

The IT support, EMR staff, and office manager should be engaged in the workflow redesign session to discuss the feasibility of scanner installation in the desired location and to help decide what additional equipment—including computers with EMR software installed, scanner stands, scanner mounts, corded scanners, or cordless scanners—is needed to best integrate 2D barcode scanning into the workflow.

Considerations

- Is there enough space at the potential location to accommodate a scanner?
  - Is there space on the counter/surface for the scanner and a stand?
  - Is there space on the wall for the scanner and a mount?
  - Could a wireless scanner provide more flexibility?
- Can the room be rearranged (e.g., desks, refrigerator) to accommodate the scanner and the workflow?
- Is there a computer or computing device in the room?
- Is there space on the wall or near the scanning station to store configuration barcodes and troubleshooting tips?
- Is there space on the wall or near the scanning station to post reminders to scan?
- Can a wireless scanner solve any problems around computer location or lack of space?

Staff may need to test and iterate to come to a consensus on a process that is best for the workflow. Additionally, stakeholders may need to work with the office manager to determine the technology and hardware to be purchased, moved, and installed. Note that in a large health system, procurement decisions may be made centrally, and stakeholders will need to work with this central entity.

> Findings from a 2016 to 2017 pilot found that, in aggregate, installing scanners in multiple locations led to higher scanning rates than at a single location. In particular, the refrigerator/draw/prep area paired with another location (used equally or as a primary with a backup) had the highest scanning rates.
>
> View the **Lessons Learned** supplement for more details on the 2016 to 2017 pilot and additional findings.

2 Workflow Redesign Session: Determine Technology Needs

Use the checklist below as a guide to document the 2D barcode scanner locations and to describe the technology needs to IT staff, EMR staff, and/or the office manager. Make sure that all scanners, scanner support equipment, and scanner locations are included while reviewing the checklist.

- ☐ List potential scanner locations.

- ☐ Consider number of scanners needed at each location.

- ☐ Confirm if a computer or computing device is present at all locations.
    - ☐ Identify any computers that may need to be moved to a different location.
    - ☐ Determine if any computers would need to be installed.

- ☐ Determine if wired and wireless scanners may be preferred in each location.
    - ☐ If a wired scanner is preferred, determine if there is a minimum length cord required.

- ☐ Determine if wall mounts or stands would be needed or desired at each location.

- ☐ Determine if any scanners would be used at a mobile station and if additional materials or hardware would be needed.

3 | Adjust Protocol and Update Training Materials

Any adjustments to the vaccine administration workflow should be communicated to staff. Train staff on new protocols and SOPs to ensure consistent 2D barcode scanning during vaccine administration in daily practice.

Adjust Protocol | To promote buy-in to new scanning protocols for vaccine administration, staff should be informed of any adjustments to protocol (e.g., whether scanning is mandatory or a highly encouraged practice).

- ☐ Determine if scanning should be a mandatory practice.
- ☐ Communicate expectations from the start about how scanning will be monitored.
- ☐ Adjust SOPs and quality-assurance procedures to match the redesigned workflow.
- ☐ Ensure that staff members are clear on expectations prior to the training and address any questions or feedback that they may have.

Update Training Materials | To reduce any potential confusion, training materials should be reviewed and tailored to match your site's needs.

- ☐ Confirm that training materials match the redesigned workflow and specify the new protocol.
- ☐ Walk through the redesigned workflow, if possible, to ensure that all staff members have a clear understanding of any changes.
- ☐ Keep training materials accessible to staff to reference as needed.

Anticipate Protocol Breaches | An inconvenient workflow can deter health care providers from practicing proper vaccine 2D barcode scanning. Anticipate potential areas of noncompliance and proactively address them in the revised protocol and staff trainings.

- ☐ The vaccine should be scanned **PRIOR** to vaccine administration to take advantage of safety measures (e.g., alerts to confirm that the scanned vaccine matches the vaccine order).
- ☐ The time of vaccination and site of injection should be entered **AFTER** vaccine administration when these data points become available.

Consider how the workflow may be impacted during busy times of the year:

It can be hard to adjust to a new workflow and deal with challenges when the staff is already busy.

An alternate workflow may be beneficial or necessary during mass vaccination periods, such as flu season.

Resources

More information on incorporating 2D barcode scanning into the vaccine administration workflow can be found in the following documents:

[Lessons Learned on Workflow from Scalability Pilot](#)

[Implementation Pilot for Two-Dimensional (2D) Vaccine Barcode Utilization: Additional Workflow Analysis (WFA) Final Report](#)

For more information, contact CDC
1-800-CDC-INFO (232-4636)
TTY: 1-888-232-6348 | www.cdc.gov