

Optimizing Biospecimen Workflows: Streamlining Clinical Trial Blood Collection Through a Novel Integration of Enterprise I.T. Systems

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1. Background

The Research Biofluid Management Unit (RBMU) of the Clinical Trials Office (CTO) at NYU Langone Health (NYULH) Perlmutter Cancer Center (PCC) is responsible for clinical trial biofluid collections in collaboration with the CTO clinical coordination unit (CCU). Before 2022, CCU staff emailed requests for blood collections to RBMU as an Excel attachment “research ticket,” prompting RBMU to deliver a patient- and visit-specific blood kit to the clinic. One research ticket was completed for each timepoint and included redundant or erroneous patient demographics, appointment, and specimen information. RBMU received hundreds of emailed tickets that frequently required revision due to schedule add-ons, typos, or errors. The email ticket system required CCU staff to monitor Epic electronic medical records (EMR) for schedule changes. Errors in tickets and add-ons resulted in missed or erroneous collections, delays in lab and clinical workflows, and longer wait times for patients on research studies. A more sophisticated and automated system was needed.

2. Goals

We aimed to replace the existing research ticket email workflow with an integration between enterprise laboratory information management system (LIMS) LabVantage and Epic EMR. The new request system would reduce human error and last-minute requests by automating patient demographics and real-time appointment updates from Epic to LabVantage, ultimately streamlining kit delivery, blood collection, and downstream sample processing.

3. Solutions and Methods

In 2018, a clinical trial management project began development with LIMS LabVantage and Epic EMR integration and enhancement. Project requirements included:

- Capture study information in LabVantage via integration with enterprise clinical research management system (CRMS)
- Automatically enroll participants in LabVantage studies based on CRMS and Epic enrollment
- Build clinical protocols in LabVantage outlining specimen collection schedules
- Create a new “research blood draw” order in Epic that staff can link to patients’ lab or infusion appointments
- Develop a scheduling integration to show research-specific Epic appointments within LabVantage
- Build a platform in LabVantage for CCU staff to request appointment-specific blood kits
- Create a calendar to track expected samples with real-time automatic Epic appointment updates based on visit check-ins, completions, rescheduling, cancelations, and no-shows
- Train faculty group practice schedulers, phlebotomists, infusion nurses, and research staff

4. Outcomes

In July 2022, the Epic-LabVantage integration replaced the email-Excel research ticket for PCC outpatient blood collections in Manhattan. Currently, 90 percent of all clinical trial blood specimens are collected using this system. Over 200 NYULH personnel were trained on new workflows in Epic and LabVantage.

Category: Network Operations, Decentralized Trials, and Multi-site Research – Completed project

The integration eliminated the risk of inaccurate patient demographics in specimen requests by replacing Excel and email with information automatically pulled from patients' charts. Automatic Epic appointment updates decreased the occurrence of last-minute kit requests by 50 percent and eliminated the risk for missed visits caused by unsent Excel tickets. Since implementation, the Epic-LabVantage integration has facilitated 13,000 specimen collections for 250 clinical trials with Epic research blood draw orders.

5. Lessons Learned and Future Directions

Integrating NYULH Epic EMR with LIMS LabVantage streamlined clinical trial specimen management for clinical and laboratory staff. Accurate patient demographics and real-time automated updates to the specimen calendar reduced errors on requisition forms, missed or incorrect specimen collections, and delays in sample collection and processing downstream. Next steps include expanding the Epic-LabVantage integration to include blood and tissue collections at inpatient sites and NYULH PCC Long Island and Brooklyn locations.

Figure

Images:

(BEFORE) Excel Document Research Ticket (printed):

Human Specimen Resource Center
RESEARCH NON-CLINICAL SAMPLE COLLECTION
LABORATORY SERVICES

Research RUC Coordinator/Subscriber: Emily Hines

Do NOT draw tube until patient has been seen by MHP

Patient Name: Patient, Test
DOB: 876543
DOB: U/1/1900
Last Date: 1/1/99
Study #: 588-21013
Screen ID: 02_001
Patient ID: N/A
Cycle/Day: C1D1
Collection: Phase 1 combo safety

Patient Visit: Blood Add Tissue Urine Other

BLOOD SPECIMEN INFORMATION

Requires Centrifuge
Group Response: Requires HIBC Processing
Collection Facility:
Appointment Time:
 Requires Pharmacokinetics
PK Time Point:
PK Instructions:
 Requires Pharmacodynamics
PK Time Point:
PK Instructions:

Individual requests:
Cytokines PK + PD
Cytokines PK + PD
Half-Plasma PK
Cytokines Collection
CDNA
PSAC
Serum Protein Markers

(AFTER) LabVantage Request Platform with Epic appointment integration:

Demographics
MRN: 19054472
Last Name: MILK
Birth Date: 01/14/1976
Sex: Female
First Name: JAY

Appointment Information
Appointment ID: 48611199
Appointment Date: 06/15/2022
Appointment Time: 1:30 PM
Appointment Visit Type: LAB-LV
Appointment Department: CCRPL
Appointment Floor: TH CC INFUSION-5 FL
Infusion Chair: INF-08
Appointment Status: Scheduled
Appointment Update Date Time: 06/15/2022

Orders

Order Number	Parent Order Number	Procedure Order Text	Order Department	Order Status	Participant
<input type="checkbox"/> 15284176		RESEARCH BLOOD DRAW POST DRAW 1	RESEARCH	Scheduled	
<input checked="" type="checkbox"/> 15284175		RESEARCH BLOOD DRAW SINGLE DRAW	RESEARCH	Scheduled	

LabVantage
Add Event

MRN * 19054472
Participant ID (S19-01947 | A8102 + A8683)
Wait Definition C2015
Wait Definition Timepoint C2015 Pre-Dose A8102
Wait * C2015
Label A8680 PK Plasma -Pre-dose **place on wet ice, PD-Cytokines (F,PO Serum (F)
Notes
Wait Date * 06/15/2022
Wait Time (H:MM) * 01:30 PM
Collection Facility CC - 34