



Implementing an Advanced Sample Management System to a Clinical Biobank for the collection, storage and testing of colorectal cancer samples

REDEFINE QUALITY • DRIVE PRODUCTIVITY

CONFIDENCE IN EVERY SAMPLE

Established to collect, process, store, and ultimately test clinical samples for the discovery and development of new innovative diagnostic tools and biomarkers such as circulating tumor cells and circulating tumor DNA.

The high value of the samples collected and their susceptibility to degradation when outside of cold storage, required a system to track and manage ID, but also ensure sample quality both pre and post storage.

The Bluechip Advanced Sample Management solution tracks **ID** and **sample temperature** down to cryogenic environments



Bluechiip System Setup

The Biorepository has deployed Bluechiip equipment at the Main Lab where they have -80°C storage and at collection sites. All Bluechiip equipment is networked to communicate to each other.

Sample Collection Site



Tablet on NM WAN



Handheld Reader

Main Lab and Storage



Multi-vial Reader



Handheld Reader



Stream Database

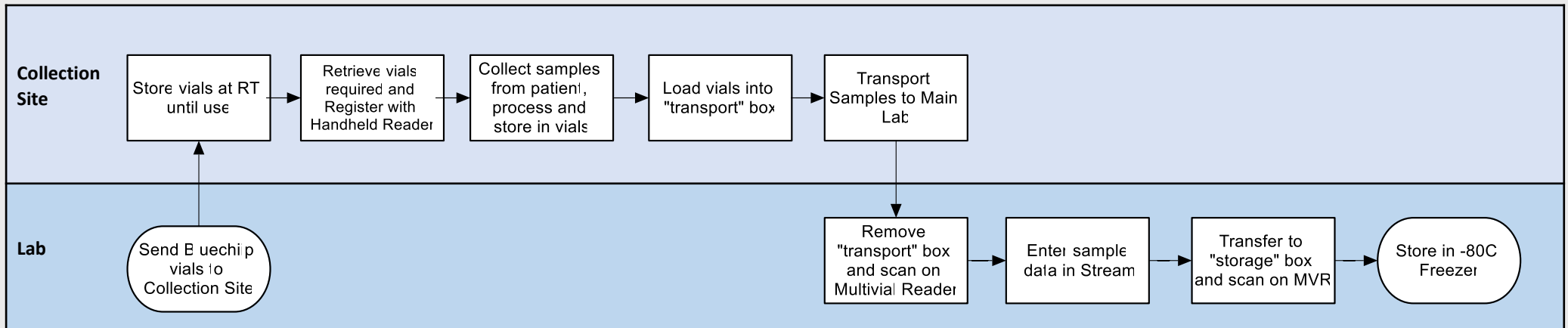


Any NM laptop or tablet on WAN

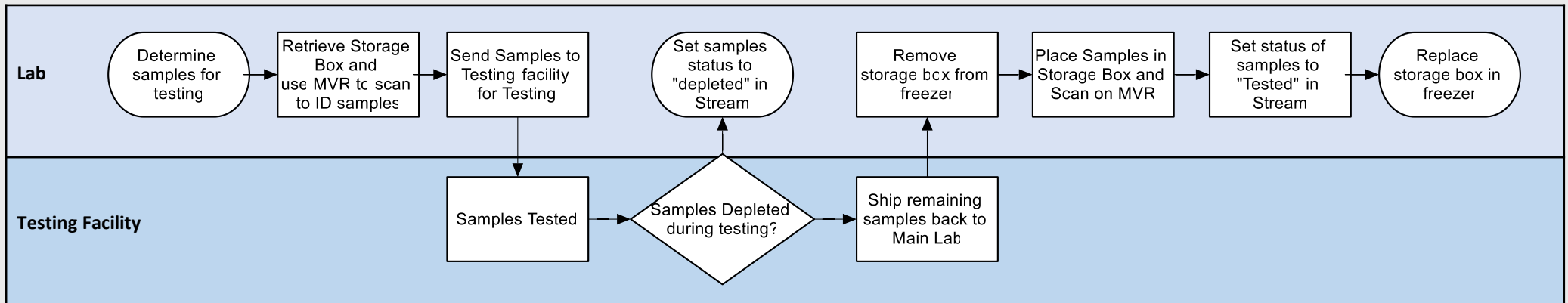


Biorepository Sample Workflow

The Biorepository collects samples from various sites, stores them in Bluechip Enabled Vials, sends them to the main lab where sample data is entered and then stores them in a -80°C freezer



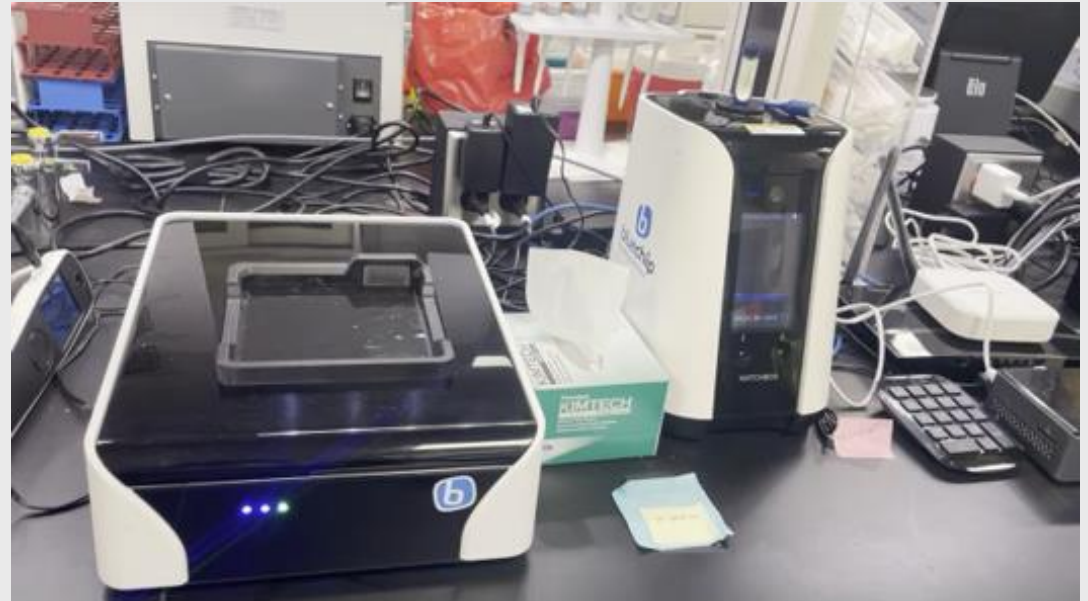
When samples are required for testing, they are found in Stream, physically ID'ed, sent for testing at 3rd party facility. If any sample remains, it is returned to storage and Sample status is updated in Stream database



Efficiency Improvements

The Bluechiip solution enabled several tangible and intangible efficiency improvements across the entire workflow

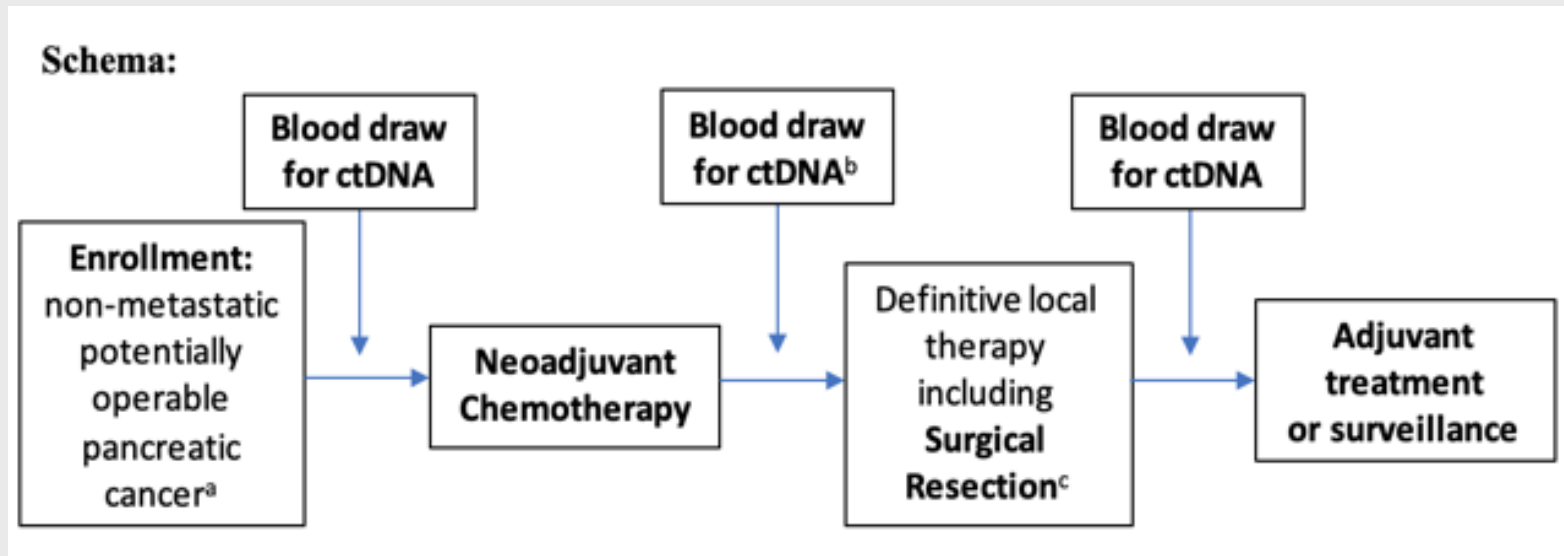
- ID -80°C samples without frost removal
- Bulk Data entry
- Automatic Sample location update
- Multi-site functionality
- Sample status management



CryoBox Inventory	Multi-Vial Reader Scan time
Cryobox with 81 Cryovials pulled from Freezer to ID samples for retrieval	24 seconds
Cryobox scanned after pulling 7 vials to update database	25 seconds

Sample Quality

Circulating Tumour DNA Samples were retrieved from storage and tested by Digital Droplet PCR and NextGen Sequencing for KRAS mutations



	KRAS D-Probe	KRAS V-Probe	KRAS R-Probe	NGS
Collection A	5/5	5/5	2/2	6/6
Collection B	12/12	9/9	7/7	12/12
Collection C	12/12	11/11	11/11	11/11

103 total samples were tested across the 4 assays with 100% ability to generate a testing result

Conclusion

Implementing the Bluechiip Solution provided several improvements for the Surgical Oncology Translational Research Biorepository

- Storage and Retrieval Efficiency – Seamless updates between virtual and physical sample locations
- Quantifiable quality – reduced sample temperature excursions. Improved sample temperature visibility outside of storage
- Inventory confidence – Improved Ease of sample identification in storage
- Capacity optimization – Identifying where capacity exists
- Complete Audit trail – What, Who, When, Where and Temperature

“The Bluechiip System allows me to have a significant amount of oversight into our data without the legwork. This is particularly important when there are different team members involved throughout the banking process” – Dr Akhil Chawla

Bluechiip would like to extend our gratitude to the entire Biorepository team at NW Medicine

Dr Akhil Chawla MD - Clinical Assistant Professor of Surgery

Amy Wells - Research Technologist

Jean Marie Nazareth – Graduate Scientist