One Person
One Experience

nova scotia health

IWK Health

Let's Talk Informatics

How Nova Scotia Revolutionized COVID-19 Lab Testing

Don Doiron, John MacIntosh & Justin Martin
October 28, 2021

Acknowledgement

We acknowledge we are gathered today
in Mi’kma’ki (*Mig-***_maw_**-gee), the traditional ancestral
unceded territory of the Mi’kmaq (*Mig-**maw**) people.

Informatics

Informatics utilizes health information and health care technology to enable patients to receive best treatment and best outcome possible.

Let’s Talk Informatics Objectives

This series is designed to enable participants to:

- Identify knowledge and skills healthcare providers need in order to use information now, and in the future.
- Prepare healthcare providers through an introduction to concepts and experiences in Informatics.
- Acquire knowledge to remain current by becoming familiar with new trends, terminology, studies, data and news.
- Collaborate with a network of colleagues to establishing connections with leaders who can provide advice on business issues, best-practice and knowledge sharing.

Session Specific Objectives

At the conclusion of this activity, you will be able to:

- Know the initial challenges and bottlenecks Nova Scotia labs were facing early in the COVID-19 pandemic.
- Understand how technology helped alleviate pressures on Nova Scotia labs during the COVID-19 pandemic.
- Recognize how a close working relationship between various stakeholders and the Pathology Informatics team lead to quick solutions and adoption of new processes.

Let's Talk Informatics certifications:

- **Digital Health Canada** - participants can claim 1CE hour for each presentation attended.
- **College of Family Physicians of Canada and Nova Scotia Chapter** - participants can earn one Mainpro+ credit by providing proof of content aimed at improving computer skills applied to learning and access to information.
- **Canadian College of Health Information Management** **-** approves 1 CPE credit per hour for this series for professional members of Canada's Health Information Management Association (CHIMA).

Scope of Presentation

As part of this presentation, we will demonstrate the work we (**Pathology & Laboratory Informatics**) were involved with to help the lab increase its overall testing capacity and assisting the province in it's overall COVID-19 testing strategy/response.

When discussing lab tests, we are specifically referring to **PCR COVID-19** testing.

We will **NOT** cover Rapid Antigen testing.

We will **NOT** cover operational Human Resource adjustments in the Microbiology Labs.

Overview

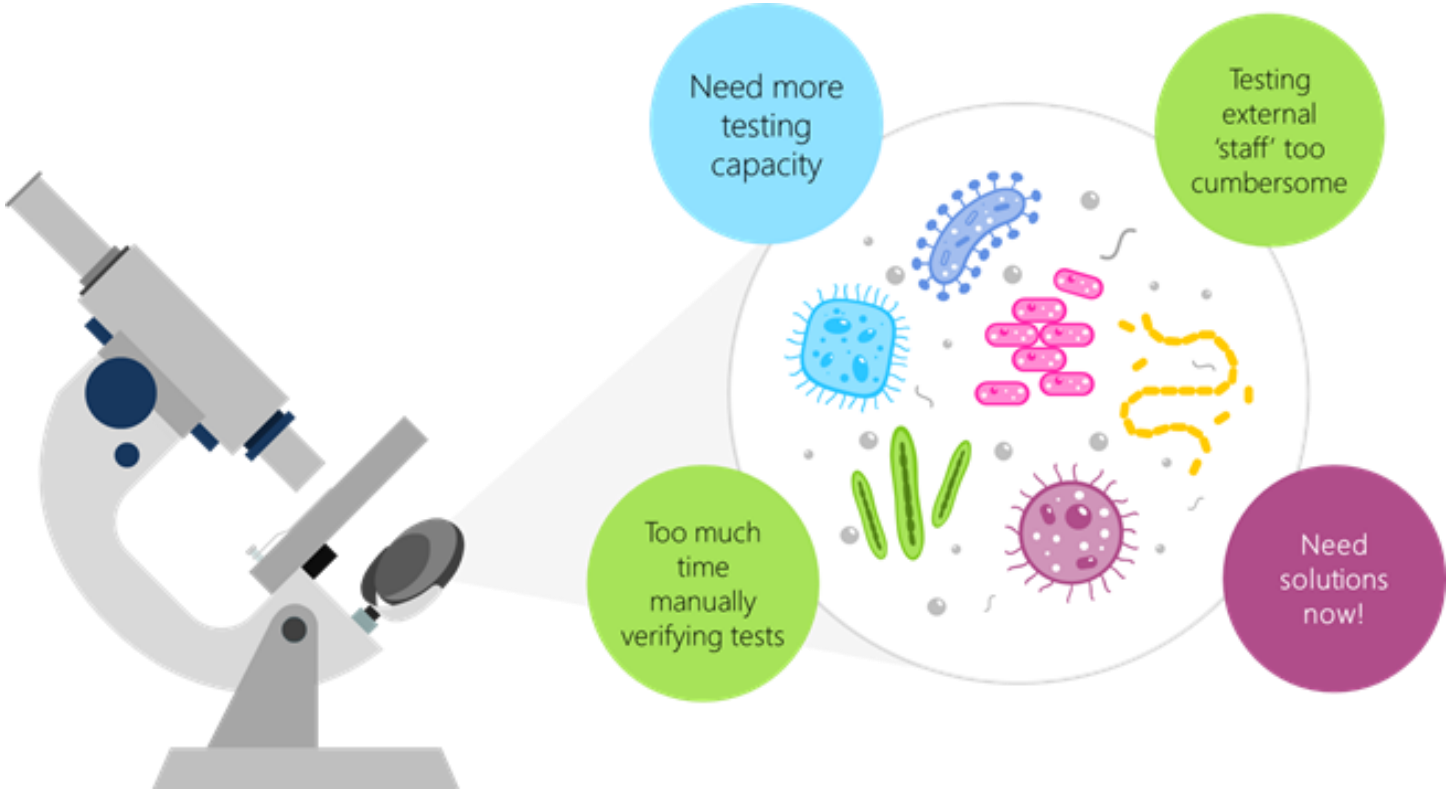
1. **INITIAL CHALLENGES AND OVERVIEW**

2. **OUR SOLUTIONS & RESPONSES**
   - Web Registration & Workflow Optimization
   - Web Registration & Integration into LIS *(Lab Information System)*
   - Self/Home Collection COVID-19 Testing
   - Interfacing New COVID-19 Lab Analyzers to LIS
   - Pooling COVID-19 Samples in LIS
   - Integrating & Supplying Clinical Data/Reports

3. **SUMMARY & TAKEAWAY**

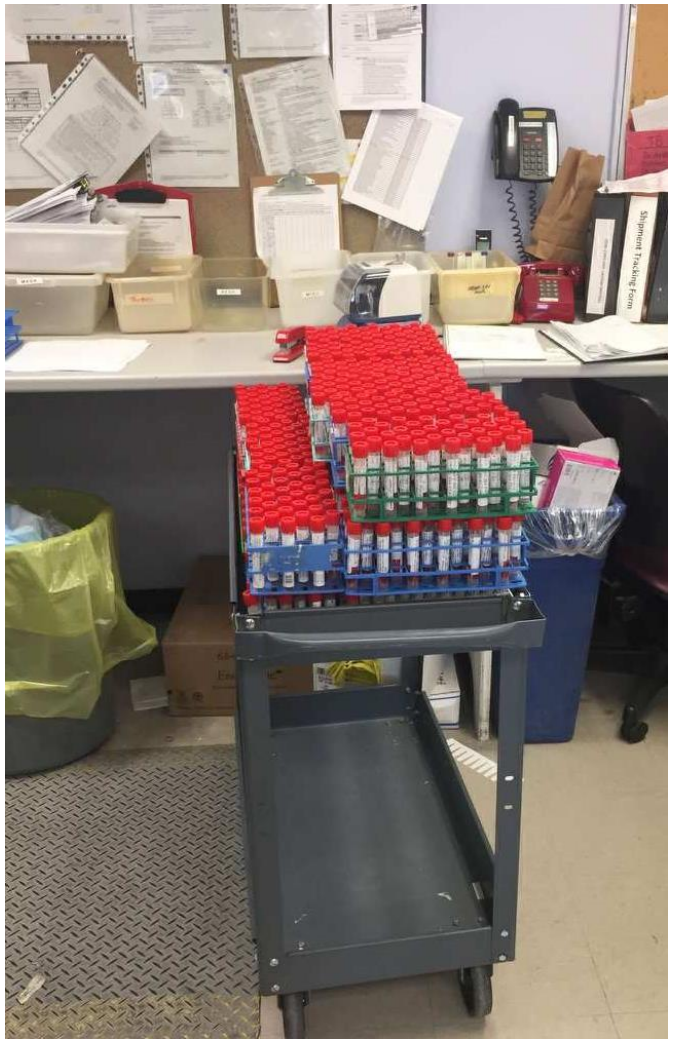
4. **ACKOWLEDGEMENTS & OUR TEAM**

Initial Challenges and Overview



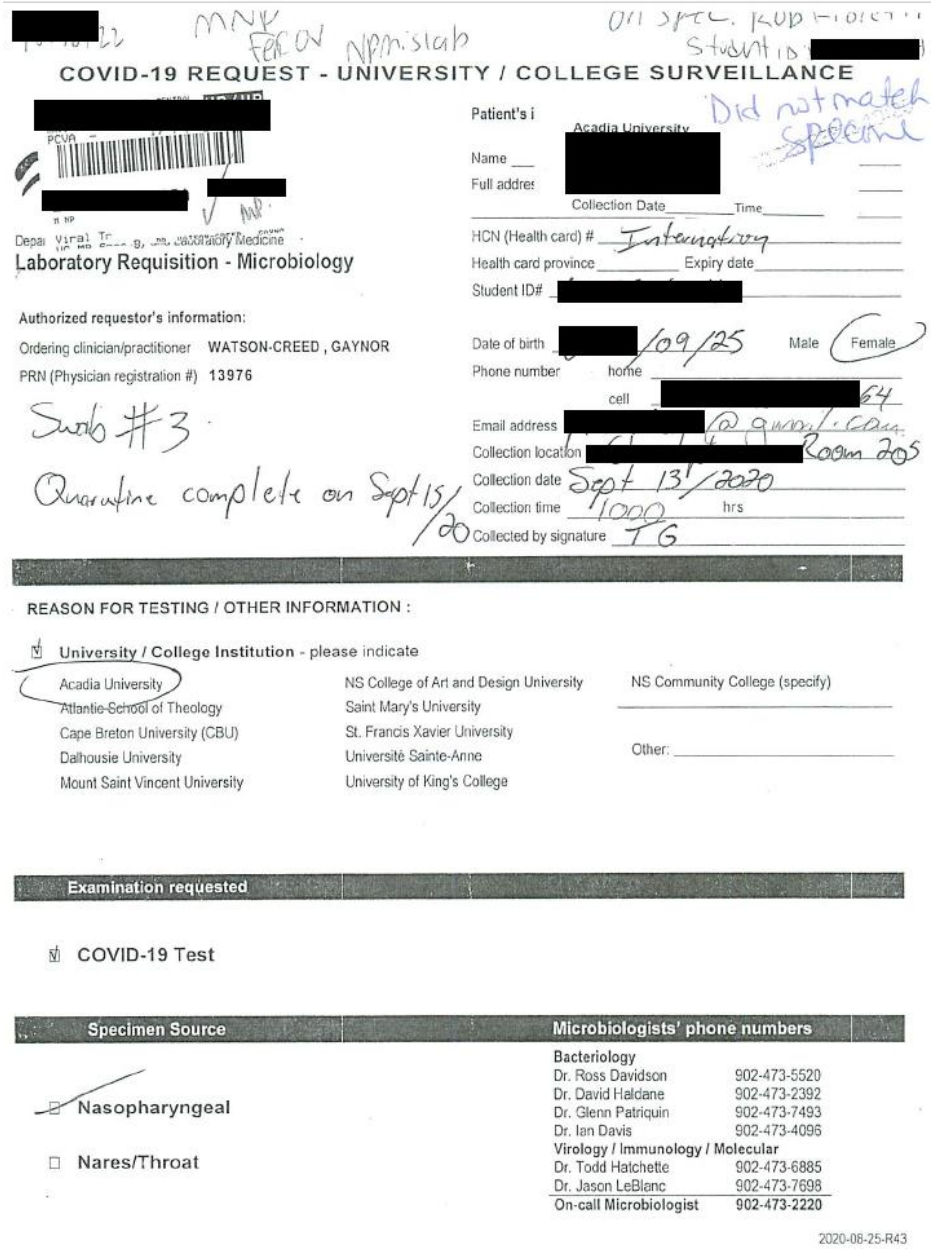
COVID-19 Samples Received at CZ Microbiology Lab

COVID-19 Samples Received at CZ Microbiology Lab



COVID-19 Paper Lab Requisition

- All samples collected (in the various collection workflows) required this paper requisition to be filled out.



COVID-19 REQUEST - UNIVERSITY / COLLEGE SURVEILLANCE

Laboratory Requisition - Microbiology

Authorized requestor's information:

Ordering clinician/practitioner WATSON-CREED , GAYNOR

PRN (Physician registration #) 13976

Patient's i

Acadia University

Name

Full addres

Collection Date Time

HCN (Health card) # Interantory

Health card province Expiry date

Student ID#

Date of birth /09/25 Male Female

Phone number home

cell

Email address

Collection location Room 205

Collection date Sept 13th/2020

Collection time 1000 hrs

Collected by signature TG

Swab #3

Quarantine complete on Sept 15/20

REASON FOR TESTING / OTHER INFORMATION :

☑ University / College Institution - please indicate

Acadia University
Atlantic School of Theology
Cape Breton University (CBU)
Dalhousie University
Mount Saint Vincent University
NS College of Art and Design University
Saint Mary's University
St. Francis Xavier University
Université Sainte-Anne
University of King's College
NS Community College (specify)
Other:

Examination requested

☑ COVID-19 Test

Specimen Source	Microbiologists' phone numbers	
	Bacteriology	
☑ Nasopharyngeal	Dr. Ross Davidson	902-473-5520
	Dr. David Haldane	902-473-2392
	Dr. Glenn Patriquin	902-473-7493
	Dr. Ian Davis	902-473-4096
☐ Nares/Throat	Virology / Immunology / Molecular	
	Dr. Todd Hatchette	902-473-6885
	Dr. Jason LeBlanc	902-473-7698
	On-call Microbiologist	902-473-2220

2020-08-25-R43

Initial Challenges & Overview

- Pre COVID-19 the CZ Molecular Microbiology lab was receiving around 200-300 samples per week. Once COVID-19 started that lab reached a maximum of **2,500 COVID samples a day** primarily through provincial PAC (Primary Assessment Clinics)
- Required extensive **data entry into LIS from paper lab requisitions.**
- The turn around time to train and get access to our information systems **wasn't going to meet the rapid evolving testing strategies** that were being rolled out to our PAC (Primary Assessment Centers)
- COVID-19 testing strategies were going to grow and scale up (October/November 2020). These areas didn't have access to any of the Registration Information Systems
    - **Long Term Care -** Employee Serial/Scheduled testing
    - **Department of Correctional Services -** Employee Serial/Scheduled testing
    - **Department of Community Services -** Employee Serial/Scheduled testing
    - **Public Health Mobile Testing Vans/Units** – Traveling around province testing citizens

Initial Challenges & Overview - Workflow

Registration & Collection

Register Patient Inf. System

Fill Out Paper Lab Requisition "Order Lab Test"

Label Specimen

Collect Sample

Laboratory Processing

Transcribe from Paper Lab Requisition.

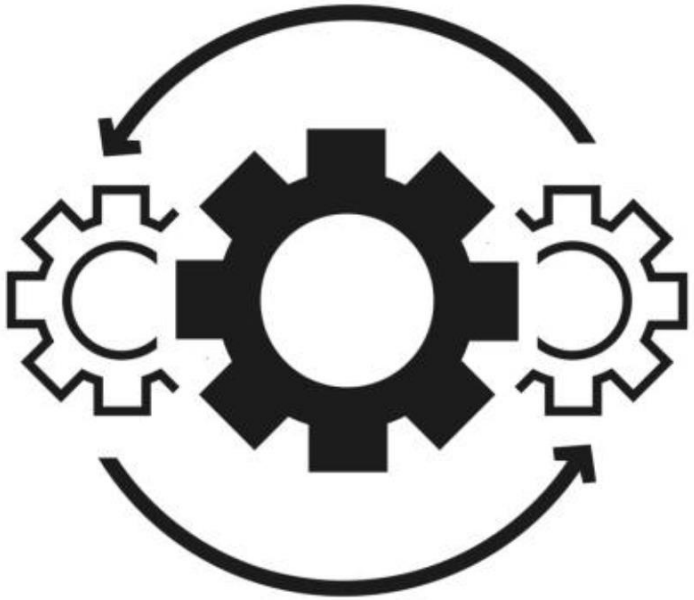
Register & Order Covid Test in Lab Inf. System.

Clinical lab workflow & testing

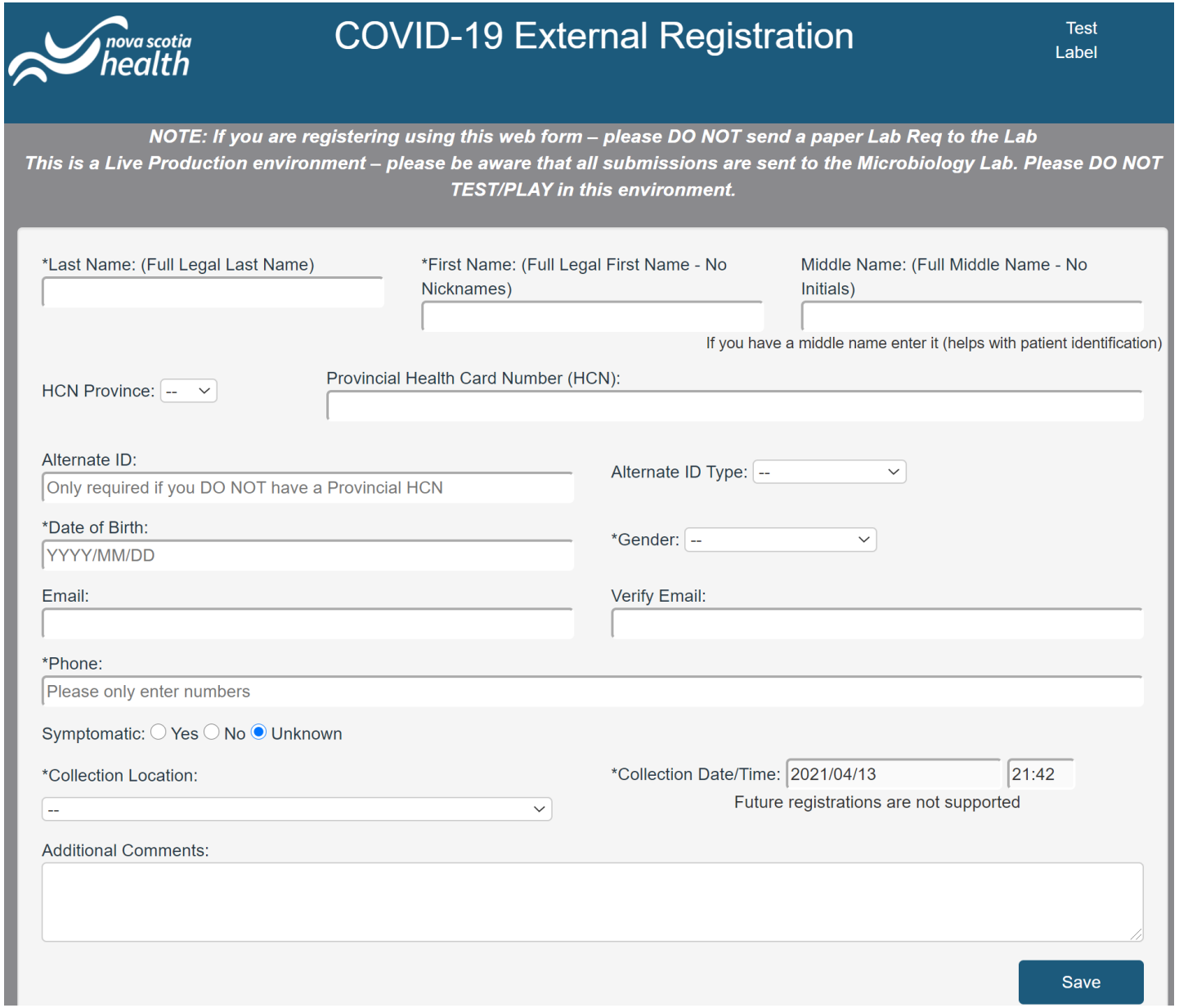
Our Solutions & Responses

Web Registration & Workflow Optimization

Custom COVID-19
Web Registration



Web Registration Form COLLECTION Area



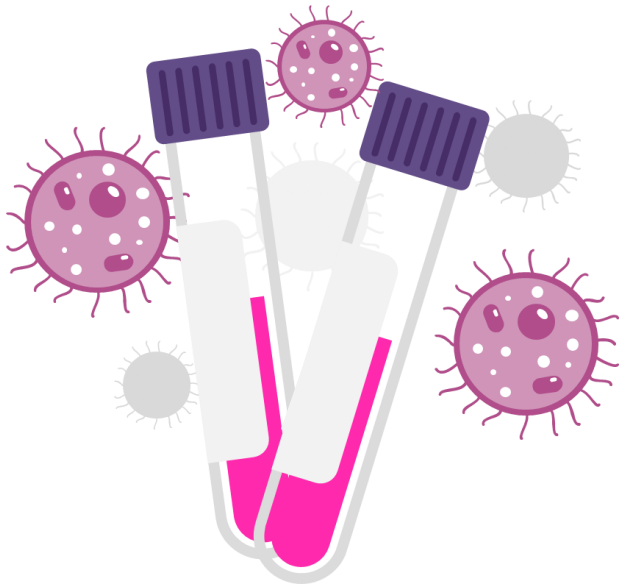
Labeling Sample
COLLECTION Area

HCN: 1234567890 NS Alt ID: 987654321

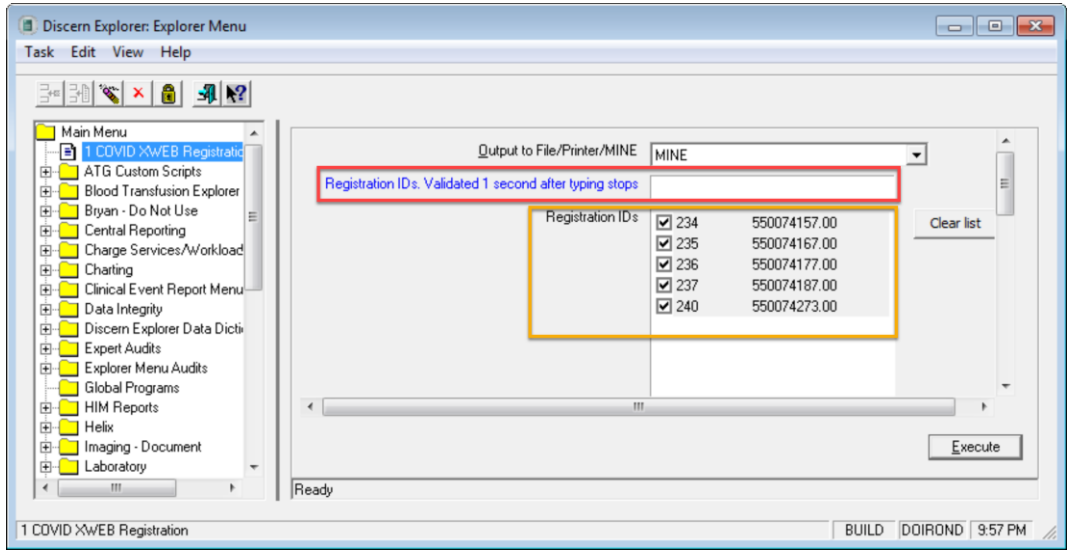
Last Name, First Name

DOB: 1923/04/23 M Reg ID: 5678

Back Print



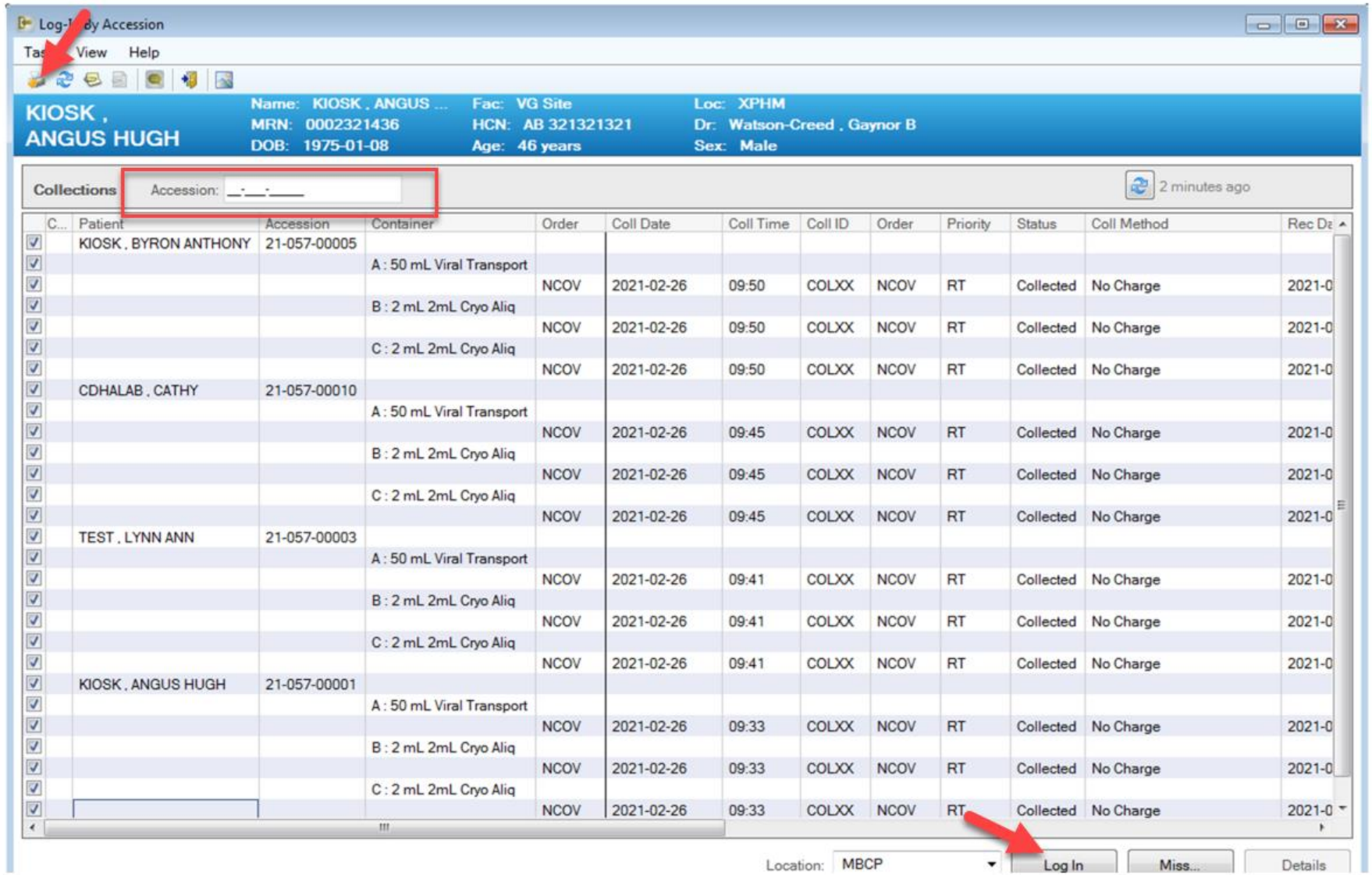
Scanning Samples into LIS
LAB Area



UNSOLICITED COVID XWEB REGISTRATIONS 2021/04/13 22:02

NAME / REG ID / EMAILADDR	HCN	SEX / DOB	PHONE	ACC / BARCODE / ACC
CDHALAB , QUEBEC 235 cdhalabq@gmail.com	QC-GAGL00001701	Female 1974/03/04	4186669898	21-090-00020
CDHALAB , SASKATCHEWAN 236 cdhalabs@gmail.com	SK-692033726	Male 1977/07/07	3063063060	21-090-00021
CDHALAB , YUKON 237 cdhalaby@gmail.com	YT-111005	Female 1982/12/12	8674333344	21-090-00022

Generate LIS Specimen Label and “Log In” the sample LAB Area



C...	Patient	Accession	Container	Order	Coll Date	Coll Time	Coll ID	Order	Priority	Status	Coll Method	Rec Da
☑	KIOSK , BYRON ANTHONY	21-057-00005										
☑			A : 50 mL Viral Transport									
☑				NCOV	2021-02-26	09:50	COLXX	NCOV	RT	Collected	No Charge	2021-0
☑			B : 2 mL 2mL Cryo Aliq									
☑				NCOV	2021-02-26	09:50	COLXX	NCOV	RT	Collected	No Charge	2021-0
☑			C : 2 mL 2mL Cryo Aliq									
☑				NCOV	2021-02-26	09:50	COLXX	NCOV	RT	Collected	No Charge	2021-0
☑	CDHALAB , CATHY	21-057-00010										
☑			A : 50 mL Viral Transport									
☑				NCOV	2021-02-26	09:45	COLXX	NCOV	RT	Collected	No Charge	2021-0
☑			B : 2 mL 2mL Cryo Aliq									
☑				NCOV	2021-02-26	09:45	COLXX	NCOV	RT	Collected	No Charge	2021-0
☑			C : 2 mL 2mL Cryo Aliq									
☑				NCOV	2021-02-26	09:45	COLXX	NCOV	RT	Collected	No Charge	2021-0
☑	TEST , LYNN ANN	21-057-00003										
☑			A : 50 mL Viral Transport									
☑				NCOV	2021-02-26	09:41	COLXX	NCOV	RT	Collected	No Charge	2021-0
☑			B : 2 mL 2mL Cryo Aliq									
☑				NCOV	2021-02-26	09:41	COLXX	NCOV	RT	Collected	No Charge	2021-0
☑			C : 2 mL 2mL Cryo Aliq									
☑				NCOV	2021-02-26	09:41	COLXX	NCOV	RT	Collected	No Charge	2021-0
☑	KIOSK , ANGUS HUGH	21-057-00001										
☑			A : 50 mL Viral Transport									
☑				NCOV	2021-02-26	09:33	COLXX	NCOV	RT	Collected	No Charge	2021-0
☑			B : 2 mL 2mL Cryo Aliq									
☑				NCOV	2021-02-26	09:33	COLXX	NCOV	RT	Collected	No Charge	2021-0
☑			C : 2 mL 2mL Cryo Aliq									
☑				NCOV	2021-02-26	09:33	COLXX	NCOV	RT	Collected	No Charge	2021-0

Areas of use for collecting samples and registering patients

- **All Central Zone (Halifax area) - Primary Assessment Centers**
  - Saint Mary's University
  - Bayer's Lake
  - Burnside
  - Forum
  - 10 PH Mobile Testing Vans

- **Dynamic Response to Testing Requirements**
  - Irving Shipyard (hot spot)
  - Temporary Foreign Workers (serial testing)
  - NB Traveling Health Care Workers
  - Long Term Care (serial testing)
  - Correctional Facilities (serial testing)
  - International Airport Testing
  - Home Self Collection Testing

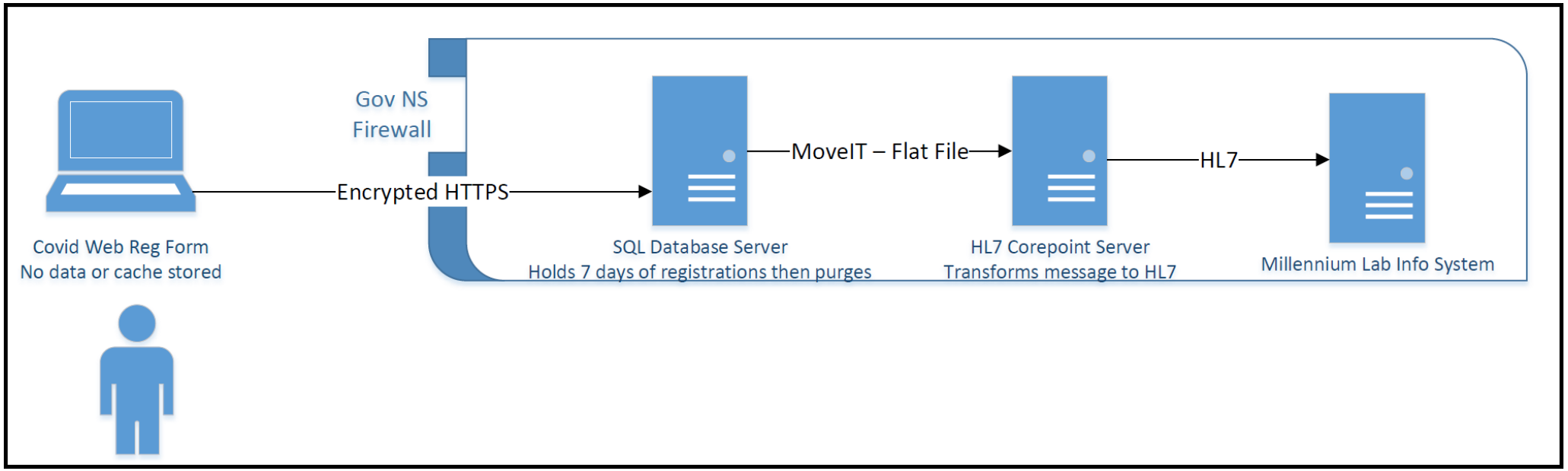
- **Various events**
  - Film/movie crew in South Shore NS (serial testing)
  - 2021 IIHF Ice Hockey Women's World Hockey (serial testing)

Web Registration & Integration into LIS

Custom COVID-19 Web Registration

Lab Information System

Interface Overview



Patient Matching – Millennium LIS

- **IF all the following match**
  - HCN
  - HCN Province code
  - First name
  - Last Name
  - Gender
  - DOB

  Attach New Encounter and Order to Existing Person Record

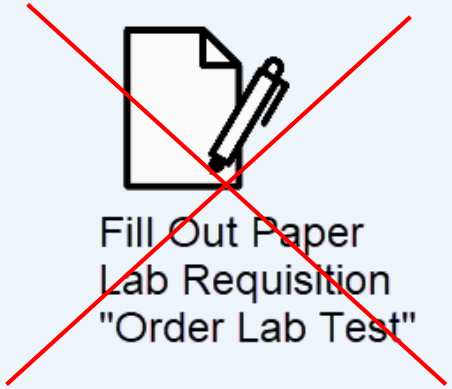
- **IF No Match**

  Create New Person Record, Encounter and Order

Optimized Workflow

Registration & Collection

Register Patient
~~Infx. System~~
Web Registration



Fill Out Paper
Lab Requisition
"Order Lab Test"

Label
Specimen
with Barcode

Collect
Sample

Laboratory Processing

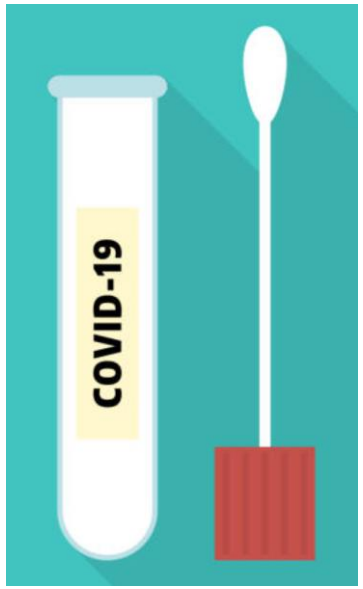
Transcribe from Paper Lab Requisition.

Register & Order Covid Test in Lab Inf. System.

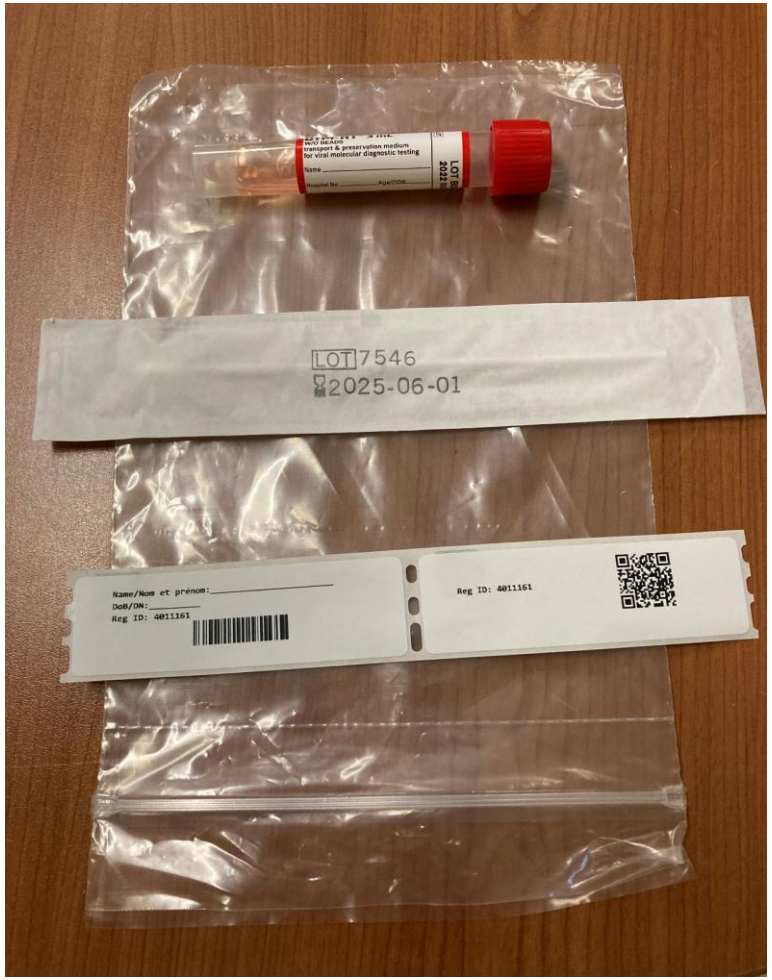
Scan Specimen into LIS

Clinical lab workflow & testing

Self/Home Collection PCR COVID-19 Testing



Home Collection Kits



COVID-19 SELF-TEST — TAKE HOME INSTRUCTIONS

How to give yourself a throat and nose swab

Your COVID-19 self-test kit includes: swab, liquid-filled tube, a testing bag and a printed QR code to register your kit online.

Contents of self-test kits may differ slightly between locations and may look different than shown. The self-test steps are the same.

1 **You must register your self-swab test using the QR code provided.**

If you do not register online, your test will not be processed.

2

Write your name (first/last) and date of birth (YYYY/MM/DD) on the self-swab label and place on the tube.

3

Wash or sanitize your hands before beginning the self-test.

4

Remove the swab from the package. **Do not touch the soft tip.**

5

Open your mouth widely. Rub and rotate the swab on the very back/sides of your throat (avoid your tongue and cheeks).

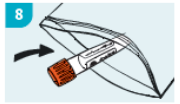
5

Using the same swab, rub and rotate 3 times on the inside of both nostrils (inserting no more than 1-2 cm).

7

Put the swab into the tube, breaking the swab at the line. The swab will drop into the liquid.

8



Tightly screw the cap onto the tube, put into the testing kit, squeeze air from the bag and seal it.

9

Wash or sanitize your hands after handling your swab and tube.

10

You must deliver the COVID-19 self-test within 48 hours of arrival in Nova Scotia and no later than 6 hours after collecting your sample.

Deliver the COVID-19 self-test to the closest Primary Assessment Centre or Public Health Mobile Unit. Locations around the province are listed at nshealth.ca/coronavirustesting. If you did not register online, your test will not be processed.

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Updated August 6, 2021

nshealth.ca/coronavirustesting

REGISTERING YOUR SELF-SWAB TEST ONLINE

What you need to know

You have used the self-swab kit to test yourself for COVID-19. **Now it is time to register your self-swab test online using the online registration form.** Listed below is how to access your online registration form and what information you will need to complete your registration.

If you do not register online using the QR code provided, your self-swab test will not be processed.

STEP 1
There is a **QR code** similar to this printed on your self-swab collection kit. Scan it by opening the camera on your mobile device and pointing it at the square symbol like you would take a photo. A pop-up box will appear on your screen, when you click this, it will redirect you to the COVID-19 Home Collection Registration site. Click "Continue" to start the registration form.

STEP 2
Complete the registration form by providing the following information:

- ✓ Full legal name (Last Name, First Name, Middle Name)
- ✗ *Do not use nicknames or initials when completing these fields.*
- ✓ The province your Provincial Health Card is registered in, and your Provincial Health Card number.

If you do not have a Provincial Health Card: You may use your Driver's License number, Military/CAF number, Student ID, or another number that is unique to you. Do not use a passport number or social insurance number.

- ✓ Date of Birth (YYYY/MM/DD)
- ✓ Email address
- ✓ Phone number

Providing your Health Card information and your email address on your self-swab registration form allows negative COVID-19 test results to be emailed to you.

STEP 3
Review the information you provided to make sure it is correct. Please click "Back" to make changes to the information on the form.

STEP 4
Once you have reviewed your information, and it is correct, click "Continue" to submit your registration form. Once submitted you cannot change or edit your information.

STEP 5
Write your name (first/last) and date of birth (YYYY/MM/DD) on the self-swab label.

STEP 6
Place the label on the self-swab tube and deliver it to the **nearest COVID-19 assessment centre** or **Public Health Mobile Unit within 6 hours of doing your test.**

STEP 7
Close the web page.

STEP 8
Please keep your self-swab label containing the QR code and Registration ID number safe. The Registration ID number on the label can be used to access your results online if you did not use a Provincial Health Card number or Student ID in your registration.

GETTING YOUR TEST RESULTS

You can check your COVID-19 negative test results by visiting the **Nova Scotia Health COVID-19 Result website**. You will be asked to provide either your Provincial Health Card number, Student ID, or the self-swab registration number (the 7-digit number on your self-swab label). It may take up to 72 hours for test results to be posted.

If you provided a valid Provincial Health Card or Student ID you will also receive your negative results via auto-call or email.

If your test result is positive, Public Health will contact you directly and provide further instructions.

Updated August 6, 2021

nshealth.ca/coronavirustesting

nova scotia health

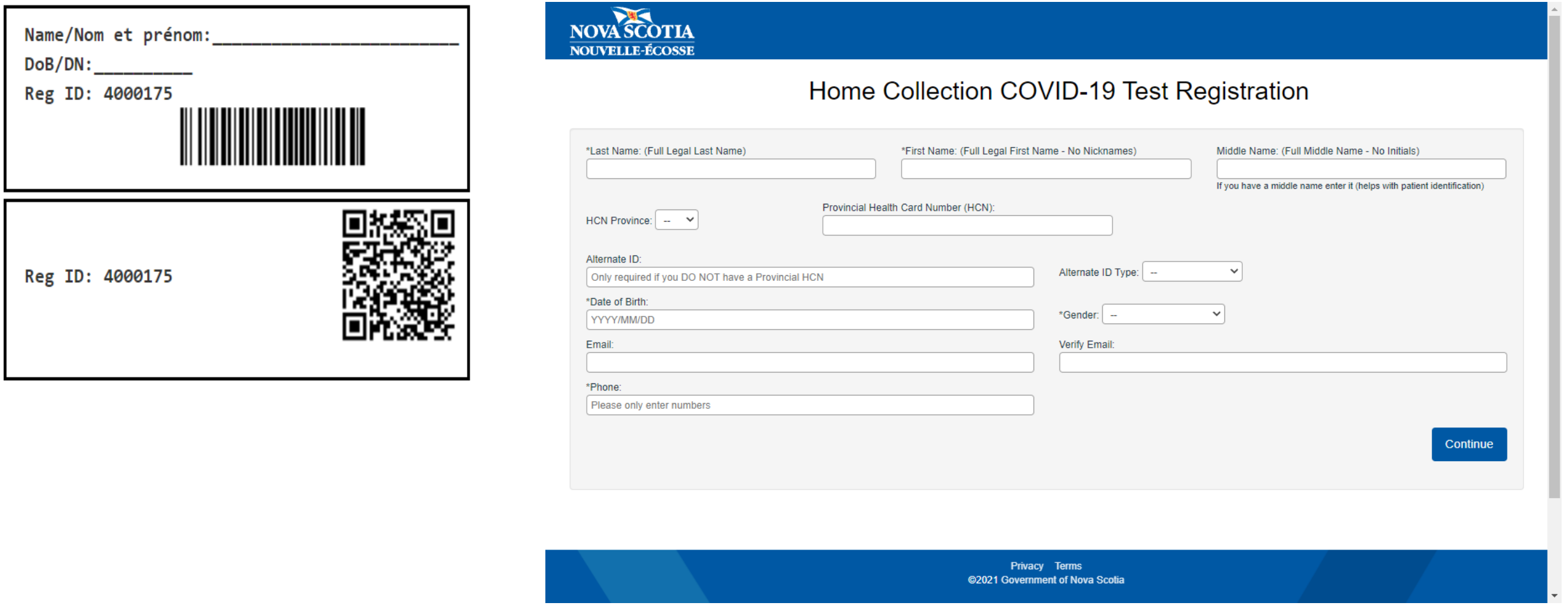
Home Collection Label & Registration

Name/Nom et prénom:_____

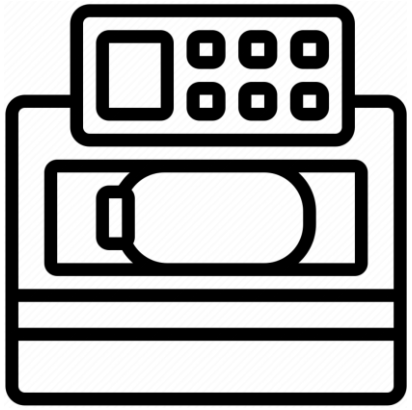
DoB/DN:_____

Reg ID: 4000175

Reg ID: 4000175



Interfacing New COVID-19 Lab Analyzers
LIS



Lab Analyzers

Lab Information System

Interfacing New COVID-19 Lab Analyzers to Lab Information Systems

- **Nov 2020** we interfaced the ***Cobas 6800*** in Central Zone (Halifax) to LIS
- This analyzer can batch 96 samples per run
- Turn around time is about 3-3.5 hours

Interfacing New COVID-19 Lab Analyzers to Lab Information Systems

- **Spring 2020 till Spring 2021** we interfaced **three** new Panthers throughout the province for a **total of five**.
- This analyzer can batch about 120 samples per run.
- Turn around time is about 3.5 hours

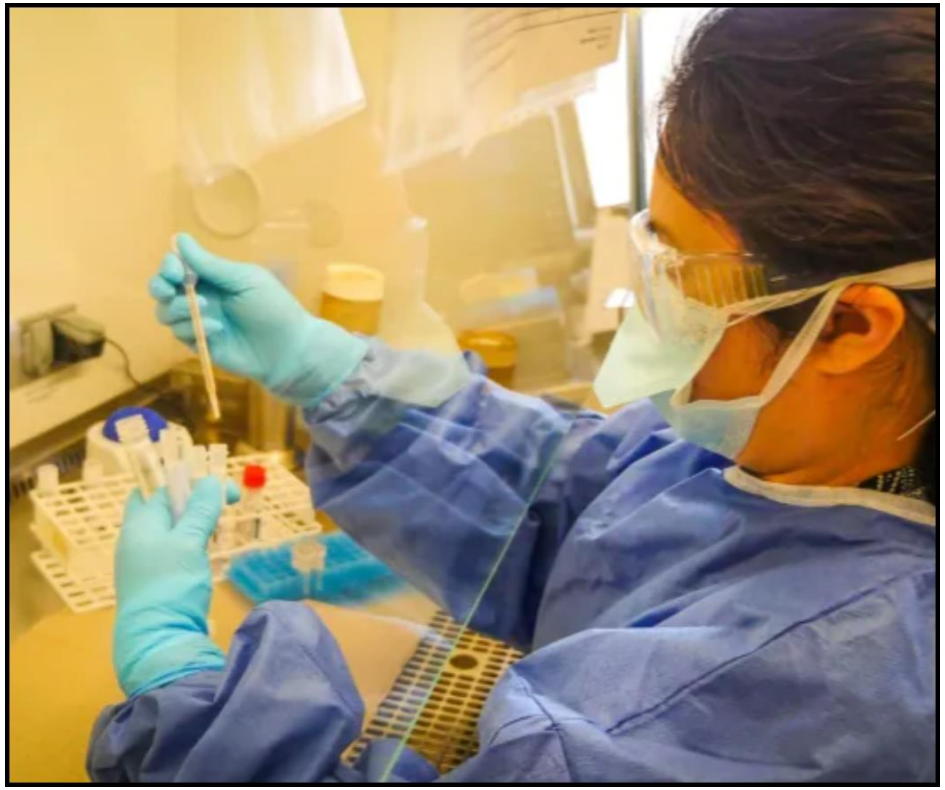
Interfacing New COVID-19 Lab Analyzers to Lab Information Systems

- **Spring 2020 till Spring 2021** we interfaced **over 20** new Abbott IDNow throughout the province
- This analyzer can perform **1** test per run
- Turn around time is about **5-15** minutes per run
- This analyzer was rolled out and evolved through various clinical areas as a Point of Care device.
  - Emergency
  - Surgery
  - Etc.

Non-interfaced COVID-19 Lab Analyzers used throughout provincial labs

- These various devices/analyzers are also used to help with testing COVID-19 throughout the province which at this time aren't interfaced to our LIS. Overall, these help the lab reach their daily testing numbers.
- **GeneXpert**
  - Multiple new analyzers rolled out during COVID, now available at nearly every regional site
  - Most labs have a capacity of 4 tests, approx. 45 minutes per test
  - Provides rapid results when needed, must meet certain criteria for testing
- **Biofire**
  - Analyzer is now available in each zone
  - Performs a panel of tests including COVID-19
  - Provides rapid results, stricter criteria than GeneXpert
- **Roche MagNA Pure + ABI 7500 Thermocyclers**
  - These analyzers performed a large number of COVID-19 tests during the pandemic
  - However, analyzers are not new nor interfaced

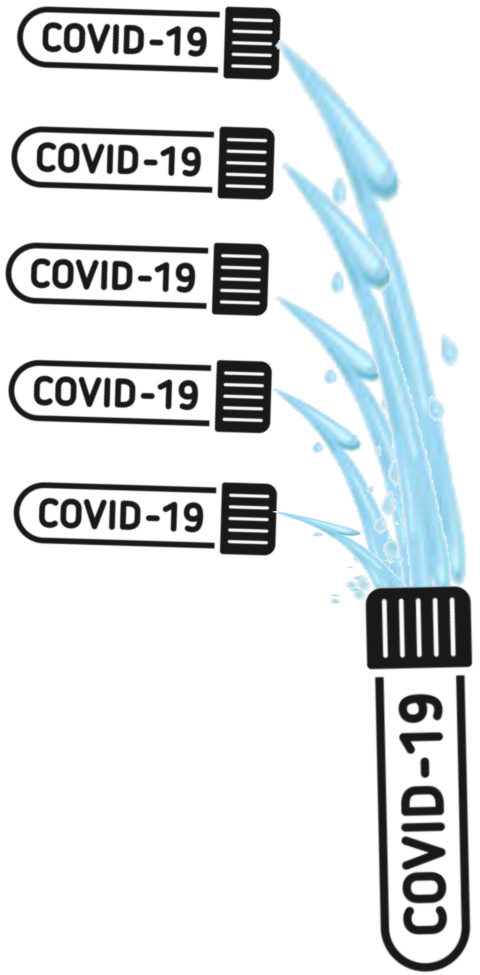
Pooling COVID-19 Samples in LIS



What is specimen pooling?

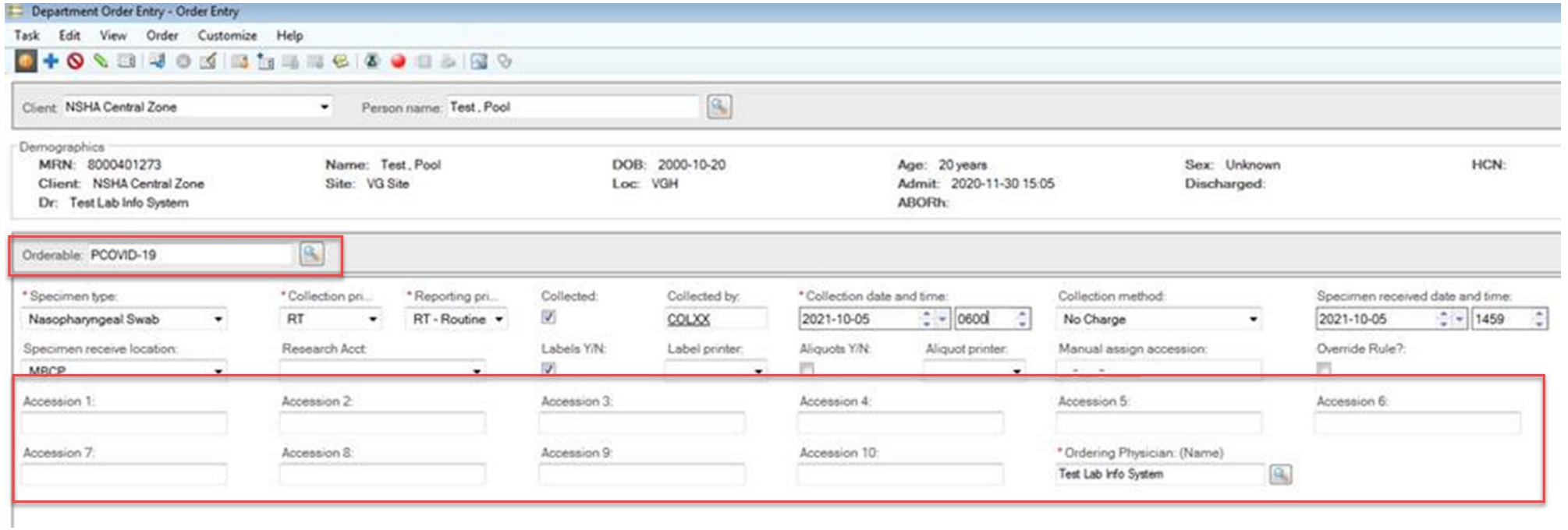
“Pooling samples involves **mixing several samples together in a "batch"** or pooled sample, then testing the pooled sample with a diagnostic test. This approach increases the number of individuals that can be tested using the same amount of resources.”

Source*: https://www.fda.gov/medical-devices/coronavirus-COVID-19-and-medical-devices/pooled-sample-testing-and-screening-testing-COVID-19*



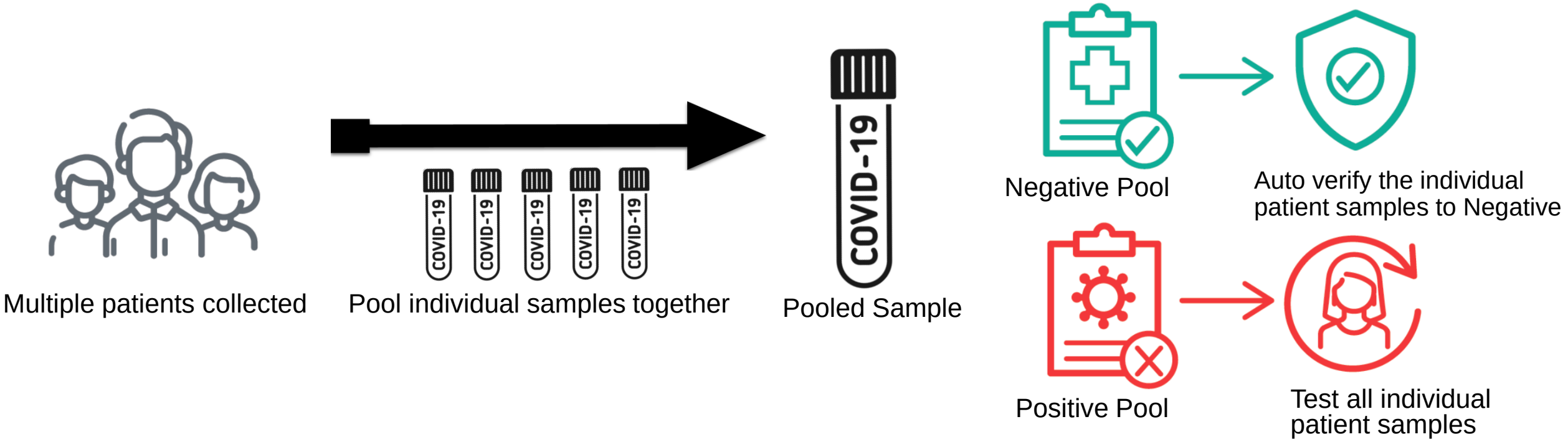
Pooling COVID-19 Samples in LIS

- The functionality of being able to scan & digitize the children (patient samples) accession/specimen number to the parent pool container & accession number was rolled out in our environment.
- The lab can dynamically use this pooling functionality based on demand.
- Up to 10 samples can be pooled together.



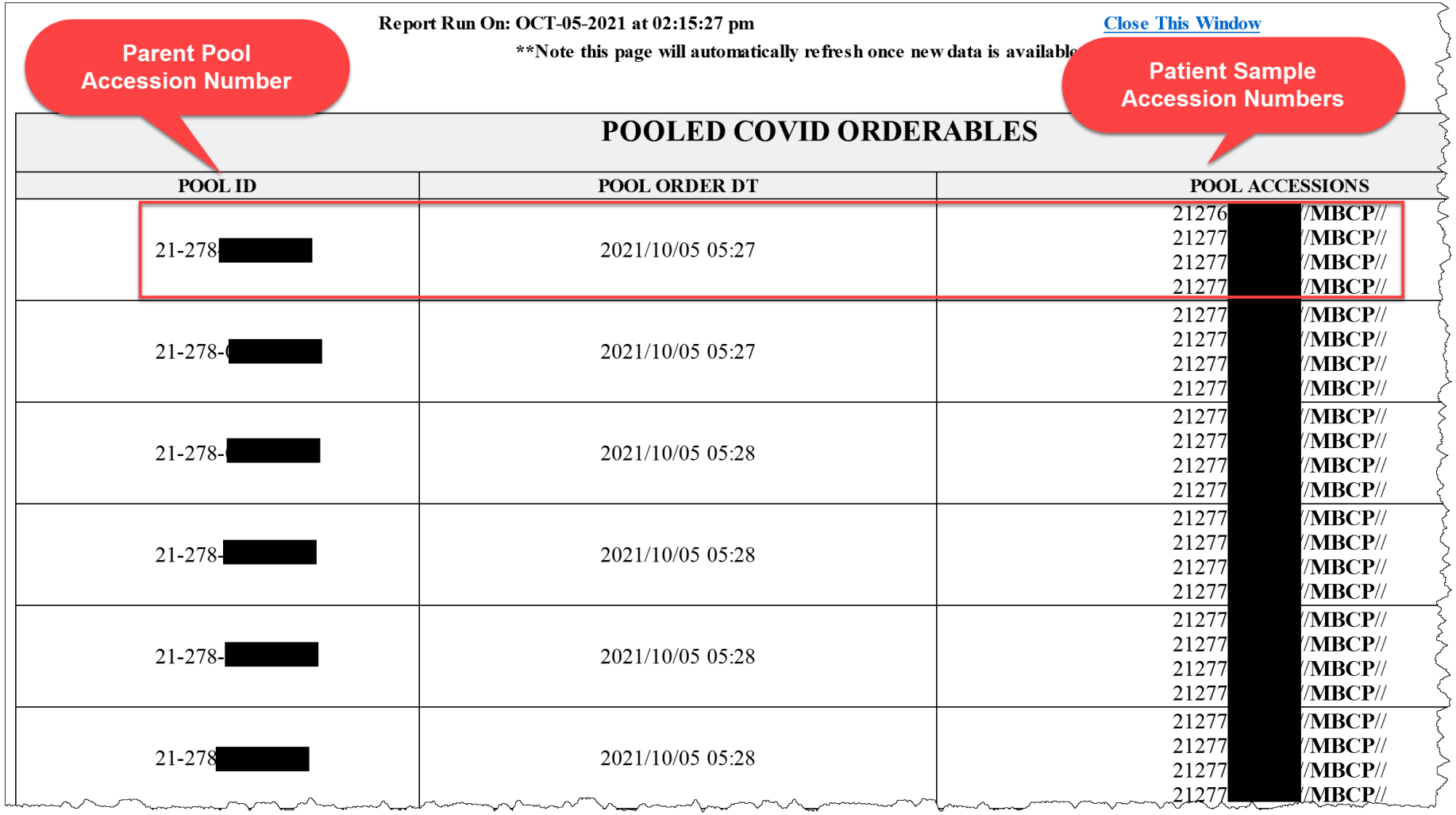
Pooling COVID-19 Samples in LIS – Overall Logic

- Individual patient specimens (up to 10) are pooled/poured off into 1 container.
- The pooled container is put on one of the COVID-19 lab analyzers.
- Once the lab analyzer is done its work – the results are transmitted to LIS.
  - If the pool result comes back as **Negative** – all of the children automatically “verify” to Negative.
  - If the pool result comes back as **Positive** – automation stops. The lab retrieves those individual patient samples (that were part of the pool) and run them individually to find out which sample(s) was positive.



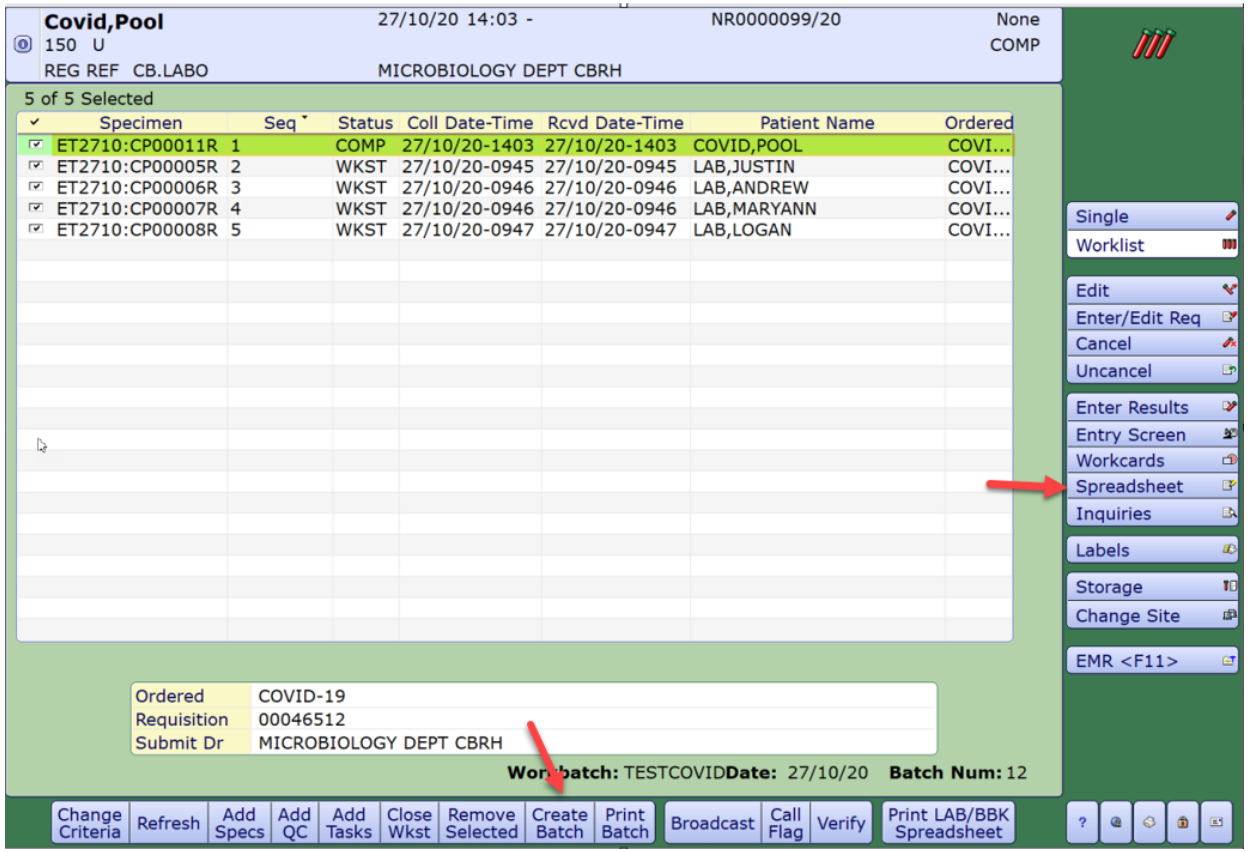
Managing COVID-19 Pools in LIS

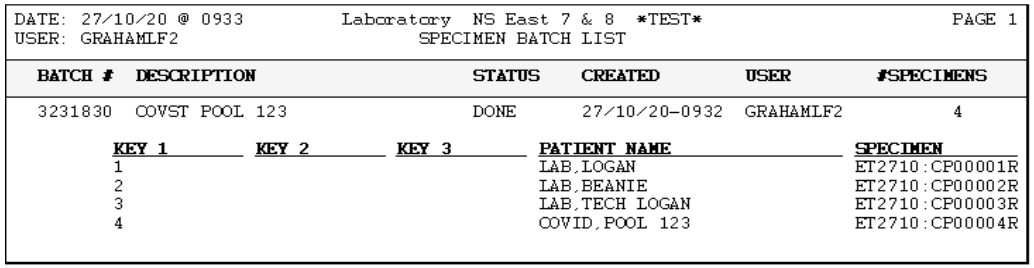
- Automated & custom dashboard was developed for the Microbiology lab to help manage & track their COVID-19 Pools



Pooling COVID-19 Samples in MEDITECH C/S

- Unlike Millennium, there is no native pooling function available in MEDITECH C/S.
- Our team was tasked to try to use current functionality to create a workflow for pooled samples.

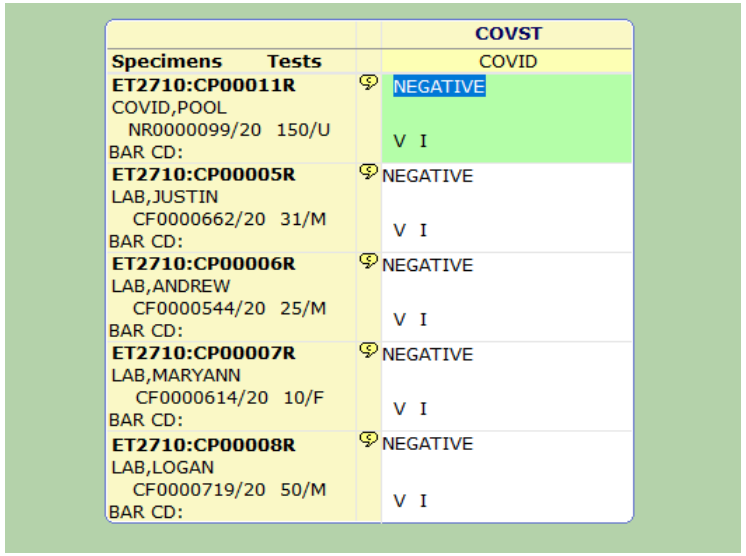




DATE: 27/10/20 @ 0933 Laboratory NS East 7 & 8 *TEST* PAGE 1
USER: GRAHAMLF2 SPECIMEN BATCH LIST

BATCH #	DESCRIPTION	STATUS	CREATED	USER	#SPECIMENS
3231830	COVST POOL 123	DONE	27/10/20-0932	GRAHAMLF2	4

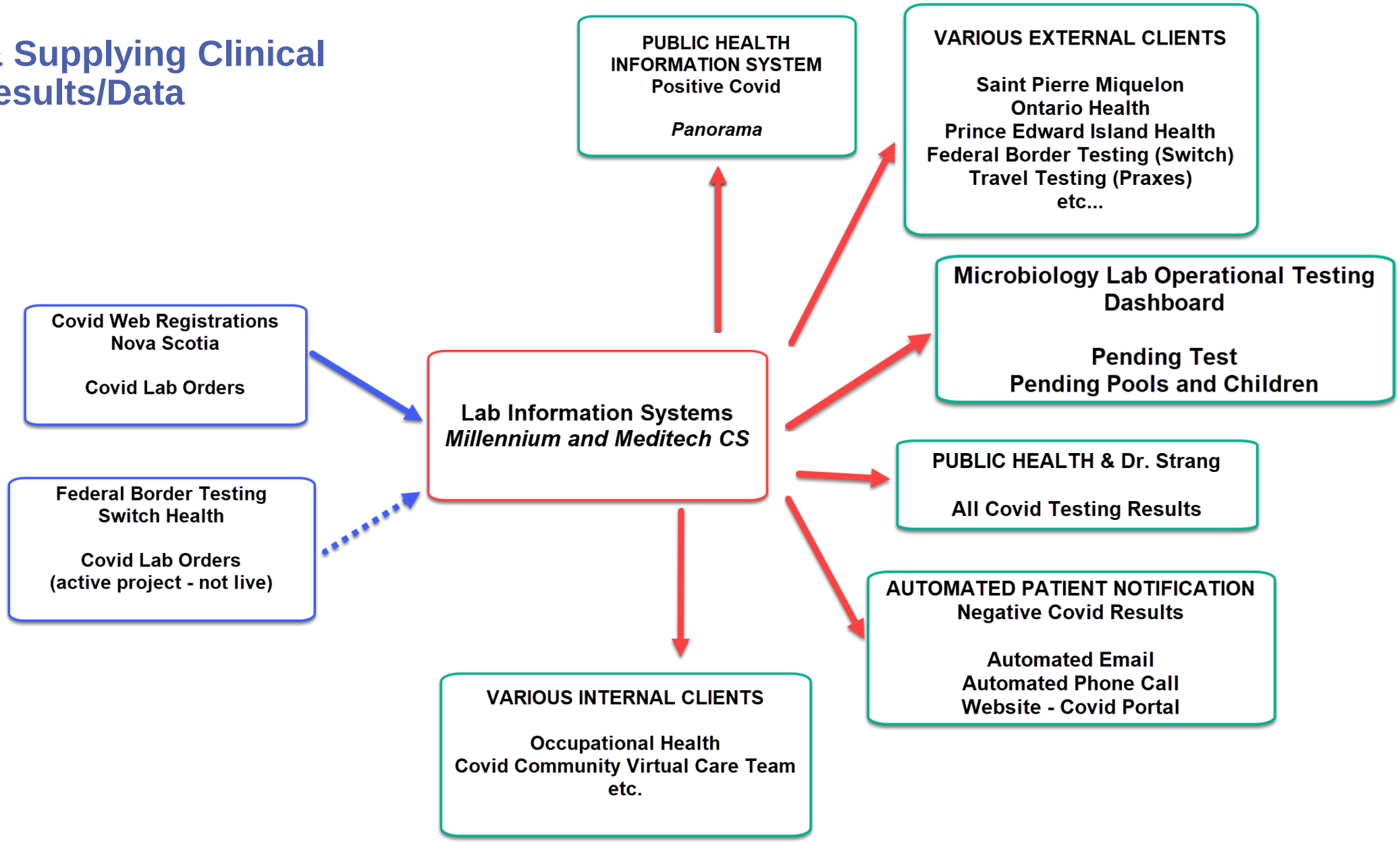
KEY 1	KEY 2	KEY 3	PATIENT NAME	SPECIMEN
1			LAB,LOGAN	ET2710:CP00001R
2			LAB,BEANIE	ET2710:CP00002R
3			LAB,TECH LOGAN	ET2710:CP00003R
4			COVID,POOL 123	ET2710:CP00004R



Specimens Tests	COVST COVID
ET2710:CP00011R COVID,POOL NR0000099/20 150/U BAR CD:	NEGATIVE V I
ET2710:CP00005R LAB,JUSTIN CF0000662/20 31/M BAR CD:	NEGATIVE V I
ET2710:CP00006R LAB,ANDREW CF0000544/20 25/M BAR CD:	NEGATIVE V I
ET2710:CP00007R LAB,MARYANN CF0000614/20 10/F BAR CD:	NEGATIVE V I
ET2710:CP00008R LAB,LOGAN CF0000719/20 50/M BAR CD:	NEGATIVE V I

Integrating & Supplying Clinical Data/Reports

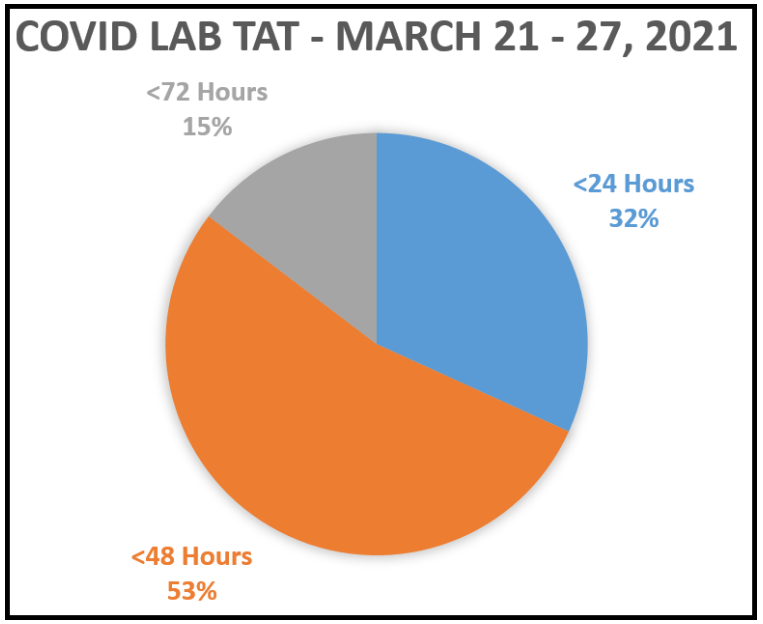
Integrating & Supplying Clinical Lab Covid Results/Data



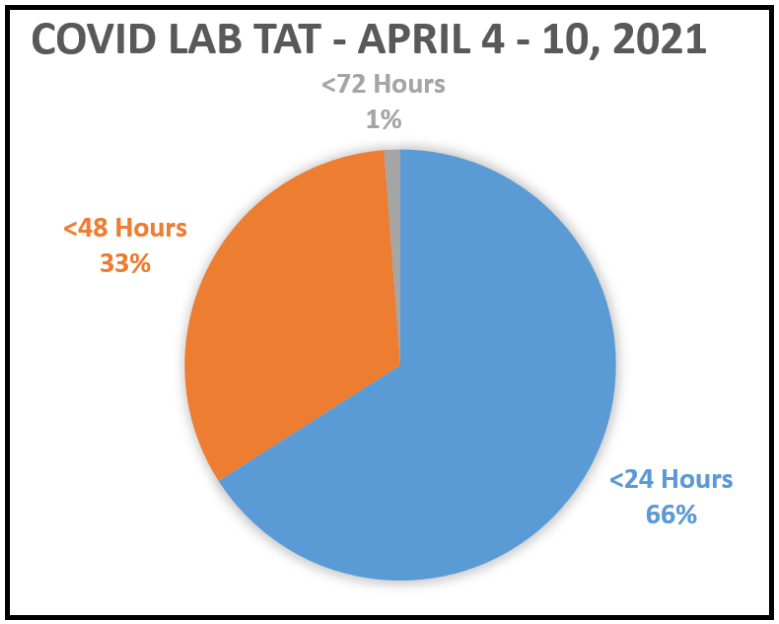
Summary & Take Away

- Daily Provincial Lab Testing capacity grew and hit highs of **20,000 tests per day.**
- We were able to **quickly & responsibly scale up & roll out** to the evolving provincial testing/swabbing strategies.
- Covid-19 Lab testing turn around times stabilized at **around 24 hours** – even after increased the testing volume.

PRE Go-Live



POST Go-Live



Summary & Take Away

- Listen and work with your **Clinical Stakeholders**
- Build and maintain – positive, collaborative & respected **Relationships**
- Understand the main **bottlenecks and pain points**
- Understand your **Information Systems** (capabilities and limitations)

- Understand the **technologies in your ecosystem** and how they can be incorporated in the overall workflow and experience
- Think about the **overall experience** for the end user and the patient
  - How can we make it better
  - How can we automate
  - How can we optimize

Acknowledgements & Our Team

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Thank You

Need More Info?
letstalkinformatics@nshealth.ca