



Ontario's Long-Term Care COVID-19 Commission

Testing and the COVID-19 Pandemic
Response

NOVEMBER 25, 2020



Participants

Dr. Vanessa Allen, Chief Microbiology And Laboratory Science, Public Health Ontario Laboratory, Medical Director, Ontario's Laboratory Network

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Agenda

Introductions – Matthew Anderson

Overview: COVID-19 Testing Continuum – Matthew Anderson

Testing Approach and Strategy – Dr. Vanessa Allen, Fredrika Scarth

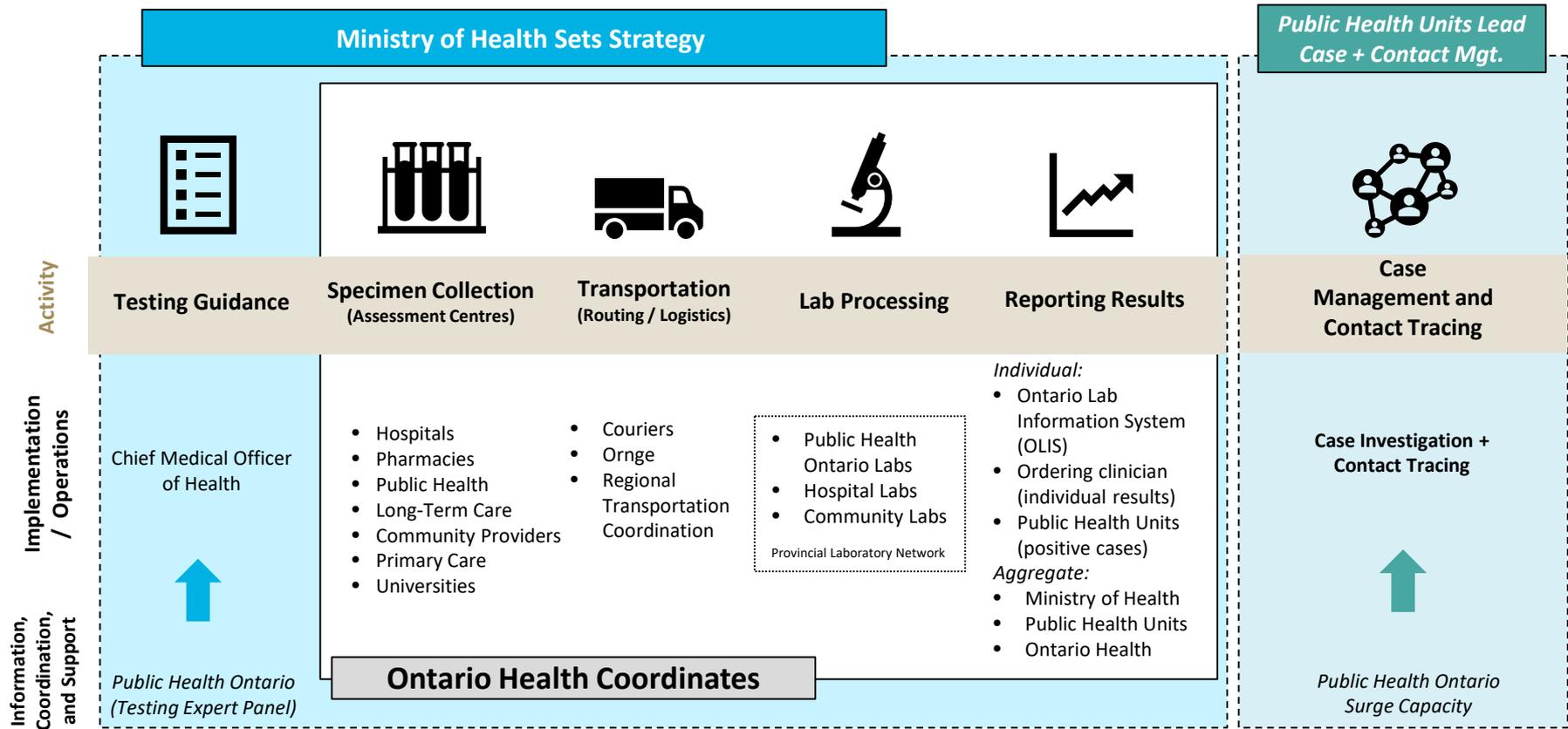
Testing within the Long-Term Care Sector – Olha Dobush, Dr. Dirk Huyer



Overview

COVID-19 Testing Continuum

COVID-19 Testing Continuum

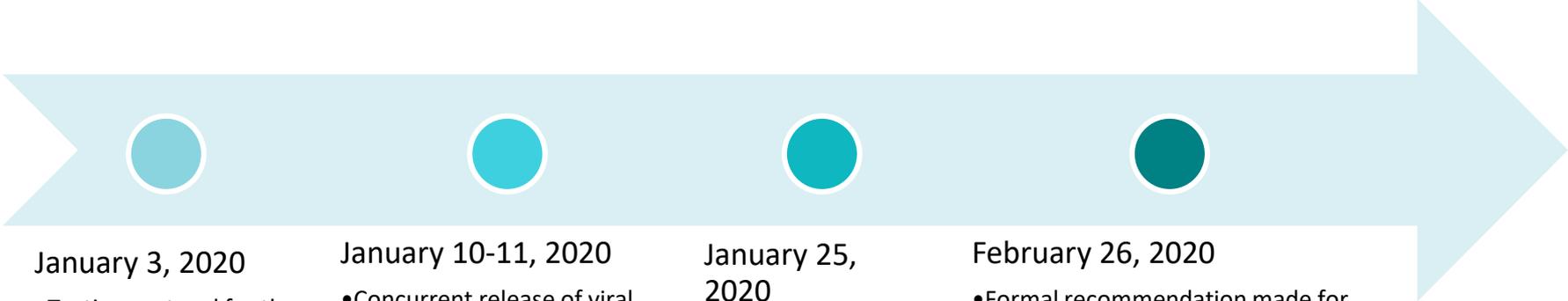


*Ministry of Long-Term Care testing responsibilities include long-term care testing guidance, specimen collection in long-term care homes.



Testing Approach and Strategy

Initial Chronology of COVID-19 Testing at Public Health Ontario



January 3, 2020

- Testing protocol for the unknown pathogen established at PHO
- Teleconference with provincial partners
- Update of website for guidance

January 10-11, 2020

- Concurrent release of viral sequence from Chinese authorities, matched pan-coronavirus PCR that was part of protocol (RdRp gene)
- First sample tested and negative at PHO, retested at NML also negative

January 25, 2020

- First case of COVID-19 identified at PHO, confirmed at NML on January 27, 2020

February 26, 2020

- Formal recommendation made for distributed testing to CMOH
- Only 629 samples to date had been tested in Ontario
- Cases at this time identified in China, Hong Kong, Iran, Italy, Japan, Singapore and South Korea
- PHO never rejected a sample for testing unless the sample integrity was compromised

Assessment (Testing) Centres



March 2020

Ontario Health partners with hospitals to establish COVID-19 Assessment Centres



Planning Assumptions and Operational Readiness Checklist for COVID-19 Assessment Centres



Regional leaders confirm Assessment Centre readiness and modality



Today

160+ testing locations, plus mobile and community testing sites and pharmacies

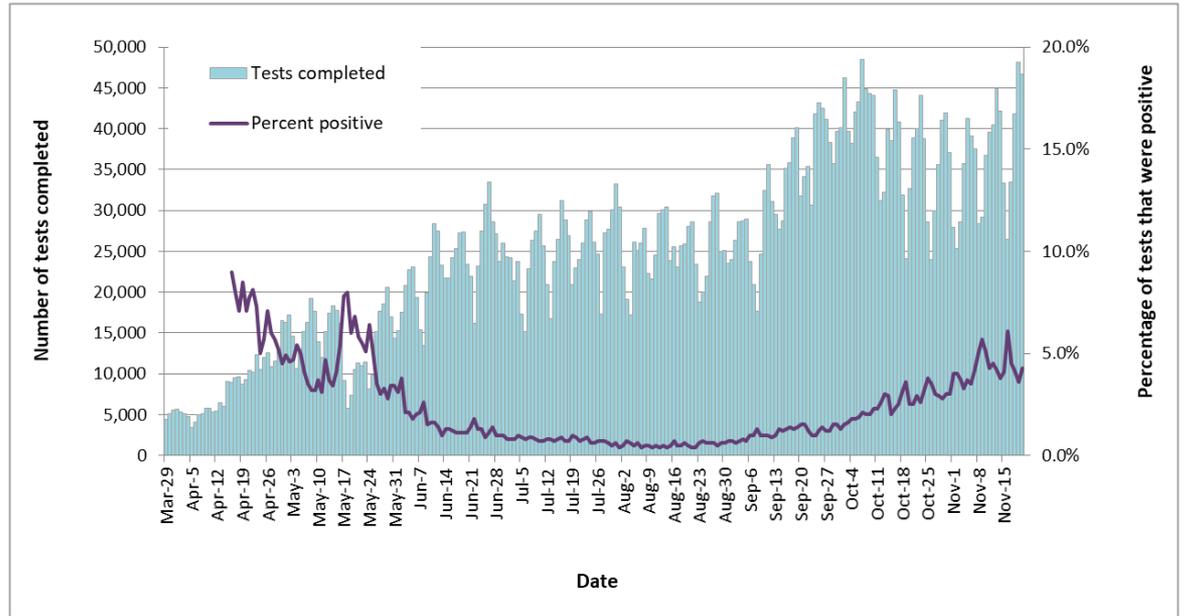
Chronology of Testing Volumes

Prior to March 29, 2020

Post March 29, 2020

(after initiation of the Provincial Diagnostic Network)

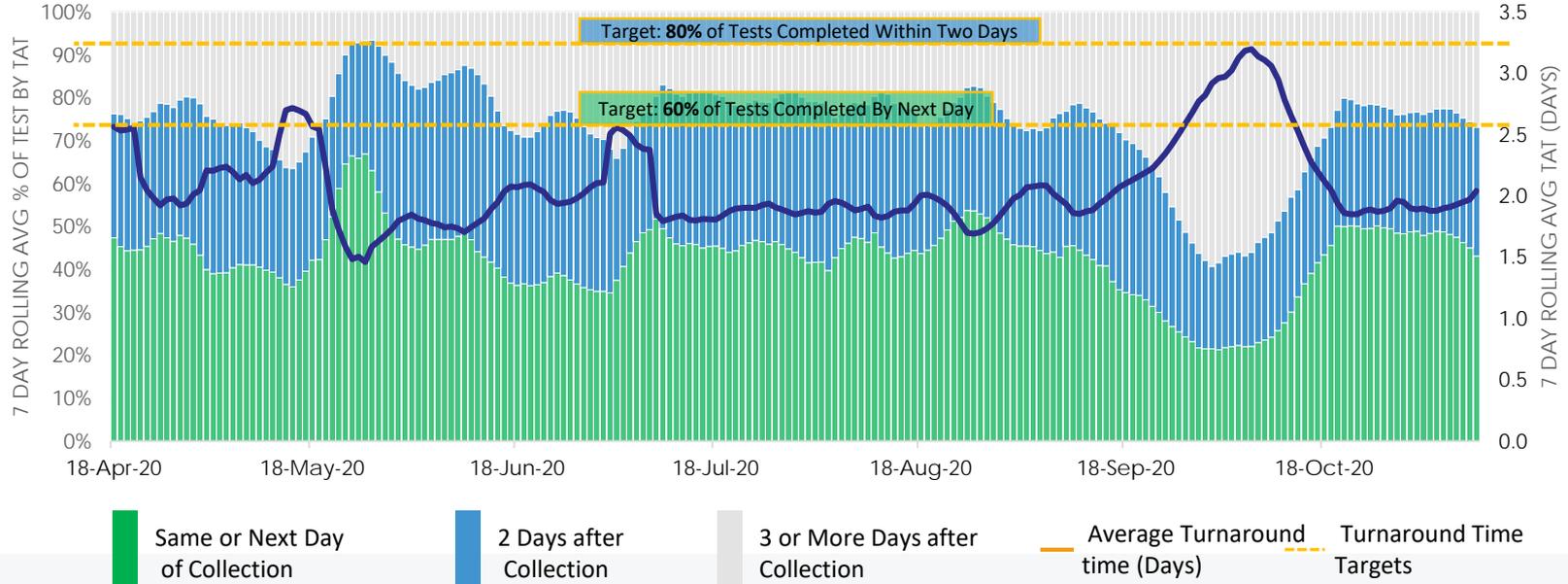
Time Period (2020)	COVID-19 Tests Completed
January	103
February	1,838
March 1-29	49,227 32,068 - PHO 17,159 - hospital labs



Network Turnaround Time Performance

- Since the high of 3.2 days in early October due to a heightened backlog, the network has reduced the average end-to-end testing turnaround times by **38 per cent** to 2.0 days, as of November 10, 2020.
- During this same time period, in-lab processing times decreased **43 per cent** from an average of 35 hours to an average of 20 hours.

Turnaround Time Results – April 18 – November 10



Main Components of Delivering Laboratory Testing Services for the Pandemic

A laboratory testing strategy has the following main components

1. Who should be tested.
2. How and where a sample is collected (specimen collection and routed).
3. How the sample is analyzed (laboratory testing/ analysis).
4. How results get to those who need it (result reporting).
5. How should results be used to inform action (interpretation).

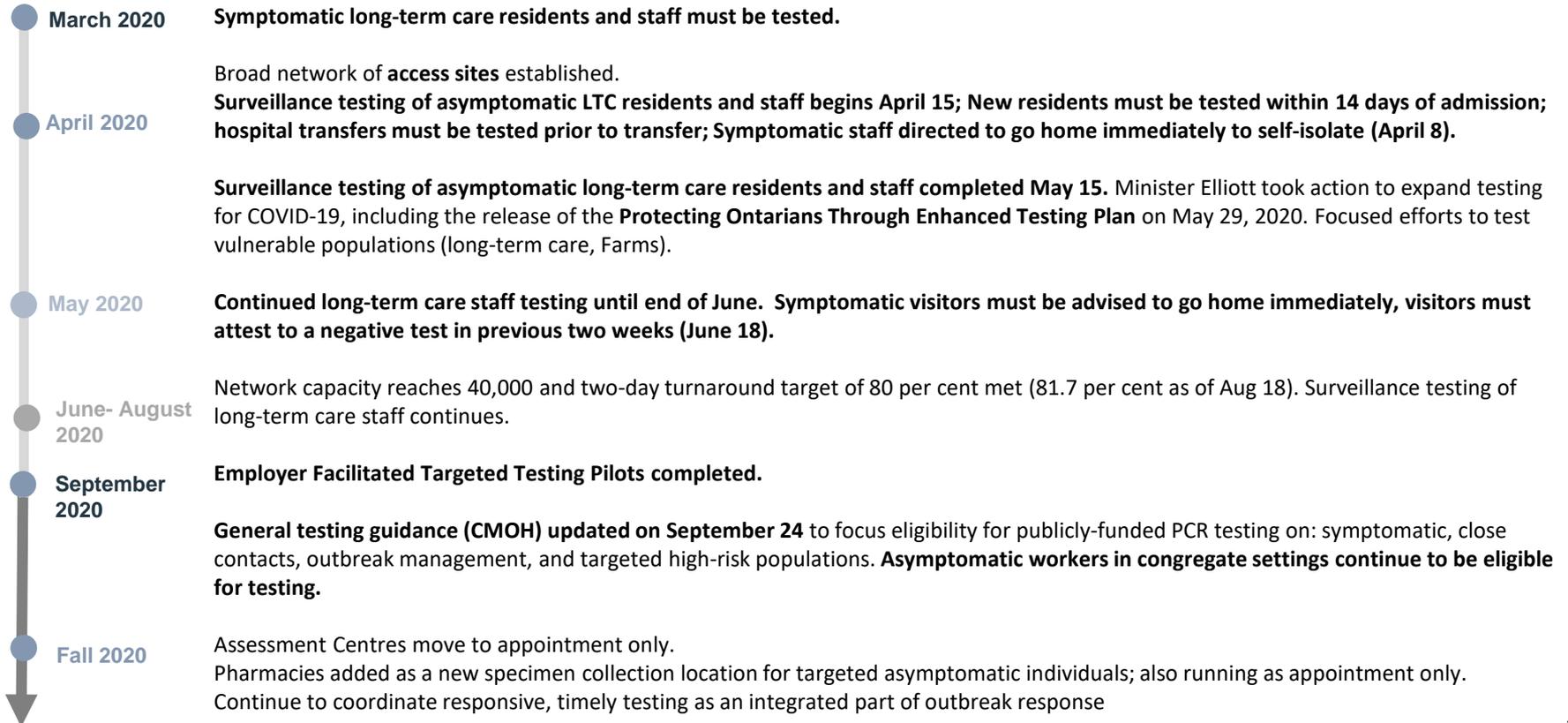
There has been evolution and innovation in these components throughout the pandemic.

1. Who Should Get Tested

Testing Strategy Expert Panel

- Formed on April 5, 2020 at the request of the Health Command Table.
- The Testing Strategy Expert Panel is one source of input into the development of testing guidance and ministry policy. They provide recommendations regarding testing to the Chief Medical Officer of Health via Public Health Ontario for consideration in making policy.
- Members include experts from public health, microbiology, ethics, infection control, epidemiology and analytics.
- The initial mandate for the Testing Strategy Expert Panel was to provide evidence-based, pragmatic recommendations to update testing guidance as provincial testing capacity increased.
- Since July, areas of focus include advice on:
 - Ongoing review of routine testing recommendations
 - Workplace testing
 - Resource prioritization
 - Targeted testing

Timeline of Testing Milestones



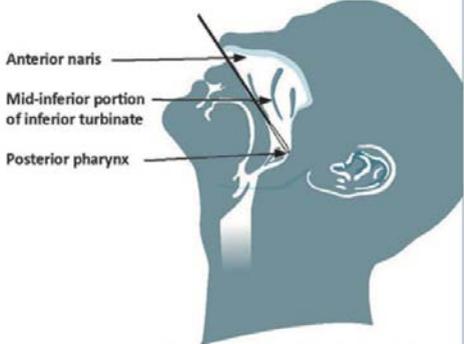
2. How a Sample Can Be Collected

- Nasopharyngeal samples (NPS) are the gold standard specimen collection type
 - Highest sensitivity when compared to other specimen types (i.e., able to detect small amounts of viral genetic material).
 - Can be used to test for other respiratory viruses as well (e.g., influenza).
 - Needs licensed healthcare provider to take sample.
 - Requires change of PPE for each patient.
 - Discomfort in collecting sample (and some people have medical conditions that make it difficult to collect a NPS).

Nasopharyngeal Specimen Collection Instructions

Public Health Ontario | Santé publique Ontario

1. Tilt patient's head back 70°.
2. Insert flexible shaft mini-tip swab through nares parallel to palate (not upwards) until:
 - a. Resistance is met, OR
 - b. Distance is equivalent to half the distance from the patient's ear to their nostril.
3. Gently rub and roll the swab.
4. Leave swab in place for several seconds to absorb secretions.
5. Slowly remove the swab while rotating it and immediately place in sterile tube containing transport medium.



In a seated position, tilt the head back at a 70° angle as illustrated in the picture

Ontario

Other Acceptable Sample Collection Types

- Combined throat and nares is the preferred alternative to NPS.
- Other samples are acceptable, but less sensitive (lead to a less reliable test)
 - Deep nasal
 - Nasal
 - Throat
 - Saliva
- PHO provides guidance to healthcare providers on preferred and acceptable specimen types for COVID-19 testing by patient characteristic.

Specimen Type ¹	Non-hospitalized patients with respiratory symptoms or asymptomatic persons meeting criteria outlined by the Ministry of Health	Hospitalized patients with respiratory symptoms	Performance Characteristics Notes
Nasopharyngeal (NP) swab	Preferred	Preferred	A preferred specimen type for optimal sensitivity ²
Combined swab of Throat and both Nares	Preferred when NP specimen cannot be collected	Preferred when NP specimen cannot be collected	A preferred specimen type among non NP-options ²
Deep Nasal swab	Preferred when NP specimen cannot be collected	Preferred when NP specimen cannot be collected	A preferred specimen type among non NP-options ²
Anterior Nares/Nasal/Nostril Swab (both sides)	Acceptable	Acceptable	Less sensitive than NP, Deep Nasal or Combined Throat and Nasal specimen ²
Throat/Oropharyngeal swab	Acceptable	Acceptable	Less sensitive than NP, Deep Nasal or Combined Throat and Nasal specimen ²
Saliva - neat	Acceptable when NP, nasal or throat specimens cannot be collected ³	Not appropriate	Less sensitive than NP, Deep Nasal or Combined Throat and Nasal swab specimens ^{2,4,5,6}
Saliva: mouth rinse – "swish and gargle"	Acceptable when NP, nasal or throat specimens cannot be collected ³	Not appropriate	Less sensitive than NP, Deep Nasal or Combined Throat and Nasal swab specimens ^{2,4,5,6}
Lower respiratory tract (when possible); sputum, BAL, bronch wash, pleural fluid, lung tissue, tracheal aspirate	Acceptable	Preferred	A preferred specimen type for optimal sensitivity in severely ill patients

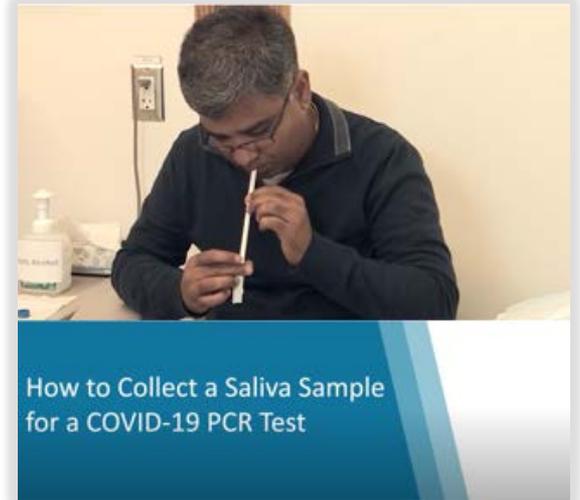
Innovative Sample Collection Types

Saliva & Swish and Gargle

- Lower sensitivity compared to NPS (but acceptable)
- Cannot be used to test for other respiratory viruses as well (e.g., influenza)
- Does not require a licensed HCP to collect sample
- Does not require change of PPE for each patient
- Less discomfort compared to NPS.

Groups for saliva and swish and gargle

- Children under the age of 16 who do not tolerate NP, nasal or throat collection
- People with a relative or absolute contraindication to NP swab
- Adults who are not able to tolerate swab collection for other reasons



<https://youtu.be/1rasC2obaKY>

3. How the Sample is Analyzed: Types of Testing for COVID-19

	Molecular (PCR)	Antigen	Serology
What question does it answer?	Do I currently have COVID-19? (CURRENT DIAGNOSIS)	Possible early warning of COVID-19 ?	Have I had COVID-19? (past exposure)
How does a sample get collected?	 NPS, Nose and/or throat swab, saliva	 NPS (to follow nasal, saliva)	 Blood (serum) sample
What is being detected in the test?	 Genetic material of the COVID-19 virus	 Proteins from the COVID-19 virus	 An individual's antibodies
When should this test be taken?	Early in the disease cycle (Ideally day 2-4 of infection)	Early in the disease cycle (within first 7 days of infection)	Late in the disease cycle (Ideally day 14+ after infection)
Where is this test conducted?	Lab-based (& Point of Care)	Point of Care (no use case for lab-based)	Lab-based (no clear use case for Point of Care at this time)

Overview of Rapid Tests

Types of Rapid Tests	Accessible Rapid Tests	Rapid Tests That Require Instrumentation	Rapid Tests in The Laboratory
Example for COVID-19 test	Antigen tests 	Small analyzer based tests (Precision Biomonitoring) 	Larger user friendly analyzers (Cepheid) 
Analogy in other testing	Urine pregnancy test	Blood gas analyzer	Plug and play analyzers that process single specimens

Definition from Clinical Laboratory Standards Institute. POCT15: Point-of-care testing for infectious diseases. 1st edition January 2020.

Ontario's Rapid Testing Program Goals and Workstreams

As set out by the Strategy and Policy Taskforce for COVID-19 Testing Innovation Ontario's rapid testing **program goals** are to:

- **Increase accessibility to diagnostic testing** for populations experiencing long turnaround times for test results.
- **Enable rapid identification of positive/negative patients** to begin contact tracing, support outbreak management and surveillance.
- **Reroute testing demand** away from the current laboratory-based polymerase chain reaction network.

Ontario's Rapid Testing Program includes the following **workstreams**:

- **Long-Term Care Homes:** Voluntary participation, double swabbing required, testing staff and residents.
- **Employer Pilot:** Any Ontario-based employer across a variety of workplaces; screening asymptomatic individuals.
- **Northern/Remote/Rural Communities:** To help improve turnaround times.
- **Indigenous Communities:** To help improve access.
- **Early Outbreak Identification and Management:** To provide additional support to local Public Health Units.

Summary of COVID-19 Laboratory Testing Landscape in Ontario

Specimen Collection Type

Nasopharyngeal
(gold standard)

Preferred alternatives:

- Combined throat and nares
- Deep nasal

Acceptable but not preferred alternatives:

- Throat
- Nasal

Innovative methods:
Saliva & Swish and Gargle*

Specimen Testing

Standard PCR

Diagnostic RT-PCR
(viral genetic material)

Gold standard for diagnosis

Rapid tests

Rapid Molecular Diagnostic Test
(viral genetic material)

Early diagnostic results
(all require a confirmatory PCR)

Antigen Screening Test
(viral proteins)

Frequent and on-site screening
(Concurrent regular PCR for high risk settings)

* Only available as a specimen type for clinical standard laboratory based PCR testing in Ontario

Considerations in the Deployment of Rapid Tests for COVID-19

Pros	Cons
<p>Potential innovative tool for population level intervention:</p> <ul style="list-style-type: none">• Identify more cases• More rapid identification (decreased turn around times)	<p>Limited data on field performance: initial data shows higher rate of false positive and false negative</p> <ul style="list-style-type: none">• For high risk and high probability should be done in tandem with lab based PCR
<p>May detect those that are most infectious</p>	<p>Need to reinforce that these tests can not replace critical prevention strategies</p>
<p>Increased overall test capacity</p>	<p>Still require quality and reporting infrastructure</p>
	<p>Limited specimen collection types</p>

4/5. Results Reporting and Interpretation

- Results Reporting
 - Results must be communicated to the ordering clinician and health unit
 - In the first wave of the pandemic
 - Results communicated through a combination of faxes & phone call and individual lab information system
 - Patient viewer introduced, captured all results successfully captured in OLIS.
 - Second wave
 - New tools developed for HU reporting through CCM
 - OLIS initiative to streamline data entry at assessment centres.
- Results Interpretation
 - Support provided to clinicians & health units
 - Online advice
 - 24/7 microbiologist on call service
 - Participation in multiple teleconference calls.



Testing Within Long-Term Care

COVID-19 Testing Strategy for Long-Term Care Homes

	LOCAL PUBLIC HEALTH UNIT LEVEL				
	Green-Prevent	Yellow-Protect	Orange-Restrict	Red-Control	Grey-Lockdown
Staff	<ul style="list-style-type: none"> Tested every two weeks 		<ul style="list-style-type: none"> Tested weekly 		
Students					
Volunteers					
Caregivers	<ul style="list-style-type: none"> Provide proof of a negative COVID-19 test result in the past two weeks Verbally attest to not subsequently testing positive* 		<ul style="list-style-type: none"> Provide proof of a negative COVID-19 test result in the past week Verbally attest to not subsequently testing positive* 		
Support workers					
General Visitors	<ul style="list-style-type: none"> Provide proof of a negative COVID-19 test result in the past two weeks Verbally attest to not subsequently testing positive* 		<ul style="list-style-type: none"> Not applicable; visits not permitted. 		
*Unless the support worker or visitor requires immediate access in an emergency or palliative situation.					
Residents	<ul style="list-style-type: none"> Symptomatic residents must be isolated and tested for COVID-19. New admissions (community or hospital) and re-admissions (from hospital) must: <ul style="list-style-type: none"> Receive a negative test result and be transferred to the home within 24 hours of receiving result, be isolated at the home for 14 days and tested again at the end of isolation; or Be confirmed infected and cleared of COVID-19. Tested as part of the outbreak management, as directed by the Public Health Unit. 				

Timeline of Testing Practices: Long-Term Care

Residents

March	April	May	June	July
March 9: Standard respiratory test specimens also tested for COVID-19				
March 30: Symptomatic residents must be tested	April 15: Surveillance testing of asymptomatic residents begins	May 15: Surveillance testing of asymptomatic residents completed		

Staff

	April 8: New residents must be isolated & tested within 14 days of admission		June 10: New admissions and re-admissions (from hospital) must be tested prior to transfer and retested after 14 days of isolation, (unless cleared of COVID-19) Symptomatic resident should be tested.	
	April 8: Hospital transfers must be tested prior to transfer			
March 30: Symptomatic staff tested; positive & symptomatic staff cannot attend work	April 8: Positive and symptomatic staff cannot attend work		June 10: Symptomatic staff must be to be tested; symptomatic or positive staff cannot attend work	

Visitors

	April 15: Surveillance testing of asymptomatic staff begins	May 15: Surveillance testing of asymptomatic staff complete. May 31: Continued surveillance testing of staff until end of June.		July 16: Surveillance testing of staff to continue until further notice with at least two tests per month
	April 8: Anyone w COVID-19 symptoms shouldn't be allowed to enter the home		June 10: Symptomatic visitors must not be allowed in the home, advised to self-isolate and be encouraged to be tested	
			June 18: Visitors must attest to a negative test in the previous 2 weeks	

Directive #3

Visitor Policy

Memos

Currently → implemented

Current Work to Enhance COVID-19 Testing in Long-Term Care

- Specimen Prioritization Protocol distributed and emphasized
 - Commitment to 48 hours turn around time from collection to reporting if followed
 - Refinement in November 9, 2020.
- Webinar series with long-term care homes for enhancing specimen collection, labelling and packaging and transportation (joint Ontario Health/Public Health Ontario)
 - Five webinars, week of November 23.
- Implementation of rapid tests in long-term care (led by the Ministry of Long-Term Care and the Ministry of Health and supported by Ontario Health and Public Health Ontario)
 - ID now for outbreak support
 - Panbios for screening and outbreaks.



Appendix

Roles and Responsibilities

Ministry of Health:

- Leads the development of the overall COVID-19 Testing Strategy.

Chief Medical Officer of Health:

- Sets and directs testing guidance through directives etc. The guidance informs who should get tested.
- Provides clinical and public health leadership and advice to the public health sector.

Medical Officers of Health and Public Health Units

- Oversees the implementation of local pandemic management plans including testing.

Public Health Ontario:

- Serves as the centre for expertise and reference testing for public health microbiology in Ontario including providing clinical advice around test use and interpretation, test validation, innovation and deployment.

Ministry of Long-Term Care:

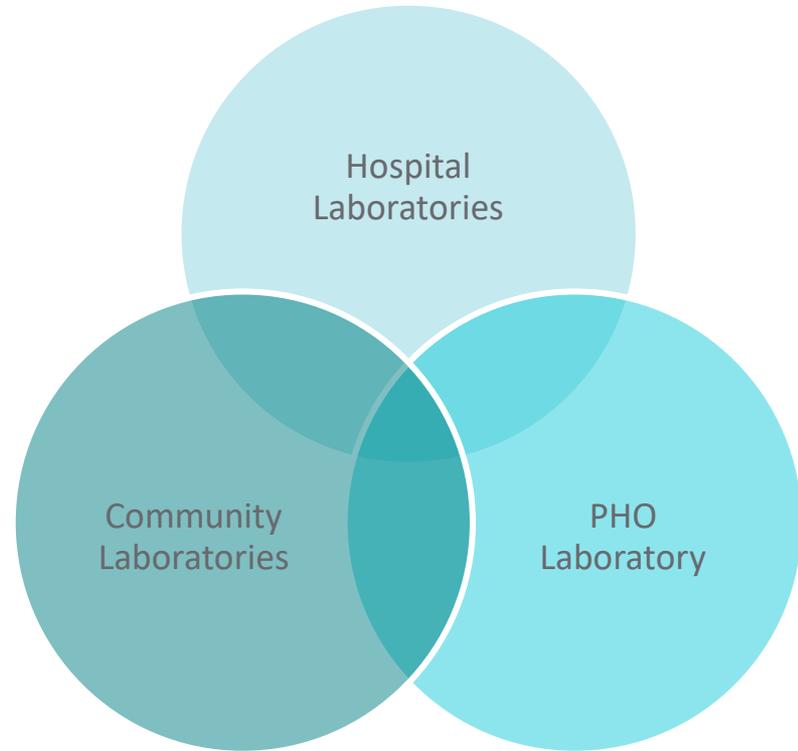
- Establishes additional testing guidance for long-term care homes.

Ontario Health:

- Operationalizes the COVID-19 Testing Strategy, coordinates the testing sites and provincial laboratory network.

Ontario's Laboratory Providers

- Significant collaboration across providers that includes specimen referral, quality, best practices
- Distinct IT systems, specimen transport routes, funding mechanisms and oversight



Public Health Ontario's Role in COVID-19 Laboratory Science and Testing

Public Health Ontario (PHO) Laboratory offers routine, reference and public health microbiology expertise, science and laboratory services for Ontario

- Role in preparedness for emerging pathogens
 - Has an established Pathogen Preparedness and Test Development Unit
 - Strong collaboration with National Microbiology Laboratory (NML)
 - Tests developed and offered at PHO to ensure timely and local capacity include Ebola, Zika, MERS-CoV, E. coli O111, Zika
- Testing plan for COVID-19
 - Established and available January 3, 2020 to include sample sequencing and respiratory panel (prior to confirmation of the causal pathogen)
 - PHO tested first clinical sample on January 10, 2020