



The Value of Rapid Antigen Testing

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Learning Objectives

- Explain the overall value and differences between molecular and antigen testing
- Discuss the respiratory disease state and the recent tripledemic in the US
- Describe the benefit of combination rapid antigen testing during respiratory seasons

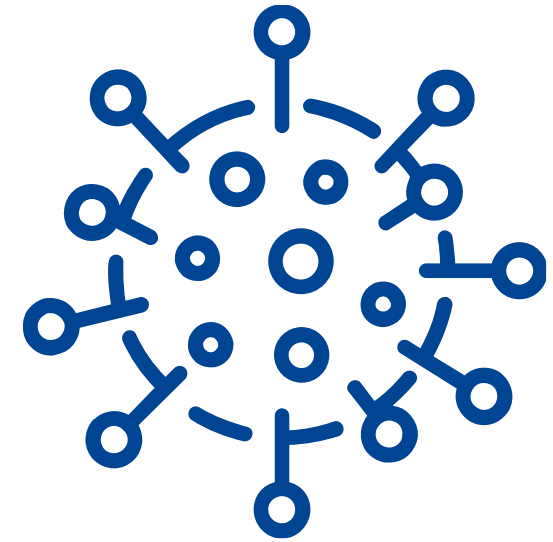
Testing is Critical

SO IS CHOOSING THE RIGHT TESTING MODALITY

Molecular and Antigen tests are commonly used to diagnose patients with active upper respiratory infections.¹



Molecular Test



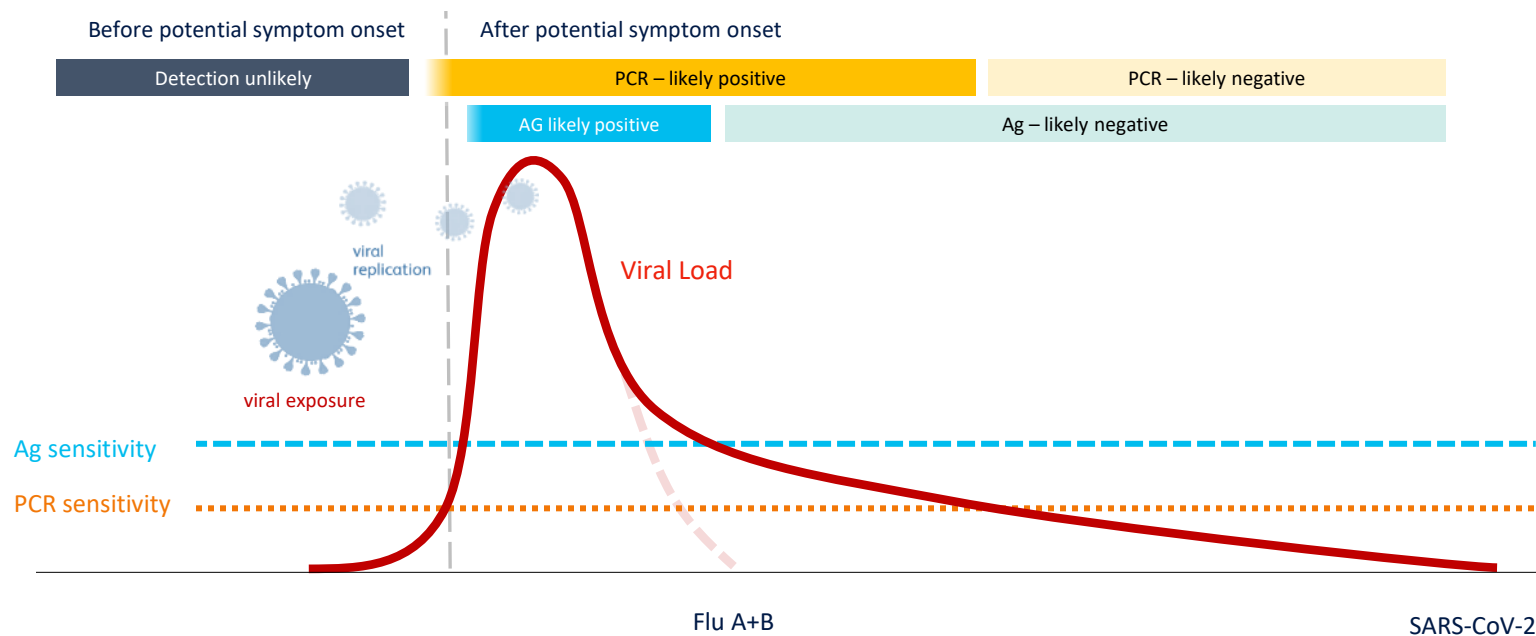
Antigen Test

Overview: Molecular vs. Antigen testing

	Molecular (Laboratory)	Antigen (POC, At-Home)
Other Names	PCR, NAAT ¹	Rapid test ¹
Tests for	Viral genetic material (RNA) ¹	Specific proteins of the virus ¹
Sample Type	Usually collected from nose or throat ¹	Usually collected from nose or throat ¹
Personnel Required	Samples can be self or provider-collected, but lab personnel required to perform testing ¹	Collection and testing can be performed independently or by HCPs (e.g. SCV2 at-home tests) ¹
Processing Time	~2-3 hours ¹	~15-30 minutes ¹
Result Communication Time	~24-48 hours plus transport time ¹	Immediately ¹
Accuracy (sensitivity)	Highly sensitive, gold standard ¹	Less sensitive than molecular, especially in those without symptoms ¹
Window of Detection	Up to 90 days post-symptom onset ¹	Usually 5-7 days post-symptom onset ¹ (usually when most infectious)
Confirmatory Test Required?	No ¹	Serial testing and/or follow-up PCR confirmatory testing required if negative ¹

When to test symptomatic patients for COVID-19 and Influenza

PROGRESSION OF VIRAL INFECTION^{2,3,4}



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2. Sethuraman N, Jeremiah SS, Ryo A. Interpreting Diagnostic Tests for SARS-CoV-2. *JAMA* (v0.1)
3. Q., Liu, B., Deng, H. et al. Antibody responses to SARS-CoV-2 in patient (v0.1)
4. Mina Michael J. et al. Rethinking Covid-19 Test Sensitivity - A Strategy for Containment N (v0.1)
5. Goyal A et al. Viral load and contact heterogeneity predict SARS-CoV-2 transmission and super-spreading events

THE VALUE OF RAPID ANTIGEN TESTING

Different tests are appropriate at different times and for different objectives. Selecting the appropriate test depends on several criteria:^{2,3,4}

- ✓ **What's the testing objective?**
- ✓ **What's the patient's condition and potential exposure?**
- ✓ **What's the patient care setting and access to a lab?**
- ✓ **How quickly do you need an answer?**

Rapid Antigen Testing

BUILT FOR THE DEMANDS OF TODAY

With its shorter turnaround time, ability to accurately detect active infection, ease-of-use, and results delivered at the point-of-care or at-home, antigen testing is well-suited for early diagnosis and intervention:⁶



Rapid results

support immediate diagnosis and patient management^{1,6}

Same day convenience reduces patient and care wait times and loss to follow up⁶



No prescription required for at-home antigen tests¹



No medical professional required for sample collection or for testing for at-home antigen tests¹



Clinically validated and trusted⁶



Cost-effective to support frequent testing scenarios such as serial testing⁶



Expands access to testing^{1,6}

Condition	Time of year	Treatment(s)	Us disease burden
COVID-19	<ul style="list-style-type: none"> • Still being understood¹ • Expected to become seasonal, like influenza²² 	<ul style="list-style-type: none"> • Antivirals (Remdesivir, Paxlovid, Molnupiravir)¹⁸ • Immune Modulators (Olumiant and Actemra)¹⁸ 	<ul style="list-style-type: none"> • 104M+ confirmed cases¹⁶ • 6.1M+ admissions¹⁶ • 1.1M+ deaths¹⁶
Influenza A & Influenza B	<ul style="list-style-type: none"> • Flu activity typically peaks between Dec and Feb¹² • Atypical flu transmission has been reported all over the world after the COVID-19 pandemic²⁰ 	<ul style="list-style-type: none"> • Antivirals (Tamiflu, Relenza, Peramivir, and Baloxavir marboxil)⁹ 	<ul style="list-style-type: none"> • 9M-41M cases per year¹² • 140k-710k hospitalizations per year¹² • 12k-52k deaths per year¹²
Respiratory Syncytial Virus (RSV)	<ul style="list-style-type: none"> • Peaks late-December to mid-February¹⁴ 	<ul style="list-style-type: none"> • No treatment in most cases, typically self-limiting¹³ 	<ul style="list-style-type: none"> • 2.1M outpatient visits per year in children <5¹⁴ • 235k hospitalizations per year¹⁴ • 6k-10k deaths in adults 65+ per year¹⁴
Group A Strep	<ul style="list-style-type: none"> • Cases occur year-round, but more commonly in winter and spring¹⁵ 	<ul style="list-style-type: none"> • First Line abx's: Penicillin V & Amoxicillin¹⁵ • If PCN allergic: Erythromycin & Cephalixin¹⁵ 	<ul style="list-style-type: none"> • 5.2M+ outpatient visits annually¹⁵ • >2.8 million antibiotic Rx's annually for persons aged 0-64 years¹⁵

Key Takeaways:

- ✓ **Several highly contagious respiratory infections co-circulate during fall/winter months.**
- ✓ **Each have different approved treatments and plans of care.**
- ✓ **Rapid and accurate diagnosis at the POC allows quicker and more effective treatment intervention.**

Why test? Similar Presentation & Symptoms

Condition	Molecular (Laboratory)
COVID-19 ¹⁰	Fever/chills, cough, shortness of breath or difficulty breathing, muscle or body aches, headache, new loss of taste or smell , sore throat, congestion or runny nose, nausea or vomiting, and diarrhea
Influenza A and Influenza B ¹⁰	Fever/chills, cough, sore throat, runny or stuffy nose, muscle or body aches, headaches, fatigue, vomiting, and diarrhea
Respiratory Syncytial Virus (RSV) ¹³	Fever, runny nose, decreased appetite, coughing, sneezing, and shortness of breath
Streptococcal Pharyngitis ¹⁵	Fever/chills, sore throat, headache, nausea, scarlatiniform rash and vomiting
Allergic Rhinitis ⁷	Sneezing, runny nose, congestion, itchy and watery eyes , headache, post-nasal drip, and scratchy throat
Common Cold ⁸	Sneezing, runny nose, congestion, sore throat, coughing, fever, and post-nasal drip.

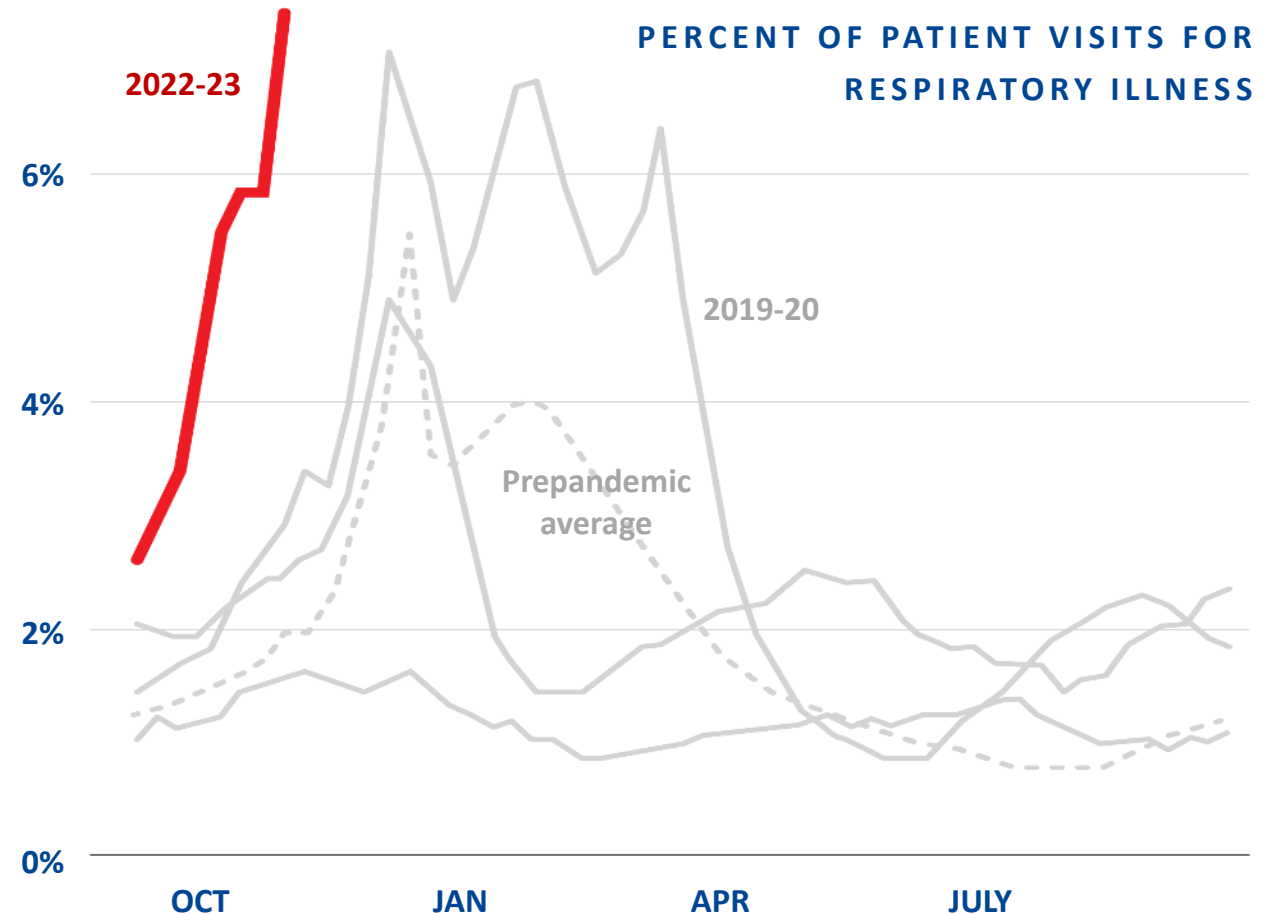
● Overlapping symptom

● Condition-specific symptom



2022-2023 U.S. Tripledemic

- The 2022-2023 “Tripledemic” (SARS-CoV-2, Flu, RSV) overwhelmed the U.S. healthcare system much earlier than expected last year²⁷
- ~40% of U.S. adults reported someone in their household became infected with one of the 3 viruses²⁵
- Co-infections are possible and evidence suggests they can lead to more severe disease in hospitalized patients²⁶



Multi-analyte Antigen Testing During Respiratory Season

POTENTIAL BENEFITS OF COMBO TESTING ^{17,19,21}

- More efficient and convenient provider and patient workflows (1 sample, 1 test, 3 results)
- Increased diagnostic confidence
- More targeted treatment (decreased risk of inappropriate abx use)
- Ability to detect co-infections
- Increase patient satisfaction (faster TTR, more confidence behind provider diagnosis)
- Conservation of healthcare resources and supplies

What the experts are saying...

- “Given overlap between influenza and symptoms of mild/moderate COVID-19, systematic testing for SARS-CoV-2 and influenza will be needed during the upcoming influenza season” (Flannery et al., 2021)¹⁹
- “A fast and convenient differential diagnosis between COVID-19 and influenza has significant clinical value” (Li et al., 2021)²¹
- “...treatments for COVID-19 and influenza are very different, and misdiagnosis could result in treatment delay and unnecessary wastage of medical resources” (Li et al., 2021)²¹

Summary & Key Takeaways

BENEFITS OF POC RAPID ANTIGEN TESTING

- Increased diagnostic confidence given significant symptom overlap between infections (multi-analyte testing capabilities)^{19, 21}
- Decreases risks of unnecessary and/or inappropriate prescribing (antibiotics & antivirals)²³
- Increased patient convenience (receive evaluation, testing, and treatment in one visit)^{1, 19, 21}
- Helps to further mitigate community transmission^{1,19,21,24}
- Can promote faster initiation of antiviral therapies (e.g. Tamiflu, Paxlovid)²⁴
- Easy to use and low training requirements²⁴

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THE VALUE OF RAPID ANTIGEN TESTING

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Questions?