Influenza and Group A Strep in Urgent Care:
Evidence-Based Guidelines and the Impact on Diagnostics and Treatment

December 9, 2019

1:00 pm – 2:00 pm ET

This webinar is sponsored by

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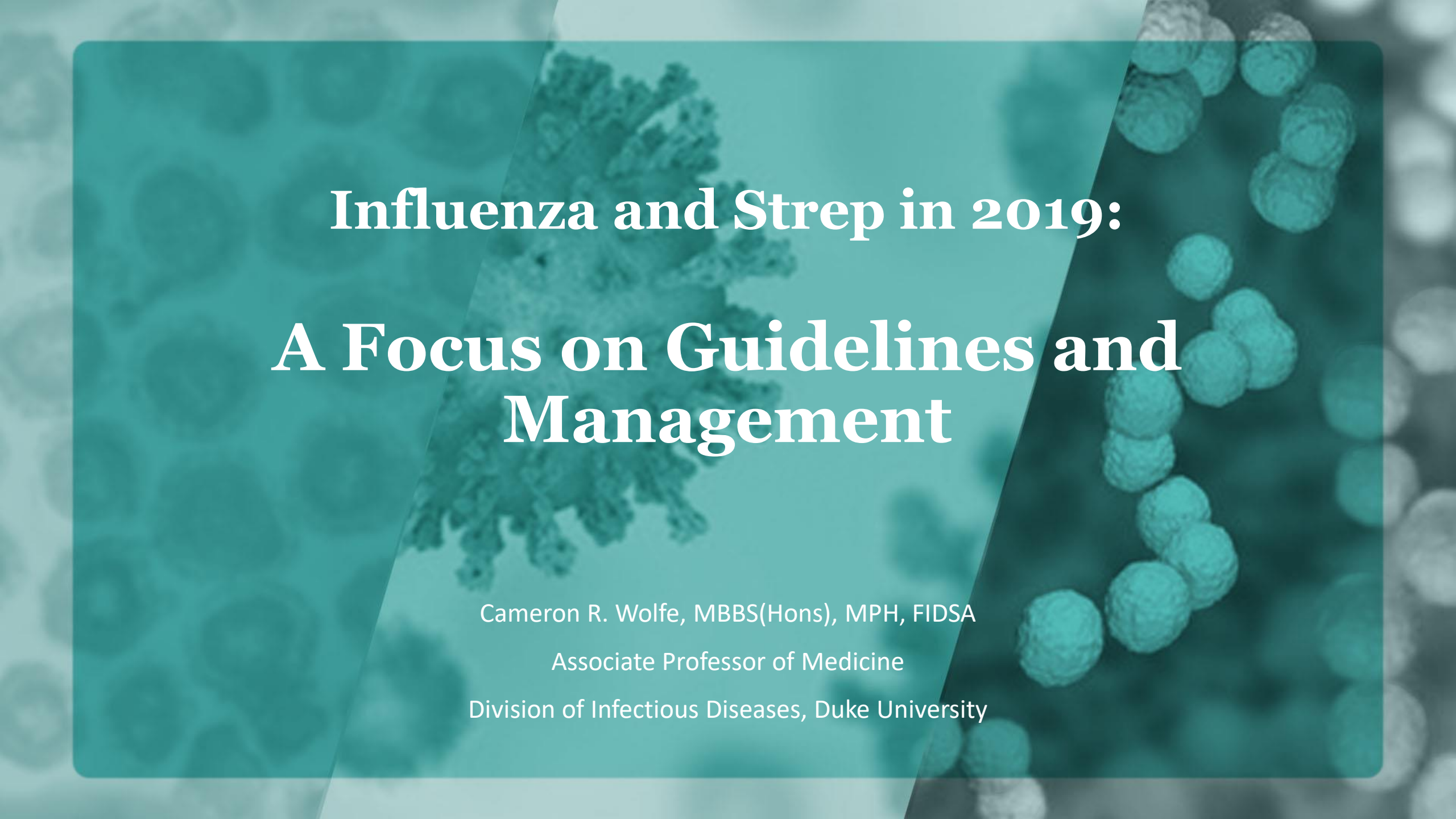
Speakers are presenting on behalf of Abbott. The information presented is consistent with applicable FDA guidelines.



Influenza and Strep in 2019:

A Focus on Guidelines and Management

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Division of Infectious Diseases, Duke University

Disclosure

In the last 12m received research and DMSB funding from:

Consultancy:

- Astellas (Antifungals)
- Chimerix (Antivirals)
- Cellerant (Heme/onc)
- Abbott (diagnostics)
- PWN Health (ID/IT diagnostics)

DSMB:

- Visterra (influenza Rx)
- Janssen (influenza Rx, RSV Rx and vaccines)
- Cellerant (neutropenic salvage Rx)
- Merck (CMV Rx)

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Outline:

- Motivation for New ID Society Guidelines for Influenza
  - How are the guidelines constructed?
  - What questions do they answer for outpatient care?
  - What's new compared to 2009, what's changed?

- Background and Burden
  - How common is influenza, clinical impact?

- Current Clinical Challenges with Testing & Treatment
  - What are our biggest challenges in the clinic?
  - How might the current guidelines drive change in the lab?

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Motivations to Change:

Clinical Practice Guidelines by the Infectious Diseases Society of America: 2018 Update on Diagnosis, Treatment, Chemoprophylaxis, and Institutional Outbreak Management of Seasonal Influenza[a]

Timothy M. Uyeki,[1] Henry H. Bernstein,[2] John S. Bradley,[3,4] Janet A. Englund,[5] Thomas M. File Jr,[6] Alicia M. Fry,[1] Stefan Gravenstein,[7] Frederick G. Hayden,[8] Scott A. Harper,[9] Jon Mark Hirshon,[10] Michael G. Ison,[11] B. Lynn Johnston,[12] Shandra L. Knight,[13] Allison McGeer,[14] Laura E. Riley,[15] Cameron R. Wolfe,[16] Paul E. Alexander,[17,18] and Andrew T. Pavia[19]

Clinical Infectious Diseases

IDSA
Infectious Diseases Society of America

- Guideline structure
  - Major sections
  - Major updates since last guideline (e.g., testing – both who, when and with what) and also treatment
  - Subtle changes in when to treat and with what, some new drugs, better understanding of when to use them
  - Ongoing changes occur in vaccination strategies, although these are intentionally not addressed in the guidelines (but specifically, vaccinate more people, more frequently, especially in health care circles where the risk of passing inadvertent flu to at risk folk is greatest)

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Background to Writing the Guidelines

- 4 Major Sections:
  - Diagnosis
    - Who to test, with what specimen?
    - Testing on which platform?
  - Treatment
    - Who to treat, when?
    - Which drug, how long?
    - Hospitalized vs outpatient care
    - Rx when your patient doesn't improve?
    - Experimental strategies
  - Antiviral Chemoprophylaxis
    - Who should receive prophylaxis?
    - If given, with what drug and for how long?
  - Institutional Outbreak Control
    - Focusing on Long-Term Care facilities

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Cost Burden of Four Adult Vaccine-Preventable Diseases in the U.S. (65 yrs and older), 2013

Vaccine-Preventable Disease	Estimated # of CASES	Estimated COSTS (Medical & Indirect) *(in millions)*
Influenza	4,019,759	8,312.8
Pneumococcal	440,187	3,787.1
Zoster	555,989	3,017.4
Pertussis	207,241	212.5
TOTAL	**5,223,176**	**$15,329.8**

226,000 admissions
3-49k deaths, per yr
Typically bimodal:
- very young
- very old or infirm

Direct cost: ~$10.4B
Indirect costs: $87B

~$11 billion more annually if population 50–64 yrs of age included

McLaughlin, JM., Tan, L., et al. 2015 J Prim Prev. 2015 Aug;36(4):259–73.

immunization action coalition
IAC
immunize.org

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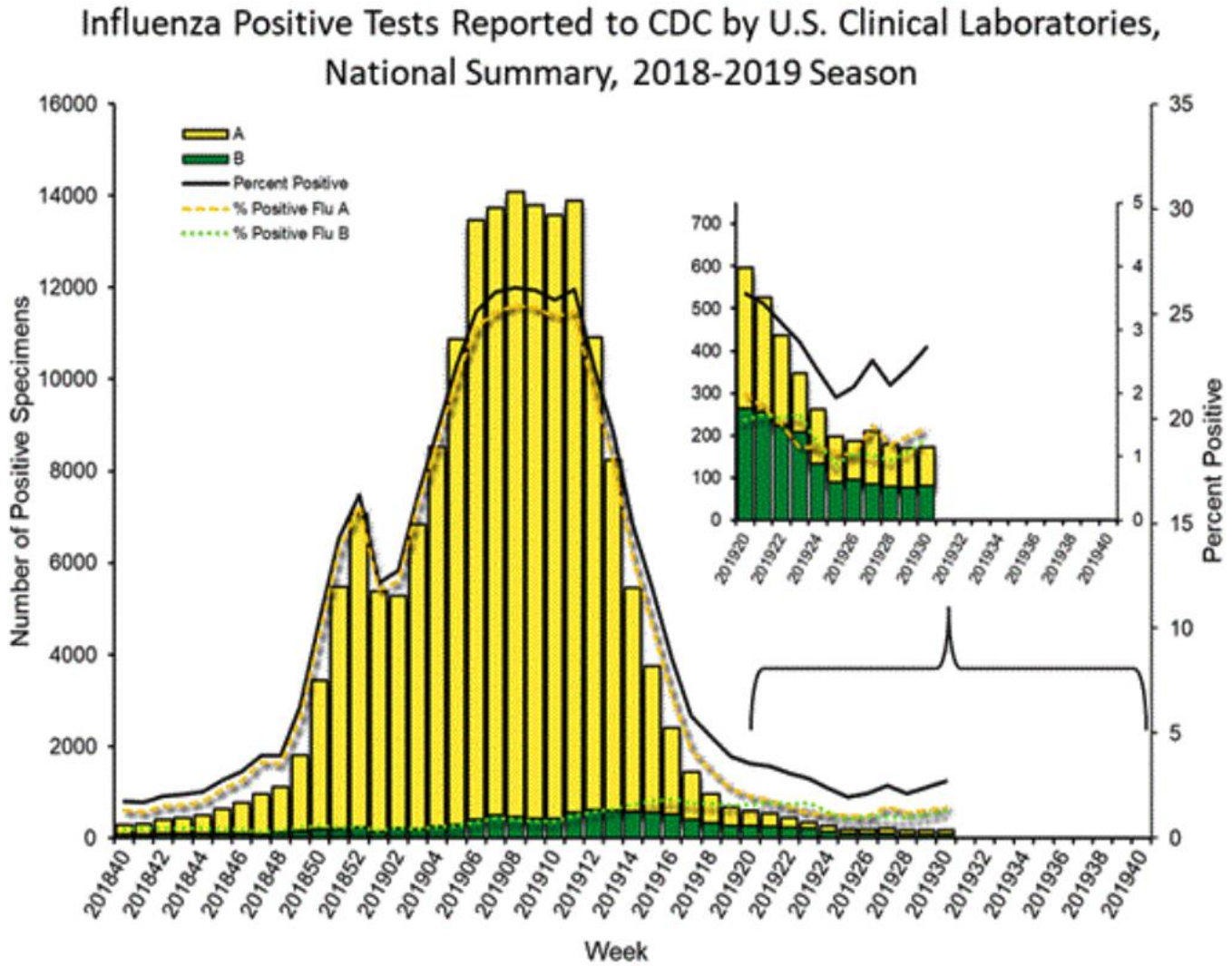
Seasonal Burden of Disease



CDC Weekly US Influenza Surveillance Report. https://www.cdc.gov/flu/weekly/index.htm (accessed Aug 8, 2019)
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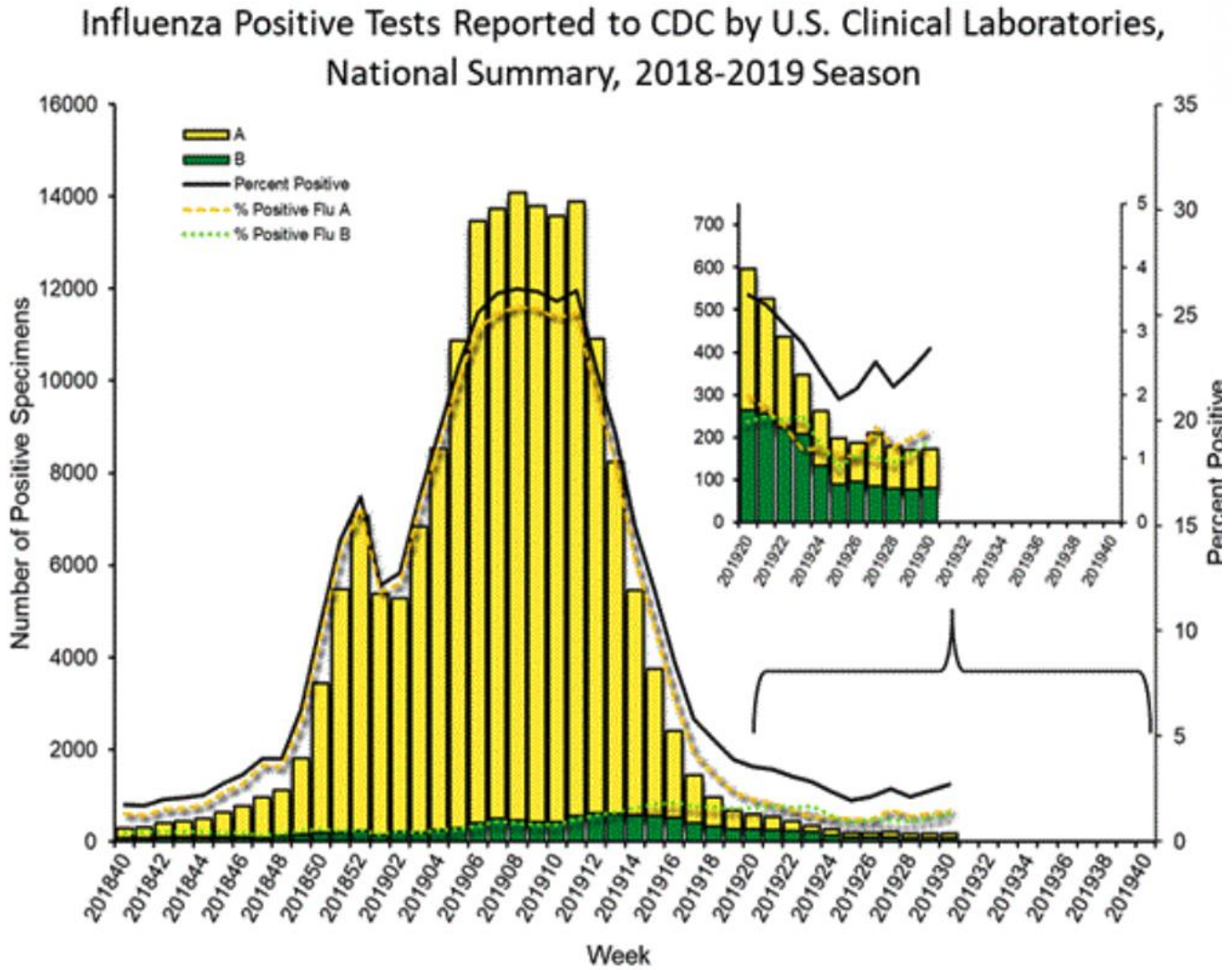
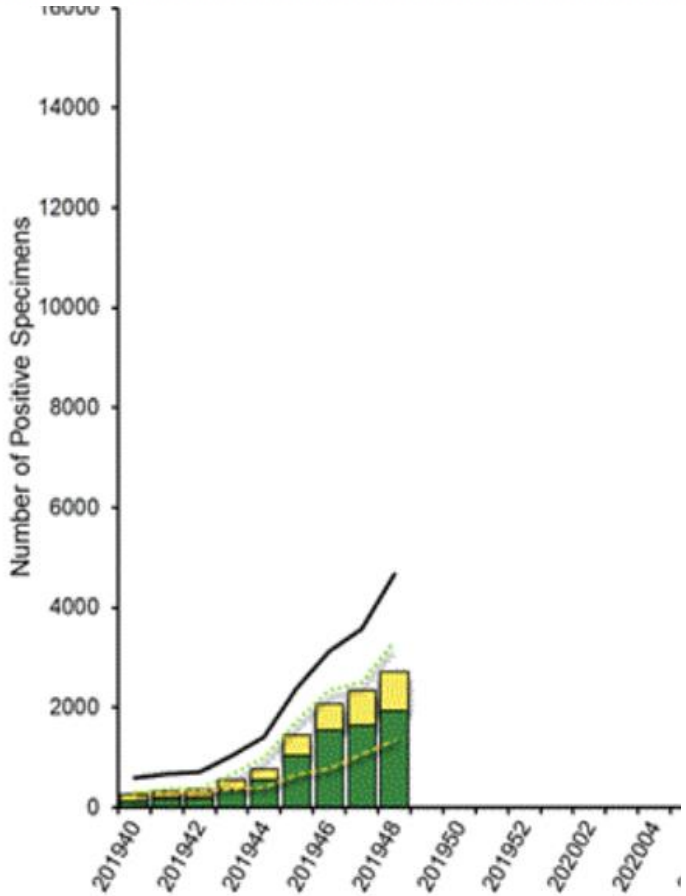


National Summary,
2019-2020 Season



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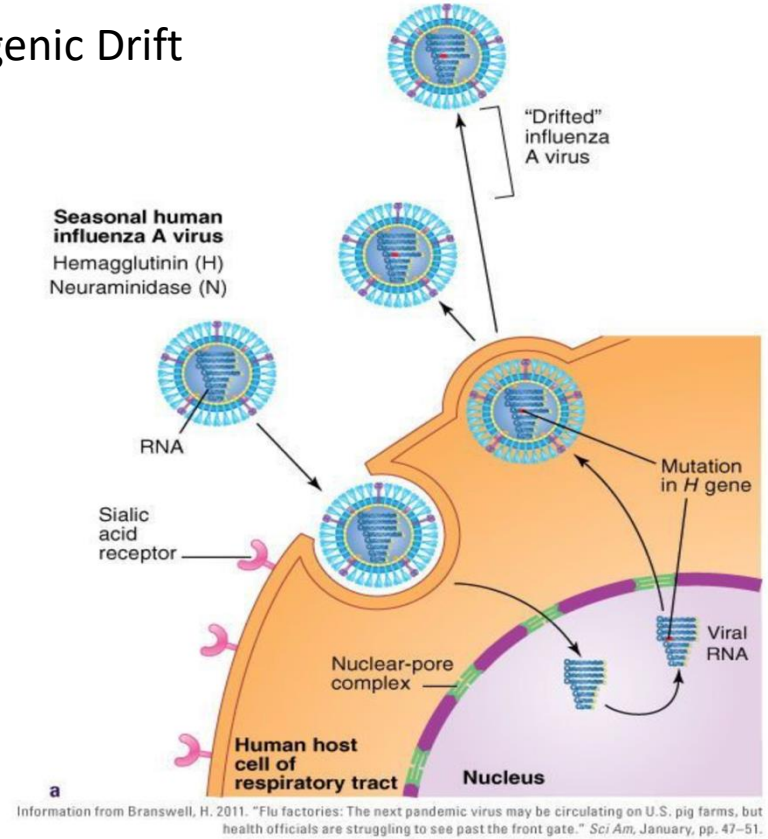
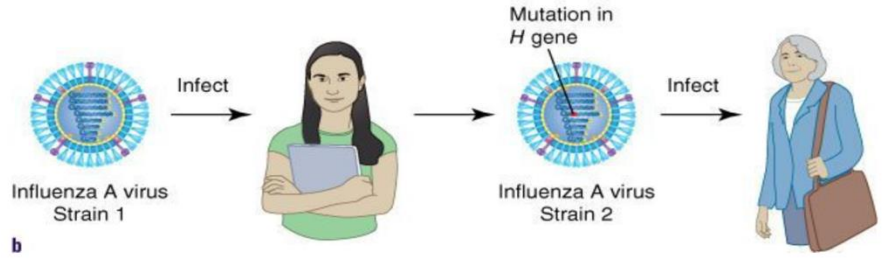
Basic Influenza Virology Review

Antigenic Drift



Information from Branswell, H. 2011. "Flu factories: The next pandemic virus may be circulating on U.S. pig farms, but health officials are struggling to see past the front gate." *Sci Am*, January, pp. 47–51.



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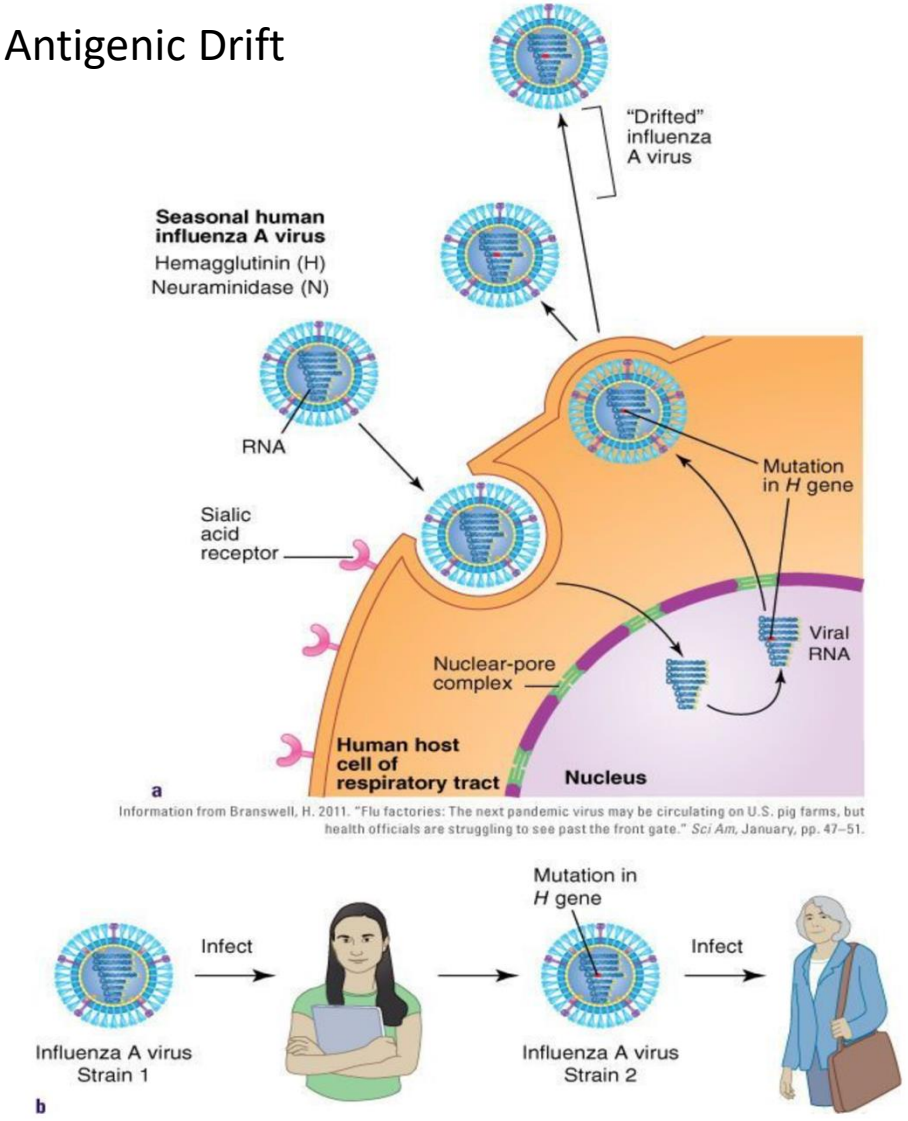
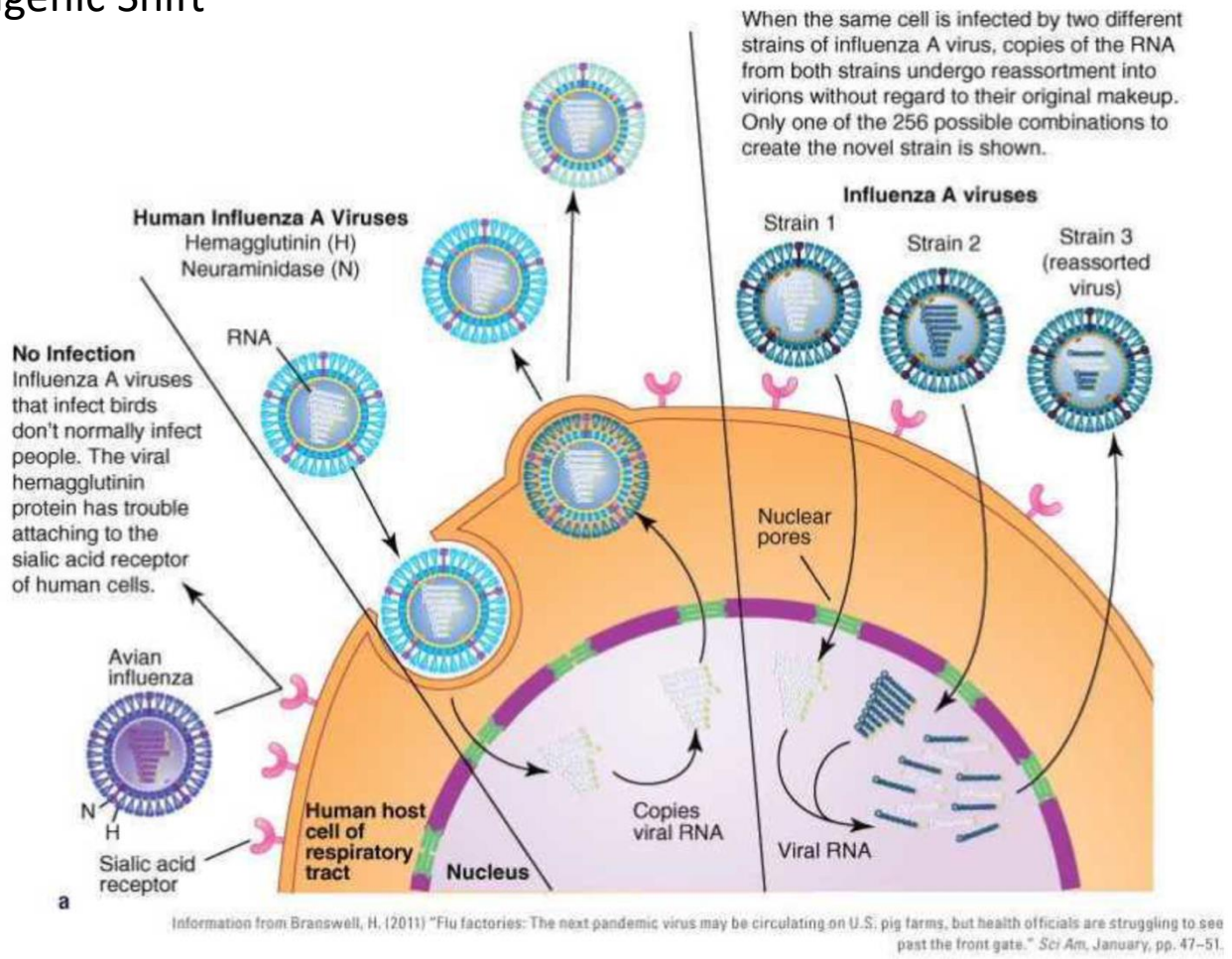


Antigenic Shift



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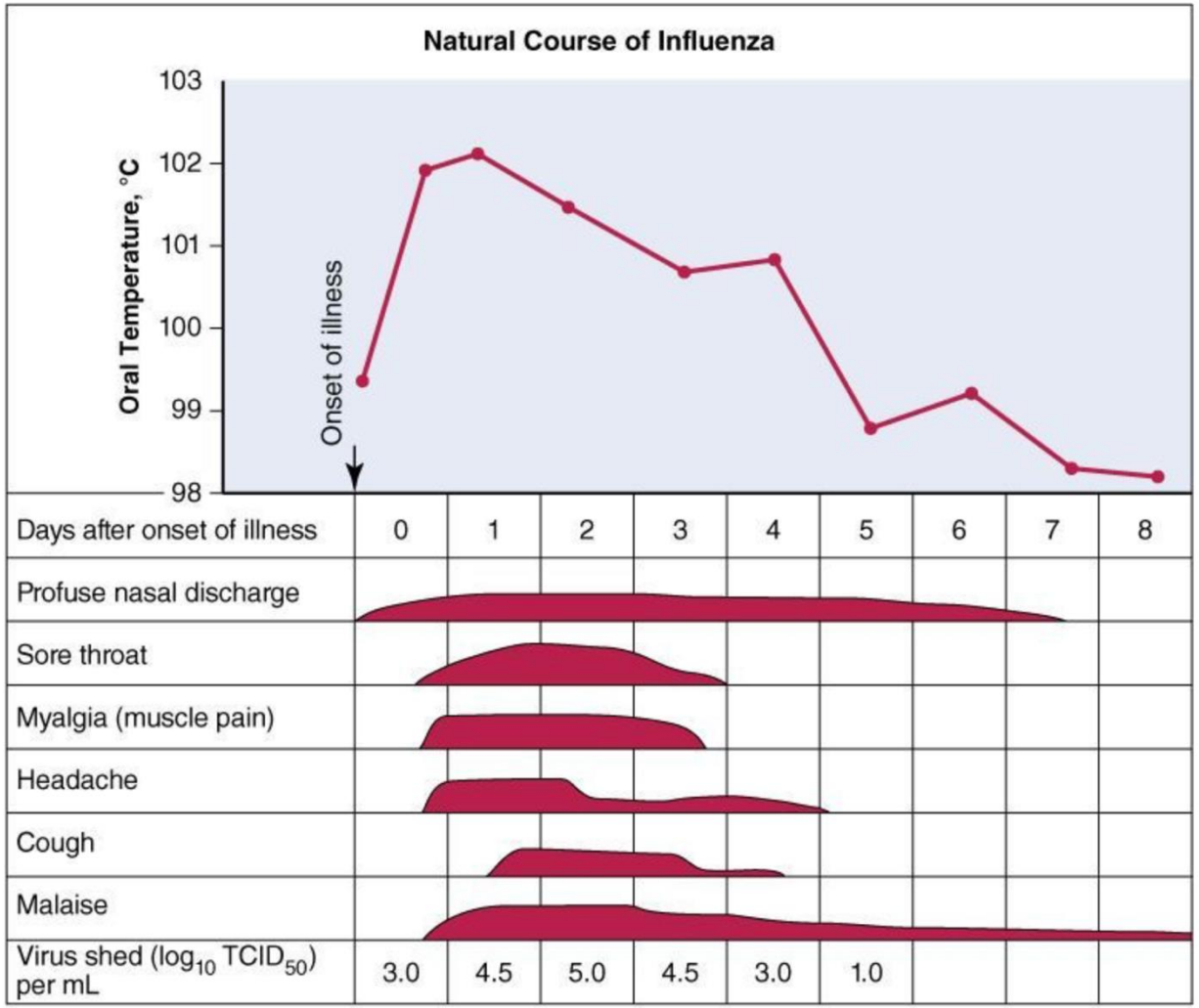
Clinical Syndromes



Information from Dolin, R. 1976. "Influenza: Current concepts." *Am Fam Phys* 14:74.

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Breadth & Frequency of Recognized Influenza Complications Has Expanded

Widely recognized:

- Cough
- Sore throat
- Rhinitis
- Fever
- Headache
- Sinusitis / bronchitis
- Myalgias

https://www.cdc.gov/flu/symptoms/index.html
Uyeki TM, et al. Clinical Infectious Diseases, Volume 68, Issue 6, 15 March 2019, Pages e1–e47

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Widely recognized:

- Cough
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Less well recognized:

- Neurologic:
  - Febrile convulsions
  - Seizures
  - Encephalitis
  - Guillain-Barre Synd.
- Pulmonary:
  - Pneumonia
  - Exac of COPD
- Cardiac
  - Pericarditis
  - Myocarditis
  - Exac of Ischemic dis
- Pregnancy
  - Inc. fetal loss
  - Inc. maternal mortality
  - Prematurity
  - Small neonatal size

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Background to Writing the Guidelines

- Panel Makeup?
  - Lead by of Infectious Disease Society of America
  - CDC, Emergency Medicine, Obstetrics,
  - Pediatrics, Transplant, Primary Care

- How Constructed?
  - >10,000 manuscripts reviewed from 2009-2017
  - Synthesized data into 'grade level' recommendations to answer directed clinical questions

- Intentionally Does NOT Cover:
  - Vaccination
  - Infection Control Techniques

Table 1. Infectious Diseases Society of America–US Public Health Service Grading System for Ranking Recommendations in Clinical Guidelines

Category and Grade	Definition
Strength of recommendation	
A	Good evidence to support a recommendation for or against use
B	Moderate evidence to support a recommendation for or against use
C	Poor evidence to support a recommendation
Quality of evidence	
I	Evidence from 1 or more properly randomized controlled trials
II	Evidence from 1 or more well-designed clinical trials, without randomization; from cohort or case-controlled analytic studies (preferably from >1 center); from multiple time-series; or from dramatic results from uncontrolled experiments
III	Evidence from opinions of respected authorities, based on clinical experience, descriptive studies, or reports of expert committees

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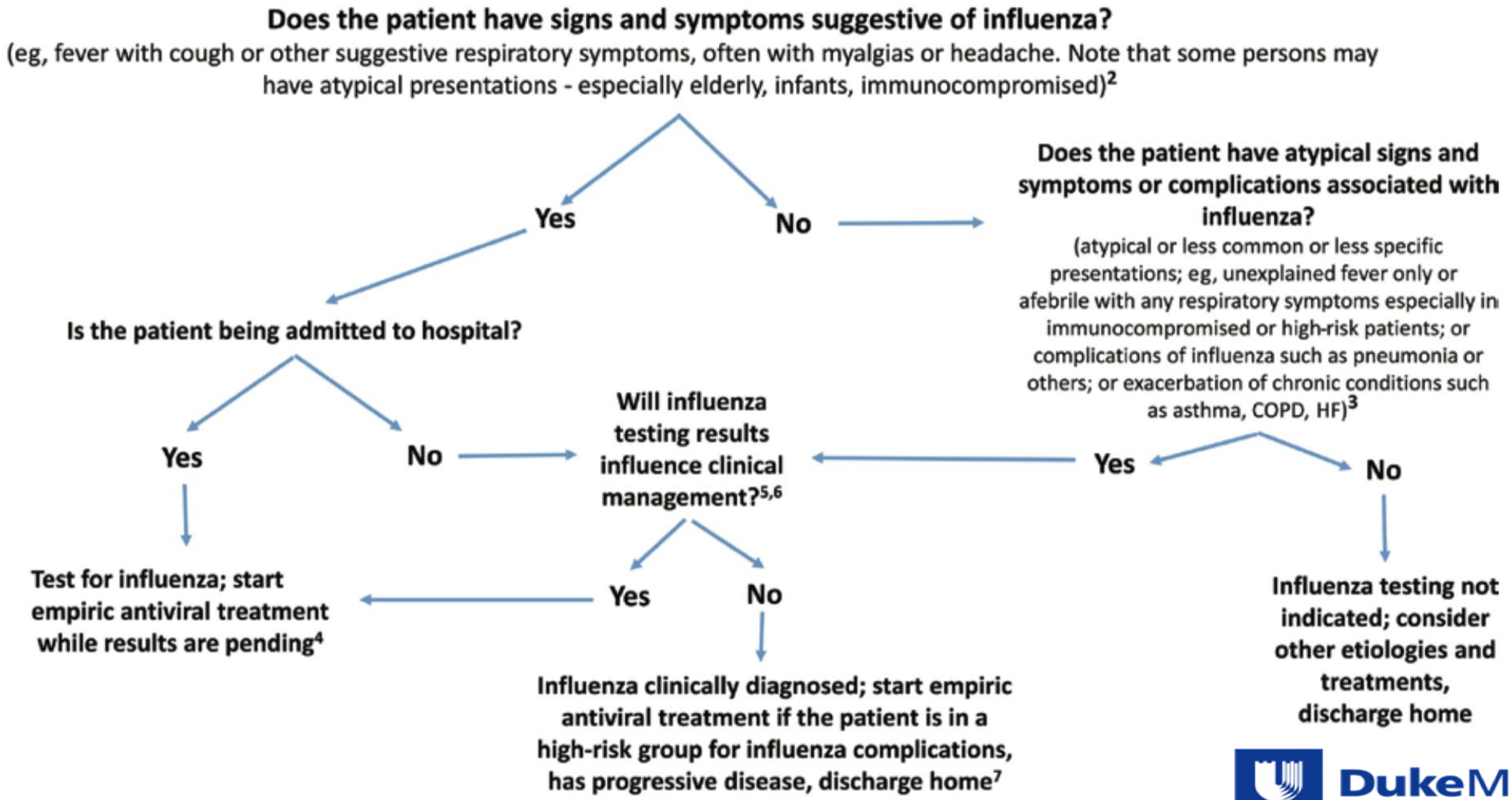
When to Test for Flu - Outpatients:



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Diagnostic Test Recommendations:

What Test(s) Should Be Used to Diagnose Influenza?

Recommendations

10. Clinicians should use rapid molecular assays (ie, nucleic acid amplification tests) over rapid influenza diagnostic tests (RIDTs) in outpatients to improve detection of influenza virus infection *(A-II)* (see Table 6).
11. Clinicians should use reverse-transcription polymerase chain reaction (RT-PCR) or other molecular assays over other influenza tests in hospitalized patients to improve detection of influenza virus infection *(A-II)* (see Table 6).
12. Clinicians should use multiplex RT-PCR assays targeting a panel of respiratory pathogens, including influenza viruses, in hospitalized immunocompromised patients *(A-III)*.
13. Clinicians can consider using multiplex RT-PCR assays targeting a panel of respiratory pathogens, including influenza viruses, in hospitalized patients who are not immunocompromised if it might influence care (eg, aid in cohorting decisions, reduce testing, or decrease antibiotic use) *(B-III)*.

Increased emphasis on molecular assays

Increased emphasis on multiplex platforms for patients who are immunocompromised

14. Clinicians should not use immunofluorescence assays for influenza virus antigen detection in hospitalized patients except when more sensitive molecular assays are not available *(A-II)*, and follow-up testing with RT-PCR or other molecular assays should be performed to confirm negative immunofluorescence test results *(A-III)*.
15. Clinicians should not use RIDTs in hospitalized patients except when more sensitive molecular assays are not available *(A-II)*, and follow-up testing with RT-PCR or other molecular assays should be performed to confirm negative RIDT results *(A-II)*.
16. Clinicians should not use viral culture for initial or primary diagnosis of influenza because results will not be available in a timely manner to inform clinical management *(A-III)*, but viral culture can be considered to confirm negative test results from RIDTs and immunofluorescence assays, such as during an institutional outbreak, and to provide isolates for further characterization *(C-II)*.
17. Clinicians should not use serologic testing for diagnosis of influenza because results from a single serum specimen cannot be reliably interpreted, and collection of paired (acute/convalescent) sera 2–3 weeks apart are needed for serological testing *(A-III)*.

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Other tests generally discouraged for clinical practice

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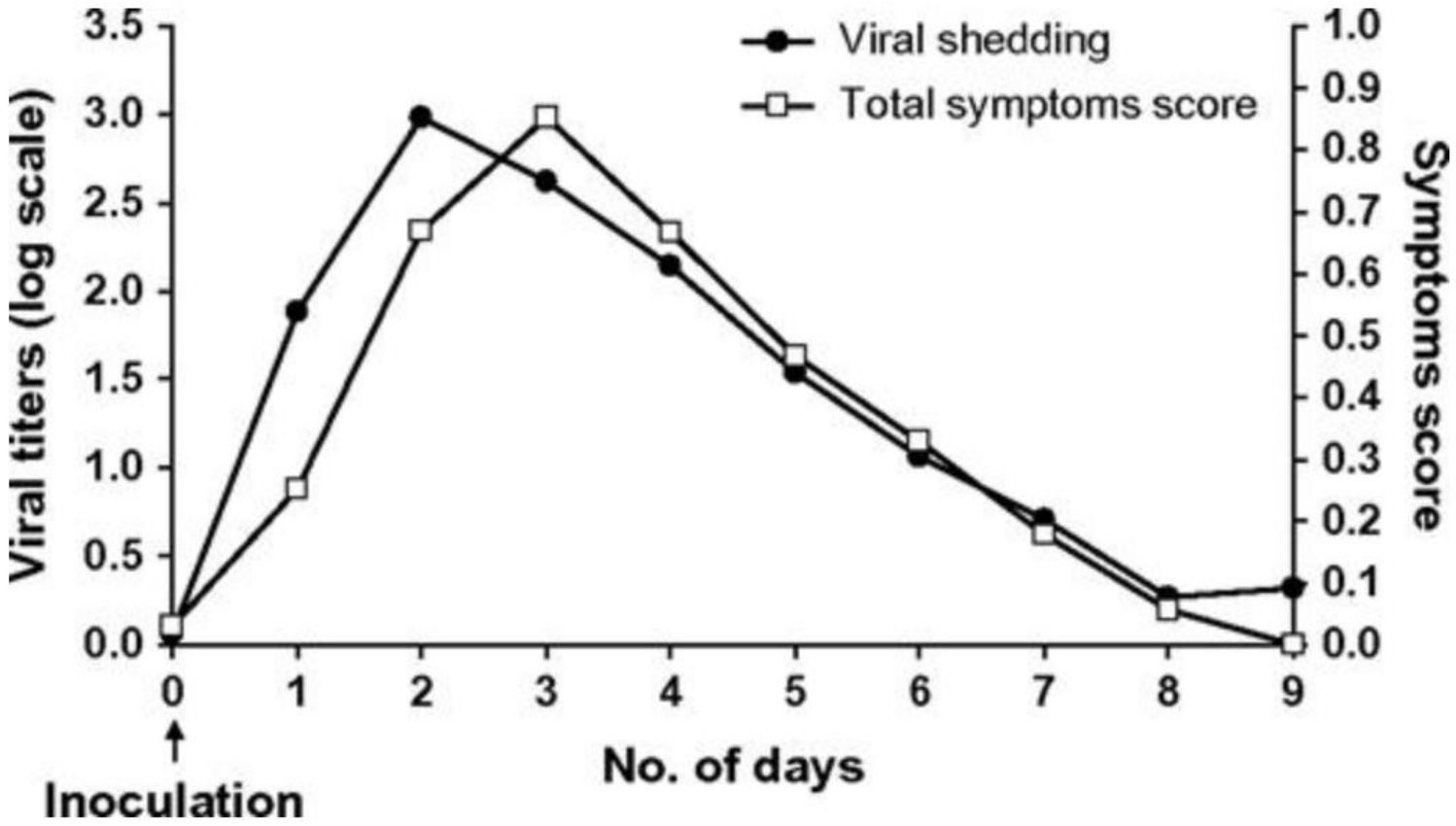
Why the Emphasis on Molecular Testing?

1. Viral kinetics and social behavior



American Journal of Epidemiology, Volume 167, Issue 7, 1 April 2008, Pages 775–785,

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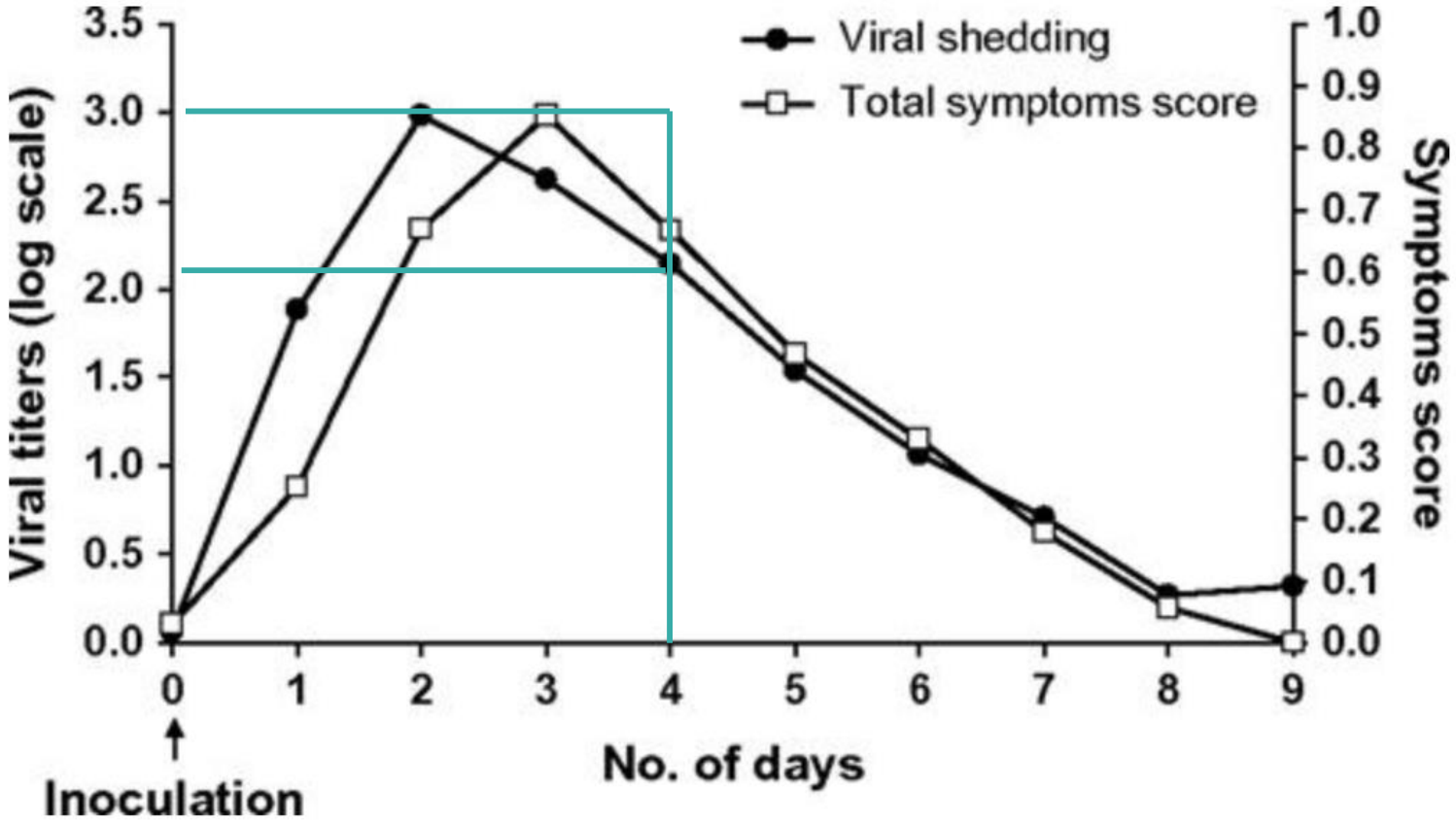
Already **~33%** reduction in detectable virus



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Why the Emphasis on Molecular Testing?

2 Improved test accuracy[1-3]

- Greater clinical confidence in results[2]
- More appropriate antiviral prescribing[2,3]

1. Uyeki TM, et al. Clinical Infectious Diseases, Volume 68, Issue 6, 15 March 2019, Pages e1–e47. 2. Benirschke RC et al. J Clin Microbiol. 2019 Feb 27;57(3). 3. Hansen GT, et al. J Clin Virol. May 2018; 102:42-49. 4. Hayden et al, N Engl J Med 1997; 337:874–80. 5. Boivin et al, J Infect Dis 2000; 181:1471–4.

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3 Earlier treatment leads to earlier (and more likely) recovery

- Early trials of neuraminidase inhibitors (eg: Oseltamivir) for outpatient care demonstrated earlier initiation of drug was more effective
  - Reduced fever and Sx's by 1-2 days if initiated within 36-48hrs of symptoms[4]
  - Reduced symptoms by up to 4 days, if treatment initiated within 6hrs of symptoms[5]

1. Uyeki TM, et al. Clinical Infectious Diseases, Volume 68, Issue 6, 15 March 2019, Pages e1–e47. 2. Benirschke RC et al. J Clin Microbiol. 2019 Feb 27;57(3). 3. Hansen GT, et al. J Clin Virol. May 2018; 102:42-49. 4. Hayden et al, N Engl J Med 1997; 337:874–80. 5. Boivin et al, J Infect Dis 2000; 181:1471–4.

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Clinical Implications Derived from Guidelines

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    - Concentrate on tests that provide actionable results (eg: flu, RSV. ↓ emphasis on multiplex)
      - For ED, UC and the Clinic, this may be operational efficiency and/or benefits with infection control
    - More tests likely to be run if:
      - (a) fast, (b) sensitive and specific, (c) affordable – compared to the risk/cost of a poor outcome

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    - More tests likely to be run if:
      - (a) fast, (b) sensitive and specific, (c) affordable – compared to the risk/cost of a poor outcome
  - Occurs at the same time as availability of baloxavir
    - Single-dose, well tolerated
    - Rapid decline in viral shedding (? Less infectivity)
    - Marginally quicker time to clinical improvement c/w oseltamivir
    - ? Early concerns regarding drug resistance

Clinical Implications Derived from Guidelines

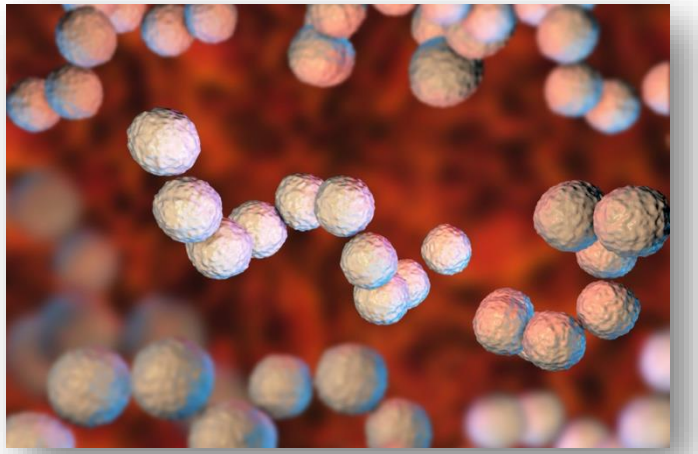
- For laboratory:
  - Seasonal flexibility critical, especially for molecular platforms, given time sensitivity
  - Anticipate more testing as importance of ruling influenza in (and out) increases.
  - Likely anticipate desire for range of platforms, based on the location of the clinicians (e.g., ICU vs clinic)

Strep in the Clinic…

- Group A Strep
  - Most common bacterial cause of tonsillopharyngitis in adults and kids
  - One of the few real causes that justifies antibiotic treatment in guidelines
  - Colonization vs Infection
    - 4-5% adults / 2-20% children colonized[1]
  - "Strep throat" presents clinically as:
    - Sudden onset tender, Cx LAD
    - Fever, HA, red swollen tonsils +/- uvula, with or without exudates
    - Winter / early spring predominance
  - No case reports of penicillin resistance
    - Limited reports of Azithro /clarythro resistance.

- Why treat? What's problems arise?
  - Reduced symptom duration
  - Reduced acute complications (peritonsillar abscess, otitis media etc)
  - Reduced infectivity
  - Reduced long term non-bacterial complications

    (acute rheumatic fever, post-strep glomerulonephritis)



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[1]Gunnarsson RK et al, Scand J Prim Health Care. 1997;15(3):149.

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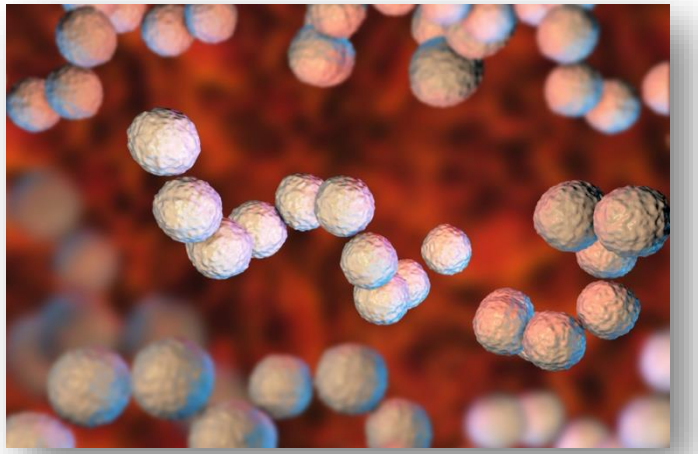

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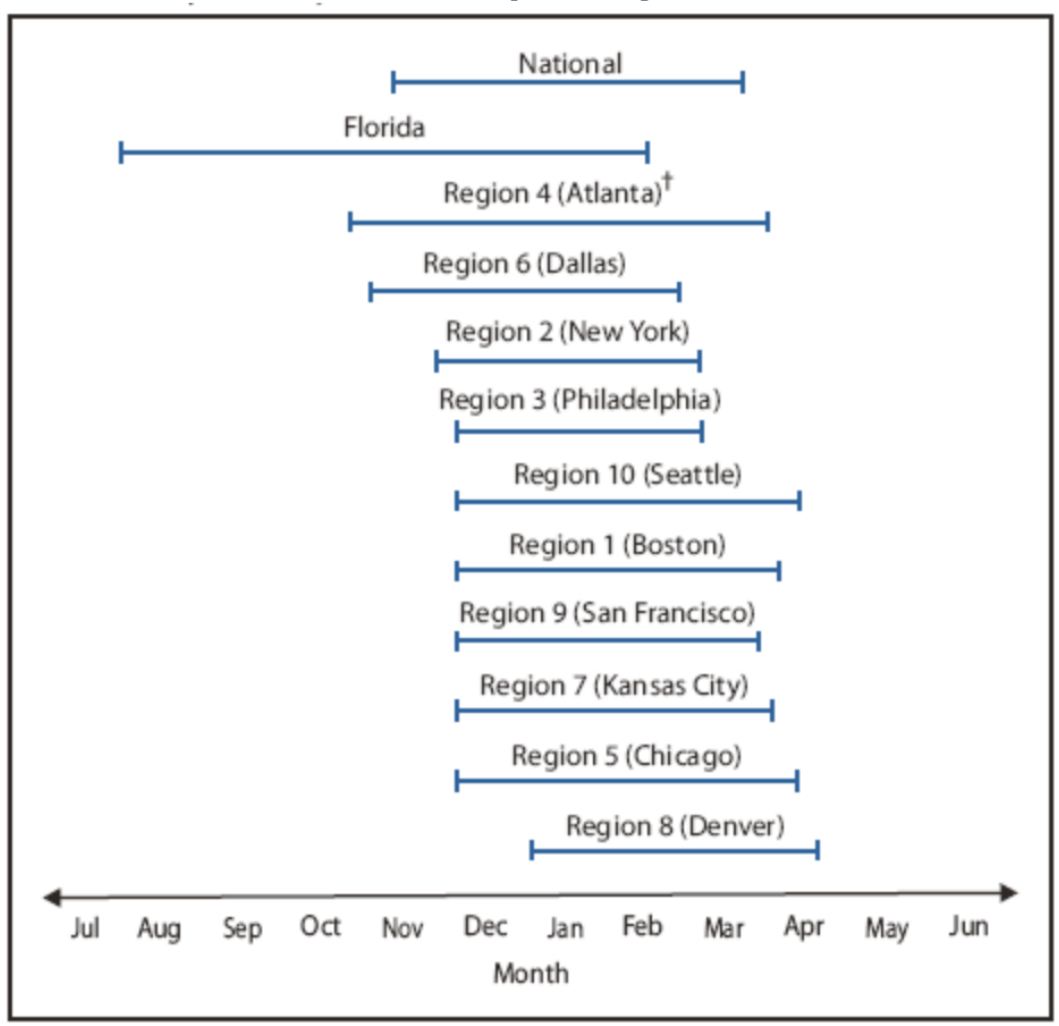
Other Common Imitators?



https://www.cdc.gov/rsv/research/us-surveillance.html
https://www.cdc.gov/mmwr/volumes/67/wr/mm6702a4.htm#F1_down.

- Respiratory Syncytial Virus (RSV)
  - Ubiquitous amongst young children
    - 2.1m visits children <5yrs annually
    - 57,000 children and 177,000 adult admits/yr
    - 14,000 deaths in persons >65yrs[1]
  - Seasonality typically overlaps flu directly.
  - Same risk associations as flu
  - Clinically difficult to distinguish, less systemic complications, myalgias, and duration less.
  - Molecular testing accurate for adults and children, esp early, but expensive. (preferred test for the very sick, or the most at risk patients?)
  - Ag testing typically better in kids, but variably sensitive in adults.

Summary

- Flu is probably even more common than we think!
- Benefit now recognized for testing and treating influenza *early*.
  - Guidelines emphasize a broader array of clinical syndromes and clinical settings that should ideally lead to molecular testing
- Differentiating flu from ‘strep throat’ (GAS) is classically easy, but not every case is so straightforward, and strong desire to want to treat appropriately.
- Understanding your local influenza epidemiology really helps clinicians order and interpret influenza and respiratory viral tests, and treat appropriately when necessary.
- As clinicians are encouraged to think about influenza more frequently, having diagnostic platforms available that allow for rapid, accurate and cost-effective testing will be very helpful, both in the clinic and ward setting.

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Point of Care Testing for Innovative Urgent Care

Jonathan David Zipkin, MD, MA, FAAP, FACP

Board Certified in Internal Medicine & Pediatrics

National Chair of Clinical Quality

Regional Medical Informatics Officer

Associate Medical Director

Urgent Care Physician

Northwell Health - GoHealth Urgent Care

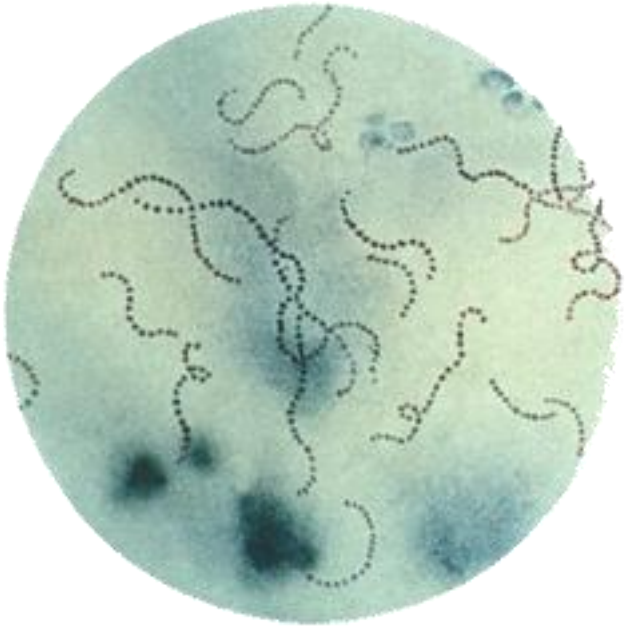
Disclosure

- Speaker honoraria, Abbott

- Evidence based medicine is paramount.

Importance of Group A Strep (GAS) Testing

Strep throat pain is self-limited, so why do we test and treat?



- Acute rheumatic fever (arthritis, carditis, chorea, etc)
- Peritonsillar / Retropharyngeal abscess
- Post-infectious glomerulonephritis
- Strep toxic shock syndrome
- Pediatric autoimmune neuropsychiatric disorder associated with GAS (PANDAS)
- **Prevent the spread to others**

https://www.cdc.gov/groupastrep/diseases-hcp/strep-throat.html

GUIDELINES

American Academy of Pediatrics

Group A Strep testing is not recommended for:

- Obvious viral symptoms
- Children younger than 3 years old

Group A Strep Diagnosis – What NOT To Do

- Never diagnose clinically
- **All antibiotics should be withheld before laboratory confirmation of GAS infection**
- FDA-cleared rapid home test kits exist and should be discouraged due to false positives and a low negative predictive value
- Magical thinking (e.g. swabbing for isolated cough without sore throat)

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American Academy of Pediatrics

Appropriate Group A Strep Diagnosis

Rapid Antigen Detection Test (RADT) for strep via "vigorous swabbing using a pair of swabs on both tonsils and the posterior pharynx"

- Negative RADT **should** be followed by throat culture (in kids)
- Positive RADT **should NOT** be followed by throat culture

"Some studies suggest that [isothermal nucleic acid] tests may be as sensitive as standard throat cultures…"

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Infectious Disease Society of America

Still recommending RADT with latest Group A Strep guidelines from 2012, but…

2018 IDSA and American Society for Microbiology joint update on Lab Guidelines also state:

"Rapid, CLIA–waived methods for molecular group A Streptococcus testing provide improved sensitivity and may not require culture confirmation, though they have not yet been incorporated into consensus guidelines."

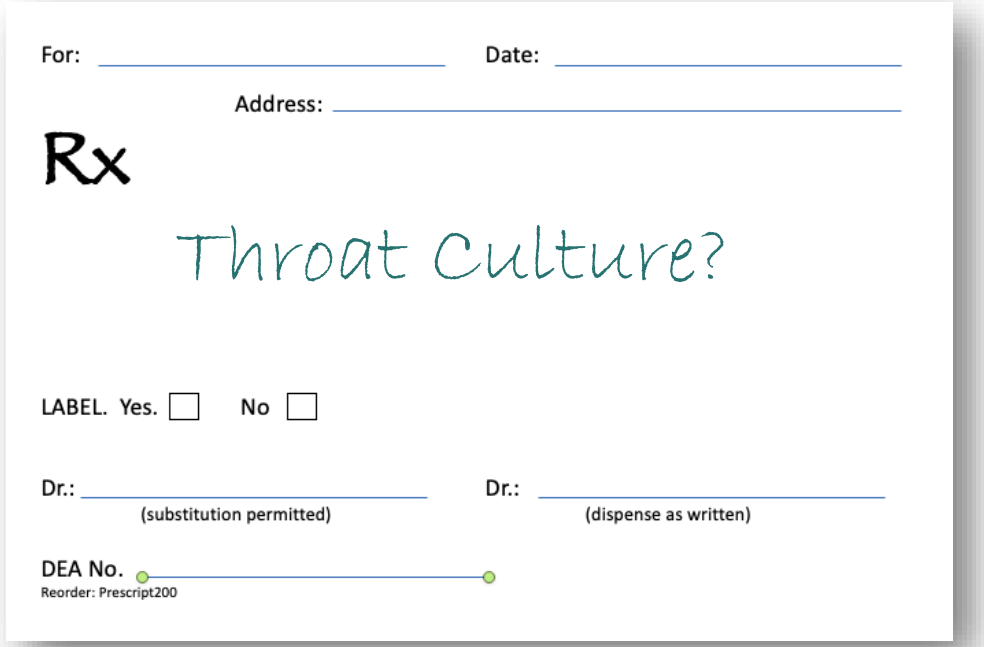
https://www.idsociety.org/es/practice-guideline/laboratory-diagnosis-of-infectious-diseases/

Infectious Disease Society of America

DO NOT get anti-strep antibody titers for routine strep throat for any age

Adults **DO NOT** require routine throat cultures after negative RADT*

- Low incidence of Group A Strep in adults
- Very low risk of sequelae (e.g. acute rheumatic fever)



* Per the IDSA.
However, is controversial and off-label for RADT.

CLIA waived tests require following the manufacturer's instructions or are no longer considered CLIA waived.

[1]https://academic.oup.com/cid/article/55/10/e86/321183
[2]https://www.idsociety.org/es/practice-guideline/laboratory-diagnosis-of-infectious-diseases/

Other Groups on GAS Testing

American Heart Association

American College of Physicians

Centers for Disease Control and Prevention

Recommend RADT followed by culture
Have no mention of molecular testing
Generally agree with other guidelines

While we are seeing a lot of supporting individual research articles and opinion pieces on molecular tests (NAATs) from reputable sources, many guidelines for Group A Strep have not been updated to directly comment.

AMERICAN SOCIETY FOR MICROBIOLOGY | Journal of Clinical Microbiology

Point-Counterpoint: A Nucleic Acid Amplification Test for *Streptococcus pyogenes* Should Replace Antigen Detection and Culture for Detection of Bacterial Pharyngitis

Bobbi S. Pritt,[a] Robin Patel,[a] Thomas J. Kirn,[b] Richard B. Thomson, Jr.[c,d]

Division of Clinical Microbiology, Department of Laboratory Medicine and Pathology, Mayo Clinic, Rochester, Minnesota, USA[a]; Departments of Pathology & Laboratory Medicine and Medicine, Rutgers Robert Wood Johnson Medical School, New Brunswick, New Jersey, USA[b]; Department of Pathology & Laboratory Medicine, NorthShore University HealthSystem, Evanston, Illinois, USA[c]; The University of Chicago Pritzker School of Medicine, Chicago, Illinois, USA[d]

Nucleic acid amplification tests (NAATs) have frequently been the standard diagnostic approach when specific infectious agents are sought in a clinic specimen. They can be applied for specific agents such as *S. pyogenes*, or commercial multiplex NAATs for

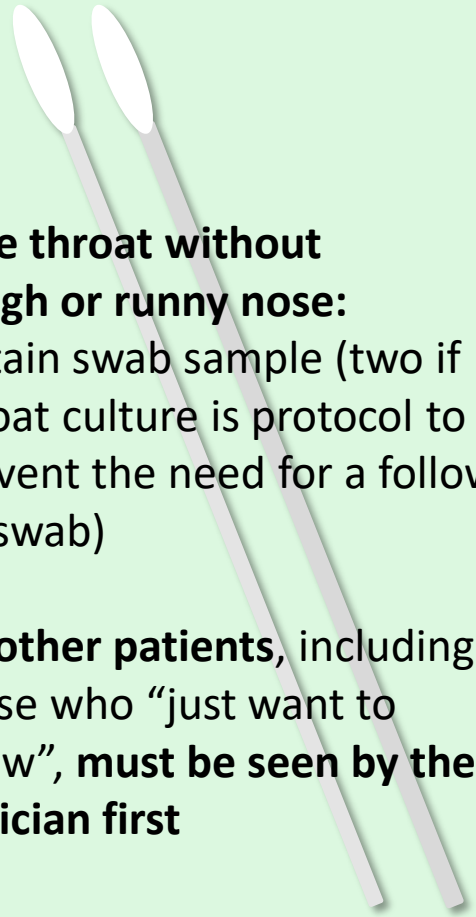
What About Clinical Prediction Rules?

- Centor scoring is great as initial teaching tools for trainees and staff to give a general sense of correlating signs and symptoms
- Encouraged for medical theater with patients and parents to demonstrate reasoning
- The American Academy of Pediatrics warns against use as several studies have shown unreliability in assessing elements

WORKFLOW

Urgent Care Group A Strep Workflow

Standing Order

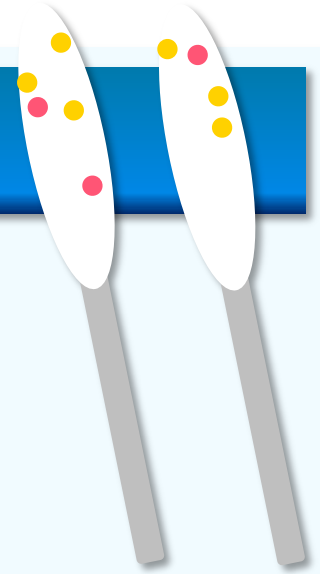


Sore throat without cough or runny nose: Obtain swab sample (two if throat culture is protocol to prevent the need for a follow-up swab)

All other patients, including those who "just want to know", **must be seen by the clinician first**

OR

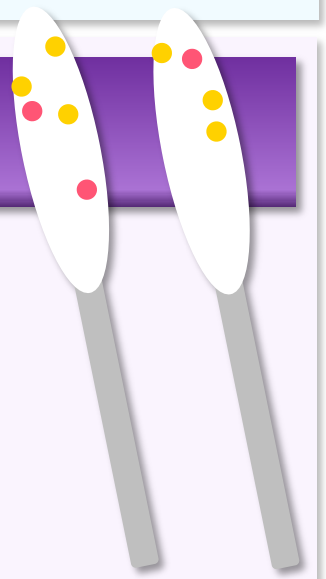
RADT Negative Throat Culture Order



- **Children** — **Always**
- **Adults** — **Consider** only with very high suspicion of group A strep pharyngitis

NAAT Negative Throat Culture Order

Molecular



- **Children** — **Consider** only with very high suspicion of group A strep pharyngitis
- **Adults** — **Never**

Swabbing the Challenging Child

- Lay them down on exam table
- Hands over head, held by parents
- Your axilla on their belly, both hands free

- Tongue blade wedged between teeth flat, then turned 90 degrees
- Swab (be prepared to dodge the cough/spit)

Treatment

- Amoxicillin x 10 days
- Amoxicillin x 10 days
- Amoxicillin x 10 days
- Do **NOT** escalate to Augmentin

- CDC: “There has **never** been a report of a clinical isolate of group A strep that is resistant to penicillin. However, resistance to azithromycin and clarithromycin is common in some communities.”

- Penicillin allergy: narrow spectrum cephalosporins
- Last resort: clindamycin, macrolides

https://www.cdc.gov/groupastrep/diseases-hcp/strep-throat.html

What About Group C and G Strep?

- As mentioned, strep throat is self-limited
- Unlike Group A Strep, Group C and Group G Strep have no known association with acute rheumatic fever
- These represent normal flora, and are often asymptomatic colonizers
- Throat culture is not needed to specifically identify Group C and Group G Strep
- When incidentally found in the throat, may treat in the same way as Group A Strep based on clinical picture

Follow Up Expectations

No matter what method is used to evaluate sore throat

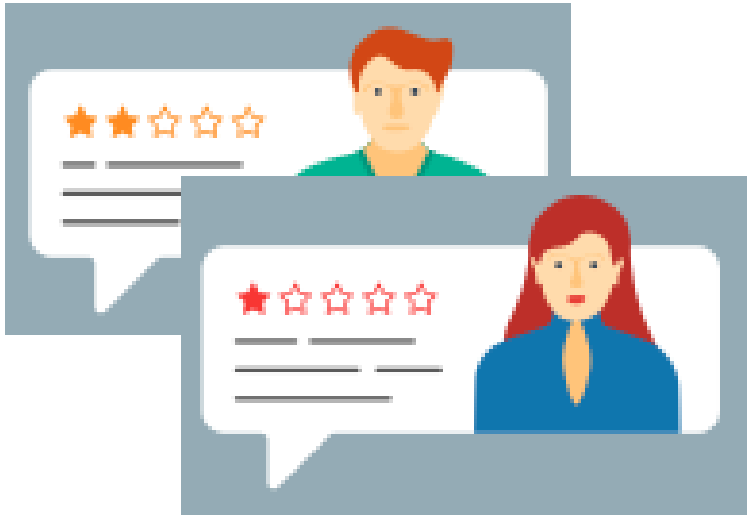
all staff must be trained to effectively convey follow up

Satisfaction = Perception - Expectations

Patient Experience

Traditional protocols with negative RADT can result in:

- Throat culture gold standard but time: up to 3 days wait
- Completely unnecessary antibiotics
- Delay of necessary antibiotics
- Spread to others
- Attempting to successfully connect patient with center during business hours often interferes with work (operational burden)



METHODS

CLIA Waived Molecular (NAAT) Methods

	Device	Type	Group A strep	Influenza	Min Time*	Max Time*
	Abbott ID NOW	Isothermal	✓	✓	2 min	13 min
	Cepheid GeneXpert	PCR	✓	✓	18 min	30 min
	Roche Cobas LIAT	PCR	✓	✓	15 min	20 min
	Sekisui Silaris	PCR		✓	30 min	

*Times are test dependent.
References available in Full List of References.

GAS Test Accuracy

Throat Culture

Gold Standard

Rapid Antigen Detection Testing[1]

Sensitivity:	85.6%
Specificity:	95.4%

Molecular Testing[2]

Sensitivity:	98.3 – 100%
Specificity:	93.4 - 94.2%

[1]https://www.cochranelibrary.com/cdsr/doi/10.1002/14651858.CD010502.pub2/full

[2]Test performance ranges per the available rapid CLIA waived GAS test methods. See Full Reference List.

ROI Considerations

It is up to each organization to determine if ROI is adequate under various patient care models, including:

- Fee for service
- Bundled/episodes of care (case rate)

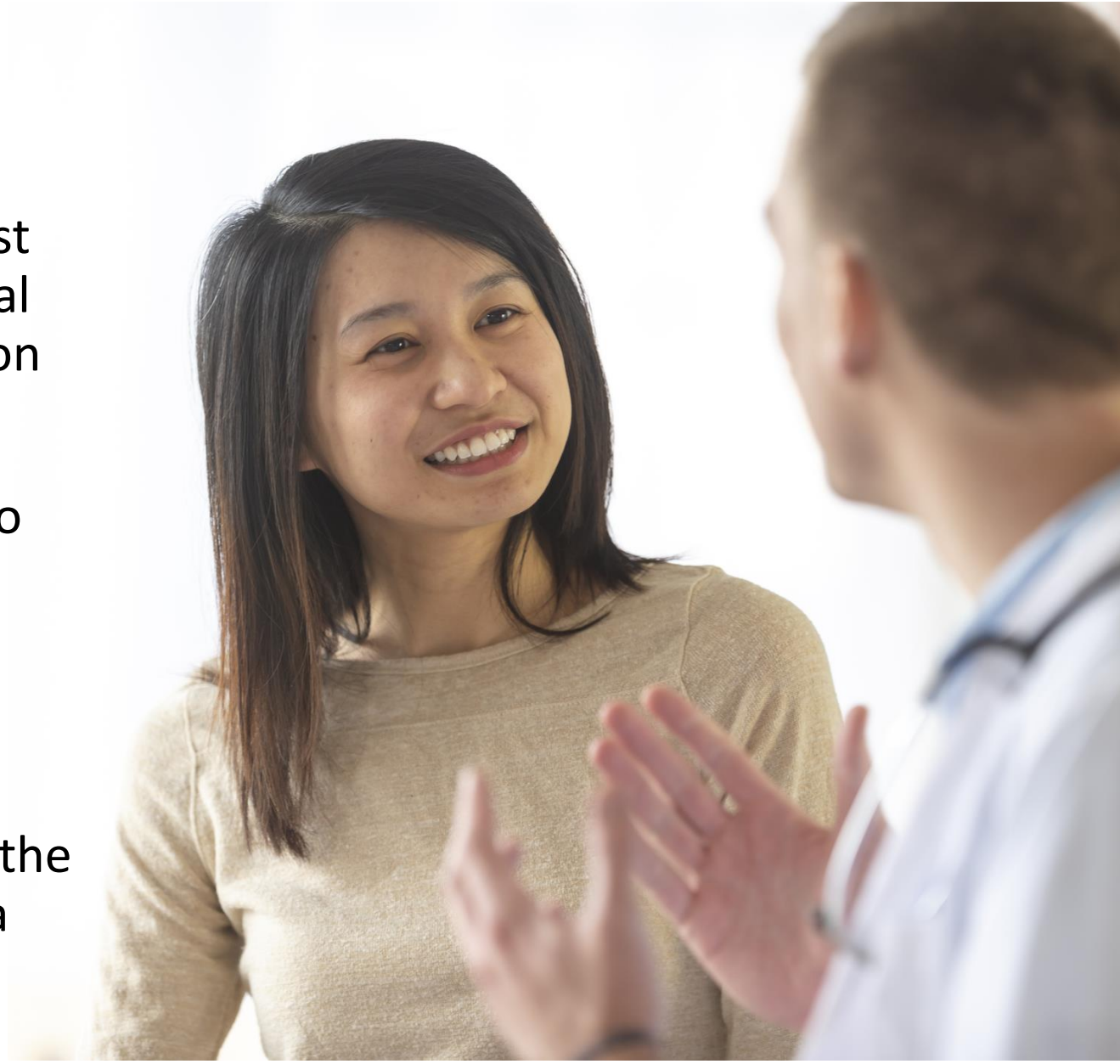
Throat cultures require additional time / resources to contact patients with results

Marketability

Successful urgent care organizations must be able to deliver convenient, exceptional medical care with high patient satisfaction

Training and scripting is recommended to ensure front line employees actively convey the benefits and differences in molecular point of care testing

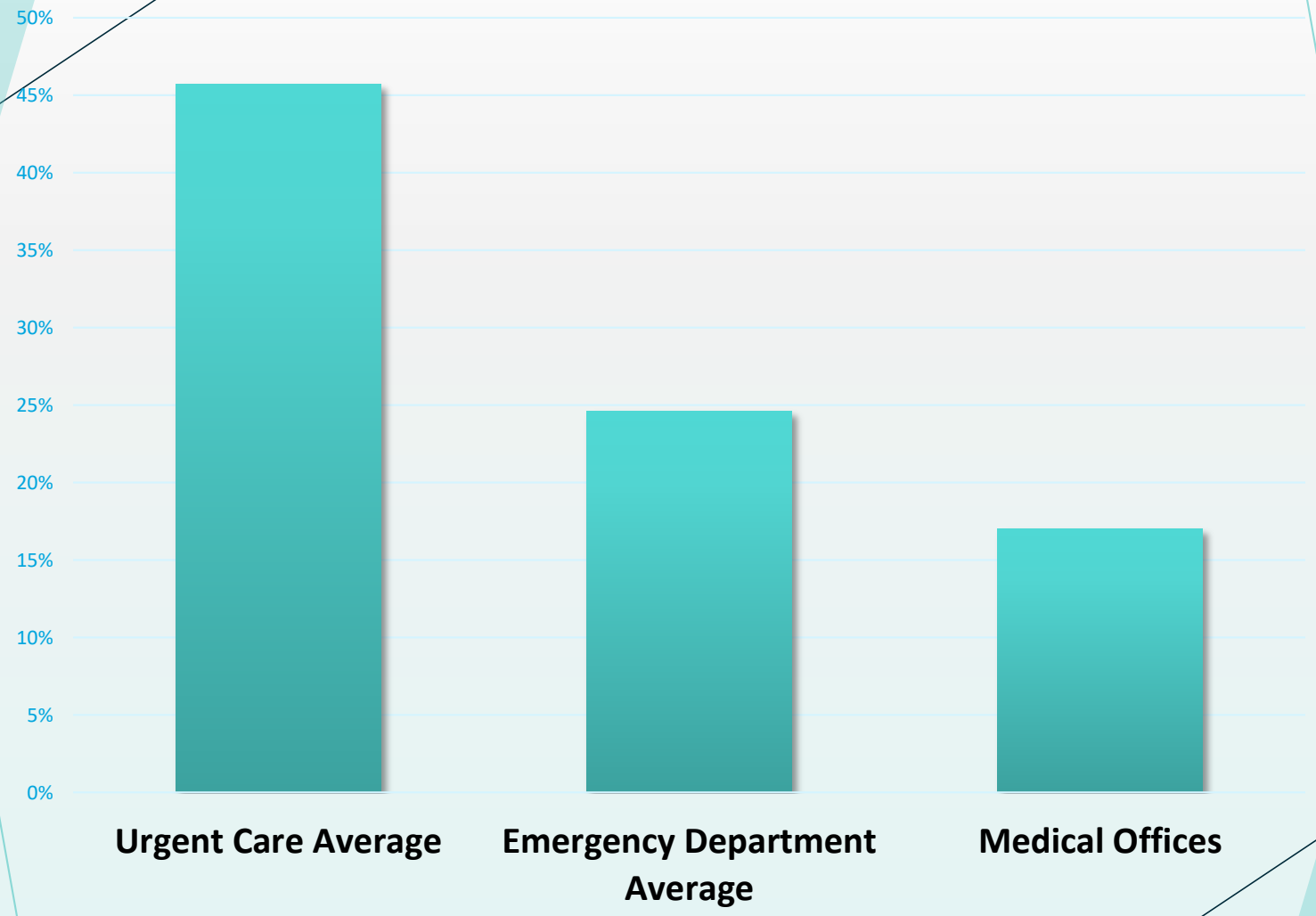
Marketing teams should be informed of the testing options for future campaigns as a differentiator to competing urgent care centers



QUALITY


DEPARTMENT OF HEALTH & HUMAN SERVICES · USA
CDC
CENTERS FOR DISEASE CONTROL AND PREVENTION
EDWARD R. ROYBAL CAMPUS

Inappropriate Antibiotic Use



Palms DL, Hicks LA, Bartoces M, et al. Comparison of Antibiotic Prescribing in Retail Clinics, Urgent Care Centers, Emergency Departments, and Traditional Ambulatory Care Settings in the United States. *JAMA Intern Med.* 2018;178(9):1267–1269.

Quality Metrics: Defining Success

- Highly advised that all urgent care organizations can track antibiotic stewardship
- MIPS/MACRA measure: Appropriate Testing for Children with Pharyngitis
- Must have top-down buy-in, ideally with appointed Quality Champion
- Personal and organizational accountability over time
- Few IT resources: Manual chart review
- Robust IT resources: MITIGATE toolkit: https://bit.ly/2Rl9pEB

Summary

- Emerging evidence shows high sensitivity and specificity of NAAT relative to throat culture, but more data still needed to affect guidelines
- Strep guidelines still focused on traditional RADT + culture
- RADT methodology still largely reliant on throat culture and the consequences of that time delay
- Protocols and workflow for molecular strep testing easily adopted by urgent care
- Antibiotic stewardship is a necessary responsibility for all clinicians
- Clinical utility, ROI, marketability, and patient satisfaction should all be weighed when considering molecular strep testing

Full List of References

- A Guide to Utilization of the Microbiology Laboratory for Diagnosis of Infectious Diseases: 2018 Update by the Infectious Diseases Society of America and the American Society for Microbiology https://www.idsociety.org/es/practice-guideline/laboratory-diagnosis-of-infectious-diseases/
- Clinical Practice Guideline for the Diagnosis and Management of Group A Streptococcal Pharyngitis: 2012 Update by the Infectious Diseases Society of America https://academic.oup.com/cid/article/55/10/e86/321183
- Multicenter Clinical Evaluation of the Novel Alere i Strep A Isothermal Nucleic Acid Amplification Test https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4473182/
- Pediatrics in Review - Group A Streptococcus https://pedsinreview.aappublications.org/content/39/8/379
- American Academy of Pediatrics Red Book – Group A Streptococcal Infections https://redbook.solutions.aap.org/chapter.aspx?sectionid=189640187&bookid=2205
- American Heart Association – Circulation - Prevention of Rheumatic Fever and Diagnosis and Treatment of Acute Streptococcal Pharyngitis https://www.ahajournals.org/doi/10.1161/CIRCULATIONAHA.109.191959
- Abbott ID NOW 120004451 v06 ID NOW Platform Trifold Brochure EN US.pdf. https://www.alere.com/en/home/product-details/id-now.html
- Abbott ID NOW Strep A 2 Package Insert. IN734000 Rev.3 2019/06.
- Cobas® Liat® website. https://diagnostics.roche.com/us/en/products/systems/cobas-liat-system.html#productSpecs
- Cobas® Strep A Package Insert. 07806124190-03EN.
- Xpert® Xpress Flu Data Sheet 0715-01. http://www.cepheid.com/us/cepheid-solutions/clinical-ivd-tests/critical-infectious-diseases/xpert-xpress-flu
- Xpert® Xpress Strep A Data Sheet 0673-01. https://www.cepheid.com/administrator/components/com_productcatalog/library-files/34103fc2b80bac1ad7cb24d91c86b057-Xpert-Xpress-Strep-A-Datasheet-US-0673-02.pdf
- Silaris® Influenza A&B Test IFU, P/N 60012-D (2018-09). https://sekisuidiagnostics.com/product-documents/60012-d_v1.5_silaris_ifu.pdf
- Palms DL, Hicks LA, Bartoces M, et al. Comparison of Antibiotic Prescribing in Retail Clinics, Urgent Care Centers, Emergency Departments, and Traditional Ambulatory Care Settings in the United States. JAMA Intern Med. 2018;178(9):1267–1269.
- MITIGATE toolkit. https://qioprogram.org/sites/default/files/editors/141/MITIGATE_TOOLKIT_final_approved%281%29_508.pdf
- Multicenter Clinical Evaluation of the Novel Alere i Strep A Isothermal Nucleic Acid Amplification Test https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4473182/
- Accurate Detection of Streptococcus pyogenes at the Point of Care Using the cobas Liat Strep A Nucleic Acid Test. https://www.ncbi.nlm.nih.gov/pubmed/28006981
- Rapid antigen detection test for group A streptococcus in children with pharyngitis. https://www.cochranelibrary.com/cdsr/doi/10.1002/14651858.CD010502.pub2/full

Molecular Testing in Urgent Care and the ER

Ron Elfenbein, MD

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Chesapeake ERgent Care

Emergency Physician (USACS) Medstar St. Mary's Hospital

University of MD, Charles Regional Medical Center

Disclosure

- Receiving speaker honoraria
- No financial ties to/interest in Abbott
- Use Abbott products in the urgent care, but not incentivized to own or operate

About me

Board certified ER doctor, trained at Johns Hopkins, 19 years of experience

Working experience with US Secret Service, NASA, private entities

Attending in multiple ER’s in Maryland and other states

Opened UCC in 2016 - owner and medical director

Innovative, like to bring latest technology to forefront/patients

Care very deeply about providing stellar service and care

Urgent Care

- Very competitive market
  - Need whatever advantage(s) one can get
- Our UCC motto, “Stellar Care, Stellar Experience”
  - Need to deliver and establish yourself
  - Separate oneself from pack
- How to stand out among the competition?
  - Offer superior products and services
  - Meet or exceed patient expectations

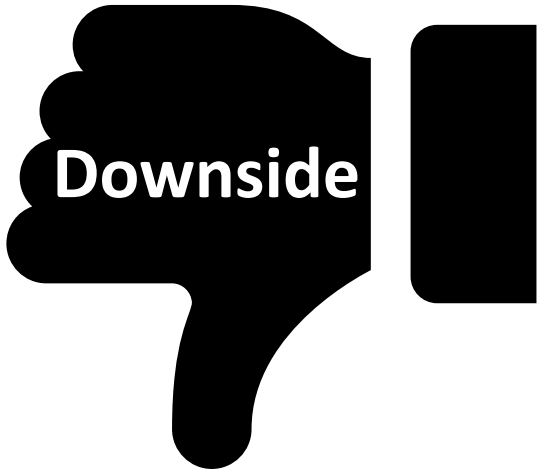
Molecular testing offers MANY ways to do this

Urgent Care

- Do POC tests that help YOUR patient population
  - Flu/GAS/INR/RSV/HA1C
- CLIA Waived
- Convenience
- Speed/efficiency
- Patient demands
- ROI

Molecular Testing in Urgent Care

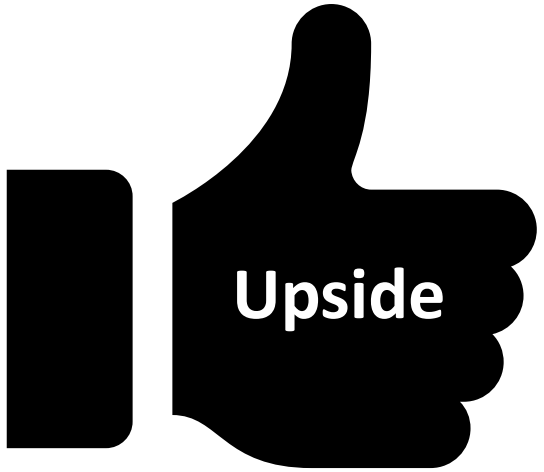
- VERY expensive tests
  - NOT all insurance covers (per encounter rate)
  - LOTS of admin burden (training, oversight)
- Need new, separate instrumentation
- Need to stock both traditional testing AND molecular
- More training (BUT SUPER, SUPER simple to operate)



Molecular Testing in Urgent Care

- Faster turn around time (get people in/out)
- More accurate (eliminates false treatments, supports antimicrobial stewardship)
- Eliminates need for follow-up testing (no culture, etc.)
- Saves money, time, staff involvement, staff work, patient effort
- New technology, fancy instrument - patients love this
- Easy to use and VERY reliable
- ★★★★★ HUGE patient satisfier
- Separates your clinic from “the pack”

  Don’t underestimate this



Urgent Care - Why Use Molecular?

You have one chance to do these tests

- Not repeat business
- Maximize antimicrobial stewardship
- Maximize Pt satisfaction
- Minimize staff burden/effort/ cost (hidden and real costs)
- Manage ROI

Same Is True For the ER

- Much more reliable results
- Potentially more cost effective
- MUCH faster TAT
  - Why ERs don't embrace POC technology? Molecular tests?
- HUGE satisfier (HCAPS)
- NO culture (HUGE savings)
- Obvious way (lab costs/time, etc..)
- Time lost following up/calls, etc.. (mail/certified letters)
- Pt angst
- Misuse of antimicrobials

Why Did We Make the Leap to Molecular?

- What things did we consider?
  - Cost
  - Ease of use/implementation/training
  - Instrument
  - Availability of supplies
  - ROI (always need to consider this)
  - TAT
- Evaluation of two CLIA waived molecular platforms
  - TAT (chosen method, ID NOW, is fastest by a large margin), accuracy, overall workflow
- Experience thus far

Molecular Advantages for Diagnosis

Almost eliminates false positives/false negatives

Molecular Testing

	Sensitivity/Specificity
GAS:	98.5% / 93.4%
Flu:	96-100% / 97%+
RSV:	98.6% / 98%

https://www.alere.com/en/home/product-details/id-now-influenza-ab-2.html
https://www.alere.com/en/home/product-details/id-now-strep-a-2.html
https://www.alere.com/en/home/product-details/id-now-rsv-us.html

”Standard” Testing

	Sensitivity/Specificity
GAS:	86% / 95%
Flu:	62% / 96%
RSV:	80% / 97%

Cohen JF, et al. 2016, Issue 7. Art. No.: CD010502.
Chartrand C, et al. *Ann Intern Med.* 2012;156:500 –511.
Chartrand C, et al. J *Clin Microbiol.* 2015. 53:3738 –3749.

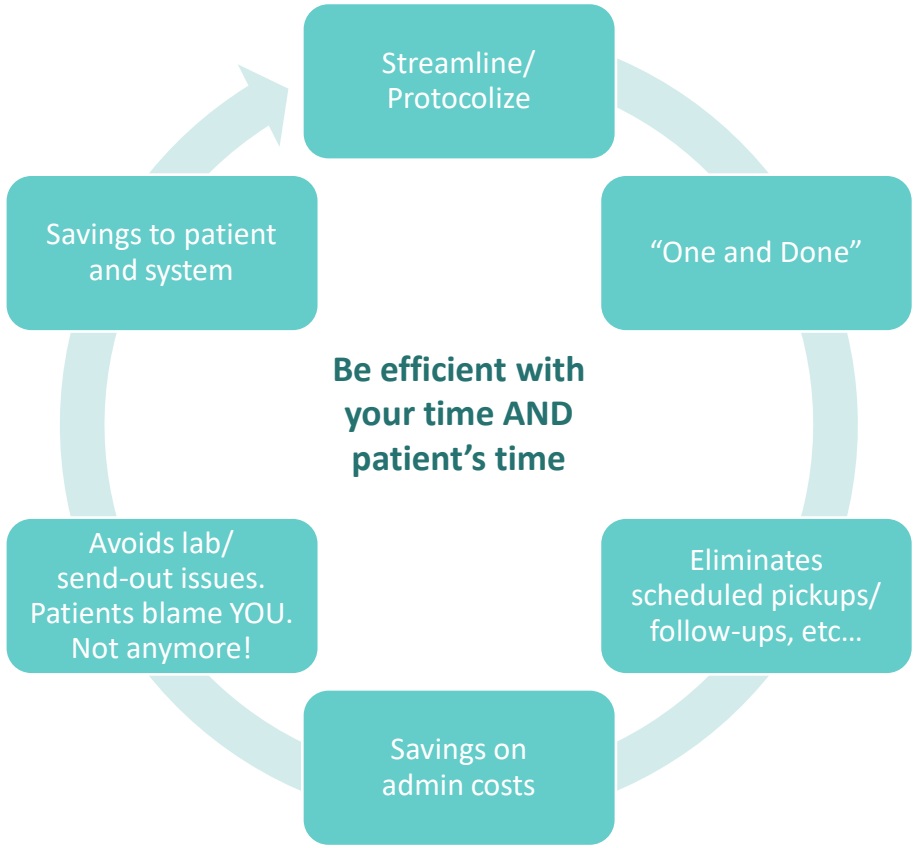
Antimicrobial Stewardship

HUGE benefit to knowing for sure if positive or negative

- Do NOT need to wait for culture for GAS
- No waiting to send patient home with unnecessary Rx (hold to fill)
  - We have reduced antibiotic Rx for Strep by >25%
- Easier to follow antiviral treatment guidelines
  - Pt's much more agreeable to treatment decision - Rx or no Rx
  - We have reduced antiviral use by 30%

Workflow Analysis

Molecular testing virtually eliminates the need for follow-up strep culture



Savings Per Patient

5 – 10 mins	In-clinic time
> 10 mins	Calls/paperwork/ administrative burden
> 15 mins	**Overall savings**

Satisfaction:

Patients

Parents

(ENORMOUS satisfier)

Staff

(Don't underestimate this, either)

Financial Analysis

Based on the clinical benefits and operational value

Conducted financial analysis

Considered 3 molecular tests for our practice

Independently evaluated 4 of our payors across each test

We found reimbursement was adequate

Financial analysis was based on our experience at Chesapeake ERgent Care. Each practice will vary.

Patient Case

5-year old female presents to clinic with 3 days of worsening fever, body aches, runny nose, intermittent “wheezing” sore throat, intermittent N/V/D, Tmax 103.

- Physical Exam:
  - Tachy, positive adenopathy, minimal bilateral tonsilar exudate present, lungs CTA bil.
- Vitals:
  - Temp 101.2, HR 145, RR 30

- **What tests would you order?**
  - Not clear cut
  - Perhaps all 3: Strep, Flu AND RSV
    - We frequently order >1 test

Patient Case (cont.)

- Tests
  - Strep: NEG
  - RSV: NEG
  - Flu: POS, Flu B
- Diagnosis: Acute Influenza
- Treatment
  - Outside RX guideline window
  - Supportive

Patient Case (cont.)

- Outcome
  - She did very well
  - School note (missed 3 days)
  - Defervesced the following day

- Advantages of Molecular Testing
  - TAT
    - Initial results back in < 4 minutes (Strep)
    - Last test was back in < 12 minutes (RSV)
    - PT spent < 37 minutes in our clinic (from check-in to D/C)
  - No question about diagnosis
  - No question about need to Rx
  - Mom was VERY satisfied
    - Had answer/treatment plan and a path forward
    - Mom has 3 other kids - this helps her with plan for rest of family

Patient Case (cont.)

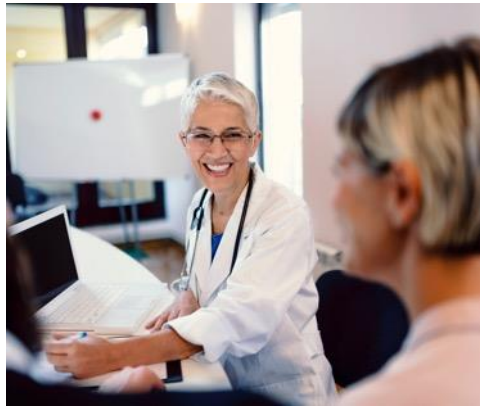
- More clinically reliable results
  - MUCH lower worry about over/under prescribing
  - No need for culture
  - Diminished and streamlined follow-up, increased workflow efficiencies

WIN-WIN FOR EVERYONE

Summary

- Molecular testing is GAME CHANGING
  - Fewer false negatives/false positives
  - Antimicrobial stewardship
  - **TAT - Lifeblood of Urgent Care**
    - **Efficiency of workflow**
  - Faster time to treatment/symptom relief
  - Patient satisfier
  - Potential favorable reimbursement
  - Staff satisfaction

WIN-WIN for everyone



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Thank you!

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