Nursing Home ECHO
COVID-19 Action Network

Virginia Nursing Homes * VCU Department of Gerontology
VCU Division of Geriatric Medicine * Virginia Center on Aging

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SESSION 6

COVID-19 Testing
Quality Assurance Performance Improvement-
5-step Improvement Model

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Christian Bergman, MD – none; Dan Bluestein, MD – none; Joanne Coleman, FNP-none; Laura Finch, GNP - none; Tara Rouse, MA, CPHQ, CPXP, BCPA – none; Sharon Sheets-none;

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ECHO is All Teach, All Learn

Interactive
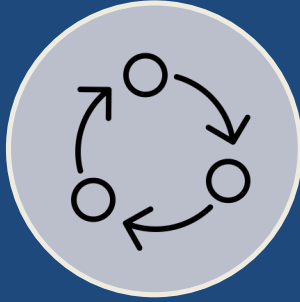
Co-Management of Challenges

Peer-to-Peer Learning
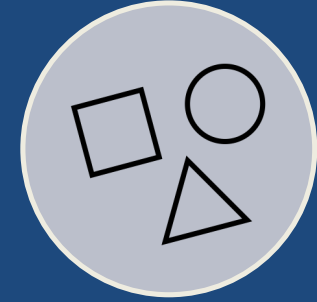
Collaborative Problem Solving

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Week 6 Learning Objectives

Covid-19 Content: Testing

1. Describe the different SARS-CoV-2 testing options and considerations for their use
2. Apply the SARS-CoV-2 testing guidance for nursing home residents and healthcare personnel (HCP)
3. Discuss factors that impact the interpretation of test results

Quality Assurance/Performance Improvement:

1. Describe the 5-step Improvement Method

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SARS-CoV-2 Testing Considerations

for more information visit: **www.cdc.gov/COVID19**

Question 1

PCR tests are most likely to be positive

    a)   Immediately upon the virus entering one's system

    b)   At symptom onset

    c)   4 weeks post symptom onset

    d)   a and b

COVID-19 infection timeline and testing

Figure. Estimated Variation Over Time in Diagnostic Tests for Detection of SARS-CoV-2 Infection Relative to Symptom Onset

Key: test results must be interpreted in relation to course of infection
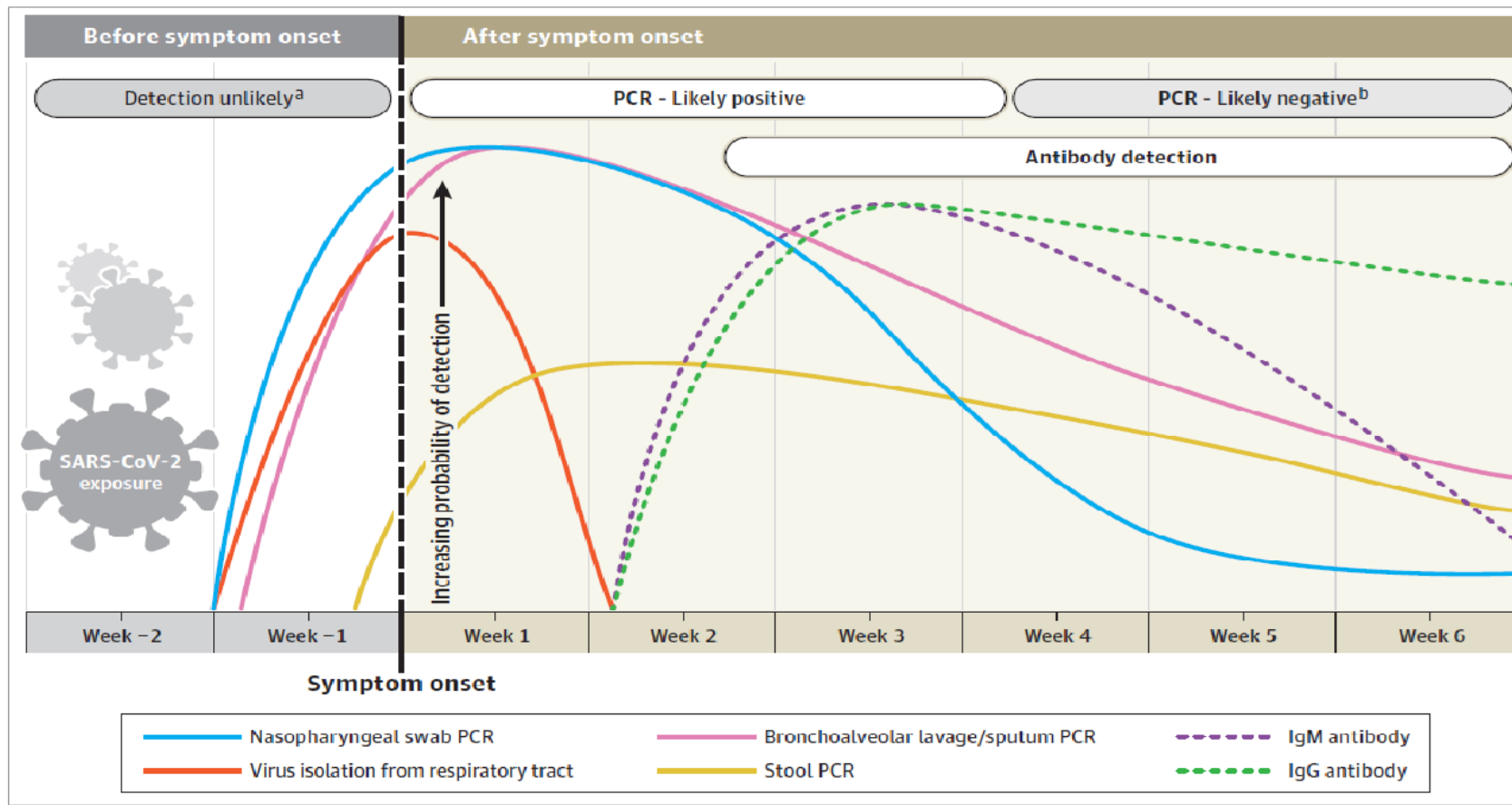
Question 2

Which of the following are diagnostic tests for COVID-19:

 a) Antigen tests
 b) PCR tests
 c) Antibody tests
 d) a and b
 e) b and c

SARS-CoV-2 Virus

Antibody tests Target antibodies for these proteins

Envelope (E) protein
- Assembly and morphogenesis of virions
- Pathogenesis

Antigen tests target N protein:
- Quidel Sofia SARS
- Abbott BinaxNOW
- BD Veritor
- LumiraDx

Nucleocapsid (N) protein
- Replication and transcription

Membrane (M) protein
- Virus fusion, assembly and budding

Key: Antibody tests are not for diagnosis. Different tests target different parts of the virus

Viral RNA

Spike (S) protein
- Virus entry
- S1 subunit: binding to host cell receptors
- S2 subunit: fusion of viral and cellular membranes

PCR based tests target viral RNA

https://www.frontiersin.org/articles/10.3389/fimmu.2020.00879/full

A

B

ORF1a   ORF1b   S   ORF3a E ORF7a M ORF10

ORF6 ORF8

30 kb

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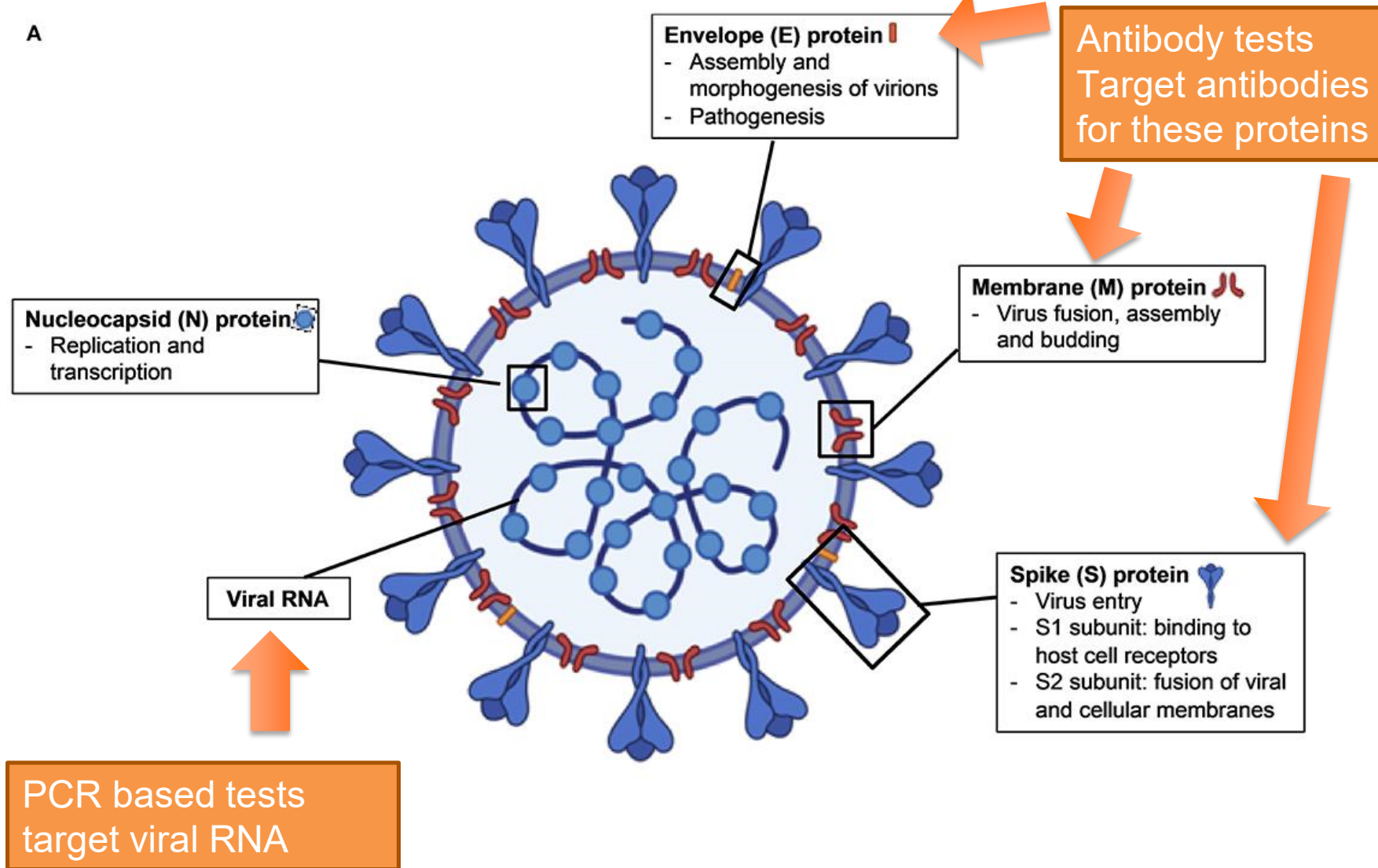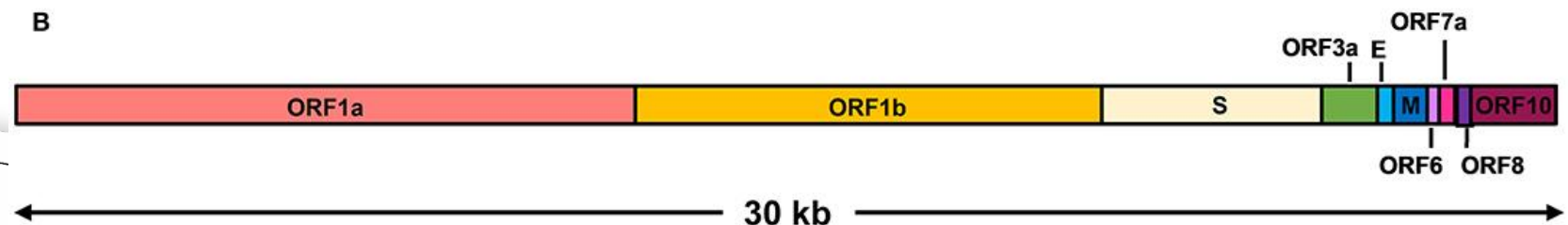
SARS-CoV-2 viral testing: Molecular vs. Antigen

- **Clinical sensitivity:** Accuracy of detecting positive patients with infection – lower sensitivity leads to higher false negative results
- **Clinical specificity:** Accuracy of detecting negative patients without infection – lower specificity leads to higher false positive results

Table 2. Summary of Some Differences between RT-PCR Tests and Antigen Tests

	RT-PCR Tests	Antigen Tests
Intended Use	Detect current infection	Detect current infection
Analyte Detected	Viral RNA	Viral Antigens
Specimen Type(s)	Nasal Swab, Sputum, Saliva	Nasal Swab
Sensitivity	High	Moderate
Specificity	High	High
Test Complexity	Varies	Relatively easy to use
Authorized for Use at the Point-of-Care	Most devices are not, some devices are	Yes
Turnaround Time	Ranges from 15 minutes to >2 days	Approximately 15 minutes
Cost/Test	Moderate	Low

https://www.cdc.gov/coronavirus/2019-ncov/lab/resources/antigen-tests-guidelines.html

Question 3

A test's sensitivity is the percentage of persons with disease who have a positive test

    a)   True

    b)   False

Question 4

A test's specificity is the percentage of people without disease who have a negative test:

    A. True

    B. False

Question 5

All of the following factors affect test performance EXCEPT:

a)   Experience of tester

b)   Cleanliness of testing area

c)   Time of day test is run

d)   Adequacy of specimen collection

Extrinsic Factors that can impact interpretation of test results

- Quality of the specimen collection
  - Inadequate sampling or specimen mishandling
  - Running tests on specimens collected outside of the recommended time period recommended by manufacturer's instructions for use

Human Environmental Disease activity

- Proper use of the testing platform
  - Trained personnel, proficient in sample handling with dedicated time
  - Space designated for running POC tests should be free of clutter, with regular surface cleaning/disinfection to prevent sample contamination
  - Quality controls should be used according to manufacturer's instructions for use (e.g., new operators, new lots of test kits/reagents)
- Clinical presentation at the time of the test (e.g., symptoms)
- Prevalence of COVID-19 infections in the center and community

https://www.youtube.com/watch?v=8oCRqlY1kJw
https://www.cdc.gov/coronavirus/2019   -ncov/lab/lab   -biosafety   -guidelines.html#decentralized

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Current recommendations for testing in nursing homes

- Diagnostic testing:
  – Test any symptomatic residents and HCP immediately
  – Testing practices should aim for rapid turnaround times (e.g., less than 24 hours) in order to facilitate effective interventions

- Outbreak testing:
  – Triggered by a new SARS-CoV-2 infection in any HCP or any [nursing home-onset](#) SARS-CoV-2 infection in a resident

- Non-outbreak testing:
  – **Baseline testing:** Test all residents and staff once as part of reopening
  – **Serial staff screening:** test asymptomatic staff at frequency determined by county positivity (monthly, weekly, twice weekly)

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VDH Community Test Positivity
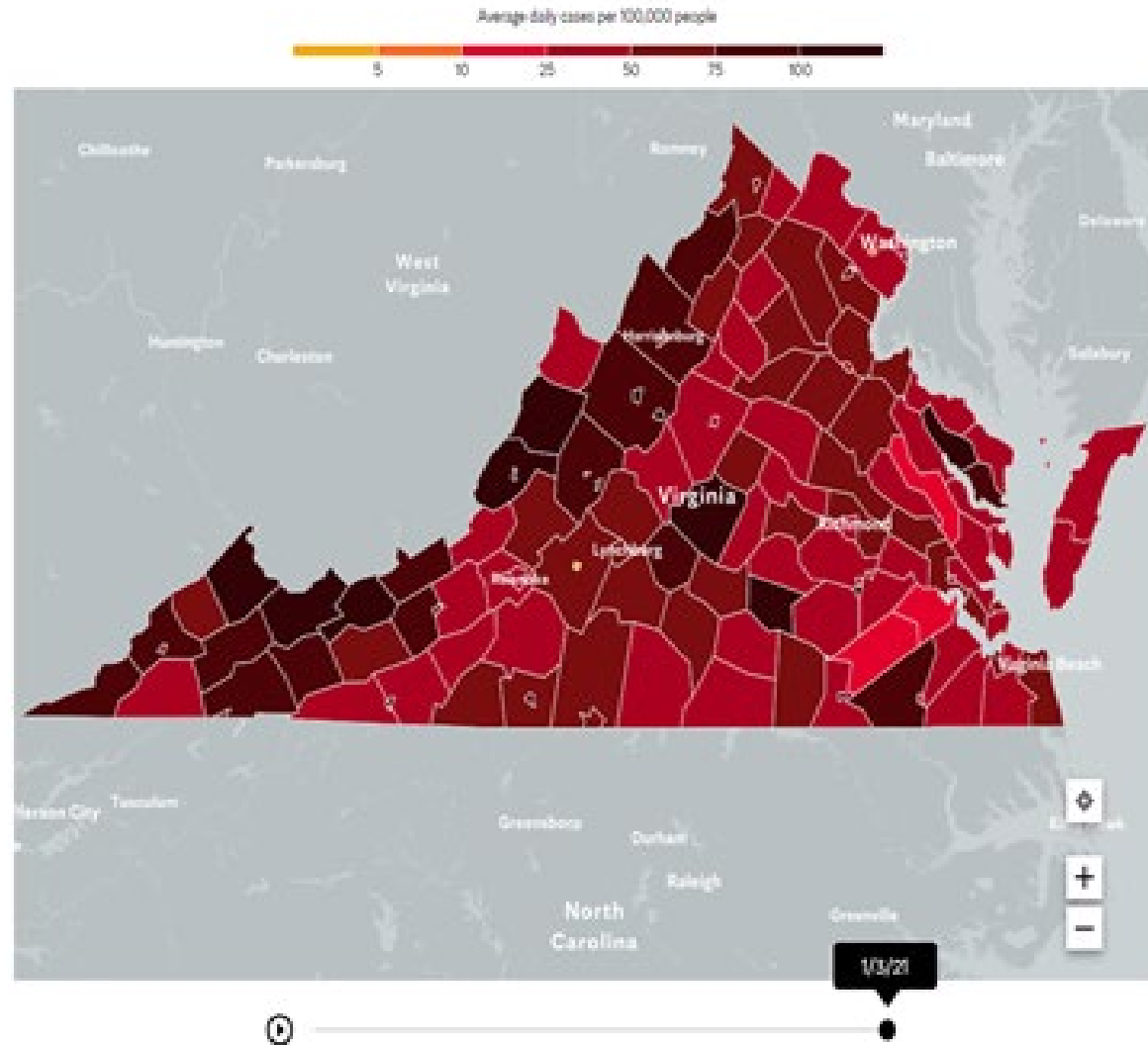
Outbreak testing in response to a new SARS-CoV-2 case

- Expand diagnostic testing for all residents and HCP
  - Initiate facility-wide testing as soon the **first** SARS-CoV-2 case is confirmed

- Perform repeat testing of all previously negative residents and HCP
  - Optimal outbreak testing occurs every 3 days during the first 14 days from the initial case identification; followed by testing every 7 days
  - Continue serial testing until no new positive cases are identified for a period of 14 days from the most recent positive result.
  - If testing capacity is limited, prioritize testing for residents with known exposure to a case, residents and HCP on affected units, and residents who leave and return to the facility

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Timing of facility-wide testing associated with new cases

- 93 nursing homes working with 5 health departments performed targeted COVID-19 testing in response to a case

- Median time was 7 days from first case to facility-wide testing (range: 1-41)

- For each additional day before completion of initial facility-wide testing, an estimated 1.3 additional cases were identified

Sooner the better

FIGURE. Association between total number of persons with positive SARS-CoV-2 test results after facility-wide testing and number of days from first case identification until completion of facility-wide testing* — five state and local health department jurisdictions,† United States, March–June 2020
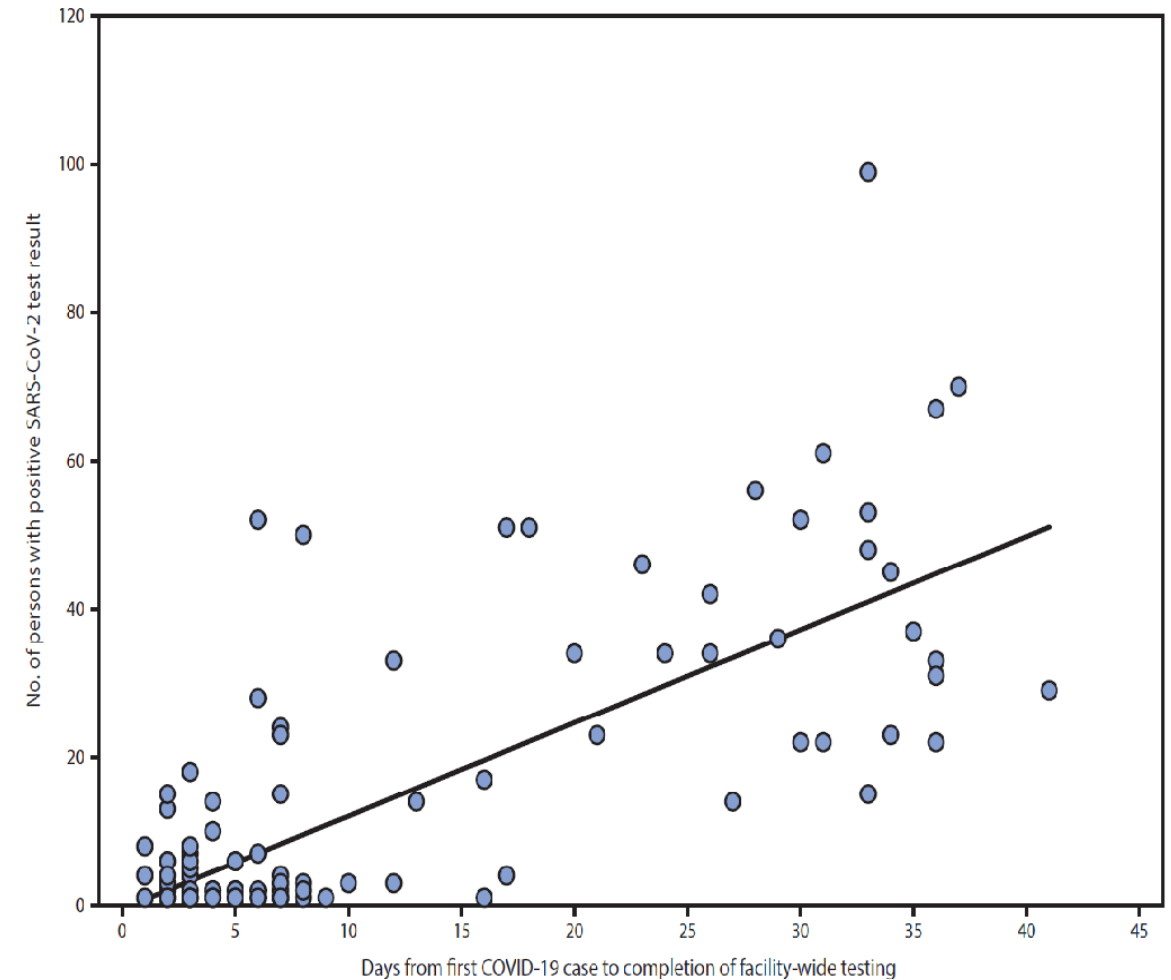
Considerations when implementing testing in nursing homes: Post COVID-19 retesting, Asymptomatic testing

- Managing residents and HCP clinically recovered from COVID-19
  - Within 3 months of symptom onset of their most recent illness, no need to quarantine or retest for SARS-CoV-2 during outbreak response or staff screening
  - If testing positive for SARS-CoV-2 more than 3 months from recovery, should be considered infectious and placed in isolation or work exclusion
  - Retesting within first 3 months may be warranted for new symptoms consistent with COVID-19 if alternative etiologies for the illness cannot be identified

- Unclear benefit to regular screening tests for asymptomatic residents outside of outbreak response
  - Could result in false-positive results and lead to unnecessary testing
  - Consideration could be given to testing asymptomatic residents who frequently leave the facility of medical treatment, especially in communities with moderate to substantial SARS-CoV-2 transmission

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Question 6

A resident develops a fever, cough, and malaise. Her POC antigen test is negative. After isolation, you should:

a) Do serial antigen tests
b) Do a PCR
c) Discontinue isolation when she improves
d) Obtain a sputum culture for bacterial pathogens

(Note: can consider influenza testing in addition)

Question 7

An asymptomatic employee has a positive on a monthly POC antigen test. COVID-19 prevalence is 2%. After restricting from work, You should:

a) Repeat the antigen test after cleaning the testing area
b) Order a PCR
c) Do a different antigen test
d) Do stool testing

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Question 8

During an outbreak, an asymptomatic employee has a positive antigen test. You should
   a)   Do a PCR
   b)   Repeat the Antigen test
   c)   Do a different Antigen test
   d)   Consider that the employee has COVID-19

Considerations for use of SARS-CoV-2 POC antigen tests

- Testing scenarios:
  - Symptomatic individuals
  - Asymptomatic individuals in facilities with an outbreak
  - Asymptomatic staff in facilities without an outbreak

- Identifies when POC antigen results should be confirmed by RT-PCR

https://www.cdc.gov/coronavirus/2019-ncov/hcp/nursing-homes-antigen-testing.html
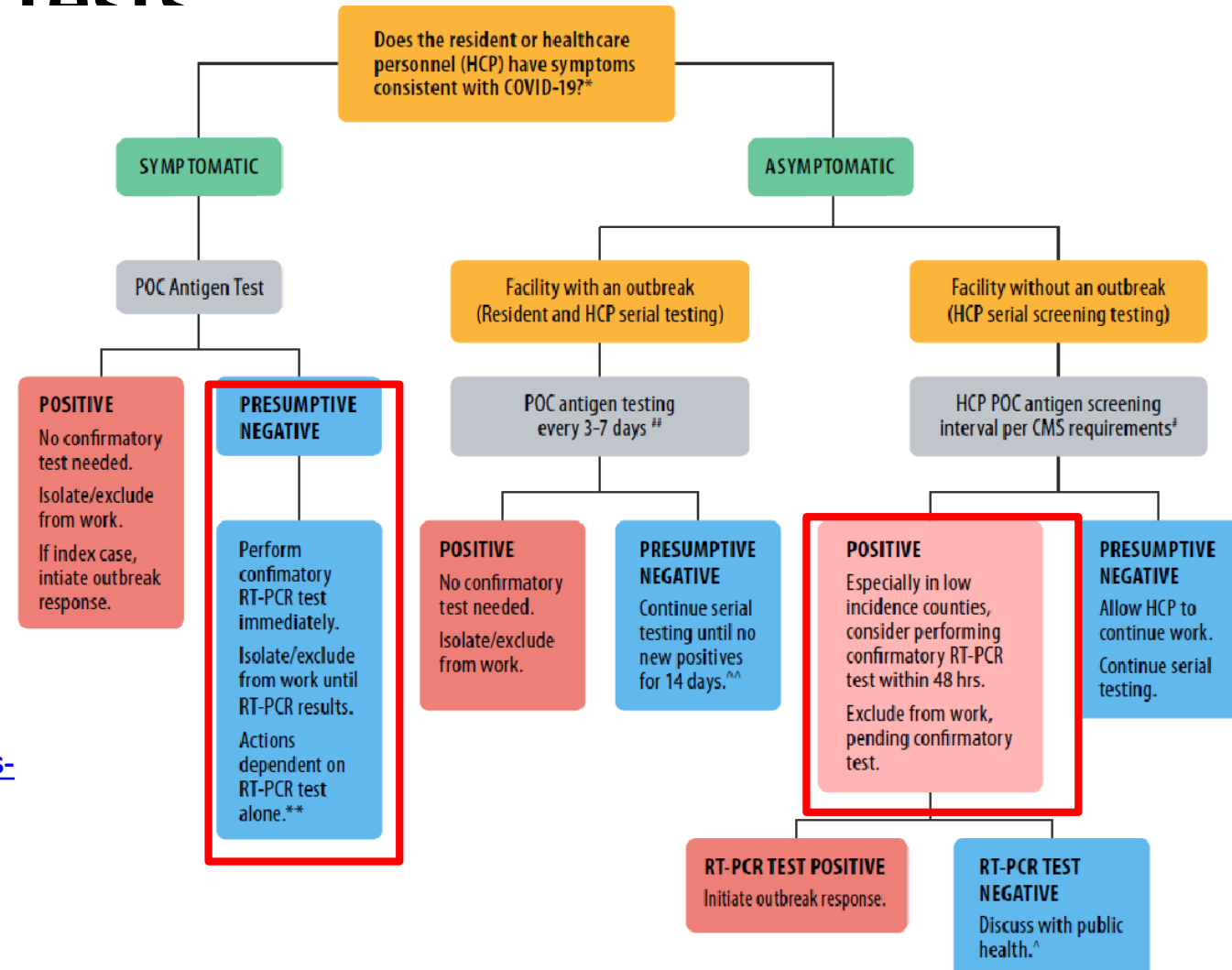
Responding to POC antigen results

- While awaiting confirmatory test results for potential false-negative or false-positive antigen test results, maintain IPC measures (e.g., HCP work exclusion, resident placement in Transmission-Based Precautions)

  PCR to determine false - or false + antigen tests

  - Select a confirmatory test with high sensitivity (e.g., RT-PCR)
  - Perform confirmatory test within 2 days of initial result
  - Additional testing of asymptomatic residents or other close contacts can be delayed until results of confirmatory testing are available, unless additional symptomatic individuals are identified
  - Only move residents with confirmed infection to a dedicated COVID-19 unit
- Confirmatory RT-PCR testing after a positive antigen test result is not recommended when the person being tested is symptomatic or had recent exposure to a SARS-CoV-2 case (e.g. during an outbreak)

https://www.cdc.gov/coronavirus/2019-ncov/hcp/faq.html#Testing-in-Nursing-Homes

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Limitations to SARS-CoV-2 testing

- A single negative test may not rule out COVID-19 infection in asymptomatic individuals
  - A person can be incubating SARS-CoV-2 for up to 14 days before manifesting clinical illness or having detectable virus
  - Testing immediately before or after admission cannot be used to remove a resident from 14-day quarantine

- Clinicians must consider the likelihood of COVID-19 infection as part of interpreting test results
  - A negative test in someone with exposure and symptoms consistent with COVID-19 infection should be verified
  - A positive test in an asymptomatic person, in a community with low prevalence of COVID-19 infection should be verified

- Testing alone cannot prevent the spread of SARS-CoV-2
  - Facilities must remain committed to all infection prevention strategies to protect residents and staff

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Break slide

Next up – Case Discussion

Case Study example

Situation: Increased falls 5% since COVID-19 pandemic have caused some injuries and ED visits.

Background: Due to the COVID-19 pandemic, our nursing home has had significant staff turnover and reduced staffing throughout the units. As a result, snacks for residents that used to be twice a day have been cut back to 'when possible'.

Assessment: Without reminders to drink fluids during the day, residents have become dehydrated more often than usual. Several of them have demonstrated poor balance, unsteadiness, and have fallen more than during the pre-COVID-19 period. Some of those falls resulted in emergency department transfers and injuries.

Recommendation: Problem solve with CNAs, nurses, therapy staff and activities to develop a team approach to falls. Collect data on falls to determine causes and outcomes. Use the daily huddle to discuss ideas for optimizing hydration and snacks and lowering fall risk. What would you recommend?

Break slide

Next up – Quality Assurance / Performance Improvement: 5-step model

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Follow-up on last week's "Leave in Action"

- What process did you investigate?

- What did you learn?

Improving Our Processes

Reflections: Reliability

- Choose one process or procedure in your facility's COVID-19 response that you are unsure of its reliability

- Ask 5 staff
  - WHO does it?
  - WHEN should it be done?
  - WHERE is it done?
  - HOW is it done?
  - WHAT is needed to do it?

- Observe if the responses are correct and consistent

FOCUS ON PROCESS

If you think a PROCESS works pretty well, test the FIVE ATTRIBUTES

- WHO does it
- WHEN should it be done
- WHERE is it done
- HOW is it done
- WHAT is needed to do it

- Ask 5 staff to describe the 5 attributes.
- If 5 direct care staff can describe the work with the 5 attributes, you have a good chance to achieve 95% performance and SUSTAIN the performance over time.
- If they can't, determine which attribute they can't describe and develop a simple process for improvement.

If you have a process that does NOT work so well

- Determine if it is a COMMON or INFREQUENT failure.
- Observation of ONE PERSON does not mean it is a common failure.
- Fix ONE Attribute (who, when, where, how, what) at a time.

COMMON
- Don't rely too heavily on education as THE FIX.
- Get CURIOUS to determine WHY this is occurring.
- Inform staff on the WHY.
  - WHY is this process important.
  - WHY do we do it this way.
- Get CURIOUS WHY are they NOT following the process.
- Develop a plan to fix ONE process, test and refine.
- Keep it SIMPLE!

INFREQUENT
- Infrequent does NOT mean you have a bad process.
- Don't try to make it perfect - you will use up too many precious resources.
- Talk to that one person to reeducate or determine WHY it is occurring.
- Accept defeat & MOVE ON to focus on another process.

REMEMBER - HOW DO YOU EAT AN ELEPHANT? ONE BITE AT A TIME!
PERFECTION IS THE ENEMY OF RELIABLE DESIGN!

Process Improvement by Roger Resar and Frank Federico, IHI, Marla DeVries, THE GREEN HOUSE® Project, and Arkansas COVID-19 Action Network

Project ECHO®

PROCESS IMPROVEMENT

HOW TO MAKE CHANGE STICK
- Focus initially on KEY PROCESS rather than on benchmarked outcomes.
- Evaluate if staff KNOW the process.
- KEEP it SIMPLE!
- Commit to be a LEARNING ORGANIZATION.

REASSESS THE GOAL
- The goal is 95% performance.
- WHY? 95% or better means it is likely to be SUSTAINABLE over time.

95%

KEEP IT SIMPLE
- It is more important that the process be STANDARD than it be perfect.
- When you design for perfection - you often get overly complex protocols, planning for every contingency.
- A policy and procedure make look great on paper, but it if is too complicated it likely won't be remembered or followed.
- Shift away from RESOURCE INTENSIVE meetings to MINIMAL RESOURCE approach. Smaller is better. Play around with improvements and pilot test.

Using a Performance Improvement Project (PIP) for Covid-19 Vaccinations

Improvement in 5 Steps

1. Get curious about the nature of the problem
   - Observe it
   - Talk to staff (huddles!)
   - Map/diagram/brainstorm
   - Measure it

2. Set a goal for what you want to achieve

3. Decide what you want to try

4. Test/try it on a small scale…1 day, 1 resident

5. Measure your impact in ways that make sense

Covid-19 Vaccination PIP

Step 1. Get curious… Can we find out:

➢ How do we get vaccines into the facility?

➢ Who will be eligible and when?

➢ What are staff currently feeling/thinking about the vaccine?

➢ What supports exists or are in development to help us?

➢ What previous experience do we have with vaccination programs that we can build on?

AHRQ ECHO National Nursing Home COVID-19 Action Network

UNM HEALTH SCIENCES | ECHO Project | AHRQ Agency for Healthcare Research and Quality | Institute for Healthcare Improvement

‹#›

Covid-19 Vaccination PIP

Areas to address:

➤ What are the logistics of vaccinating all our residents?

➤ What are the logistics of vaccinating our staff?

➤ What concerns do residents and families have about the vaccine?

➤ What concerns do staff have about the vaccine?

➤ What do we need to message about 'post vaccination' behaviors and immunity expectation?

Covid-19 Vaccination PIP
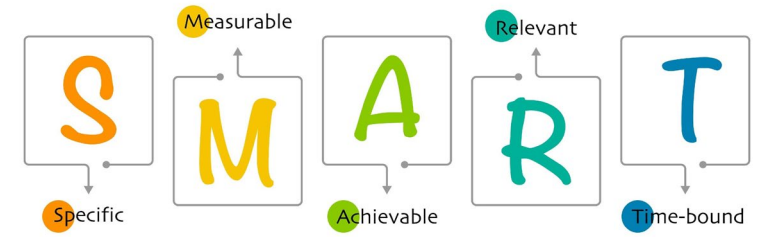
Step 2. Define your goal.

➢ 90%* of staff are immunized against Covid-19 by March 31st 2021
➢ 90%* of residents are immunized against covid-19 by March 31st 2021

*Dependent on vaccine availability

Step 3. Pick something to try.

➢ Map out the process of 'vaccination day' using a process map
➢ Use a 'fishbone diagram' to brainstorm the various issues you might need to address for a smooth vaccination program
➢ Connect with staff 1:1 to discuss their questions and concerns around getting the vaccine
➢ Find a staff 'Vaccine Champion' to speak to hesitant colleagues
➢ Control the information flow and ensure reliable resources are being used and shared
➢ Simulate 'vaccination' day with staff and leaders to ensure process works as intended

Tools You Can Use: Process Diagram

Your facility receives vaccine consent forms → Consent forms are given to staff to introduce to assigned residents/family members → Resident/family members review consent form with staff → Consent form signed?

No → Staff share vaccine declined status with DON → DON enters data into facility tracking form

Yes → Staff request proof of insurance forms from resident/family → Staff provide signed consent form and proof of insurance to DON → DON enters data into facility tracking form

Tools You Can Use: Fishbone Diagram

1 PEOPLE

Lack of knowledge

Mistrust related to systemic racism

3 ENVIRONMENT

Difficulty observing residents in individual rooms following vaccine administration

Lack of space for vaccine administration

Challenges to Vaccine Administration

2 MATERIALS

Limited vaccine supply

Mistrust related to speed of vaccine development

4 POLICIES & PROCEDURES

Staff call-outs due to vaccine side effects

Difficulty coordinating with pharmacies

Covid-19 Vaccination PIP

Step 4. Try something small.

➢ Map and simulate 'vaccination day'

➢ Test using 1:1 conversations using the questions below to uncover concerns and tactics regarding vaccine hesitancy in staff – start with 3 staff this week

  ➢ What concerns do you have for residents, yourself, or the team regarding the covid-19 vaccine?

  ➢ What information would be helpful to address your concerns?

  ➢ Would it be alright if I shared with you some of what I've learned about the vaccine? (ASK-TELL-ASK)

Step 5. Measure your impact.

➢ # of residents and staff engaged in vaccine conversations

➢ % staff immunized, % residents immunized

Leave in Action
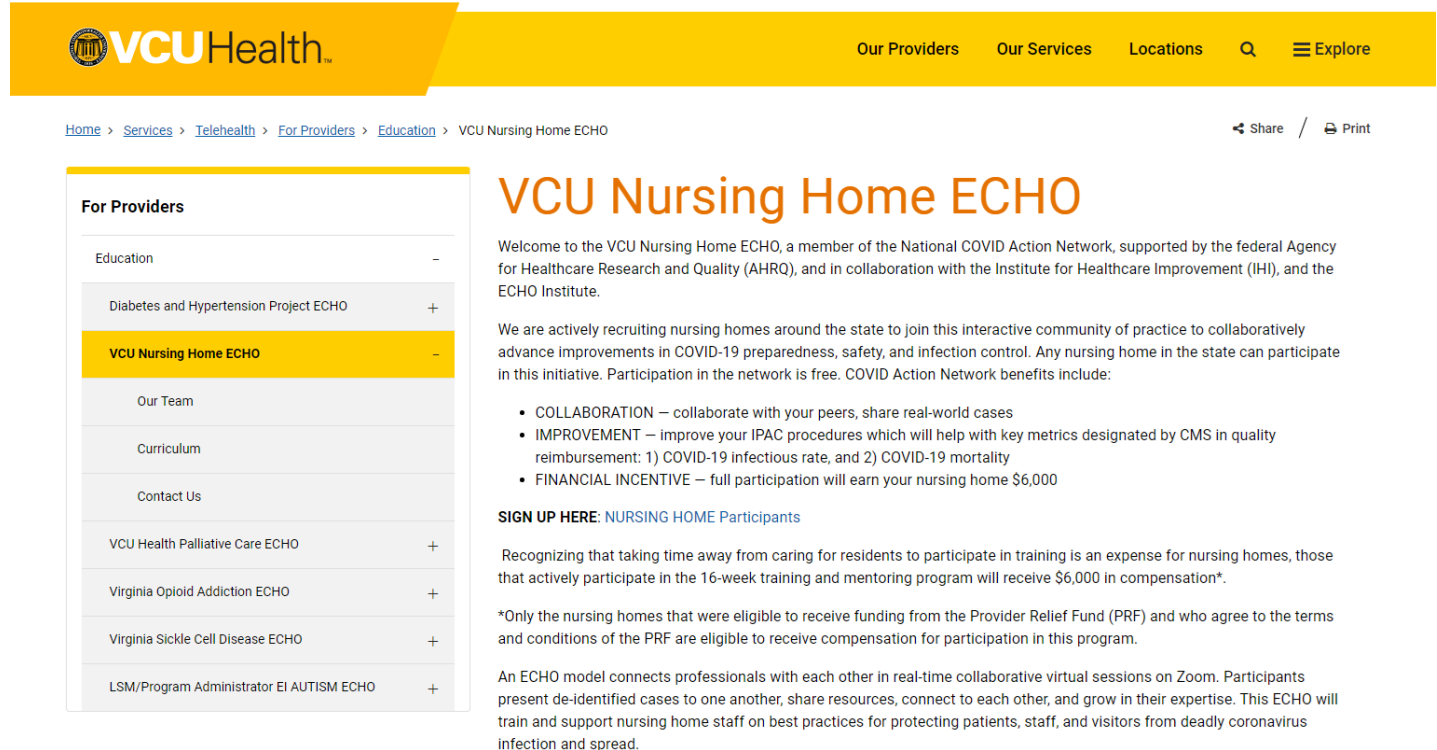
1. In the next week connect with 3 staff regarding being vaccinated for covid-19 and ask them the three questions:

> ➢ What concerns do you have for patients, yourself, or the team regarding the covid-19 vaccine ?
>
> ➢ What information would be helpful to address your concerns? How can we answer these questions together?
>
> ➢ Would it be alright if I shared with you some of what I've learned about the vaccine?

2. Start on your 'vaccination day' process map and simulation

3. Find your facility staff 'vaccine champion' who can help with reliable messaging regarding the covid-19 vaccine

Break slide

NEXT UP – WRAP UP & NEXT STEPS

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VCU Nursing Home ECHO Website

- Team members

- Curriculum content

- Handouts-Don't forget your 1-Pager!

- Contact information

https://www.vcuhealth.org/NursingHomeEcho

Curriculum Content

1. Preventing and Limiting the Spread of COVID-19 in Nursing Homes

2. Guidance and Practical Approaches for use of Personal Protective Equipment (PPE) During COVID-19

3. Approaches to Cohorting during COVID-19

4. Promoting Solutions for Making the Built Environment Safe During COVID-19

5. Guidance for Cleaning and Disinfecting During COVID-19

6. COVID-19 Testing for Nursing Homes

7. **COVID-19 Community Transmission and Nursing Home Screening Strategies**

8. Staff Returning to Work Safely During COVID-19

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NEXT UP – RESOURCES

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# CDC Testing Guidance and FAQs

https://www.cdc.gov/coronavirus/2019-ncov/hcp/nursing-homes-testing.html
https://www.cdc.gov/coronavirus/2019-ncov/hcp/testing-healthcare-personnel.html
https://www.cdc.gov/coronavirus/2019-ncov/hcp/faq.html#Testing-in-Nursing-Homes

COVID-19 Resources for Nursing Homes

- Infection Control Guidance
- SARS-CoV-2 Testing Guidance
- Assessment tools
- Training resources

https://www.cdc.gov/coronavirus/2019-ncov/hcp/nursing-home-long-term-care.html