When Someone Asks What I Did Today at Work: Here is What I Tell Them

Ruth Carrico PhD DNP APRN CIC FSHEA FNAP FAAN

Carrico & Ramirez, PLLC

Adjunct Professor, Division of Infectious Diseases

University of Louisville School of Medicine

Disclosures

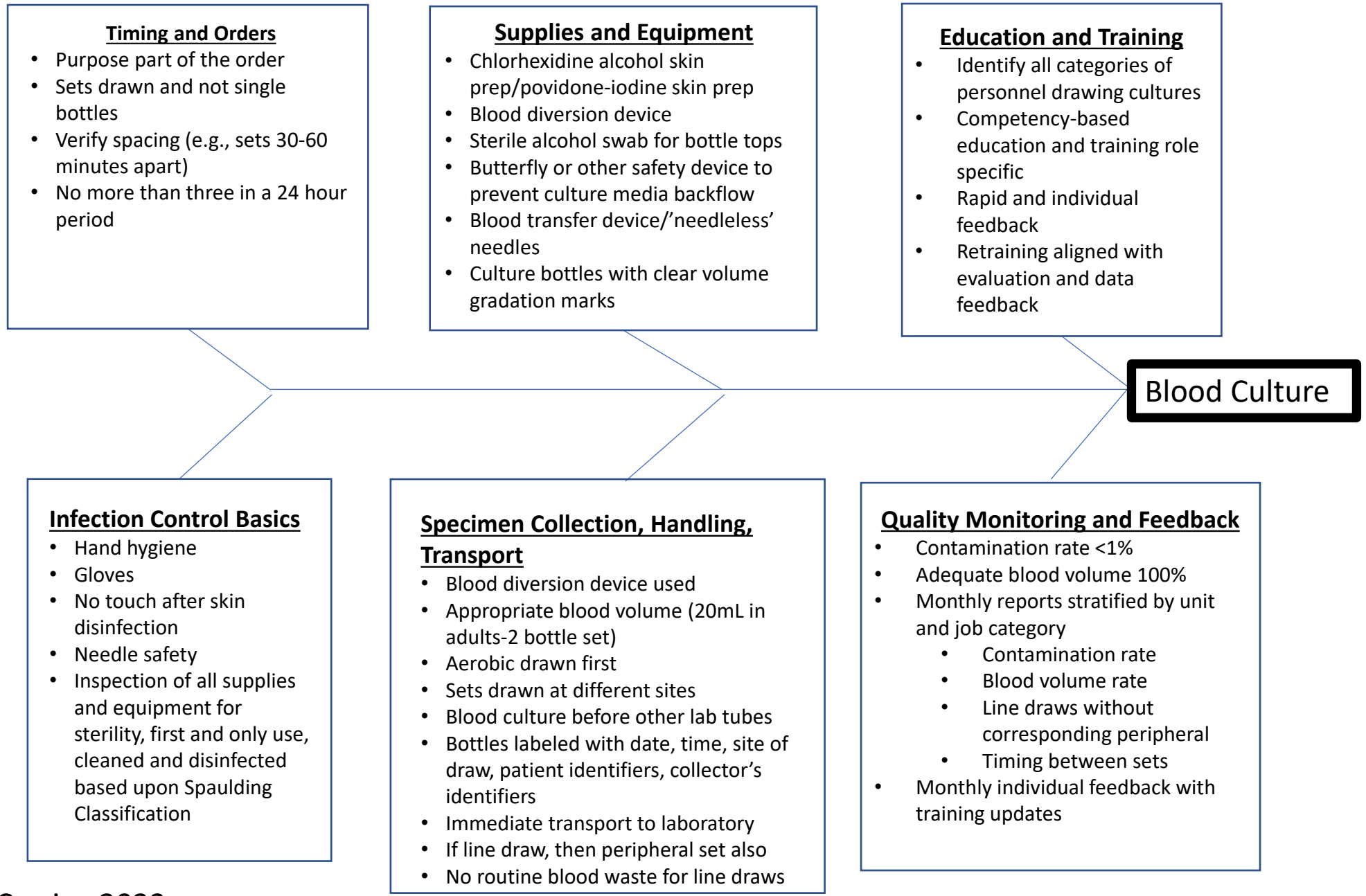
- None relevant to this topic
- Advisory Boards—Sanofi [influenza vaccine], Pfizer [meningococcal vaccine, Paxlovid], Moderna [COVID-19 vaccine], Valneva [travel vaccines], Seqirus [influenza vaccine], Novavax [COVID-19 vaccine]
- Speakers Bureau —Sanofi [influenza immunization], Pfizer [pneumococcal immunization, Paxlovid]
- Consultant- VaxCare [vaccination logistics]; American Hospital Association [environmental infection control]

Objectives

- Review of several common infection prevention scenarios occurring in healthcare settings
- Explore evidence-based approaches to these scenarios
- Identify practice gaps and opportunities for education, process, and practice improvement

Scenario 1: Blood Culture Process Improvement

- For more than a year, we have been working on improving practices involving blood cultures:
  - Reducing contamination rates
  - Ensuring appropriate volumes of blood in the blood culture bottles
- We have received notification about the new CMS standard and had our party to congratulate the group as our processes and education align beautifully with this standard.
- This morning (Friday), we were ready to launch the training for the new policies, procedures, competencies, and training components, but when we looked at the new blood culture bottles, the lab called to tell us that those new bottles are not compatible with our laboratory instrument.
- What do I do?



Carrico 2023

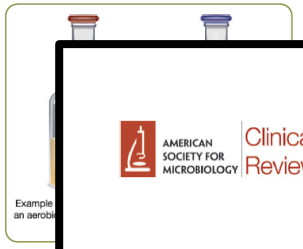
Blood Culture Contamination: An Overview for Infection Control and Antibiotic Stewardship Programs Working with the Clinical Laboratory

Purpose

Blood culture contamination can compromise quality of care and lead to unnecessary antibiotic exposure and prolonged length of hospitalization. Microbiology laboratories typically track blood culture contamination rates and can provide data to assist in reducing contamination rates. Infection control programs and microbiology laboratories might participate in designing and implementing interventions to decrease contamination rates, and antibiotic stewardship programs could also be engaged to optimize multidisciplinary quality improvement efforts to decrease blood culture contamination and improve the collection of blood culture specimens.

Background

Blood cultures are important diagnostic tools for identifying the pathogen(s) responsible for a patient's infection. This is especially true of patients with suspected sepsis or septic shock and for patients with suspected infective endocarditis[1,2]. When indicated, blood cultures should be obtained prior to starting antimicrobial therapy[1,2]. A conventional blood culture set consists of an aerobic and an anaerobic bottle. For adults, 20-30 mL of blood per venipuncture (depending on the instrument manufacturer) is recommended and may require >2 bottles depending on the system[2]. At least two blood culture sets should be obtained within a few hours of each other via peripheral venipuncture when obtaining blood cultures for a total volume of 40-60 mL of blood to optimize detection of pathogens[2]. The College of American Pathologists laboratory accreditation program states that clinical laboratories have a written policy and procedure for monitoring blood cultures from adults for adequate volume and provide feedback on the the monitoring and reporting of blood culture contamination rates is a laborat



Because blood is a normally sterile body site, positive blood cultures with a k overall high positive predictive value for infection. However, blood culture con In the era of modern blood culturing techniques, virtually all blood culture con the source of contaminants is usually the patient's skin or the hub or cannula an existing catheter is used to obtain the specimen). Frequent causes include insufficient skin disinfection. Typical organisms include coagulase-negative st spp., *Bacillus* spp. other than *Bacillus anthracis, Micrococcus* spp., and *Cutib* Consequences include unnecessary antibiotic exposure with the potential for consequences (e.g., possible allergic reactions and *Clostridioides difficile* infe include the unnecessary removal of intravenous catheters or other devices, a increased costs[5]. One study found that the average length of stay was 2 days blood cultures compared to patients with negative cultures[6]. That same study costs of a contaminated blood culture were $12,824 compared to $8,286 for $4,538 for preventing a contaminated blood culture)[6].

U.S. Department of Health and Human Services
Centers for Disease Control and Prevention

AMERICAN SOCIETY FOR MICROBIOLOGY | Clinical Microbiology Reviews®

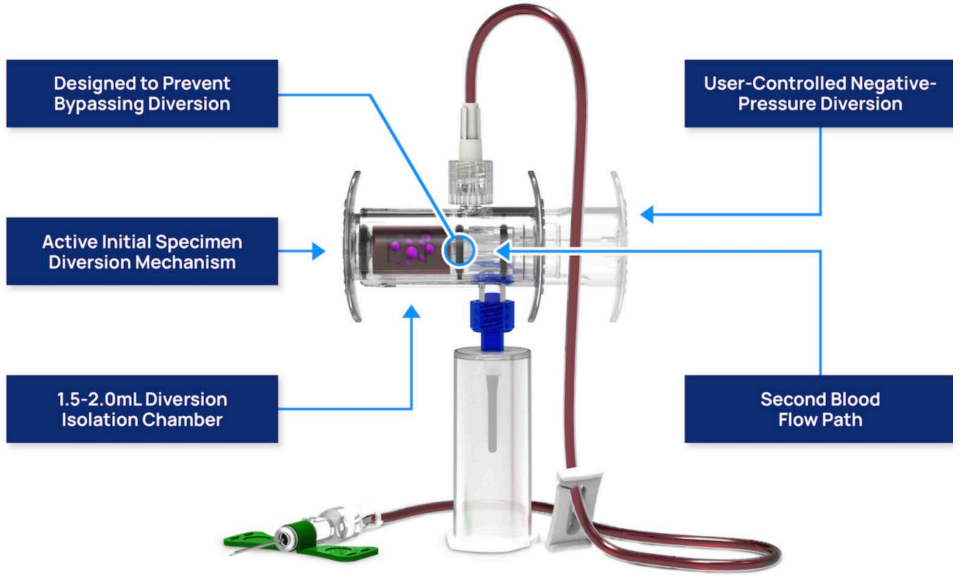
PRACTICAL GUIDANCE FOR CLINICAL MICROBIOLOGY

Check for updates

A Comprehensive Update on the Problem of Blood Culture Contamination and a Discussion of Methods for Addressing the Problem

Gary V. Doern,[a] Karen C. Carroll,[b] Daniel J. Diekema,[c] Kevin W. Garey,[d] Mark E. Rupp,[e] Melvin P. Weinstein,[f] Daniel J. Sexton[g]

[a]Department of Pathology, University of Iowa Carver College of Medicine, Iowa City, Iowa, USA
[b]Division of Medical Microbiology, Department of Pathology, John Hopkins University School of Medicine, Baltimore, Maryland, USA
[c]Division of Infectious Diseases, Department of Medicine and Department of Pathology, University of Iowa Carver College of Medicine, Iowa City, Iowa, USA
[d]Department of Pharmacy Practice and Translational Research, University of Houston College of Pharmacy, Houston, Texas, USA
[e]Division of Infectious Diseases, Department of Medicine, University of Nebraska Medical Center, Omaha, Nebraska, USA
[f]Department of Pathology and Laboratory Medicine, Department of Medicine, Robert Wood Johnson Medical School, New Brunswick, New Jersey, USA
[g]Division of Infectious Diseases, Department of Medicine, Duke University School of Medicine, Durham, North Carolina, USA



What I Did Today

- Planned meeting with Microbiology regarding trends in contamination and blood volume
- Reviewed current policies and procedures relevant to blood cultures
- Reviewed CLSI M47 [Microbiology will likely have a copy]
- Planned meeting with my facility Value Analysis team to talk about supplies and supply chain
- Planned meeting with Antimicrobial Stewardship team to review impact of blood culture results on treatment [antibiotic use]
- Planned meeting with Nursing Education to review current training for nurses drawing blood cultures
- Planned meeting with Laboratory to review current training for phlebotomists drawing blood cultures

Scenario 2: Indoor Air Quality

- As part of improving how we address respiratory disease transmission, engineering and facilities management have begun conversation regarding indoor air quality and how policies and procedures could be impacted.
- ASHRAE *Standard 241, Control of Infectious Aerosols*, was released July 2023
- Standard 241 establishes minimum requirements to reduce the risk of airborne disease transmission, such as SARS-COV-2 virus, which causes *COVID-19*, the flu virus and other pathogens in buildings like single and multi-family homes, offices, schools and healthcare facilities. The standard applies to new and existing buildings and major renovations and provides requirements for many aspects of air system design, installation, operation and maintenance.
- What background information do I need as I participate in an initial indoor air quality meeting?

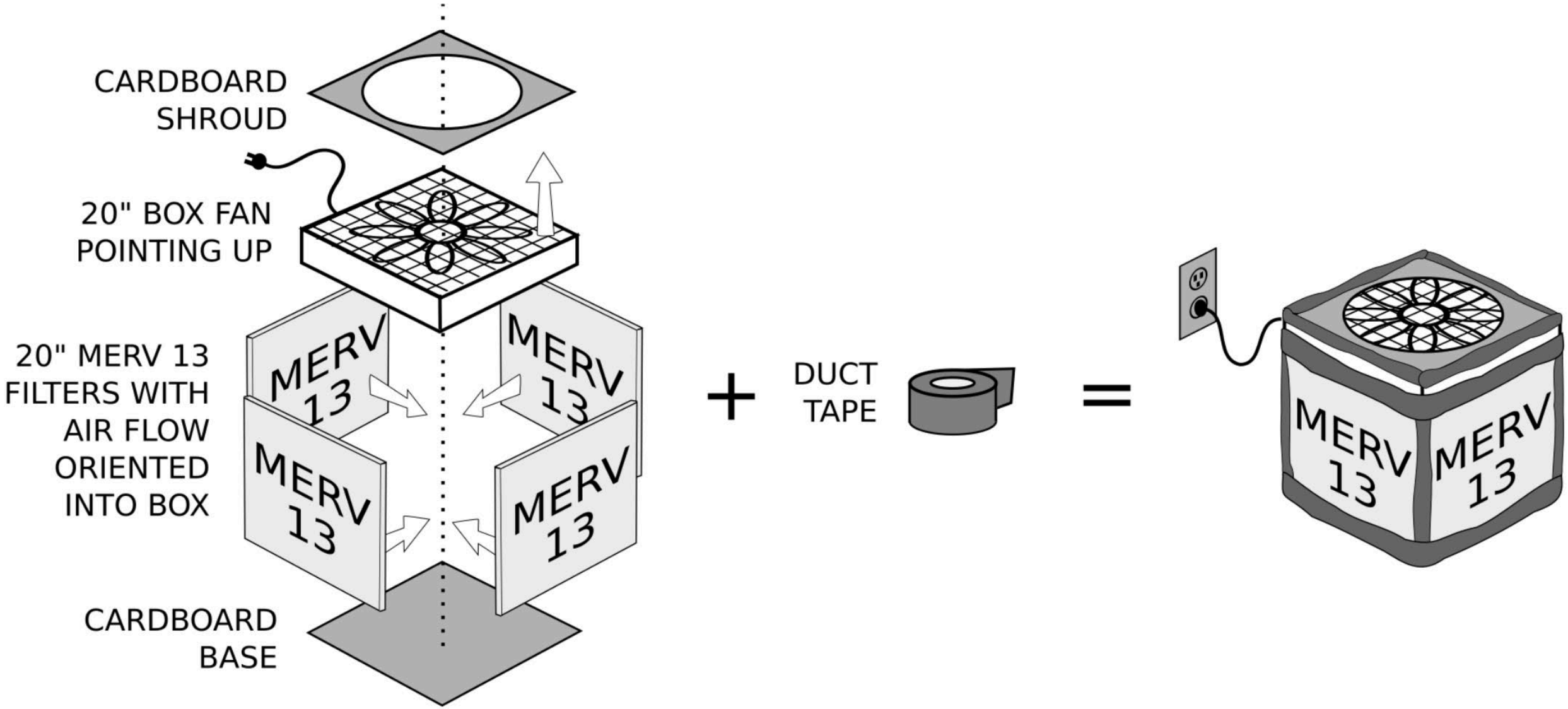
Important topics addressed in the standard:

- **Infection Risk Management Mode (IRMM)** – Establishes requirements for an infection risk management mode (IRMM), which applies during identified periods of elevated disease transmission risk. Authorities having jurisdiction can determine when the enhanced protections of Standard 241 are required. Resilience (the ability to respond to extreme circumstances outside normal conditions) in indoor air quality control design and operations is introduced.
- **Requirements for Equivalent Clean Airflow Rate** – Sets requirements for equivalent clean airflow rate target per occupant of pathogen free air flow, reducing the risk of infection.
- **Requirements for Use of Filtration and Air Cleaning Technology** – Provides extensive requirements for use of filtration and air cleaning (such as HEPA filters, air ionizers, or UV lights) to achieve equivalent clean airflow requirements and be cost effective effectively and safely.
- **Planning and Commissioning** – Provides assessment and planning requirements for being ready for the times when there is an event with increased disease causing pathogen transmissions. The standard has a *building readiness plan*, that documents procedures for assessing existing or new HVAC systems to determine if they are working properly and attributing to the equivalent clean air delivered to spaces.

Take a Tour of Ventilation System:

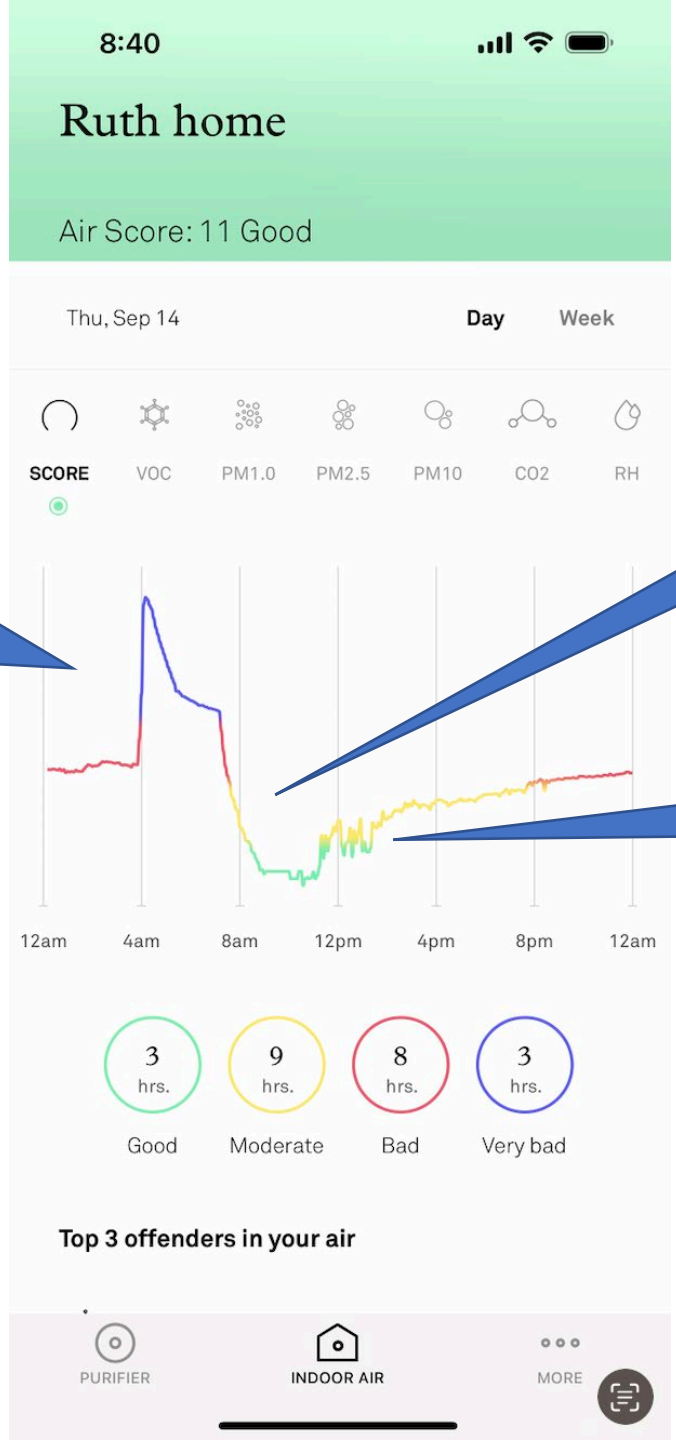
- Which air handlers serve which areas
- Relative humidity
- Airflow
- Balance
- Temperature
- What structural elements impact air flow (e.g., elevators)
- System filtration
- Electronic monitoring and reports

Corsi-Rosenthal Box



Not for routine use, especially in healthcare settings, but is valuable for learning about airflow and filtration.

Cheap and easy to construct.



Changed HVAC filter. Overnight ventilation

Opened door for fresh air

Closed door

What I Did Today

- Read the new standard [ASHRAE *Standard 241]* and made notes with my questions
- Planned for HVAC tour and schematics
- Reviewed CDC's Project Firstline videos [collaboration with ASHE available at https://www.ashe.org/project-firstline/ventilation-e-learning-course]

Scenario 3: Healthcare Worker Vaccine Acceptance

- Monovalent COVID-19 vaccine authorized by FDA, ACIP recommendations, and payer coverage in early Oct 2023
- CDC and White House concerns regarding lack of bivalent vaccine acceptance and how that will impact monovalent acceptance
- Employee/Occupational Health will have COVID-19 and influenza vaccine available for healthcare workers
- Facility administration is concerned regarding healthcare worker acceptance, vaccine costs, supply chain, and communication
- Meeting called for next week. What do I do?

COVID-19 Remains

- Mid-October approximately 900 deaths each week
- Disease still present across all population groups
- Children are in school and daycare, and they are continuing the same behaviors associated with transmission of other viruses (God bless their little hearts!)
- Age is strongest risk factor for serious outcomes
- Vaccination is still the greatest asset we have for public health and personnel health protection
- How do we deal with hesitance/ apathy/ loss of vaccine confidence among healthcare workers?

Some Key Behavioral Biases Relevant to Vaccine Hesitance

Availability Rule of Thumb	Optimism Bias	Confirmation Bias	Omission Bias	Social Norms	Framing Loss v. Gain
The more you are able to picture it, the more important it is.	We think we can beat the odds.	We only accept research or facts that support our own 'tribal' view.	We prefer to take no action rather than risk being the cause of a bad outcome.	People routinely conform to the prevailing social behavior.	People value avoiding a loss two to three times more than winning a gain

Adapted from Dr. Christopher Graves

Some Key Behavioral Biases Relevant to Vaccine Hesitance

Availability Rule of Thumb	Optimism Bias	Confirmation Bias	Omission Bias	Social Norms	Framing Loss v. Gain
The more you can picture it, the more important it is.	We think we can beat the odds.	We only accept research or facts that support our own 'tribal' view.	We prefer to take no action rather than risk being the cause of a bad outcome.	People routinely conform to the prevailing social behavior.	People value avoiding a loss 2x-3x more than winning a gain.
If you have not had a personal experience with the disease, you discount the need for vaccination. Make the disease vivid, relevant, and personal to that individual.	People may skip vaccines thinking they will beat the odds. Use testimonials from someone who also believed this but was devastated by illness. This is *Convert Communication*	People who believe vaccines are dangerous or part of a plot will not readily change their minds when provided with evidence. Instead use other techniques such as *Convert Communication*, *Social Proof*, *Narrative Transportation.*	If someone fears even the slightest possibility of an adverse reaction or fears a bad outcome, such as autism, they will avoid vaccination, even knowing the risk of no vaccination. So, frame the inaction as the bigger risk.	Emphasizing and reminding people that the vast majority of people have chosen to have their children vaccinated *Social proof* means using examples of people just like themselves.	All messages can be configured as a loss (do not do this, and bad things will happen) or a gain (do this and good things happen). Loss frames are more effective.

Adapted from Dr. Christopher Graves

Some Relevant Theoretical Considerations

- Convert Communication
  - Convert communicators are those **perceived as credible sources because they are arguing against the person's own previously held attitudes and behaviors.**
  - The communication is the **message as well as the method** used for the communication (personal, a link to click, a document).
- Social Proof
  - **people copy the actions of others in choosing how to behave in a given situation**.
  - **"herd mentality".**
  - **Decision-making becomes credible and validated through the behavior of others**.
- Narrative Transportation
  - **when people lose themselves in a story, their attitudes and intentions change to reflect that story.**
  - being completely **immersed in a story and leaving the real world behind**. Transportation involves **cognition, emotion, and mental imagery**, all focused on the story.

Some Key Behavioral Biases Relevant to Vaccine Hesitance

Availability Rule of Thumb	Optimism Bias	Confirmation Bias	Omission Bias	Social Norms	Framing Loss v. Gain
The more you are able to picture it, the more important it is.	We think we can beat the odds.	We only accept research or facts that support our own 'tribal' view.	We prefer to take no action rather than risk being the cause of a bad outcome.	People routinely conform to the prevailing social behavior.	People value avoiding a loss two to three times more than winning a gain
	I rarely get sick but if I do, it is always mild.	I read that vaccines don't really work and none of my family wants to take the risk of a vaccine.	I am afraid of the vaccine. It may cause me to be unable to have children.	This is the government's way of controlling what we do. Nobody in my group of friends is vaccinated.	
	My immune system is strong and I do not need a vaccine to help me.	Vaccines are not safe. The information is all over FaceBook.	I would rather take the chance with the disease than have some of those side effects.	Walk around my town. Nobody wears masks and nobody is afraid of this virus.	

Adapted from Dr. Christopher Graves

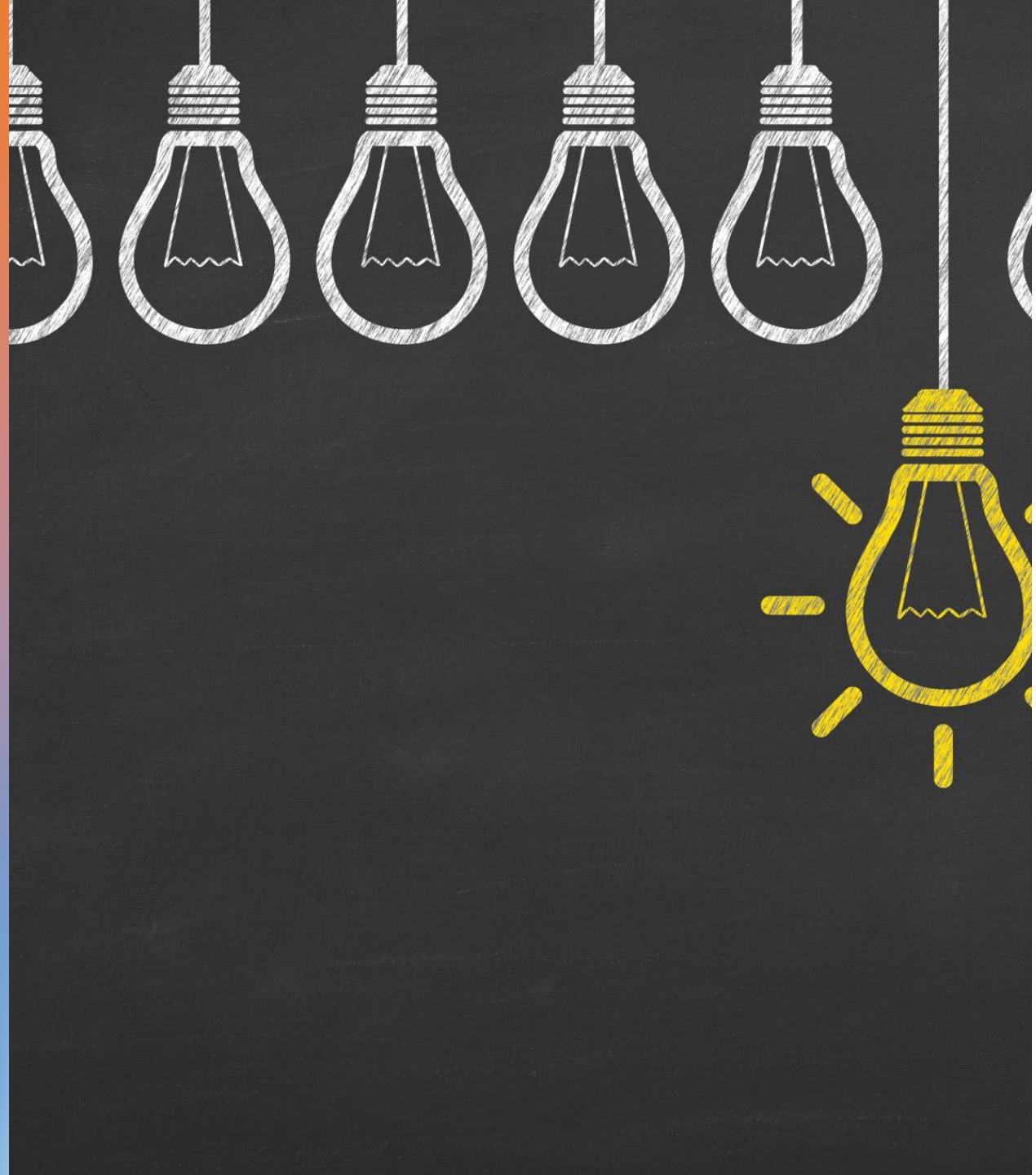
Some Key Behavioral Biases Relevant to Vaccine Hesitance

Availability Rule of Thumb	Optimism Bias	Confirmation Bias	Omission Bias	Social Norms	Framing Loss v. Gain
The more you are able to picture it, the more important it is.	We think we can beat the odds.	We only accept research or facts that support our own 'tribal' view.	We prefer to take no action rather than risk being the cause of a bad outcome.	People routinely conform to the prevailing social behavior.	People value avoiding a loss two to three times more than winning a gain
Stories that paint a picture; photos; videos: -the disease -the vaccine -vaccination -outcomes	I rarely get sick but if I do, it is always mild.	I read that vaccines don't really work and none of my family wants to take the risk of a vaccine.	I am afraid of the vaccine. It may cause me to be unable to have children.	This is the government's way of controlling what we do. Nobody in my group of friends is vaccinated.	Frame the loss: -illness -hospitalization, death -lost work, school -transmission to others
Credible people Realistic scenarios Local scenery	My immune system is strong and I do not need a vaccine to help me.	Vaccines are not safe. The information is all over FaceBook.	I would rather take the chance with the disease than have some of those side effects.	Walk around my town. Nobody wears masks and nobody is afraid of this virus.	Recognize the win: -no vaccination -autonomy to push back

Adapted from Dr. Christopher Graves

What I Did Today

- Reviewed existing guidance regarding healthcare worker immunizations
- Planned a meeting with Employee/Occupational Health to talk about strategies to understand our healthcare worker concerns, biases, and feelings regarding vaccination
- Planned a meeting to include Microbiology to assess trends in vaccine-preventable diseases occurring in patient population and look at employee illness trends and vaccination
- Planned a meeting with Healthcare Epidemiologist [or provider with prescribing authority for vaccines] to talk about patient and employee impact
- Reviewed current vaccines available for use [Pfizer, Moderna, Novavax]



Take Home Thoughts

- Recognize the expanding role of the Infection Preventionist in all settings
- Perform a self-assessment of our own existing knowledge, gaps, and plans for future
- Consider how to obtain additional professional education
- Consider new partners both internally and externally
- Consider how to expand your influence so responsibilities are broadly shared

ruthcarrico@gmail.com

www.linkedin.com/in/drruthcarrico

Questions?