FIRST QUARTER **2020**

SafetyMatters

A quarterly, collaborative publication
from MedFlight and HealthNet
Aeromedical Services

Taking Ownership of Safety

By Jeff White, M.S., MTSP-C, FP-C
Director of Safety, HealthNet Aeromedical Services

A famous saying from Julius Caesar goes "If you want to take the island, burn the boats." Simply put, you need to make your goals so big and transparent you have no choice but to strive for them every day. In the world of safety, leaders must set the standards high and help teams strive to reach those expectations. But, changing the mindset of our industry is easier said than done.

The EMS industry has embraced a "just get it done" mentality. This means taking calculated risks where needed and finding ways to make things happen, often with quite a bit of risk involved. Add to that the changing face of the patients we are seeing, violence against responders, and the employee's perception of what EMS should be. This all creates a drastic safety issue that requires management.

EMS is also now evolving from what was once a solid long-term career choice to a stepping-stone into other areas of medicine. So how does this create a safety issue? If you know you will not be working in an industry very long, do you put everything into it? Do you learn and abide by all the safety regulations, especially when each company does it so differently? Typically, the answer is no. Others want to make this as a career but get stuck in the vortex of spending time with the older "burnt out" provider who creates a bias in the new provider. That bias almost always comes in the form of the worst phrase in history, "We have always done it this way."

The first step for the new employee is to determine if they want to make a commitment or be a contributor. There's a commonly used fable that can help explain this difference. Imagine you are setting down to a nice breakfast of ham and eggs. While the chicken contributed to your meal, the pig made a commitment. Now, I'm not asking you to sacrifice everything for your organization. You do have to make a choice to put in the extra work and make your immediate environment as safe as possible for you and your partner. You must individually decide that the benefit of risk management processes outweigh the perceived time delay and harassment from those who decided to not follow the safety programs.

As leaders we can burn the boats and set up a great system, but it is up to everyone inside the system to make a commitment that they want to drive the system and make it great. In order to motivate crew members, leaders must create an environment of change. Create an environment where the right way is the only way. Educate the employees and put them in simulated scenarios where the right choices become second nature. Only at that point will you nurture an industry mindset change that will ultimately lead to increased safety for the crews and patients. ■

THIS ISSUE INCLUDES:

MedFlight

HealthNet Aeromedical Services

Mission. Ready.

History of Mechanical Ventilation

By Karen Swecker, RN, CIC
Exposure Control Liaison, MedFlight

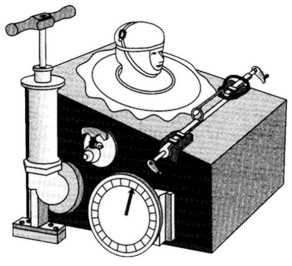
Ventilators have become a common piece of equipment in healthcare, saving lives and providing respiratory assistance for those who may be depending on it to stay alive. Like most equipment in healthcare, someone saw a need and came up with a solution.

The ventilator has a history that begins in the 16th century by Andreas Vesalius, who at the age of 23 taught anatomy. Due to his dissection of human cadavers, his ideas were greatly frowned upon by the church. In 1543 Vesalius published a series of books on the human anatomy, describing a tracheotomy and blowing air into the hole to cause the lungs to "rise again". Prior to Vesalius, common belief was that the act of breathing caused the heart to beat.

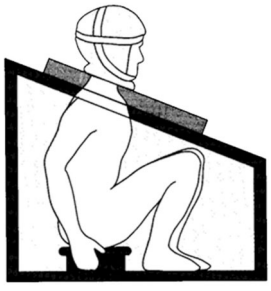
In 1667 scientist Robert Hook demonstrated that blowing air into the lungs kept one alive. However, it still wasn't clear why people breathed or why they became pulseless. The most common belief was that people became unconscious due to a lack of stimulation. Treatment for this included rolling a patient over barrels, putting them over a trotting horse, hanging them upside down, or using a fumigator that blew smoke up the rectum.

During the 1730s, Scottish surgeon William Tossach successfully resuscitated a coal miner with mouth to mouth breathing, describing the process in medical literature. The process included pinching the nose and blowing as hard as he could into the patient's mouth. Once the patient regained a pulse the doctor "pushed, pulled, and rubbed" the patient to stimulate circulation. Mouth to mouth resuscitation became popular until oxygen was discovered in the 1770s. The belief was that any exhaled air was depleted of oxygen therefore mouth to mouth was of no use to a person in respiratory distress.

Ventilators based on negative pressure were developed in the late 1800s. The patient sat in a box with the head exposed, a plunger device was used to decrease pressure inside the box causing inhalation, then reversing the process to cause exhalation. Per the inventor, Alfred Jones, the box "cured paralysis, neuralgia, seminal weakness, asthma, bronchitis, dyspepsia" and many other diseases.



In 1876 the first iron lung was developed and place along the Seine River to save drowning victims. The first iron lung to treat polio victims was used in Boston in 1929. One difficulty with the iron lung was figuring out how to access the patient's body for care. A respirator room was created where the patient's body lay inside the room with the head sticking out. Pistons were used to create pressure changes causing air to move in and out of the lungs. Multi patient ventilation rooms were developed for use during polio epidemics.



During the 1950s epidemics of polio were occurring, at one point there were 50 patients a day were admitted to a Copenhagen hospital with respiratory muscle paralysis that had a mortality rate of more than 80%. Tracheostomies and positive pressure respiration use dropped the death rate to 40%. As there were no individual respirators, patients were continuously hand bagged. These patients were cohorted into the same room, thus creating the first ICU.

During the 1940s and 1950s, positive pressure invasive ventilation was developed which provided volume-controlled ventilation. There were no alarms or monitors and no specific settings. Total volume was measure separately. Soon a double circuit ventilator was used in both OR and ICU. It included monitoring for pressure and tidal volume and machine triggered inspiration. In the 1960s, PEEP became standard care. By the early 1970s, second generation ventilators monitored tidal volume, respiratory rate and allowed patient triggered inspiration. Improvements continued at a fast pace leading to the ventilators now in use. Speculation of the future of ventilators include the ability of the ventilator to integrate with other bedside technology, smart alarms, and decision support. ■

2019 Measles Update

By Karen Swecker, RN, CIC
Exposure Control Liaison, MedFlight

In 2019, the Centers for Disease Control and Prevention (CDC) confirmed 1,276 cases of measles in 31 states. The outbreak has finally slowed down, but cases may still occur.

Measles Outbreak Facts:

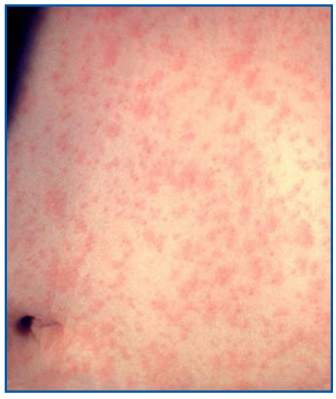
- Majority of cases were in unvaccinated people
- 124 people were hospitalized
- 61 people reported complications like pneumonia and encephalitis
- Ohio reported one case of measles in an adult that was unvaccinated and traveled to a state with confirmed measles cases
- If you are unvaccinated, you have a 90% risk of being infected just being in the room with a measles patient
- Measles can live up to two hours in the air where an infected person coughed or sneezed
- You can contract the measles via airborne or contact with contaminated surfaces
- People are infectious four days before to four days after the rash appears
- One out of 20 children with the measles will get pneumonia (most common cause of measles related death)
- One out of 1,000 children with measles will develop encephalitis
- One to 3 out of 1,000 children infected with measles will die from respiratory or neurologic complications

The Threat Continues

In December, the CDC received reports of measles infected persons traveling through at least five separate airports. These infected travelers included a person who traveled in Europe in late November and three infectious children visiting from New Zealand.

As a reminder, the symptoms of measles include:

- High fever
- Cough
- Runny nose
- Red, watery eyes
- A rash typically begins three to five days after the first sign of symptoms ■



Skin of a patient after three days of measles infection.

Preventing the Spread of Norovirus

By Karen Swecker, RN, CIC
Exposure Control Liaison, MedFlight

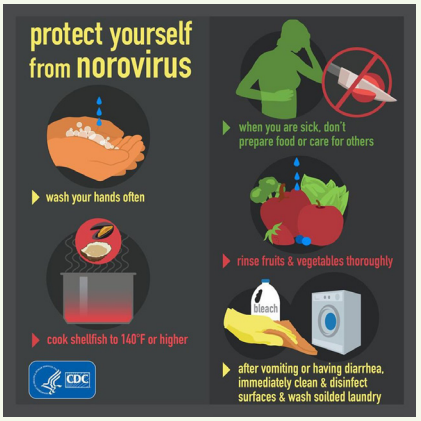
Norovirus is a highly contagious infection that can be transmitted via an infected person, contaminated food or water, and contaminated surfaces. Approximately 20 million people are infected with norovirus each year resulting in 70,000 hospitalizations and 800 deaths. Norovirus is the leading cause of foodborne illness in the United States.

A person infected with Norovirus can shed billions of viral particles; however, it only takes around 18 viral particles to cause an infection. An infected person can spread the disease beginning a few days before symptoms appear and continue to be infectious as the virus remains in the stool for two weeks or longer.

The symptoms of norovirus appear suddenly and include watery diarrhea, acute onset of nausea and vomiting, abdominal pain and may be accompanied with a fever, headache and body aches. Symptoms typically appear within 12 to 48 hours after exposure and last one to three days.

Because there isn't a vaccine for Norovirus, prevention relies on:

- Thorough hand washing with soap and water – recommended over alcohol hand gel
- Wash fruits and vegetables before preparing and eating
- Cook shellfish thoroughly – Norovirus can survive in temperatures up to 140o F
- Keep the sick away from food preparation areas
- If you are sick do not prepare food for others
- If you are sick do not provide patient care
- Clean surfaces with a bleach solution (1/3 cup bleach per gallon of water or 1TBSP +1/2 tsp of bleach per 32 ounces of water in a spray bottle) immediately after vomiting or having diarrhea. Surfaces should remain wet for 10 minutes. Wipe surfaces with clean water after bleach disinfection.



- Close the toilet lid before flushing – flushing can aerosolize viral particles
- Handle dirty laundry carefully wearing gloves. Disinfect hands and reusable gloves after use

More information may be found at: www.cdc.gov/norovirus ■

Safety Communication
Contact Information

MedFlight

VP of Risk, Linda Hines
614-734-8024 or lhines@medflight.com

Safety Officer, Amanda Ball
614-395-8338 or aball@medflight.com

Infection Control Officer, Karen Swecker
614-734-8044 or kswecker@medflight.com

Find us on social: @MedFlightOhio

HealthNet Aeromedical Services

Mission. Ready.

Director of Safety, Jeff White
304-610-3666 or jeffrey.white@healthnetcct.com

Safety Officer, Justin Koper
330-469-0146 or justin.koper@healthnetcct.com

Infection Control Officer, Justin Browning
304-653-4025 or justin.browning@healthnetcct.com

www.healthnetaeromedical.com

*Safety*Matters

Do you have any ideas for *SafetyMatters*?
Let us know by emailing jeffrey.white@healthnetcct.com