***EMS/First Responder Application of the CDC Measles Recommendations***

**The CDC has recently published a new document called *Interim Infection Prevention and Control Recommendations Guidance for Measles in Healthcare Settings (7/19)*.** It is a comprehensive document aimed at a person who provides health care to individuals who may have measles. It basically provides the framework to plan and develop policies and procedures for, as well as apply definitions and evidence-based care, to both a suspected or known case of measles. It further provides for the protection of First Responders and others in health care during their transport and arrival at the hospital through to the care if an HCP is exposed/develops the measles. There are many links to different websites leading to even more info and framework regarding measles. In an attempt to make it more EMS/ First Responder specific, we concentrated on those items that apply to EMS/First Responders and expanded them so they can be utilized by First Responder agencies as they update or develop a comprehensive plan to manage the possibility, or reality, of measles in their local area.

**Important Definitions from the CDC (applicable in any situation/disease – not only measles):**

**Healthcare Personnel/Provider (HCP):** includes paid and unpaid individuals, working in healthcare settings, who have the potential for exposure to patients and/or infectious materials, such as body substances/fluids, contaminated equipment and medical supplies (durable, reusable and disposable), contaminated environmental surfaces, or contaminated air. These individuals include, but are not limited to, EMS personnel, nurses, physicians…. …students and trainees, and volunteers like explorers or riders. It also covers contractual staff not directly employed by the service/facility, and those not directly involved in patient care but could be exposed to infectious agents (germs/diseases capable of being transmitted) in a healthcare setting (i.e. quartermaster, security, engineering or facilities management, or anyone else having access to contaminated medical equipment, contaminated surfaces or contaminated medical waste not secured as directed in *OSHA Fed Register 1910*. Even SUV or truck mechanics, or vendors may access patient care areas that have not been rendered decontaminated by time and/or appropriate washing and disinfecting.

**Healthcare Settings:** any place where healthcare is provided, including but not limited to, vehicles where healthcare is delivered, acute and long-term care facilities, inpatient rehab and nursing homes, home healthcare, and outpatient facilities.

**Exposure to Measles for HCPs in Healthcare Settings:** includes any time spent, while not adequately protected such as with recommended PPE, in a shared air space with an infectious measles patient at the same time, or in a shared air space that was vacated by an infectious measles patient within the 2 hours prior to being in that air space. Many of these exposures will occur without the suspicion or knowledge of the patient being infected with measles, so it will require a retrospective look at personnel present, whether PPE protection

was truly adequate, and anyone else who was in the space in the 2 hours following an infectious patient being in that space. This includes subsequent patients, family members or others (e.g. first responders) that were even briefly in the shared space within the 2-hour period. An even higher risk exposure, and one that is fairly typical for EMS and other 1st Responders, is a susceptible HCP, without appropriate PPE, are providing close up care and the patient is not masked.

Previously published recommendations have included removing a transport unit and durable equipment from service for 2 hours, if ever possible, to avoid contamination of others to the space or to equipment not adequately disinfected. If terminal cleaning with devices is used, consult the manufacturer's product information, and a reliable infection control expert, to determine how this changes the time frame. The two hours is based on the air exchanges needed to remove the virus.
For more specific information about air exchanges that help estimate the time for 99.9% removal of airborne contaminants see:
**https://www.cdc.gov/infectioncontrol/guidelines/environmental/appendix/air.html#tableb1**

1. Stakeholders including the Designated Infection Control Officer, Medical Director(s), and operational and/or health/wellness decision makers, should review the document URL referenced above, which specifically names EMS personnel as covered by it, and explore the various supporting websites throughout that document. Note that many of these URLs are also appropriate for other infectious diseases which EMS and other First Responders may encounter. The information that follows takes that document, which is intended for many different types of health care providers and facilities, and makes it more First Responder-friendly. Most of the time, it will be appropriate for EMTs and Paramedics who are in contact with patients. However, other First Responders may also come into contact with those suspected or known to have measles, so this information can be applied to them as well. Local Health Departments, the receiving hospital's Infection Prevention and/or Occupational Health staff, and your Agency's Medical Direction Team will provide expertise in applying the CDC Recommendations to the pre-hospital or patient transfer environment.

The following info is designed to assist with EMS and other First Responder applications, but may contain information not complete or applicable to a particular agency or situation. All stakeholders should read the entire CDC document to ensure appropriate compliance. ***Interim Infection Prevention and Control Recommendations for Measles in Healthcare Settings (7/19)*:** **https://www.cdc.gov/infectioncontrol/guidelines/measles/index.html**

This link provides multi-media resources (print, online, *PowerPoint*, et al) for use by those wanting information about measles to display/post, provide instruction, etc.
**https://www.cdc.gov/measles/resources/multimedia.html**

2. A policy and procedure should be developed or updated to help insure those that may come into contact the measles virus follow what the CDC considers "Fundamental Elements to Prevent Measles Transmission," which apply to First Responders – particularly EMS. These include the following concepts as outlined by the CDC, and will be expanded upon below:

- Ensuring that all health care providers (HCPs) have presumptive immunity against measles (Rubeola).
- Quickly recognizing and isolating patients with signs/symptoms of suspected measles or those with known disease (previously diagnosed).
- Strictly following both Standard and Airborne Precautions when evaluating, treating and/or transporting suspected or known measles patients.
- Making all responders aware of proper respiratory hygiene and cough etiquette for use at all times, and ensuring that they have the knowledge (training, practice, signage, etc.) and equipment necessary to make it part of their practice.
- Providing rapid, appropriate surveillance and management of anyone who might have been exposed, became symptomatic, or diagnosed with measles.

3. Prevention of measles in healthcare settings (of which EMS is one), requires a process with multiple components. Per CDC guidance, these include:

A. **Making sure that HCP (including First Responders, EMTs, and Paramedics) have presumptive evidence of immunity to measles.** This evidence includes:
"1) written documentation of vaccination with 2 doses of measles virus-containing vaccine (1st dose @ ≥12 months; the 2nd no earlier than 28 days after the 1st dose); OR
2) laboratory evidence of immunity (measles immunoglobulin [IgG] in serum; equivocal results are considered negative); OR
3) laboratory confirmation of the disease; OR
4) birth before 1957.

B. Consider vaccinating HCP born before 1957 who do not have other evidence of immunity to measles.

C. **During a measles outbreak, 2 doses of measles virus-containing vaccine are recommended for all HCP, regardless of year of birth**.

D. Recommendations on immunization of HCP for measles are maintained by CDC & ACIP
**https://www.cdc.gov/mmwr/preview/mmwrhtml/rr6204a1.htm** "

4. EMS agency officials should pre-determine and write into their policy and procedure, specifics to provide for the best control of respiratory secretions of the patient within the transport vehicle as possible and appropriate. It should include items such as closing the door between the cab and the patient compartment to limit the shared-air space, whether to turn off the A/C or heating system, if an exhaust system should be used, and/or to open windows, etc., should be outlined. Some direction should also be given for other infection control measures such as to avoid opening internal compartments once that patient has been moved into the patient compartment and until, whenever possible, the patient compartment has been disinfected and the air space is considered clean again. Many of these decisions will be based on the type and options on a given transport unit and have to be decided locally. The goal is to limit the amount of exposure and risk of spread or recontamination of the air space or equipment. Responders should adhere to their agency's guidelines, and suggest other mitigations for consideration as well. If agency policies and procedures don't exist or cover a specific issue, consult with a supervisor for clarification.

5. Agency officials must also ensure that each individual who might be required to wear an N95 or better respirator is **medically cleared to use a respirator** AND is **fit tested, using the respirator that is going to worn by that individual**. This assures the individual HCP is medically capable of safety wearing a respirator and that it fits properly so it can provide adequate protection. In the event that it does not pass the prescribed testing, other sizes or types of respirators should be available to be fit tested, until one is found that passes and is wearable by the individual. Note: for firefighters that already have evaluation for medical clearance to wear a respirator, this will suffice to fulfil the medical portion, but the fit testing must still be done with each device (SCBA and N95 or better respirator). The proper methods for medical clearance and fit testing intervals are outlined in the OSHA Protection Standard 29 CFR 1910.134 found here:
**https://www.osha.gov/laws-regs/regulations/standardnumber/1910/1910.134**

6. At all times, but especially when there are measles (or any communicable disease) in an area around you, your employer should assure that everyone knows the ABCs of the disease, appropriate PPE with the guidelines for use, including a requirement to practice donning and doffing, with a trained person watching for, and correcting errors, that could risk contamination. Refresher training is also important so that each provider can maintain their knowledge and skills in order apply it in a clinical setting, without prior warning, should the need arise. Hand hygiene, utilizing both alcohol-based hand sanitizer and/or soap and water as indicated and available, must also be included in the training. PPE disposal as medical waste, patient compartment and equipment cleaning and disinfection policies & procedures, and using EPA-approved health care level disinfectants, should be available and used by all responders. Supervisors and the Designated Infection Control Officer should make sure that the training is conducted as needed to maintain readiness but also to spot check for compliance, reminding them that these procedures are to help keep them and their families safe, as well as protect their patients.
**https://www.cdc.gov/infectioncontrol/training/index.html**
**https://www.ems.gov/pdf/ASPR-EMS-Infectious-Disease-Playbook-June-2017.pdf**

7. An adequate amount of PPE for all agency personnel, and any trainees or visitors, should be carried on response vehicles and stored in a way that prevents deterioration of the equipment's' protective elements (e.g. a cone-type N95/100 respirator should not be "squished" so it fits in a bag or other storage place. This compression of the respirator will decrease the respirator's ability to catch and trap the organisms as designed. Manufacturer-provided flat or pre-folded respirators can be stored this way but should not be folded or otherwise adapted in other ways to maintain its integrity. Respirators should be donned, worn for patient care and, once removed, discarded as medical waste and not re-worn again. If necessary, a new respirator should be donned. Airborne precautions require an N95 or better respirator. A surgical or procedure mask should not be substituted for the proper level of PPE. Personnel should be instructed by agency leaders, what to do if N95 or better respirators are not available. Other PPE that should be available, even if not used often, should be eye protection (either as close-fitting goggles or as a face shield). A face shield/Tyvek mask combo does not replace the use of a respirator, but can be worn in addition to an N95 or greater respirator. Gowns and/or jumpsuits, Tyvek or other impenetrable sleeves, head coverings, and foot booties should/may also be available but smaller amounts of some of these items may be appropriate since their use is not as common.
**https://www.cdc.gov/infectioncontrol/guidelines/isolation/appendix/transmission-precautions.html**
**https://www.cdc.gov/infectioncontrol/guidelines/isolation/precautions.html**

8. Suspicion of measles should be based on reported history, travel, contact with foreigners, exposure to measles in the community, or on those having signs and symptoms fitting a measles diagnosis, which vary, depending on the stage of infection. Initial signs/symptoms include malaise/fatigue, progression to a high fever and the 3 Cs (conjunctivitis, cough, coryza (runny nose), followed by bluish-white spots anywhere in the mouth, a bright red nose and/or throat, and **then** development of a small, flat red rash that starts on the head and face and progresses down the torso and then onto the extremities. Since measles has been in 30 states throughout the US in 2019, with outbreaks (3 or more patients in a geographic region) occurring in different areas, everyone should be aware of the signs/symptoms of measles and be on the lookout for it, particularly if it is already in your community or a nearby one. Many exposures occur, before measles has been identified in an individual, in areas frequented by crowds of people like airports and other transportation hubs, cultural or sporting events, schools and places of worship, etc., so there can be rapid spread in a community before an outbreak is recognized. Individual measles cases occur as well, and are often a result of contact while traveling and then returning home with it.
**https://www.cdc.gov/measles/about/signs-symptoms.html**

9. Minimize potential measles exposure. Evaluate and quickly identify patients with suspected (or known) measles and isolate them as much as possible. Minimize personnel exposed to shared space with the patient (this includes the place where the patient is initially found as well as the patient care compartment), especially for those that **do not**

have presumptive evidence of immunity to measles, if individuals are available that **do**. Each health care person should know their immune status. Reducing risk includes rapidly providing for appropriate respiratory and standard precautions for all personnel who are present/attending the patient (covered in detail later) and placing a surgical or procedure mask (**not** an N95 or N100) on the patient, if tolerated and condition allows; monitor $O_2$ sat and $ETCO_2$, if available. If not tolerated, a non-rebreather $O_2$ mask may be substituted if not contraindicated and allowed by protocol. Another mask/respirator should not be placed over an oxygen mask and an $O_2$ mask should not be put on the patient without having an adequate amount of oxygen flowing, unless otherwise directed by medical control. A mask on the patient is preferred but not required, if it is not tolerated, and/or protocol does not provide for $O_2$ therapy.

Notify the receiving facility early of a possible measles patient and follow instructions regarding arrival and transfer of the patient. Note: all hospital EDs should be readily able to accept and take over care of a measles patients, but there may be a specific entrance and pathway to a room they may prefer to decrease the risk to others. Early notification allows them to efficiently receive the patient. Repeat that measles is suspected upon arrival at the hospital and at initial contact with the hospital staff and physician, including what PPE and precautions in place, in case the pre-arrival notification was not transferred to all. If transferring a patient with suspected or known measles from one facility to another, the patient should be ready with a mask in place, all paperwork complete, and ready for transport. An Interfacility Infection Control Transfer Form may be a good tool to use for some agencies: **https://www.cdc.gov/hai/pdfs/toolkits/Interfacility-ICTransfer-Form-508.pdf**

10. Measles is extremely infectious (contagious) for those who are not immune by previous disease or vaccination. Since this disease is transmitted by respiratory droplet, and the droplet can persist in the air and on surfaces for two hours, the CDC recommends that **standard** and **airborne precautions** be followed. This requires, at a minimum, a previously fit tested N95 or better respirator and gloves. Standard Precautions also provide for the use of gown or jumpsuits, eye protection and foot protection depending upon the likelihood of coming into contact with the patient's body fluid(s). Therefore, if the patient is coughing, sneezing, or otherwise discharging respiratory secretions, face protection for the eyes may also be utilized and a jumpsuit or gown might also be worn if cough generating procedures will be done or copious amounts of secretions are present.
**https://www.cdc.gov/infectioncontrol/guidelines/isolation/index.html**
The IAFF suggests that all of these be worn when the patient is suspected or has confirmed measles: **http://infdisease.iaff.org/Diseases/measles.aspx**

11. For a First Responder to protect himself and his family, he/she should confirm their vaccination status and, if unsure of it, consult your Designated Infection Control Officer, Medical Director, and/or personal health care provider (who knows what you do for a living) for guidance. If potentially exposed, either personally or professionally, notify the appropriate person per your policies & procedures. If you transported to a hospital, their Infection Prevention Practitioner and/or your local public health department may be very helpful with

follow-up on the patient, as well as what you should do. Share this with the appropriate person in your chain-of-command. This will protect you and your family, as well as coworkers and patients. Even those with evidence of immunity should watch for signs/symptoms of measles for 21 days after exposure and report immediately if they become ill, even if only with a couple of symptoms.

12. During a measles outbreak in your community, where you respond to or otherwise interact with patients, 2 doses of MMR are recommended for healthcare personnel, regardless of birth year, in those who lack other presumptive evidence of measles immunity. There is no recommendation to receive a third dose of MMR vaccine during measles outbreaks The CDC and ACIP also state that during an outbreak, it is not reasonable to do titer testing for measles. There is a recommendation to consult with the Local Health Dept for assistance in determining what's appropriate.
https://www.cdc.gov/vaccines/vpd/mmr/hcp/recommendations.html
https://www.cdc.gov/infectioncontrol/guidelines/measles/index.html

13. **Management of an exposed healthcare provider/first responder**:

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A. Those **with presumptive evidence of immunity** with an exposure to measles:
   1) **PEP** (post exposure prophylaxis) is **not** needed
   2) **restriction from work is not needed**
   3) **there must still be daily monitoring for signs/symptoms of measles for 21 days from the last exposure**. Early S/S include malaise/fatigue, progression to a high fever and the 3 Cs (conjunctivitis, cough, coryza (runny nose), followed by bluish-white spots anywhere in the mouth, a bright red nose and/or throat, and then development of a small, flat red rash that starts on the head and face and progresses down the torso and then onto the extremities. It is important to note that, because of previous vaccination, S/S may present differently – perhaps with a different time frame or less severity.

B. Those **without presumptive evidence of immunity** who have had an exposure to measles:
   1) **should receive PEP** per the CDC/ACIP Guidelines which includes the MMR vaccine administered within 72 hours **OR** IG (immunoglobulin) administered within 6 days, if available; never both.
   https://www.cdc.gov/measles/hcp/index.html#prophylaxis
   2) **should be excluded from work starting from the 5th day from the first exposure to the 21st day after the last exposure**, whether PEP was administered or not.
   3) **IF** an HCP received the first dose of MMR **before** the first exposure, they may work without restriction, and receive the second dose of MMR at least 28 days after the first.
   4) like all the others HCPs exposed, they must have daily monitoring for S/S of measles [see B. 3) above], for at least 21 days after the last exposure.

C. Consider the personal life of any first responder who was exposed, regardless of their current immunity. Have an infection control specialist (MD, RN) consult with the exposed to see if being at home during the monitoring period is safe or if someone is at greater risk if exposed to measles, such as the person is immunosuppressed for any reason, pregnant, or an unvaccinated/under-vaccinated infant.

14. **Management of an HCP infected with the measles**:

A. If known or suspected measles, do not allow to work (or be around other workers) for 4 days after the rash first appears. Consider the day the rash appears as Day #0.
B. For an immunosuppressed HCP who develops the measles, **do not allow work** for the entire period of illness (the same time schedule often **does not** apply in these patients).
C. Consider the personal life of any first responder who was exposed, regardless of their current immunity. Have an infection control specialist (MD, RN) consult with the exposed to see if being at home during the monitoring period is safe or if someone is at greater risk if exposed to measles, such as the person is immunosuppressed for any reason, pregnant, or an unvaccinated/under-vaccinated infant.
D. Work with Local Health Department authorities to ensure that they are aware of measles exposures, surveillance, or suspected or confirmed cases and to assist with contact tracing, as needed.