EMS Transportation for Measles Patients

Measles Information

- Reported to survive in the air for up to 2 hours
  - General recommendations are to remove the ambulance from service for 2 hours after transport
- Determination of the patient compartment air changes per hour (ACH) can assist the agency to establish a safe and validated time period for reintroduction of the vehicle into service in less than the 2-hour time period
- Utilizing the CDC recommendations and identifying the ACH for each ambulance, the agency can manage the time for ambulances being reintroduced into service in a more timely manner
  - The appendix for Air guidelines from the CDC Guidelines for Environmental Infection Control in Health-Care Facilities (2003) Appendix B. Air | Infection Control | CDC
  - Recommended to achieve **99.9% efficiency** for air contaminant removal

Measles Images

This slide shows examples of measles rashes on the human body.

They usually begin as flat red spots that appear on the face at the hairline and spread downward to the neck, trunk arms, and legs.



Photos of Measles | Measles (Rubeola) | CDC

Measles Recommendations

1. Get vaccinated or ensure that you have immunity
2. Recognize possible measles
3. Limit exposure
4. Wear PPE (N95 respirator and eye protection)
5. Use source control by placing a surgical mask or oxygen mask on the patient (depending on the need)
6. Ventilate ambulance using vehicle ventilation fan and outdoor air when possible
7. Notify receiving facility
8. After transport, take vehicle out of service for the appropriate amount of time using validated air changes per hour for that ambulance
9. Report exposures to your infection control officer and the receiving hospital

Measles Vaccine Series

- Two measles-containing vaccines are licensed in the U.S.
  - Measles-mumps-rubella (MMR) vaccine
  - Measles-mumps-rubella-varicella (MMRV) vaccine
- Both use live, weakened form of measles virus
- Both are highly effective at providing long-lasting protection
  - MMR vaccine is **93%** effective after 1 dose and **97%** effective after 2 doses
- Boosters are **not** needed for people who received 2 doses according to U.S. vaccination schedule
- If you are not sure of your immunization status, please reach out to your PCP

MMR Vaccine Routine Recommendations

- Children and adolescents
  - 2 doses: first dose at 12 – 15 months of age, second dose at 4 – 6 years of age
- Adults without evidence of immunity
  - Most adults need 1 dose
  - High-risk adults are advised to get 2 doses given at least 28 days apart
    - Healthcare providers
    - Post-high school students
    - International travelers
    - Close contacts of people with weakened immune systems

CDC Guidelines for Environmental Infection Control in Health-Care Facilities

Table B.1. Air changes/hour (ACH) and time required for airborne-contaminant removal by efficiency *

ACH § ¶	Time (mins.) required for removal 99% efficiency	Time (mins.) required for removal 99.9% efficiency
2	138	207
4	69	104
6+	46	69
8	35	52
10+	28	41
12+	23	35
15+	18	28
20	14	21
50	6	8

The number of air changes per hour and time and efficiency.

Ambulance Design

- A study performed by the National Institute for Occupational Safety and Health in 1995 documented that Type III ambulances with HEPA-equipped filters had 30-46 air changes per hour
- Non-HEPA–equipped ambulances were noted to have 26-32 air changes per hour
- The article noted that maximizing the vehicle ventilation fan and utilizing outside air improved the rates (over 50 in a HEPA-equipped ambulance)
- Even with this information, the agency needs to identify the type of ambulance and reach out to the manufacturer for information specific to their ambulance
  - If this information is unavailable, please consider using the 2- hour time period to remove the unit from service

Recommended Air Exchange Standards

- Ground vehicle ventilation standards and CDC guidance for EMS specify:
  - **HVAC** system should be set to **non-recirculation mode**
  - **Rear exhaust** fan should be **on**

- With combined HVAC and exhaust, the ambulance should achieve a complete air exchange every 2 minutes or less (30 air exchanges per hour)
  - Even with this information, it is important to verify the number of air exchanges for each of your ambulances

Journal of Emergency Medical Services: Unpacking CDC Guidelines on Masks, Vehicle Ventilation and Post-Exposure Protocols

Operational Practices

- **Before and during patient load**: Ensure HVAC is on non-recirculating mode and exhaust fan is running

- **During transport**: Maintain continuous ventilation; avoid recirculating air

- **After patient unloading**: Continue ventilation until the patient compartment is clear and air quality is confirmed safe

Summary

- Familiarize yourself with measles symptoms
- Ensure you are immune
- Identify the air exchanges per hour for each of your ambulances to ensure accurate safety measures for each vehicle
- Use non-recirculating HVAC
- Use rear exhaust fan

Resources

Staff, J. (2025, July 3). *Unpacking CDC Guidelines on Masks, Vehicle Ventilation and Post-Exposure Protocols*. JEMS: EMS, Emergency Medical Services - Training, Paramedic, EMT News. https://www.jems.com/patient-care/masks-vehicle-ventilation-and-post-exposure-protocols/

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Resources (Continued)

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