TIP NO. 98-125-0421

MITIGATING SARS-COV-2 VIRUS RISKS ASSOCIATED WITH VEHICLE USAGE

This information is intended to provide guidance on mitigating risks associated with transporting personnel or cargo potentially capable of transmitting the Severe Acute Respiratory Syndrome-Coronavirus 2 (SARS-CoV-2). This includes information on risk mitigation prior to and during transportation, as well as post-transportation cleaning and disinfection. Information is also provided on the COVID-19 impact on agricultural cleaning and sanitization requirements for transporting Department of Defense (DOD) vehicles and associated gear/cargo to and from the United States.

1. RISK MITIGATION PRIOR TO TRANSPORT

- Remove all non-essential, loose items from inside the vehicle. Floor mats that are not essential for safety should be removed to reduce the number of areas that can trap contaminants. Signage that is not sealed to surfaces on all four sides with non-porous sealant should be removed or properly affixed to enhance disinfection.
- All compartments, storage pockets, and small openings not necessary for safe operation of the vehicle yet are accessible by passengers, should be locked or sealed to prevent trapping of contaminants and aid in post-transport disinfection. Seat-back pouches may be sealed with non-porous tape (e.g., duct tape).
- Material or cloth seats may be covered with non-porous seat coverings to prevent contamination by bodily fluids (e.g., saliva or mucous) and to enable more rapid and effective disinfection.
- Provide and pre-position hand sanitizer and disinfectant wipes at the entry to vehicles.
- Provide and pre-position re-sealable personal waste disposal bags for passengers to individually dispose of used facial tissues and sanitary wipes to reduce spread of contaminated waste.

2. RISK MITIGATION DURING TRANSPORT

- Unless unavoidable, individuals with suspected or confirmed cases of COVID-19 should not travel in vehicles with uninfected individuals.
- Individuals who are experiencing symptoms of respiratory illness, have a fever, or appear ill should not be allowed to board non-medical transportation vehicles.
- Drivers should wear face cloth coverings at all times.
- Passengers should wear cloth face coverings. This excludes children younger than 2 years of age; anyone who has difficulty breathing; or anyone unconscious, incapacitated or unable to remove a mask without assistance. Maximize the distance between occupants (including the driver) to the extent possible while in the vehicle.
- The use of larger vehicles such as vans is recommended when feasible to allow greater social (physical) distance between vehicle occupants.
- Turn on the vent or air conditioning; however, avoid using the recirculated air option for the vehicle’s ventilation system during passenger transport. Use the vehicle’s vents to bring in fresh outside air and/or lower the vehicle's windows. The intent is to avoid creating a closed environment where air can recirculate in the cabin. Bringing in fresh air from outside the vehicle, through vents and/or windows, will prevent the same air from recirculating.

- Drivers should avoid providing pooled rides or adding new passengers to an existing pool of passengers. In addition, drivers should practice regular hand hygiene and avoid touching their mouth, nose, or eyes.

3. POST-TRANSPORTATION CLEANING AND DISINFECTION

If it is determined that a vehicle was used by, or used to transport, personnel suspected or known to be COVID-19 positive, or if the vehicle was used to transport gear/cargo suspected or known to be contaminated with SARS-CoV-2, the following cleaning and disinfecting procedures in Sections 4 through 10 should be followed.

The U.S. Army Public Health Center (APHC) Technical Information Paper (TIP) No. 98-105-0420 (*Cleaning And Disinfecting Buildings And Areas Previously Occupied By Coronavirus 2019 (COVID-19) Positive Personnel*) provides guidance on establishing cleaning teams, personal protective equipment (PPE) clothing, and training requirements.

If there has been a sick person or someone who tested positive for COVID-19 in your vehicle within the last 24 hours, the CDC states you should clean AND disinfect the space.

If more than 24 hours have passed, the CDC states cleaning is still required; however, disinfection may or may not be conducted depending on the conditions or everyday practices (surface type, ease of cleaning). You may want to either clean more frequently or choose to disinfect (in addition to cleaning) in shared spaces if certain conditions apply that can increase the risk of infection from touching surfaces including:

- High transmission of COVID-19 in your community;
- Low number of people wearing masks;
- Infrequent hand hygiene; or
- The space is occupied by certain populations, such as people at increased risk for severe illness from COVID-19.

If more than 3 days have passed since the COVID-19 positive person occupied the vehicle, no additional cleaning (beyond regular cleaning practices) is necessary. To address the contact hazards, and to conserve limited PPE and disinfectant stocks, the affected vehicle and cargo/gear could be allowed to sit unoccupied/undisturbed (aka “weathering”) for a minimum of 3 days to allow the virus to die in lieu of conducting cleaning and disinfection tasks. Cleaning/disinfection can take place according to the guidelines in this document without waiting if rapid turnaround is required.

4. DEFINITIONS: CLEANING, SANITIZING, AND DISINFECTION

- Cleaning is the process of removing “soil” from a surface. Harmful germs are deposited on surfaces through direct contact with individuals or indirectly from bodily fluids that are aerosolized by individuals during activities. Germs can be suspended in soil, which includes dirt, dust, residues, bodily fluids (e.g., sweat, sputum, blood), and other debris.
- Sanitizing is a deliberate process in which the amount of germs on a surface is only reduced to a level that is considered safe for public health.

- Disinfecting is the deliberate process of killing all the germs on a surface. The ability for a disinfectant to kill specific pathogenic microorganisms is dependent upon the type and strength of the active (disinfecting) ingredient and the contact time (dwell time) in which the disinfecting agent must remain wet on the treated surface.

Surface disinfectant products are subject to more rigorous U.S. Environmental Protection Agency (EPA) testing requirements and must clear a higher bar for effectiveness than surface sanitizing products. For this reason, sanitizers do not qualify for inclusion on EPA's List N: Disinfectants for Use Against SARS-CoV-2.

There are many products registered with EPA as both sanitizers and disinfectants because they have been tested using both standards. These products are eligible for inclusion on EPA's List N because of their disinfectant claims. When using these products, follow the directions for virucidal disinfection; pay close attention to the contact time, which is how long the surface must remain wet. This can often be several minutes.

5. CLEANING AND DISINFECTION PRODUCTS

Select cleaning and disinfection products that are appropriate for the types of surfaces and items that require cleaning/disinfection.

a. Cleaning Products.

- Use the cleaning agents (soap and water, and so forth) that are normally used in these areas and follow the directions on the labels.
- Clean soft surfaces, such as seats, with soap and water (or cleaners appropriate for use on these surfaces such as steam cleaning solutions); then disinfect with an EPA-registered household disinfectant that will not impact/alter fabrics or electronics.
- Follow the manufacturer's directions for cleaning and disinfecting electronics. In the absence of guidance, use alcohol-based wipes or sprays containing at least 70% alcohol.

b. Disinfectants.

- Refer to the EPA-registered disinfectants on List N: Disinfectants for Use Against SARS-CoV-2, available at: https://www.epa.gov/pesticide-registration/list-n-disinfectants-use-against-sars-cov-2-covid-19 or
- Refer to the list of pre-approved EPA-registered products for use against emerging enveloped viral pathogens, available at: https://www.americanchemistry.com/Novel-Coronavirus-Fighting-Products-List.pdf.
    - A product approved by the EPA will have an EPA registration number that is on List N. The product label will display the number as "EPA Reg. No." Disinfection products may be marketed and sold under different brand names but share the same EPA registration number. You can identify a distributor product by its three-part EPA Reg. No. The first two parts match the primary product numbers; the third set of numbers represents distributor identification information. If you see a product on List N with two sets of numbers and your product has those plus a third set, it is an EPA-registered product.
    - Available quaternary ammonia products are suitable for use on seats and carpets.

- Unexpired 5-6% household bleach will be effective against coronaviruses when properly diluted.
  - Prepare chlorine bleach disinfecting solution with a minimum concentration of 1,000 parts per million (ppm) free available chlorine; wet contact time required to achieve adequate disinfection is 1 minute.
    - Mix: 5 tablespoons (1/3rd cup) bleach (5-6%) per gallon of water, or
    - Mix: 4 teaspoons (5-6%) bleach per quart of water.
  - Note: mixing other chemicals with chlorine bleach may produce hazardous gases.
  - A bleach/water solution loses its strength and is weakened by heat and sunlight; therefore, mix a fresh bleach solution each day.
  - Also, use of bleach solution may require additional ventilation.
- Alcohol: If undiluted alcohol is used for disinfection, it must have at least 70% alcohol content.
- APHC TIP No. 37-107-0420 (*Use of Electrostatic Sprayers (Foggers) with EPA-Registered Disinfectants in Response to COVID-19*) provides information on the use of foggers for a variety of surfaces. Note: Do not re-purpose any equipment previously used for pesticide/herbicide applications when conducting cleaning and disinfecting.
- Consult with your local Public Health office before adding anything to the disinfectant solution.

c. Supplies.
Examples of cleaning and disinfection supplies include:

Table 1. Supplies

Suggested Supplies	
Disposable wipes/cloths or micro-fiber cloths	Measuring cups
Mop heads and handles	Mop buckets
Buckets	Garbage bags
Spray bottles	Paper towels
Long handled brushes	Trash cans
Selected cleaning products	Selected disinfectants (bleach, alcohol wipes, EPA-registered disinfectant)

6. CONDUCTING CLEANING

a. Initial Site Assessment.
Identifying high-touch surfaces and unique items in vehicle areas designated for cleaning/ disinfection (e.g., vehicle exterior, driver area/compartment, passenger compartment, trunk/cargo compartment) is a necessary prerequisite to refine/adjust cleaning procedures; these will often differ depending on the type of vehicle, location of the suspected or known COVID-19 positive occupant(s) while in transit, and so forth. Select cleaning and disinfection products appropriate for the specific surface areas (e.g., glass, vinyl/plastics, metal, fabrics, leather, electronics/controls, and so forth) identified during the site assessment.
APHC TIP No. 98-105-0421, Section 2, paragraph 5g, provides information for cleaning and disinfecting carpeting. The following table suggests surfaces that should be disinfected.

Note: Plastic or other fluid impermeable coverings may be used in passenger or other compartment areas to protect surfaces. While in place, clean and disinfect the exposed surfaces of these coverings when in use, and dispose of properly as solid waste. The areas underneath the coverings would not require cleaning and disinfection.

Examples of surfaces to be disinfected include:

Table 2. Surfaces to Disinfect

Exterior	Interior	
Door edges	Visors	Overhead console/glasses case
Hood	Handles	Center console handles
Fuel door and gas cap	Seat controls – buttons or manual under seat control	Steering wheel and all buttons and levers (turn signal/windshield wipers)
Trunk touch points	Touch screen controls	Gear shift or shifter
Keys and/or key fobs	Lights, door locks, and window controls	Door components including edge of window
Door handles	Media ports and radio/media controls	Glove box handle
	Seat belts	Side mirror controls
	Push start button	Heating, ventilation, and air-conditioning (HVAC) vents/controls
	Hood/trunk/gas cap releases	Seating including arm and head rests

- In addition to the above, in larger vehicles such as passenger vans and buses, disinfect passenger windows and passenger area HVAC vents.
- Transport of material (cargo, luggage) that may be contaminated on the surface (due to handling/loading/unloading by suspected COVID-19 infected personnel) such as in the cargo area of trucks may also require cleaning and disinfecting. Unless the surface of the material was grossly contaminated (visible spittle/phlegm), allowing the material to "weather" during transport would neutralize the virus in approximately 3 days, removing the possible contact hazard. Otherwise, cleaning and disinfecting the surface of the material can be performed using the procedures noted in this document if "weathering" time is not possible.
- Identify surfaces not to be disinfected (areas may vary depending on use) such as:
  - Areas underneath seats.
  - Inside seat back pockets (unless used during transport).
  - Interior trunk areas (unless used during transport).
  - Cargo areas (unless accessed by suspected COVID-19 infected personnel during travel, loading, or unloading).

b. Cleaning Procedures

Conduct a cleaning process prior to the disinfection process to remove dirt, debris, body fluids, and so forth from surfaces because solid matter will prevent the disinfectant from contacting the surface area and killing the virus.

- Don appropriate PPE for manual surface cleaning tasks.
- Remove all trash, debris, and so forth, and dispose as general solid waste. All exposed perishable items on the surface to be cleaned will be disposed as solid waste. Place in a trash bag, and seal with a knot or tie to limit contact.
- Clean soiled areas that would impact the effectiveness of disinfection using soap and water.
- Clean soiled surface areas, such as flooring/carpeting, with an approved cleaning product to remove dirt, food wastes, stains, body fluids, and so forth.
- Remove all paper products from the area where disinfectant will be sprayed.
- Use separate wiping cloths/devices for cleaning and disinfection tasks.
- Mop cargo areas with soap (detergent) and water to remove visible dirt and debris.

7. CONDUCT DISINFECTION

Conduct the disinfection process after the cleaning process to kill any remaining virus in the environment. Conduct the disinfection process manually or with disinfection devices or contract support discussed in **SECTION 3** of APHC TIP No. 98-105-0421. Leadership will make the determination based on time required, cost, and available resources.

Disinfection Procedures—complete all cleaning procedures first:

- Don appropriate PPE for disinfectant application (possibly increased respiratory protection).
- Apply the disinfectant to all surfaces in the area. Follow the manufacturer's operating guidance for the disinfectant and adequately wet the surfaces for required contact time.
- When the CDC guidance and this document recommends a greater bleach concentration than the manufacturer recommends, follow the CDC guidance.
- Starting at the center of the vehicle area to be disinfected (e.g., driver compartment), wipe down or spray all common touch surfaces working back towards the entry point for the vehicle.
    - Wipe high-touch surfaces with a disposable wipe/cloth and disinfectant.
    - Wipe all high-touch surfaces even if they were wiped during the cleaning process.
    - If more than one entry into the vehicle area, repeat Step 3 by entering from the opposite side. For cargo areas, start at the farthest area from the entry point.
- Repeat Step 3 for all applicable areas of the vehicle to be disinfected (i.e., driver compartment, passenger compartment, cargo compartment).
- Once the bleach/disinfectant solution is applied to surfaces, allow the solution to air dry, affording sufficient contact time (specified on product label—usually 1–10 minutes).
- If the product recommends wiping or does not provide any recommendation about wiping, wait until the recommended contact time elapses and then wipe all high-contact surfaces using clean water to remove any residual disinfectant. Use clean wipes for this process.
- If used, remove protective coverings and dispose in general trash.
- Once the process is complete, spray or wipe the bottom of your shoes with a suitable disinfectant and allow to air dry.
- After disinfecting, place disposable items in the general trash and doff PPE items into the trash.
- Wash your hands with soap and water for at least 20 seconds.

8. DISPOSAL OF PPE AND CLEANING SUPPLIES

- All PPE and cleaning-derived trash will be disposed of as solid waste, except for any empty aerosol cans. These will be turned into garrison as hazardous waste and/or for recycling.
- Disposable wipes, mop heads, and cloths/paper towels are solid waste.
- Place solid waste items in a trash bag, and seal with a knot or tie to limitcontact.
- Pour dirty mop water and wash water down a drain (preferably a floor drain) to the sanitary sewer. Pour an equivalent amount of water down the drain after themop/wash water.
- Spray or wipe down any reusable supplies such as mop handles, brush handles, and so forth, with disinfectant.

9. FREQUENCY

Vehicles operated or occupied by personnel suspected or known to have contracted COVID-19 should be cleaned and disinfected before the next use, unless as previously noted a minimum of 3 days “weathering” period has passed to allow the virus to die in lieu of conducting cleaning and disinfection tasks.

Vehicles, such as ambulances, used to transport known or suspected COVID-19 patients should be cleaned and disinfected between every patient transport.

10. AGRICULTURAL CLEANING AND SANITIZATION REQUIREMENTS FOR ANTEGRADE AND RETROGRADE DOD MATERIAL

The Armed Forces Pest Management Technical Guide 31 and Defense Transportation Regulation (DTR) 4500.9-R, Part V, require agricultural cleaning while preparing military vehicles, rolling stock, and unit and personal gear for transit to and from the United States.

Armed Forces Pest Management Technical Guide 31 lists Virkon S and bleach solutions as acceptable products for disinfecting DOD materiel against resistant pathogens. Virkon S is included on the EPA-List N: Disinfectants for Use Against SARS-CoV-2. Bleach solutions are also approved for SARS-CoV-2 disinfection (see paragraph 5b). Additionally, as previously noted, the SARS-CoV-2 virus is unlikely to survive on the inanimate surfaces of DOD material for the duration of time it takes for international transit. Consequently, if products approved for use against the SARS-CoV-2 virus are used during agricultural cleaning, no additional sanitizing requirements are required for antegrading and retrograding DOD material.

For detailed requirements, reference the following regulations/guidelines:

- Armed Forces Pest Management Technical Guide No. 31, describes procedures, outlines responsibilities and defines requirements for preparing military vehicles, rolling stock, and unit and personal gear to comply with agricultural and public health pest exclusion requirements for redeploying ships, aircraft, equipment, and personnel from locations outside the United States.
- DTR 4500.9-R, Part V (DOD Customs and Border Clearance Policies and Procedures) issued under authority of the Department of Defense Directive (DoDD) 4500.09E

(Transportation and Traffic Management) assigns U.S. Transportation Command as the DOD Executive Agent for the DOD Customs and Border Clearance Program. Foreign agricultural restrictions are specified by country in this regulation; however, the same general responsibilities of DOD activities for the prevention of agricultural pest movements apply to export shipments from the United States to foreign countries as well as imports to the United States.

- Allied Medical Publication [AMedP]-4.11 (Measures to Reduce Risk of Transfer of Biological Hazards During Troop and Materiel Movement, dated MAR 2019) provides the North Atlantic Treaty Organization guidelines for cleaning and disinfectants as well as prevention and control measures.

11. REFERENCES

APHC. Technical Information Paper No. 37-107-0420, *Use of Electrostatic Sprayers (Foggers) with EPA-Registered Disinfectants in Response to COVID-19.* https://phc.amedd.army.mil/PHC%20Resource%20Library/cv19-electrostatic-sprayers.pdf

APHC. Technical Information Paper No. 98-105-0421, *Cleaning and Disinfecting Buildings and Areas Previously Occupied by Coronavirus (COVID-19) Positive Personnel.* https://phc.amedd.army.mil/PHC%20Resource%20Library/cv19-cleaning-disinfecting- areas-occupied-by-covid19-personnel.pdf

CDC. Coronavirus Disease 2019 (COVID-19), Cleaning and Disinfection for Non-emergency Transport Vehicles, Page last reviewed April 14, 2020: https://www.cdc.gov/coronavirus/2019-ncov/community/organizations/disinfecting-transport-vehicles.html

CDC. COVID-19, Cleaning and Disinfecting Your Facility, Page last reviewed July 28, 2020: https://www.cdc.gov/coronavirus/2019-ncov/prepare/disinfecting-building-facility.html

CDC. COVID-19, Cleaning and Disinfecting Your Home, Page last reviewed May 27, 2020: https://www.cdc.gov/coronavirus/2019-ncov/prevent-getting-sick/disinfecting-your-home.html

CDC. COVID-19, Reopening Guidance for Cleaning and Disinfecting Public Spaces, Workplaces, Businesses, Schools, and Homes, Page last reviewed August 20, 2020: https://www.cdc.gov/coronavirus/2019-ncov/community/reopen-guidance.html

CDC. COVID-19, Cleaning and Disinfecting Your Facility, When to Clean and Disinfect, Page last reviewed April 5, 2021. https://www.cdc.gov/coronavirus/2019-ncov/community/disinfecting-building-facility.html?CDC_AA_refVal=https%3A%2F%2Fwww.cdc.gov%2Fcoronavirus%2F2019-ncov%2Fcommunity%2Forganizations%2Fcleaning-disinfection.html#certain-conditions

CDC. COVID-19, Science Brief: SARS-CoV-2 and Surface (Fomite) Transmission for Indoor Community Environments, Page last viewed April 5, 2021. https://www.cdc.gov/coronavirus/2019-ncov/more/science-and-research/surface-transmission.html

CDC. 2019. National Center for Emerging and Zoonotic Infectious Diseases, Division of Healthcare Quality Promotion. *Best Practices for Environmental Cleaning in Healthcare Facilities in Resource-Limited Settings, Version 1.*

Department of the Army. 2019. TB MED 531, *Facility Sanitation Controls and Inspections*. https://armypubs.army.mil/ProductMaps/PubForm/TB_Cal.aspx.

EPA, Office of Pesticide Programs. 2020. *List N: Disinfectants for Use against SARS-CoV-2,* https://www.epa.gov/pesticide-registration/list-n-disinfectants-use-against-sars-cov-2

EPA. What's the Difference Between Products that Disinfect, Sanitize and Clean Surfaces? https://www.epa.gov/coronavirus/whats-difference-between-products-disinfect-sanitize-and-clean-surfaces

NIH News Release, March 17, 2020, *New coronavirus stable for hours on surfaces*. https://www.nih.gov/news-events/news-releases/new-coronavirus-stable-hours-surfaces

Occupational Safety and Health Administration. COVID-19, Control and Prevention. March 25, 2020. https://www.osha.gov/SLTC/covid-19/controlprevention.html