Non-vaccine Recommendations to Prevent Acute Infectious Respiratory Disease among U.S. Army Personnel Living in Close Quarters

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Cover photograph:
U.S. Army Soldiers of the 173rd Airborne Brigade practice building-clearing procedures during Omega training at the Joint Multinational Readiness Center in Hohenfels, Germany, October 14, 2006. The training event (conducted by the Omega Training Group, a company that provides analysis, training development, interactive multimedia instruction, and integrated logistics support for Soldier-oriented programs in support of the Department of Defense) brought together senior leaders from the 173rd Airborne Brigade Combat Team for the 4-day exercise on basic combat skills. (U.S. Army photo by Gary L. Kieffer) (Released)

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NON-VACCINE RECOMMENDATIONS TO PREVENT ACUTE INFECTIOUS RESPIRATORY DISEASE AMONG U.S. ARMY PERSONNEL LIVING IN CLOSE QUATERS

1. INTRODUCTION.

a. Purpose and Scope. The purpose of this technical guide is to consolidate the various recommendations of non-vaccine interventions that aide in the prevention of acute infectious respiratory disease among U.S. Army personnel living in close quarters. Preventive medicine personnel should consult this guidance document as a primary source for their recommendations to prevent acute infectious respiratory disease. The recommendations in this guidance document may be relevant to other populations, particularly those with people living in close contact, as found in educational settings, training camps, on ships, and in correctional facilities. Some recommendations made in this guidance document may also serve to help prevent non-respiratory communicable diseases among personnel living in close quarters.

b. General. Acute infectious respiratory diseases are a significant preventive medicine problem for U.S. Army populations living in close quarters. Crowded conditions are often found at training centers, dormitories, correctional facilities, tent cities, and deployment-staging areas. Other potential transmission environments include reception battalions, classrooms, dining facilities, and areas where items, such as, resuscitation mannequins, and water fountains are shared. Close contact, coupled with the unique stressors of military operations often puts military personnel at a greater risk for respiratory disease than their civilian peers.

- Epidemiological studies have shown that new recruits have a much higher susceptibility to respiratory infections than “seasoned” Soldiers do. New recruits arrive from all regions of the country and from a variety of different environments. The recruits are then formed into close-quartered military units. They may arrive as hosts or with mild cases of respiratory infections endemic to their own particular region of the country; they are housed in close contact with individuals from other parts of the country who may be susceptible. New recruits may also be exposed to respiratory infections that are endemic to the recruit training center. This may be an explanation as to why recruits have a higher prevalence of respiratory infections than seasoned military members do.

- Although vaccines are available for some pathogens, their effectiveness can be limited. The influenza vaccine, for example, must target the specific strains of the virus circulating among the population each year to provide protection. Even in years with good concordance between the vaccine and circulating strains, approximately 226,000 influenza-associated hospitalizations and 36,000 influenza deaths occur annually in the United States.

- Adenovirus vaccine was very effective at reducing cases of adenovirus-associated respiratory disease among basic combat trainees until production ceased in 1996, and the vaccine supply was depleted in 1999. Since then, prevaccine era morbidity has returned, and the acquisition of a safe and effective adenovirus vaccine has become a top priority for the Military Health System.

- Non-vaccine interventions have been considered since the early days of the U.S Army; a 1777 regulation limited the number of Soldiers permitted inside a tent to six Soldiers due to a military physician's belief that crowding caused disease.

- This guidance document focuses on the prevention of communicable respiratory diseases using non-vaccine interventions that do not significantly interfere with standard operating procedures for training programs.

- Non-vaccine interventions include, but are not limited to engineering controls; personal and environmental hygiene and sanitation; cough etiquette; antimicrobials; barracks layout; and the use of respiratory masks.

c. Medical Surveillance. How are diseases and injuries tracked and recorded in the U.S. Army? The Army Medical Surveillance Activity (AMSA) performs comprehensive medical surveillance and routinely publishes background rates of diseases and injuries for the Army population (see http://amsa.army.mil/AMSA/amsa_home.htm). The AMSA operates the Defense Medical Surveillance System (DMSS), an executive information system with a database containing and historical data on diseases and medical events (such as, hospitalizations, ambulatory visits, reportable diseases, HIV tests, acute respiratory diseases, and health-risk appraisals) and longitudinal data on personnel and deployments. The AMSA routinely publishes summaries of notifiable diseases, trends of illnesses of special surveillance interest, and field reports describing outbreaks and case occurrences in the *Medical Surveillance Monthly Report (MSMR)*, the principal vehicle for disseminating medical surveillance information of broad interest (see http://amsa.army.mil/AMSA/AMSA_MSMROverview.htm).

2. PERSONAL MEASURES. These interventions are implemented at the individual level with guidance and enforcement from military leadership and supporting preventive medicine personnel.

a. Hand Hygiene.

(1) Discussion. Epidemiologic evidence is limited to support hand washing as a means of preventing general respiratory disease in community settings. However, there is considerable evidence to support hand hygiene as an effective intervention to prevent other communicable diseases. Hand antisepsis refers to the application and/or use of hand rubs, gels, foams, or premoistened towelettes that use various chemicals as active ingredients to destroy pathogens.

The Centers for Disease Control and Prevention (CDC) recommends the use of alcohol-based hand rubs in a healthcare setting, which are effective against a variety of bacteria and viruses either as a supplement to traditional hand washing or as a primary means of hand hygiene if hands are not visibly soiled. Authors of these recommendations point out studies that show plain soap failing to remove organisms and the possibility of contamination of soap and soap dishes.

(2) Recommendations.

(a) At a minimum, allow individuals time to wash their hands for at least 20 seconds with soap and water before meals and after using the latrine. Instructors should require, not merely encourage, hand washing at every opportunity as part of recruit/trainee training and discipline. Recruits and training staff should be periodically provided education on the importance of hand hygiene.

(b) Ensure latrines are supplied with soap and paper towels. Liquid soap will eliminate contamination problems associated with bar soap. When hands are not visibly soiled or hand-washing facilities are not available, alcohol-based hand wipes or gel sanitizers may be used. If using gel, rub hands together until dry. The gel does not need water to work; the alcohol in it kills the germs.

(c) Wash hands with soap and water before using hand sanitizers if they are visibly soiled.

b. Cough/Sneeze Etiquette.

(1) Discussion. Illnesses like colds and flu are primarily spread from person to person in respiratory droplets of coughs and sneezes. This is called “droplet spread.” Droplet spread can happen when droplets from a cough or sneeze of an infected person move through the air and are deposited on the mouth or nose of people nearby. Some germs can also spread when a person touches respiratory droplets from another person on a surface, such as a desk, and then touches his/her own eyes, mouth, or nose before washing his/her hands. Some viruses and bacteria can live 2 hours or longer on surfaces such as tables, doorknobs, and desks.

(2) Recommendations.

(a) Cover your mouth and nose with a tissue when you cough, sneeze, or cough and/or sneeze into your upper sleeve, not into your hands.

(b) Put used tissues in the wastebasket.

(c) Clean your hands after coughing or sneezing.

(d) Wash hands with soap and water for at least 20 seconds and/or use an alcohol-based hand cleaner. (See Appendix B for more information)

c. Masks.

(1) Discussion. Respiratory diseases are transmitted from person to person primarily via large virus-laden droplets generated when infected persons cough or sneeze. These droplets can travel through the air into the respiratory tract or be transmitted by direct contact. The use of surgical masks by infectious patients may help contain respiratory secretions and limit exposure to others by acting as a barrier to these droplets. However, adults can shed the flu virus one day before symptoms appear and up to 5 days after onset of illness; thus, the use of masks may not effectively limit transmission. A better method to prevent droplet transmission is to practice the cough etiquette and hand-washing recommendations outlined in this guidance document.

(2) Recommendations.

(a) Infectious patients should wear surgical masks as directed by medical personnel to help contain respiratory secretions and limit exposure to others. This should be clearly specified on the sick-call slip.

(b) There is inadequate evidence to recommend widespread mask usage by individuals that are not sick as a protective measure. However, if in close contact with individuals who are coughing and/or sneezing, such as an infirmary, wearing a mask may be considered.

3. ADMINISTRATIVE CONTROLS. These interventions involve policy implementation that may be easier to enact and sustain than controls at the individual level.

a. Leadership Emphasis.

(1) Discussion. Leaders at all levels must be impressed with and made clearly aware that their involvement is essential to successfully preventing respiratory disease. Every leader must know and enforce the recommendations in this guidance document to prevent disease. The recommendations can be implemented while still allowing for the high levels of activity and stress expected in an environment like recruit training. Use the form at Appendix C for a self-assessment.

(2) Recommendations.

(a) Leaders at all levels should support and emphasize the recommendations prescribed in this guidance document to prevent communicable disease.

(b) Graphic aids promoting healthy behaviors are available from the USACHPPM, Health Information Operations Program (see http://chppm-www.apgea.army.mil/hio_public/orders.aspx).

b. Isolation of Infectious Cases.

(1) Discussion. Sometimes called cohorting, separating infectious cases from the general population strives to reduce the number of susceptible individuals with whom an infectious person may come in contact. If contact between infectious and non-infectious individuals can be avoided, sustained transmission of a disease organism should stop. Cohorting requires sufficient facilities and logistical support to effectively isolate infectious cases from the general population for a significant amount of time. Some installations have designated barracks where infectious individuals live and eat until they are healthy enough to return to the general population.

(2) Recommendations.

(a) When directed by medical personnel, infectious persons should be separated from the general population for the period specified on the individual's sick-call slip to include meal times.

(b) If a facility has not already been designated for this purpose, it is highly recommended that one be established, especially at recruit training installations where large groups of Soldiers often live together in open bays. In this environment, one infectious person can easily infect a large percentage of other individuals.

(c) Exercise caution when establishing a structure to temporarily house infectious individuals and involve the installation medical authority at all levels of planning. A "Respiratory Disease Barracks" is a type of housing; whereas, an "Infirmary" is considered a clinical setting and is subject to the standards set forth by the Joint Commission for the Accreditation of Hospital Organizations.

c. Per-Person Space Requirements.

(1) Discussion. Research on crowded living conditions and respiratory disease has been noted as a gap in both civilian and military medical knowledge. However, crowding is a fundamentally accepted risk factor in the transmission of infectious disease, and administrative control measures have often focused on increasing space between individuals through an increased area around beds, "head-to-toe" sleeping, fabric or other barriers between beds, and grouping. The Army Medical Department has historically recommended adequate living space to decrease the spread of infectious diseases even though the definition of "adequate" is debatable. Recommendations for space and ventilation requirements dating back to 1777 are not based on controlled studies or well-designed observational studies but rather on theory, expert or personal opinions, or limited observation. Some limited data support a positive association between crowding in sleeping areas and respiratory infections.

(2) Recommendations.

(a) The current space allocation guidelines set forth in Department of the Army Pamphlet (DA Pam) 40-11,specify 72 square feet (sq. ft.) of floor space ***per person*** to minimize disease agent transmission. For example, in an open bay, that is 90 feet (ft.) long and 45 ft. wide, there is a total of 4,050 sq. ft. and should, therefore, have a maximum of 56 personnel (4050/72 = 56.25) in the bay.

(b) Care must still be taken to ensure that each person receives 72 sq. ft. of floor space (see Figure 1, pg. 7). A two-man bunk requires 144 sq. ft. of floor space if both beds are occupied (72 sq. ft. per person x 2). All available billeting, including temporary facilities and tents when necessary, should be used to ensure this minimum space allowance. Commanders should schedule use of common areas, such as, dining facilities, classrooms, theaters, and latrines to avoid overcrowding. Bunk arrangements are depicted on page 7 of this guidance document—

- Arrangement 1 is (often) used at recruit training installations. This arrangement does not maximize available floor space.

- Arrangement 2 maximizes available floor space and the distance between bunk/cots while still maintaining egress routes and allowing for adequate command and control.

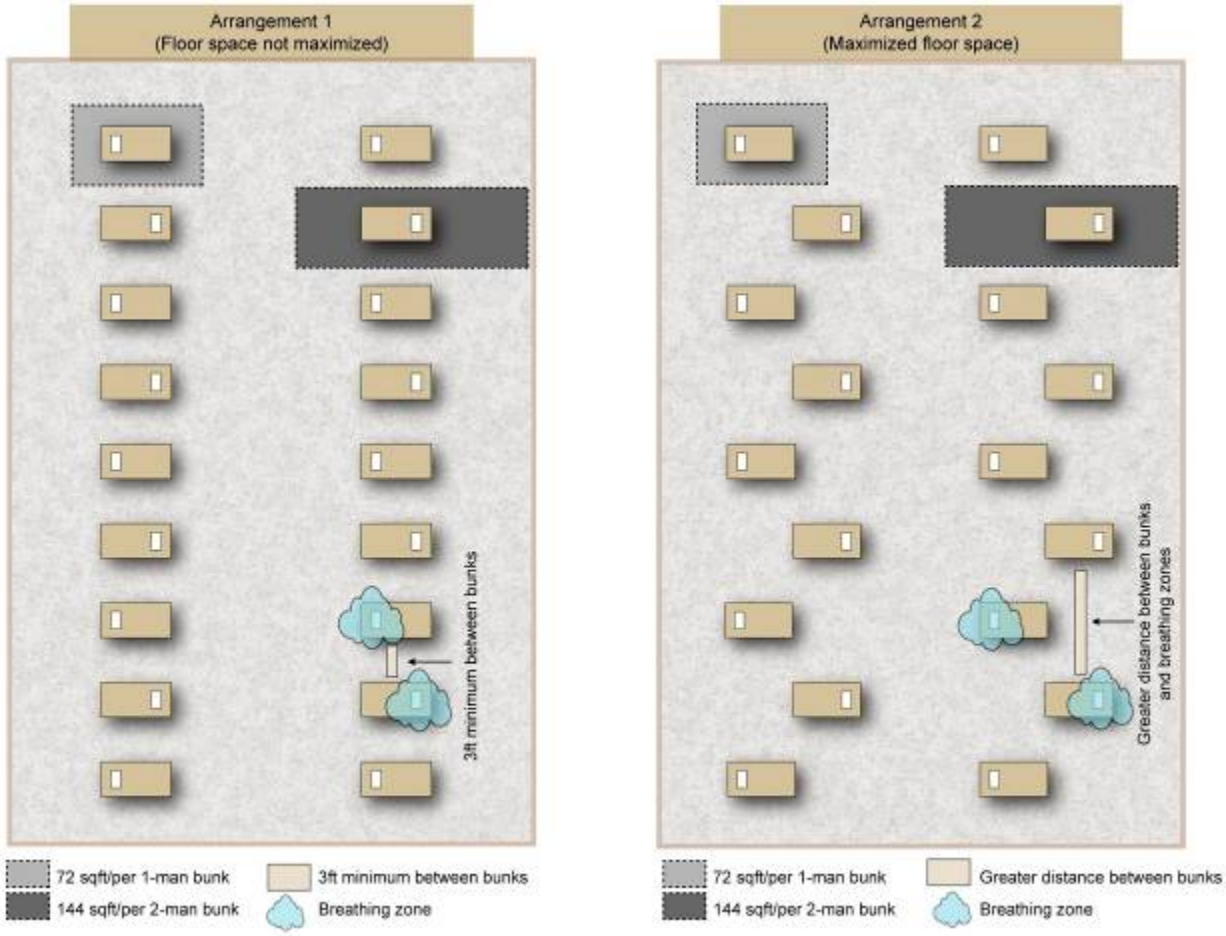

Figure 1. Comparison of Bunking Layouts

d. Bunk Spacing/Arrangement and Head-to-Toe Sleeping.

(1) Discussion. Respiratory diseases are transmitted from person to person primarily via large virus-laden droplets generated when infected persons cough or sneeze. Droplet spread can happen when droplets from the cough or sneeze are propelled a short distance through the air. The hospital guidelines of the CDC for bed spacing recommend at least 3 ft. between infectious and susceptible patients when private isolation rooms are not available. Sleeping head-to-toe, which involves alternating bed arrangements so that troops sleep in a formation of bunks alternating head and foot positions, increases the distance between breathing zones (see Figure 1, Arrangement 2 above). This practice makes sense and does not involve any additional cost or resources. However, there are no studies to date that support its effectiveness (see Appendix D for more information).

(2) Recommendations. Provide no less than 72 sq. ft. per person with at least 3 ft. between bunks, while maximizing use of all available space in the bay or tent as shown in Arrangement 2 (see Figure 1). Three feet is the recommended minimum distance between bunks, but this does not mean that they cannot be greater than 3 ft. apart. A staggered bunk arrangement provides a greater distance between bunks and breathing zones without reducing the total number of bunks in a given area. Do not cluster bunks (or personnel in bunks) in one area while leaving large open spaces in other areas. Use a head-to-toe sleeping arrangement. Extra bunks that would extend the bay occupancy beyond what is recommended (72 sq. ft. per person) should be removed to allow for maximum spacing between the remaining bunks. (See Appendix D for more information)

e. Barracks Hygiene.

(1) Discussion. Improved standards for barracks hygiene can help reduce the spread of infectious diseases. Developing an effective hygiene plan must start with the acceptance that pathogenic and potentially pathogenic bacterium, viruses, fungi, people, food, insects, and potentially the air continually and inevitably introduce protozoa into the indoor environment. An effective hygiene procedure must be applied to reduce micro-organisms to a level, which is not harmful to health. It is not intended to achieve sterility, and some microbial exposure is expected. To achieve a hygienically clean (as opposed to visibly clean) surface, the organisms must be removed or killed by a disinfection process. Methods of achieving decontamination of sites and surfaces include detergent-based cleaning followed by rinsing, and the use of disinfecting agents. (See Appendix D for more information.)

(2) Recommendations.

(a) Disinfectant Solution. A solution of household bleach and water is recommended. It is effective, economical, convenient, and readily available. The solution is easy to mix, safe if handled properly, and kills most infectious agents. Use ¼-cup bleach in 1 gallon of cool water, or 1-tablespoon bleach in 1 quart of cool water. A solution of bleach and water loses its strength over time and is weakened by heat and sunlight. Mix a fresh bleach solution each day that it is needed. The solution can either be applied via a bucket and cloth/sponge or a spray bottle and cloth/sponge. Disposable cloths, such as paper towels, are recommended. Chlorine evaporates into the air leaving no residue, so surfaces sanitized with bleach may be left to air dry. Allow mop heads to dry before reuse by hanging the mop by the handle with mop heads down.

- Conspicuously post mixing instructions for bleach and water. Do not mix bleach with other cleaning chemicals. Mixing chemicals with bleach may produce hazardous gases. Before using anything other than bleach for disinfection, consult with your local preventive medicine office.

- Always read the label and follow the manufacturer's instructions exactly. An example poster of mixing instructions is provided in Appendix E.

(b) Recommended Cleaning Cycle.

- **Daily—**disinfect bathroom floors, sinks, showers, toilets, doorknobs, handles, light switches, and other high-touch surfaces; clean other visible dirt on floors and surfaces as necessary

- **Weekly—**launder all soiled laundry and linens; mop floors and clean all horizontal surfaces with soap and water

- **Every Three Weeks—**turn in blankets, pillows, and mattress covers for laundering

- **End of Training Cycle—**turn in blankets; wipe down mattresses with disinfectant solution; launder mattress pads (if applicable); clean all walls, blinds, windows, and areas not routinely cleaned with soap and water

(c) Toilets, Urinals, Showers, and Sinks. Clean toilets daily using a toilet brush and disinfectant; this will prevent the build-up of scale, which can harbor pathogens. Sinks, showers, and urinals should be disinfected daily with a bleach and water solution to prevent build up of microbial films.

(d) Floors, Walls, and Other Environmental Surfaces. Exposure to pathogens as a result of microbial contamination on floors and furnishings is very low. The transfer of micro-organisms from environmental surfaces to individuals is largely via hand contact with the surface. High-touch surfaces (such as, doorknobs, handles, light switches, and wall areas around toilets) should be cleaned and disinfected daily. Horizontal surfaces, such as windowsills and floors, should be cleaned weekly with detergent and water and kept visibly clean as necessary. Extraordinary cleaning and disinfection of floors is not recommended. Cleaning of walls, blinds, and window curtains is recommended between training cycles or more frequently if they are visibly soiled.

(e) Laundry, Mattresses, and Pillows. Launder soiled clothing and linens weekly at 160 °Fahrenheit (F), or at 104 °F to 140 °F using an activated bleach powder. Turn in sheets and pillowcases weekly for laundering whether they appear soiled or not. Blankets, pillows, and mattress covers should be turned in every 3 weeks or when personnel change. Plastic-covered mattresses are preferred for ease of disinfection. If fabric mattresses are used, keep them dry; discard mattresses if they become and remain wet or stained, or if they become unserviceable. Between training cycles or when personnel change, clean and disinfect plastic mattress covers using U.S. Environmental Protection Agency-registered disinfectants (see http://www.epa.gov/oppad001/chemregindex.htm) that are compatible with the cover material, and exchange blankets. Replace mattress and pillow covers if they become torn or unserviceable.

(f) Education. Individuals cannot be expected to perform the multidisciplinary preventive measures recommended in this technical guide without being informed. Local preventive medicine assets should be proactive in assessing the current respiratory or communicable disease situation and using this information to identify and implement appropriate training. A training presentation is available from USACHPPM titled "Non-vaccine Recommendations to Prevent Respiratory Disease among Personnel Living in Close Quarters" (see http://usachppm.apgea.army.mil/hiomtb/). The presentation follows the format and recommendations set forth in this guidance document.

4. ENGINEERING CONTROLS. These interventions are generally considered more reliable than other intervention categories since they do not require individual compliance or the enforcement of administrative policies. However, implementation of engineering controls can be extremely resource-intensive and often is most effective when incorporated into new construction of barracks and other facilities for trainees. Preventive medicine personnel should be included as early as possible in the pre-planning, design, and layout or construction of facilities that will house personnel to provide input on the health impacts of such facilities.

a. Ventilation Standards.

(1) Discussion. The health effects of indoor environments are very complex and not fully understood. There are limited studies to support dilution ventilation as a non-vaccine intervention for the prevention of respiratory disease. However, the American Society of Heating, Refrigerating, and Air Conditioning Engineers (ASHRAE) recommends a total outside airflow equal to 5 cubic feet of outdoor air per minute per person in addition to 0.06 cubic feet of outdoor air per minute (cfm) per square foot of floor space. According to ASHRAE, carbon dioxide levels may be a reasonable surrogate for direct measurement of ventilation of a building. The ASHRAE further states that indoor carbon dioxide measurements greater than 700 parts per million (ppm) above outdoor air concentrations will make building occupants uncomfortable with respect to odors generated. Levels that are greater than 700 ppm above outdoor air levels generally indicate a ventilation rate that is less than the recommended 15-cfm per person.

(2) Recommendations. Ensure a total outside airflow of at least 5 cfm per person plus 0.06 cfm per square foot of floor space. Alternatively, outdoor air can be supplied to each room within the building at a rate of at least 15 cfm per person. Do not block any of the return or supply vents. Although ASHRAE recommendations are based on comfort, in the absence of health-based recommendations, this industry-accepted standard should be followed. Installation industrial hygiene experts can assess building ventilation rates and are generally part of the local preventive medicine service located with the installation's medical center or medical activity (hospitals).

b. Air Filtration.

(1) Discussion. Standard air filters may remove only a small percentage of potential respiratory disease pathogens. However, high-efficiency particulate air (HEPA) filters remove a

much larger percentage of bacterial and viral respiratory disease agents. Unfortunately, there are insufficient controlled, population-based studies that have examined the ability of HEPA filters or regular filters to reduce disease rates in a non-healthcare setting. The HEPA filters also require a large amount of energy to move air through them. Some estimates indicate that HEPA filters may cost 50-70 percent more to operate than non-HEPA filters.

(2) Recommendation. There is inadequate evidence to support the use of HEPA filters at this time. At a minimum, there should be a properly fitted air filter in place that is checked bi-weekly and replaced in accordance with the manufacturer's instructions. The effectiveness and life of the filter can vary and will depend on the individual conditions in the building.

c. Temperature and Humidity.

(1) Discussion. Building temperature and humidity are often considered matters of personal comfort. Activity of the occupants plays a vital role in the comfort level. However, studies in buildings and in climate chambers demonstrate an association between the temperature and health symptoms and perceived air quality. Lower humidity is sometimes associated with mucous membrane irritation, and higher humidity is sometimes associated with poor-perceived air quality. Furthermore, higher humidity can support the growth of pathogenic or allergic organisms such as fungi, mycotoxins, and dust mites. Growth is enhanced by the presence of materials with high cellulose content like fiberboard, dust, skin particles, dander, and lint. The Occupational Safety and Health Administration (OSHA) recommend maintenance of indoor temperatures in the range of 68 °F to76 °F and humidity levels of 20–60 percent. This is only a recommendation, not an OSHA standard. The ASHRAE recommends that the relative humidity in habitable spaces be maintained between 30 percent and 60 percent to minimize the growth of allergenic and pathogenic organisms.

(2) Recommendations. When practical, maintain indoor habitable spaces at a temperature between 68 ºF and 76 ºF, and at a relative humidity between 20 percent and 60 percent.

5. INSPECTION PROCEDURES.

a. Individual Units. Individual units should conduct periodic inspections to ensure compliance with the recommendations contained in this guidance document. An example of an inspection checklist is provided in Appendix C. Unit leaders should incorporate all hygiene and sanitation procedures into regular training cycles; ensure command emphasis is strong, sustained, and frequently communicated to subordinates; and enforce hygiene and sanitation standards at all levels of the organization.

b. Local Preventive Medicine Assets. Local preventive medicine assets should inspect areas where individuals are living in close quarters at least quarterly to ensure compliance with the recommendations set forth in this document.

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APPENDIX A
REFERENCES AND SUPPORTING INFORMATION

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APPENDIX B
HEALTH PROMOTION PRODUCTS

Available for order from:
http://chppm-www.apgea.army.mil/news/influenzaWebsite/pages/toolbox.htm

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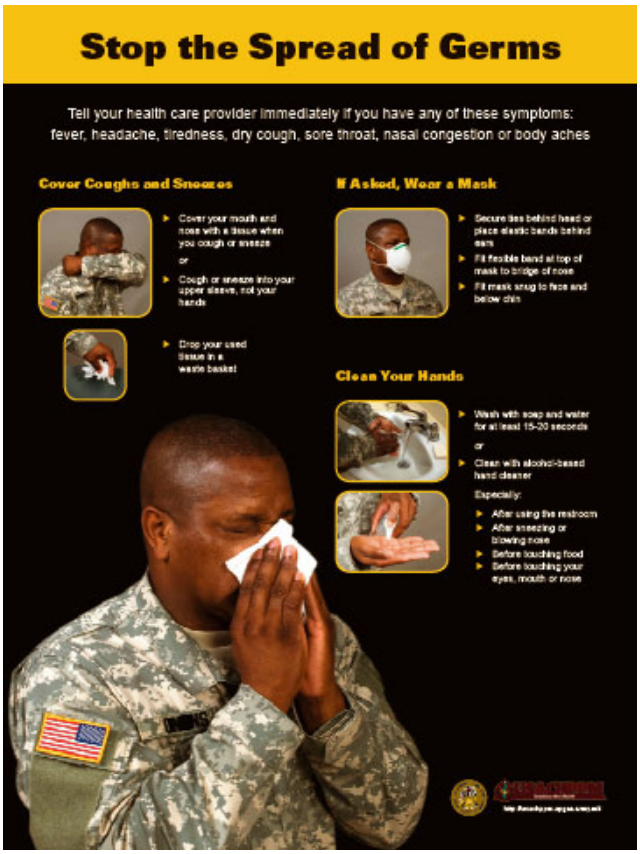

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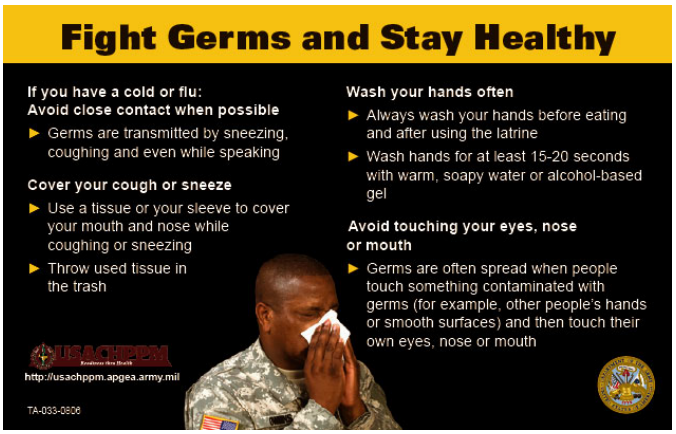

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APPENDIX C
EXAMPLE BARRACKS SANITATION ASSESSMENT

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BARRACKS SANITATION ASSESSMENT

AUTHORITY: ARMY REGULATION 40-5, PREVENTIVE MEDICINE, 22 JULY 2005; TECHNICAL RESOURCE: USACHPPM TECHNICAL GUIDE ###, DATE

UNIT:	BLDG NO:	DATE:
INSPECTOR:	COPY REPORT FURNISHED TO:	
RATING: ☐ EXCELLENT (0 "NO's) ☐ GOOD (1-2 NO's) ☐ POOR (>2 NO's)	TEMPERATURE (INSIDE/OUTSIDE):	HUMIDITY (INSIDE/OUTSIDE):
INDOOR AIR QUALITY (IAQ) RATING: ☐ SAT ☐ UNSAT	IAQ ASSESSMENT BY INDUSTRIAL HYGIENE ON RECORD (DATE):	

DESCRIPTION	YES	NO
01 ARE FEBRILE ACUTE RESPIRATORY DISEASE CASES SEGREGATED FROM THE GENERAL POPULATON (FM 8-250, 5-12 A(1))		
02 NO LESS THAN 72SQFT FLOOR SPACE *PER PERSON* WITH AT LEAST 3 FT BETWEEN BUNKS		
SQUARE FOOTAGE / NUMBER OF PERSONNEL / SQ FT PER PERSON		
03 HEAD TO TOE SLEEPING IS ENFORCED		
04 WEEKLY LAUNDERING/EXCHANGE OF LINENS/TOWELS/UNIFORMS/MATRESS PADS		
05 AT CYCLE OR PERSONNEL CHANGE, EXCHANGE BLANKETS & PILLOWS, & WIPE DOWN MATRESSES WITH DISINFECTANT SOLUTION: AT CYCLE CHANGE, DETERGENT & WATER CLEAN ALL WALLS BLINDS, WINDOWS, & AREAS NOT OTHERWISE CLEANED		
06 LATRINE FACILITIES AVAILABLE WITH TOILET PAPER		
07 TOILETS, SHOWERS, SINKS AND LATRINE FLOORS ARE DISINFECTED DAILY AND IN GOOD WORKING ORDER		
08 HIGH-TOUCH SURFACES ARE DISINFECTED DAILY (DOORKNOBS, HANDLES, LIGHT SWITCHES...)		
09 VISIBLE DIRT ON FLOORS AND SURFACES IS CLEANED AS NECESSARY		
10 WEEKLY DETERGENT AND WATER MOP FLOORS, AND DETERGENT AND WATER CLEAN ALL HORIZONTAL SURFACES		
11 SOAP/PAPER TOWELS/ HAND SANITIZER AVAILABLE FOR HAND WASHING		
12 HAND HYGIENE IS ENFORCED, ESPECIALLY BEFORE MEALS AND AFTER USING THE LATRINE (TRADOC UNITS FOLLOW TRADOC REG 350-6)		
13 COUGH ETIQUETTE IS ENFORCED; MOUTH & NOSE COVERED WITH TISSUE OR COUGH OR SNEEZE INTO YOUR UPPER SLEEVE; TISSUE IS DISCARDED IN WASTE BASKET; WASH HANDS OR USE HAND SANITIZER		
14 NO SIGNS OF EXCESSIVE MOLD OR ACCUMULATED DUST		
15 IF WINDOWS ARE OPENED ARE SCREENS IN PLACE		
16 ADEQUATE CLEANING SUPPLIES AVAILABLE AND STORED CORRECTLY (IE MOP HEADS DOWN); CLEAR INSTRUCTIONS POSTED FOR MIXING BLEACH WITH WATER - 1/4 CUP PER GALLON OR 1 TBSP PER QUART "DO NOT MIX BLEACH WITH ANYTHING BUT WATER"		
17 AIR HANDLING SYSTEM WORKING PROPERLY ("NO" REQUIRES WORK ORDER #); SUPPLY AND RETURN VENTS ARE CLEAN AND CLEAR OF OBSTRUCTIONS		
18 VENTILATION FILTERS ARE CHECKED BIWEEKLY AND CHANGED AS NEEDED		
19 LEADERSHIP EMPHASIZES PREVENTIVE MEDICINE MEASURES ABOVE AND POSTS HEALTH PROMOTION INFORMATION (POSTERS, STICKERS...) AVAILABLE FROM USACHPPM (WWW.CHPPM.COM); TRADOC UNITS MUST ALSO DISPLAY THEIR OWN POSTERS PER LOCAL POLICY		

REMARKS / RECOMMENDATIONS: (USE BACK OF FORM IF NECESSARY)
Sanitation is critical to the prevention of infectious disease when soldiers are living in close confines. Adequate hand washing and barracks sanitation reduces the spread of disease and facilitates healthier trainees and reduces costs due to illness. Preventive Medicine personnel are available to provide technical assistance. Call _____ for more information.

SIGNATURE OF INSPECTOR:	TIME:
SIGNATURE OF RECEIVER:	

FORM 0000, 2007

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APPENDIX D
USACHPPM FACT SHEETS

Available for download from:
http://usachppm.apgea.army.mil/HIO_FactSheets/

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USACHPPM
Readiness thru Health

36-016-0407

Just the Facts...

Barracks Hygiene to Prevent Disease Transmission

Infectious diseases are a major preventive medicine problem for U.S. Army Soldiers living in close quarters. Some of these infections are caused by direct person-to-person contact, but other infections are caused by the germs found on surfaces. Improved hygiene can help reduce the spread of infection. An effective hygiene plan must start with accepting that disease-causing bacteria, viruses, fungi, and protozoa are always indoors on people, food, insects, and potentially in the air. Cleaning must be adequate to reduce germs to a level which is not harmful to health. A sterile environment is not expected. To achieve a hygienically clean (as opposed to visibly clean) surface the germs must either be removed or they must be killed by disinfection. Methods of hygienically cleaning sites and surfaces include detergent-based cleaning followed by rinsing, and the use of disinfecting agents.

Hand Hygiene

The hands are probably the most important cause of cross-contamination and cross-infection. The World Health Organization suggests that sanitation-related disease in developing countries could be reduced by up to 60% if people washed their hands after defecating. Acute respiratory infections (colds, sore throats, bronchitis) are most frequently transmitted by droplets from coughing or sneezing. Using tissues or shirt sleeves to interrupt these droplets are effective ways to prevent transmission. However, coughing or sneezing into your hands allows the spread of the germs to other parts of the body (through the eyes or breaks in skin, etc.) or to other individuals through touch.

- ✓ At a minimum, personnel living in close quarters should be allowed time to wash their hands for at least 20 seconds with liquid soap and water before meals and after using the latrine.
- ✓ One study in a military population decreased lost-duty time due to acute respiratory infections with an effective hand hygiene program.
- ✓ Leadership should encourage hand washing at every opportunity and ensure latrines are supplied with liquid soap, water, and paper towels.
- ✓ Liquid soap will eliminate contamination problems associated with bar soap.
- ✓ When soap and water are not available, alcohol-based hand wipes or gel sanitizers may be used. If using gel, rub your hands (to include the backs of your hands) together until dry. The gel does not need water to work; the alcohol in it kills the germs. If hands are visibly soiled, wash with liquid soap and water before using gel sanitizers.

Reservoir Sites (toilets, showers, sinks)

Toilets, showers, and sinks can become reservoirs of germs. Moisture and residual soil at these sites provide an ideal environment for the growth of germs.

- ✓ Toilet flushing is sufficient to remove most of the microbial contamination from the toilet bowl.
- ✓ Since toilet flushing does not achieve decontamination under the flushing rim of the toilet, the toilet must be cleaned daily to maintain a low level of contamination in the toilet bowl and under the flushing rim. This will prevent build-up of scale which could harbor germs.
- ✓ Sinks and showers should also be disinfected daily to prevent build-up of scum that can support germ growth.
- ✓ Allow mop heads to dry before reuse by hanging the mop by the handle with mop heads down.

U.S. Army Center for Health Promotion and Preventive Medicine, Health Info Ops,
5158 Blackhawk Road, Aberdeen Proving Ground, Maryland 21010-5403
http://chppm-www.apgea.army.mil
DSN 584-5217: CM (410) 436-5217: FAX -8492

Floors, Walls, and Other Environmental Surfaces

Exposure to disease-causing germs from contaminated floors and furnishings is very low. Germs are usually transferred from environmental surfaces to individuals by hand contact with the surface.

- ✓ High-touch surfaces (doorknobs, handles, light switches, and walls around toilets) should be cleaned and disinfected daily.
- ✓ Horizontal surfaces, such as window sills and floors, should be cleaned weekly with soap and water and kept visibly clean as necessary.
- ✓ Extraordinary cleaning and disinfection of floors is not recommended.
- ✓ Cleaning of walls, blinds, and window curtains is recommended between training cycles or when they are visibly soiled.

Laundry, Mattresses, and Pillows

- ✓ All soiled clothing and linens should be laundered weekly at 160˚F, or at 104˚F to 140˚F using an activated bleach powder.
- ✓ Plastic covered mattresses are preferred for ease of disinfection. If fabric mattresses are used, keep mattresses dry and discard them if they become and remain wet, stained, torn beyond repair, or unserviceable.
- ✓ Between training cycles or personnel change, clean and disinfect plastic mattress covers using EPA-registered disinfectants that are compatible with the cover material.
- ✓ Replace mattress and pillow covers if they become torn or unserviceable.
- ✓ Routine turn-in of laundry will serve as proper disinfection of laundry materials.
- ✓ Turn in sheets and pillow cases weekly. Blankets, pillows and mattress covers can be turned in every 3 weeks or at personnel change.

Disinfectant Solution

Household bleach with water is the recommended disinfectant solution. It is effective, economical, convenient, and readily available. The solution of bleach and water is easy to mix, safe if handled properly, and kills most infectious germs.

- ✓ Use ¼ cup bleach in 1 gallon of cool water

  or
- ✓ Use 1 tablespoon bleach in 1 quart of cool water.
- ✓ A solution of bleach and water loses its strength and is weakened by heat and sunlight. Mix a fresh bleach solution each day that it is needed.
- ✓ The solution can either be applied using a bucket and cloth/sponge or a spray bottle and cloth/sponge. Disposable cloths, such as paper towels, are recommended.
- ✓ Chlorine evaporates into the air leaving no residue, so surfaces sanitized with bleach may be left to air dry.

Do not mix bleach with other cleaning chemicals. Mixing chemicals with bleach may produce hazardous gases. Before using anything other than bleach for disinfection consult with your local preventive medicine office. Always read the label and follow the manufacturer's instructions exactly.

Recommended Cleaning Cycle

Daily – disinfect bathroom floors, sinks, showers, toilets, doorknobs, handles, light switches and other high-touch surfaces; clean with soap and water or sweep other visible dirt on floors and surfaces as necessary.

Weekly – launder all soiled clothing and linens; use soap and water to mop floors and clean all horizontal surfaces.

Every Three Weeks – turn in blankets, pillows, and mattress covers for laundering.

End of Training Cycle – turn in blankets; wipe down mattresses with disinfectant solution; launder mattress pads (if applicable); use soap and water to clean all walls, blinds, windows, and areas not otherwise cleaned.

USACHPPM
Readiness thru Health

36-017-0407

Just the Facts...

Barracks Layout to Prevent Disease Transmission

Why the Risk of Disease Transmission?

Respiratory disease is a major medical problem for military personnel living in close quarters. Crowded conditions are often found at military training barracks, classrooms, dining facilities, tent cities, and deployment staging areas. Close contact coupled with the stress of military operations often puts military personnel at greater risk for respiratory disease than their civilian peers. The highest risk is seen during Basic Combat Training when individuals bring bacteria and viruses from around the world into crowded living conditions. These personnel are typically young and have immune systems that may be depressed from extended periods of physical and emotional stress making them more susceptible to acute respiratory disease.

How are Respiratory Diseases Transmitted?

→ infected people expel viruses when they cough, sneeze or talk

→ droplets are propelled a short distance and can either land on or be breathed in by another person

How to Prevent Transmission?

Individual Measures:

→ covering coughs and sneezes with a tissue or shirt sleeve are effective ways to block infectious droplets and reduce the risk of transmission

→ hand washing has been proven to be the most effective way to prevent transmission, but in the absence of hand washing facilities, instant hand sanitizers are also effective

Leadership's Role:

→ leader involvement is essential to preventing respiratory disease

→ every leader must know and enforce the recommendations to prevent respiratory disease

→ leaders can use administrative control measures to increase space between individuals

→ isolating sick individuals in separate sleeping areas is **critical** to prevent infections from spreading

→ barracks layout recommendations can be implemented while still allowing for the high levels of activity and stress expected in an environment like recruit training

Square Feet per Person

→ current space allocation guidelines set forth in DA Pam 40-11, Preventive Medicine, 22 July 2005, specify a minimum sleeping space allowance of 72 square feet of floor space ***per person*** to lower the risk of disease transmission

→ for example, an open bay that is 90 feet long and 45 feet wide has a total of 4,050 square feet and should hold a maximum of 56 personnel (4050/72 = 56.25). Care must still be taken to ensure that each person receives 72 square feet of floor space (see figure). Stacked bunks require 144 square feet of floor space (72 square feet X 2) if both beds are occupied.

→ all available billeting, including temporary facilities and tents when necessary, should be used to ensure this minimum space allowance

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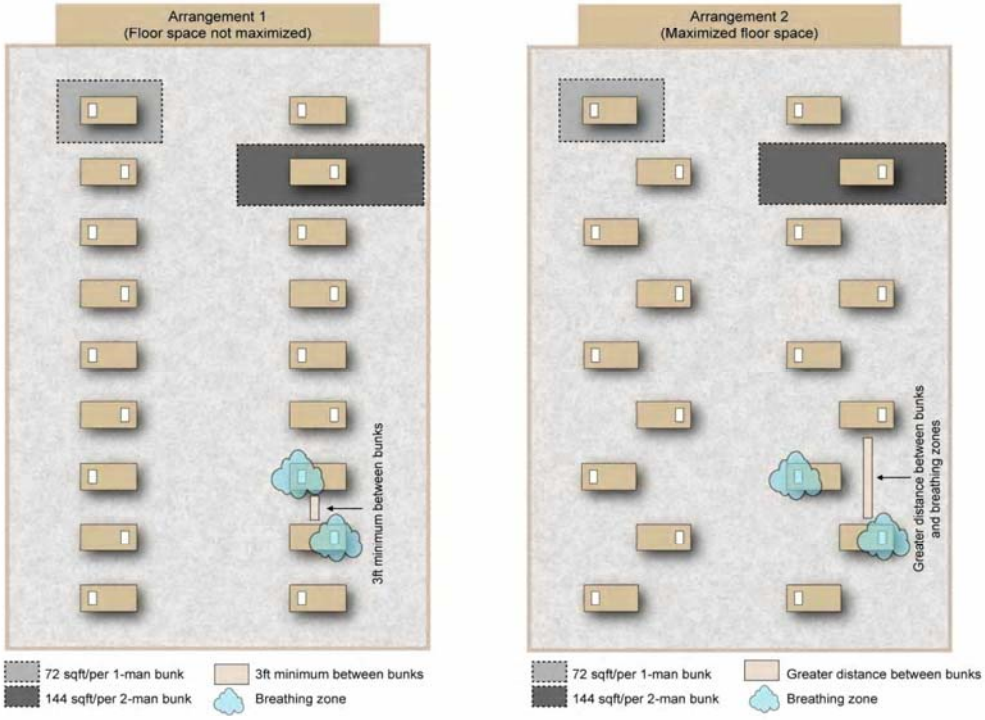
Spacing between Bunks and Head-to-Toe Sleeping

→ leaders should provide at least 3 feet between bunks
→ alternate head and foot positions on adjacent bunks to increase a person's breathing zone (head-to-toe sleeping)
→ maximize available space in the bay or tent (see Arrangement 2 below)
→ a staggered bunk arrangement provides a greater distance between bunks without reducing the total number of bunks in the same area as if the bunks were all aligned
→ do not crowd bunks (or personnel) in one area while leaving large open spaces in other areas
→ if barracks are not at full capacity, tear down excess bunks or place trainees in every other bunk to further increase distance between occupants

Figure (not to scale). Two arrangements are depicted below. "Arrangement 1" is commonly seen at recruit training installations but does not maximize available floor space. A staggered bunk/cot arrangement, as depicted in "Arrangement 2", maximizes available floor space and the distance between bunk/cots while still maintaining egress routes and allowing for command and control.



In the staggered bunk arrangement, (Arrangement 2) the center area is reduced. This area is easily re-established by sliding the inner bunks back in line with the outer bunks during the day and back to maximize sleeping space in the evening. A simple system, such as dots on the floor, can help keep the bunks in line during movement. Not all rooms or bays are represented by the figures above, but the same principles used to maximize floor space can be applied to areas of any shape or size. Respiratory disease is usually spread when an infected person expels droplets onto another person. Cough etiquette, isolation of sick individuals and space between bunks are all important preventive measures to prevent the spread of infectious diseases.

APPENDIX E
EXAMPLE POSTER OF INSTRUCTIONS FOR MIXING BLEACH WITH WATER

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MIXING BLEACH AND WATER

****DO NOT MIX BLEACH WITH ANYTHING OTHER THAN WATER****

MIX ¼ CUP OF BLEACH WITH 1 GALLON OF COOL WATER

OR

MIX 1 TABLESPOON OF BLEACH WITH 1 QUART OF COOL WATER

***Measure the amounts – DO NOT GUESS**

***Mix a fresh bleach solution each day that it is needed.**

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May 2007

USACHPPM TG No. 314