Armed Forces Pest Management Board

TECHNICAL GUIDE NO. 20

****

PEST MANAGEMENT OPERATIONS IN MEDICAL TREATMENT FACILITIES

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DISCLAIMERS

Information contained herein regarding pesticides is supplied with the understanding that no preference for specific products is intended, and no endorsement is implied to the exclusion of other pesticide products that may be suitably registered with the U.S. Environmental Protection Agency (EPA) for a given application site and target pest. The most reliable information available at the time of writing was utilized to compile this Technical Guide (TG).

Mention of a specific pesticide active ingredient should not be construed to mean that all pesticide products containing that active ingredient are suitable for use at the application site against a particular target pest. The Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA), as amended; state it is unlawful to use a pesticide in a manner inconsistent with its label or labeling. This means that the application site and suitable directions for use of the pesticide dispensing device of choice must appear on the label or in the

accompanying booklet of the specific pesticide product utilized in normal pest management operations.

Due to constantly changing laws and regulations regarding the use of pesticides, it is recommended that installation medical authorities or pest management personnel with questions concerning acceptable pesticides and procedures for their use consult their command pest management professional or the DoD Pesticide Hotline (AUTOVON 584-3773; Commercial 410-436-3773). Users should also consult the appropriate pest management professional or the DoD Pesticide Hotline for specific product information (See Section III).

FOREWORD

PEST MANAGEMENT OPERATIONS IN MEDICAL TREATMENT FACILITIES

This TG was prepared in response to inquiries about appropriate control measures for pests found infesting medical treatment facilities. As explained in the Introduction, this guide is not a regulation, but merely provides guidance to those individuals responsible for recommending or conducting pest control operations. This TG will receive periodic review and will be updated to ensure that its contents reflect current pest management procedures and are consistent with applicable rules and regulations. Individuals using this TG are encouraged to submit comments and suggestions for improvement to the Executive Director, Armed Forces Pest Management Board, Walter Reed Army Medical Center, Forest Glen Section, Washington, D.C. 20307-5001.

INTRODUCTION

A. **PURPOSE**.

This TG is intended to assist in the review and conduct of pest management operations in medical treatment facilities (MTFs). This is a guide, not a regulation, and the recommendations contained herein should not be construed as official Department of Defense (DoD) policies or procedures. Ultimate pest management responsibility remains with the existing medical or pest management authority. The sole intent of this TG is to assist responsible individuals in making decisions regarding pests and their control in MTFs.

B. **REFERENCES**. See Appendix A.

C. **TERMS AND DEFINITIONS**.

1. **Food Handling Establishment**. An area or place, other than a private residence, in which food is held, processed, prepared and/or served (Appendix B).

a. **Food Areas of Food Handling Establishments**. Areas for receiving, serving, storing (dry, cold, frozen, and raw), packaging (canning, bottling, wrapping, and boxing), and preparing of food, edible waste storage, and enclosed processing systems (mills, dairies, edible oils, and syrups).

b. **Nonfood Areas of Food Handling Establishments**. Areas such as garbage rooms, locker rooms, machine rooms, boiler rooms, garages, mop closets, and storage rooms (after canning or bottling).

2. **Food Service Establishment**. A food handling establishment whose principal business involves the sale of food directly to the consuming public. The manufacture and/or processing of food by such an establishment are only incidental to achieving its principal business objective. Representative types include restaurants, cafeterias, taverns, dining halls, hospitals, vending machines, groceries, and markets.

3. **Label**. As defined by the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA), the written, printed, or graphic matter on, or attached to, the pesticide or device or any of its containers or wrappers.

4. **Labeling**. As defined by FIFRA, all labels and all written, printed, or graphic matter will accompany the pesticide or device at any time.

5. **Nonresidual Insecticides**. Those products applied to obtain insecticidal effects only during the time of treatment and applied either as a space treatment or contact spray (Appendix B).

6. **Patient Sensitive Area**. Any area within an MTF where there is a possibility of medically compromised persons being exposed dermally, orally, or by inhalation to pesticides. See Appendix C for a list of patient sensitive areas.

7. **Pest**. Includes, but is not limited to, any arthropod, rodent, nematode, fungus, weed, or any form of plant or animal life or virus, bacterial organism or other micro-organism (except viruses, bacteria, or other micro-organisms on or in living humans or other animals) that is normally considered to be a pest or that the DoD may declare to be a pest in accordance with public law or national policy.

8. **Pesticide**. Any substance or mixture of substances intended for preventing, destroying, repelling, attracting, or mitigating any pest, and any substances or mixture of substances intended for use as a plant regulator, defoliant, or desiccant (Appendix B).

a. **Contact Treatment**. Application of a wet spray for immediate pesticidal effect.

b. **Space Treatment**. Dispersal of pesticides into the air by foggers, misters, aerosol devices, or vapor dispensers for the control of flying insects and exposed crawling insects.

9. **Residual Insecticides**. Those products applied to obtain insecticidal effects lasting several hours or longer and applied as general, spot, or crack and crevice treatments (38 FR 21685).

a. **Crack and Crevice Treatment**. Application of small amounts of insecticide to cracks and crevices in which insects hide or through which they may enter a building. Such openings commonly occur at expansion joints, between different elements of construction, and between equipment and floors. These openings may lead to voids, such as hollow walls, equipment legs and bases, conduits, motor housings, and junction or switch boxes.

b. **General Treatment**. Application to broad expanses of surfaces, such as walls, floors and ceilings, or as an outside treatment.

c. **Spot Treatment**. Application to limited areas on which insects are likely to occur, but which will not be in contact with food or utensils and will not ordinarily be contacted by workers. These areas may be on floors, walls, and the bases or undersides of equipment. A spot will not exceed 2 square feet.

D. **GENERAL CONSIDERATIONS**.

1. Besides disease vectors, other pests, especially cockroaches, flies, stored product insects and rodents, may contaminate or damage food and equipment and are therefore considered of significant health and economic importance. Pests in laboratories, pharmacies and operating rooms may affect the sterility of supplies and equipment.

2. Pests, especially flies, cockroaches, ants and rodents, may mechanically transmit pathogens from contaminated wastes, dressings, sputum, and similar materials that increase the risk of infection, especially in immunocompromised patients and newborn infants.

3. Pest infestations often cause anxiety among patients and may interfere with their comfort or recovery.

4. Patients often consider pest infestations as an indicator of inadequate sanitary conditions, thereby adversely affecting the patients' perception of their quality of medical care.

5. Pest infestations may result in costly litigation should they be implicated in compromising the quality of patient care.

6. The primary goal in preventing or reducing pest infestations should be to use nonchemical control techniques, such as basic sanitation, routine food and premises surveillance procedures, and mechanical exclusion and control procedures. These techniques eliminate the risk of further stressing patients through accidental pesticide exposure. Pesticide use should be minimized.

NONCHEMICAL PEST MANAGEMENT METHODS IN MEDICAL TREATMENT FACILITIES

A. **BASIC SANITATION**.

1. **General Considerations.**

a. Pest infestations will occur where there is harborage or where inadequate sanitation leaves food to attract and provide nourishment for pests. In MTFs it is critical to minimize the use of pesticides by maximizing sanitation. Virtually all items of subsistence, except canned foods, are susceptible to infestation or damage by insects, rodents, and other pests.

b. Infestations routinely begin in areas where food is stored or prepared. Insects, particularly cockroaches, will be introduced via foodstuffs, clothing, supplies, patients and their visitors. Infestations that occur in these areas should not be allowed to spread to other parts of the building. Routine surveillance and the initiation of appropriate control measures will be required.

c. Insects transported from food areas via food carts and other vehicles can become established where food, water, and harborage exist. Vehicles capable of disseminating pests should be routinely inspected and disinsected as necessary.

d. Insects, especially flies, may breed in food areas where garbage and refuse containers are not frequently or adequately cleaned or where grease, crumbs, and dirt accumulate in hard-to-clean areas. Flies may also breed in rotting produce in storage areas.

e. Mosquitoes require water to complete their life cycle; therefore, all standing waters in and around MTFs are potential mosquito breeding sites.

f. Stored food pests can be medically important. When swallowed with food, some mites commonly found in cheese, dried fruit, and flour can cause intestinal irritation. "Copra Itch" and "Grocer's Itch" are two types of dermatitis seen in food service personnel who handle foods infested with certain mite species. The stiff setae of dermestid beetle larvae can cause ulcerative colitis when ingested, while quinones from flour beetles are considered tumorigenic.

g. Insect ectoparasites of humans, such as scabies and lice, may enter an MTF via patients and their belongings.

2. **Recommendations.**

a. MTF personnel, especially food service employees, should have a working knowledge of the life cycle and habits of common pests and be able to identify on sight those pests that may infest the medical facility.

b. Upon receipt of food items, have food service personnel inspect all items for insect infestation, damage or contamination. If infested, return the items to the issuing agency and report the infestation to the appropriate installation veterinarian, environmental health officer, pest management coordinator, or medical authority.

c. Conduct inspections of stored food items twice each month. Report active insect infestations to the individuals listed in "b" above for control and disposition instructions.

d. Store foodstuffs and service items like napkins off the floor and in tightly sealed containers. Avoid storage in cardboard boxes. Remove supplies from their shipping containers and store them on clean metal shelves. Storage racks and containers should be 12 inches from the floor surface, at least 18 inches from walls, and should be easily movable to facilitate cleaning. If storage of cardboard boxes is unavoidable, allow sufficient air space to remain around each stack of cartons. This permits good ventilation, enhancing the drying power of the atmosphere, and allows pest management or food service personnel to inspect for infestations.

e. Store infrequently used nonfood service items, such as glassware and utensils, as far from food preparation areas as possible.

f. Ensure that floors, containers, material handling equipment, bin storage areas, pallets and platforms are clean and free of any substance that will attract pests or provide food or harborage.

g. Repair tears or ruptures in sacked and boxed subsistence. If adequate repairs cannot be made, repackage the subsistence items.

h. Rotate foodstuffs to ensure that the oldest products on the shelves are used first, i.e., first in, first out (FIFO).

i. Avoid overnight exposure of edible foodstuffs, especially in food preparation and serving areas.

j. Ensure that all spilled foods and waste materials in food preparation, serving and storage areas are collected and disposed of daily. Thoroughly clean all food preparation equipment and utensils every day. Unwashed cooking and eating utensils and bottles should be placed in areas inaccessible to crawling insects.

k. Designate staff eating areas. Do not permit employees to eat in laboratories, offices or other work stations. Coffee, sugar, cream, and other foodstuffs should be stored in sealed containers or in a refrigerator. Do not permit patients to store food in their rooms.

l. Check dumbwaiter pits daily and thoroughly clean as needed. Utensils, paper, food, and related items frequently fall from serving trays into the pit areas.

m. Thoroughly clean vending machine areas. The frequency of cleaning and methods used should be established by the local medical authority and will be based upon the type of product dispensed.

n. Steam-clean steel carts, tray racks, and other portable items, not susceptible to heat damage, to remove food particles that may have accumulated on surfaces and in crevices (see Section V). Coat legs of carts with TeflonR paint.

o. Ensure that garbage is placed in cans with plastic bag liners and tight-fitting lids. Garbage cans should be cleaned thoroughly after each collection by washing with hot water and detergent. They should be stored on racks at least 12 inches off the ground or floor.

p. Dumpsters should be kept closed at all times, placed on concrete pads, and located as far as practical from openings to the building (doors, windows, vents, etc.). They should be emptied daily and steam cleaned at least once each week.

q. Eliminate all standing water in and around the MTF. Pay special attention to clogged rain gutters and the cooling towers of air-conditioning systems.

r. Inspect basements/crawlspaces at least monthly for leaks in pipes and garbage disposal conduits, and for other potential pest attractants. Ensure that crawlspace doors are properly secured at all times.

s. Admitting physicians or MTF personnel who suspect that a patient may be infested with ectoparasites, such as lice, should thoroughly examine and subsequently treat active infestations prior to admission of the patient.

t. Contact installation preventive medicine or food inspection personnel to arrange for training seminars, including pest identification, life cycles, habits, etc., for food service personnel.

u. Inspect roofs, ledges, attics, etc., for roosting bats and birds.

B. **MECHANICAL EXCLUSION AND CONTROL OF PESTS.**

1. **General Considerations.**

a. Buildings have inherent characteristics that are attractive to pests (e.g., shelter, lights, heat, odors). Once pests arrive at a building, cracks may enable them to enter wall voids. In addition, doorways, improperly screened windows, and active or obsolete utility openings permit pests to directly enter buildings.

b. Once pests, particularly cockroaches and rodents, enter wall voids or areas above drop ceilings, they can follow the service lines (e.g., pipes, ducts, wires) in search of water, food, and harborage.

c. Rodents will enter buildings with the onset of cold weather, when nests have been destroyed, or when population increases cause individuals to seek new nesting or feeding areas.

d. Pests may gain entrance via raw food items, such as sacks of potatoes or onions and crates of produce, or in processed foods, such as flour and rice. In addition, the eggs of various insects may be carried into buildings in cartons, bags, or other containers.

e. Bushes or trees in contact with, or within jumping distance of a building allow rodents easy access to upper levels, windows, and the roof. Vines growing on the sides of buildings provide roosting and nesting cover for nuisance birds as well as protected runs for rodents.

f. Birds roosting on air conditioners, window ledges, or other structural elements can cause contamination by the accumulation of droppings. Such roosting areas can also be the point of entry for bird mites.

g. Appendix D is a schematic drawing indicating the most common pest entrances into MTFs.

2. **Recommendations.**

a. Screen all windows and doors with ordinary mesh screening. Where smaller flying insects, such as gnats and sand flies, are abundant, 18 x 18 inch mesh screening is recommended.

b. Consider the installation of air curtains over service area doors or devices for electrocuting or capturing flying insects inside entrances and at other appropriate locations (See AFPMB TG 30 for details).

c. Install electronically operated or self-closing service doors to ensure prompt closing.

d. Replace building-mounted mercury vapor lamps with high-pressure sodium lamps and incandescent flood lamps with dichrom yellow lamps to reduce the attraction of insects to buildings. An alternative is to place lighting away from buildings so that it illuminates the buildings but attracts insects away from them.

e. To reduce entry points and harborage areas for crawling insects:

(1) Fill all cracks and crevices in basement walls and around basement windows with mortar, concrete, or insulating foam.

(2) Fill all openings for service pipes or other conduits in both exterior and interior walls.

(3) Caulk or fill cracks and crevices of door jams, window frames, and baseboards.

f. To prevent entry by rodents:

(1) Cover all openings over one-quarter of an inch in diameter to prevent entry by mice and rats.

(2) Cover all edges subject to gnawing with sheet metal (24 gauge or heavier) or hardware cloth (19 gauge 1/2x1/2 inch mesh for rats, 26 gauge 1/4 x 1/4 inch for rats and mice). Because the upper teeth of rats and mice are curved inward, it is difficult for them to gnaw into a flat, hard surface.

(3) Ensure that floor drain grates are tightly fastened.

(4) Force hardware cloth into openings around pipes and fill with concrete. Fit sheet metal around the pipes where pipes enter wooden walls.

(5) Inspect all incoming food items, especially potato and onion sacks or fruit and other produce crates, for evidence of rodents.

g. To prevent climbing by rodents, install smooth sheet metal, 12 inches high, around corners located at the floor or ground level.

h. Use snap traps, live traps or glue boards within laboratories, administrative, food handling, or maintenance areas only. They work quickly, eliminate the possibility of secondary poisoning, and prevent the problem of rodents dying in wall voids, where odors may occur and blowflies or dermestids may develop. Avoid placing snap traps in patient-sensitive areas, especially psychiatric and pediatric wards, emergency rooms, and operating suites.

i. Where practical, remove vegetation growing on and around the building.

j. Coordinate long-term bird exclusion with the installation engineer and the pest management coordinator. "Build out" roosts. Caulk gaps around windows to prevent entry of bird mites.

USE OF PESTICIDES IN MEDICAL TREATMENT FACILITIES

A. **GENERAL CONSIDERATIONS.**

1. Over 1600 pesticide products are registered and labeled for use in "hospitals." Before any pesticide is applied in an MTF, it is mandatory that the product be labeled for hospital use. Information on currently registered products may be obtained from the DoD Pesticide Hotline at DSN 584-3773 or Commercial (410) 436-3773. While a pesticide may have the word "hospital" on its label, this does not imply that all areas of the hospital or MTF are suitable for pesticide applications.

a. Expensive and sensitive non-removable patient monitoring equipment, other medical equipment and computers may preclude any insecticide application that introduces droplets of insecticide into the atmosphere (e.g., nonresidual space sprays or ultra-low-volume residual treatments).

b. Medical facilities contain people who are ill or physically weakened and who are often confined to specific areas 24 hours a day. In places where patients cannot be evacuated, the use of pesticides is limited because of toxicological hazards inherent to the application of these materials.

2. Patient-sensitive areas (see Appendix C) should not receive routine preventive pesticide treatments but should only be treated when an active infestation is evident and after patients are removed. Treatment should normally consist of nonresidual contact sprays and dusts or contained insecticidal baits. Before pesticides are applied in these areas, the cause(s) for the infestation should be determined and nonchemical control measures given primary consideration.

3. After the use of any pesticide, except contained insecticidal baits, in patient-sensitive areas, and prior to the return of patients, all surfaces (walls, floors, furniture, etc.) must be thoroughly cleaned to remove pesticide residues.

4. One room should be set aside for treating insect-infested equipment, beds, cabinets, tables, carts, and other items. This room should have an independent outside vented air circulation system to prevent pesticides from getting into other parts of the building (see Appendix E).

5. The use of nonstandard pesticides and equipment (those not listed as standard in the DoD Section of the Federal Supply Catalog) requires approval by the appropriate pest management professional prior to acquisition.

6. Pesticides, except disinfectants and those used to treat pediculosis or scabies, should only be applied by or under the direct supervision of DoD trained and certified pest management personnel or by licensed and certified contract pest control operators.

7. MTF personnel should not be permitted to use aerosol pesticide dispensing devices ("bug bombs") in patient-sensitive or food handling areas.

8. Applications of nonresidual contact or residual insecticides should only be made to cracks and crevices and to those surfaces (excluding food handling areas) frequented by the particular pest to be controlled. Extreme care should be exercised in the treatment of exposed surfaces, and every effort should be made to minimize the amount of pesticide applied. Contained insecticidal baits should be placed in areas frequented by cockroaches or ants and near potential harborages.

9. Attention must be given to various utility systems, particularly air conditioning and heating systems, to avoid distributing pesticides to nontarget areas during treatment.

10. Hazards inherent to the use of gasses preclude the fumigation of MTFs for insect and rodent control.

11. Pesticide aerosol dispensers that are activated automatically are not recommended for use in any area of an MTF.

12. Plastic insecticidal strips that emit a vapor toxic to small flying insects must not be placed in hospital or clinic areas, such as patient rooms, wards, nurseries, or operating and emergency areas where infants, the ill, or aged are or will be present for extended periods of confinement. They must also not be placed in areas where food is prepared or served (This information was extracted from label precautionary statements common to all pest-strip products registered with the Environmental Protection Agency).

13. Newborns or premature infants have very low cholinesterase levels for up to 3 weeks following birth; therefore, cholinesterase-inhibiting insecticides (such as organophosphates and carbamates) applied as residual treatments should never be used in occupied infant nurseries or neonatal intensive care units.

14. The use of rodenticide baits in patient-sensitive areas is not recommended.

15. All pesticide applications within MTFs must be included in the monthly Pest Control Summary Report (DD Form 1532).

B. **RECOMMENDATIONS.**

1. **Use of Pesticides in Administrative, Maintenance, Nonfood Storage, and Refuse Areas.**

a. Routine pest control measures using residual insecticides to prevent or control insect infestations are acceptable. There are very few pesticide labels that permit true preventive treatment, since most imply the presence of a pest. Treatment should be based upon monitoring results that indicate the presence of a pest, or conditions that are conducive to pest development.

b. For active insect infestations, the use of nonresidual contact sprays, dusts and ULV treatments is acceptable if the area can be vacated during and immediately after treatment. Dusts should not be used in overhead areas or drop ceilings unless construction features preclude accidental contamination below.

c. The use of anticoagulant rodenticide baits is acceptable; however, the baits must be placed in locked or tamper-proof bait boxes and fastened to a stationary object (wall, pole, etc.). These bait boxes and surrounding areas should be inspected at frequent intervals to ensure replenishment of the bait and removal of any dead rodents. Snap traps may be used in certain areas inaccessible to patients and visitors.

2. **Use of Pesticides in Patient-Sensitive Areas.**

a. At no time should pesticide applications be made while patients are in the immediate area. When active infestations in patient areas warrant that control measures be initiated, the use of nonresidual space sprays, contact sprays, contained insecticide baits, or dusts is recommended.

b. When using nonresidual insecticides, the following procedures should be followed:

(1) Remove infested equipment, if possible, to the treatment room (Appendix E) and treat with a nonresidual contact spray. Thoroughly clean the equipment before its return.

(2) If infested equipment cannot be removed, or if the room itself must be treated, remove all patients prior to the pesticide application and ensure that the room and equipment are thoroughly cleaned before patients return.

(3) For flying insects, a space spray may be used. Close all doors and windows. Ensure that air conditioning or heating vents are closed or covered. Cover or deactivate smoke detectors to avoid having the spray set off the alarm (NOTE: Remove the deactivating cover immediately following treatment). Direct the spray mist to all parts of the room, especially windows and other light sources that attract flying insects. NOTE: Space sprays are seldom used for flying insect control, unless the infestation is extremely heavy. Mechanical control methods (e.g., fly swatters, fly paper) are generally preferred.

(4) For crawling insects, use nonresidual contact sprays, baits, gels, or dusts. Thoroughly dust hiding places, such as fuse boxes, electrical outlets, wall voids, behind baseboards, and other areas that cannot be thoroughly treated with the spray. Do not allow the dust to remain in accessible areas of the room.

(5) Following treatment with nonresidual insecticides, seal doors and leave the room closed for a minimum of two hours, or overnight if possible. After this time, vent to the outdoors, remove air vent covers and dead insects, and remove all insecticide residues from walls, floors, ceilings, etc. The room should be ventilated for at least 4 hours before patients return. NOTE: Patients, especially asthmatics, may be allergic to pyrethrum insecticide; therefore, it is vitally important that areas treated with this insecticide be

adequately ventilated before patients return. Thoroughly clean all treated equipment or equipment exposed to insecticide mists before use.

c. If infestations, especially cockroach infestations, become severe in infant nurseries, temporary quarters for the infants must be found and, while the nursery is unoccupied, nonresidual insecticides should be used. Infants should not be returned to treated and sanitized nurseries for at least 48 hours, unless contained insecticidal baits are used.

d. For bedbug control on patient mattresses, disposal of the infested mattresses should be given first consideration. If pesticides must be used, use only EPA-registered insecticide products that have both the pest (bedbug) and the site (mattress) on the label. Follow the label instructions explicitly. After treatment, dry the mattress and cover with a plastic or rubber sheet before returning it to service. Infant bedding must never be treated with insecticides; instead, dispose of all infant bedding infested with bedbugs. The bedstead, other furniture and the entire room should receive a crack and crevice treatment with an appropriate EPA-registered insecticide.

e. To control lice (pediculosis) on patients, medical personnel should use shampoos, creams, or lotions specifically registered for this purpose. In all cases, applications and subsequent reapplications of louse toxicants should be made in accordance with label instructions. Ordinary laundering, using hot water, will destroy all stages of lice on infested bed linens and clothing. Dry cleaning may be used to destroy lice on woolen blankets and garments. For further information on this subject, see AFPMB TG 6.

f. To control Pharaoh ants, use commercially available baits. Residual insecticide sprays are not recommended because merely killing the foraging worker ants will not eliminate the colony.

3. **Use of Pesticides in Food Handling Areas (See Appendix C).**

a. Preventive applications of insecticides should not be made in food handling areas of MTFs, including vending machine areas. Pesticide applications should be made only when an active infestation is in evidence. Daily cleanup activities in these areas, which often include hosing of the floors and baseboards, could dilute or remove previously applied pesticides, especially from baseboards.

b. Coordination and cooperation between pest control and food service personnel is imperative to ensure that pesticide applications in food service areas are efficient as well as effective.

c. Increasing resistance of cockroaches to pyrethrum and pyrethroid insecticides precludes their frequent application (e.g., weekly) in food areas. Food service personnel should not apply these insecticides or other pesticides at any time. Pest management problems should be referred to the MTF pest management coordinator (See Section IV).

d. For active insect infestations in food areas:

(1) Use nonresidual insecticides as space or contact treatments, gels, or baits. Ensure that label instructions for the specific insecticide product utilized specify that the material can be used in the dispensing device of choice (e.g., ULV, nonthermal fogger).

(2) Apply pesticides only when the food handling area is not in operation.

(3) During treatment with space or contact sprays, remove or cover food serving dishes, trays and eating utensils.

(4) Ensure that food-processing surfaces are covered during treatment and are thoroughly cleaned before preparing subsequent meals.

(5) Liquid residual insecticides may be used for careful crack and crevice, spot or general treatment (the label directions for use will stipulate which application methods are permitted). When making crack and crevice applications, ensure that nozzles, which deliver a pin-stream, are utilized and that the pesticide is injected directly into the cracks and crevices. Pesticides accidentally applied to surfaces must be removed immediately.

(6) Following the application of residual or nonresidual contact insecticides, avoid washing treated floors, walls, etc. for at least 2 full working days. Normal washing should not affect properly applied crack and crevice treatments.

e. For insect infestations in nonfood areas:

(1) Routine applications of insecticides in these areas are acceptable, if monitoring indicates the presence of a pest population or if conditions are conducive to pest development.

(2) Nonresidual insecticides applied as space or contact sprays and residual insecticides applied as crack and crevice, spot, or general treatments may be used.

4. **Use of Pesticides in Laboratories.**

a. Space or contact spray pesticides must not be applied to areas containing sensitive analytical equipment (e.g., gas chromatographs, infrared spectrophotometers, electron microscopes, etc.) because the pesticides may interfere with test standards and equipment calibration. Exceptions may be granted when equipment is not operational or when all apertures are protected from contamination. The use of gel or bait formulations, labeled for use in laboratories, is acceptable.

b. Laboratories that conduct microbiological tests and chemical analyses must take necessary precautions to protect all specimens, equipment and reagents from airborne contamination or contact from direct pesticide spraying.

c. To avoid possible adverse effects of pesticides in animal laboratories, pesticide applications must be coordinated with the individual who is responsible for that specific room or the research protocol.

5. **Pesticide Storage.**

With the exception of disinfectants and germicides, pesticides must not be stored in MTFs.

ESTABLISHMENT OF A PEST MANAGEMENT PROGRAM

A. **GENERAL CONSIDERATIONS.**

1. Close coordination between pest management and MTF personnel is required to ensure that pest management operations are conducted with minimal impact on the normal operations of the facility and will aid, rather than detract from, patient care.

2. Any pest management operation must be initiated or requested by the MTF pest management coordinator (PMC) and should be coordinated with the MTF staff prior to implementation. Inspections and surveillance should precede control operations.

3. **Responsibilities:**

a. **Charge Nurse of Ward/Clinic:**

(1) Ensure staff compliance with sanitary standards.

(2) Ensure removal of blood spots, spilled IV fluid, human wastes, and food materials that could attract insects.

(3) Ensure that food, particularly candy and other snacks brought to patients, is not allowed to remain on the ward for more than a day or two.

(4) Report any pest problem to the PMC.

b. **Housekeeping Supervisor:**

(1) Ensure that sanitary conditions are maintained throughout the patient care facilities.

(2) Ensure that waste spills are picked up promptly and the area cleaned accordingly.

(3) Ensure proper collection, removal, and disposal of infectious waste.

c. **Pest Management Coordinator:**

(1) Devise a pest management plan for the MTF.

(2) Upon request, evaluate and identify pest problems within medical treatment facilities.

(3) Conduct annual comprehensive pest evaluations of all the assigned medical treatment facilities.

d. **Infection Control Nurse:** Report to the PMC pest problems noted during inspection of the MTF.

e. **Nutritional Care Personnel:**

(1) Ensure proper disposal of trash, garbage, and waste generated from food handling facilities.

(2) Maintain clean and sanitary food service facilities, equipment and utensils.

(3) If available, ensure that food service personnel attend a Food Service Course offered by Preventive Medicine Service/Environmental Health Service personnel.

f. **Installation Engineer:**

(1) Initiate work orders to eliminate structural deficiencies that contribute to pest infestation.

(2) Coordinate with the PMC on nonchemical pest management practices.

B. **RECOMMENDATIONS.**

1. One individual on the MTF staff, preferably the pest management coordinator, should be responsible for overseeing pest management activities, including surveillance, verification of pest infestations, requesting oversight of pest control services, and maintaining records that document these activities.

2. Records of all pest management activities in an MTF, particularly the use of pesticides, must be accurate, well documented, and adequately maintained. Records should quantify the presence of pests or conditions conducive to pest development. This information becomes extremely important should questions or litigation arise concerning patient exposure to pest infestations or pesticides. These data should be documented on DD Form 1532-1. Additional data may be computerized for rapid retrieval and to develop a historical database on MTF pest problems and actions taken to alleviate these problems.

3. MTF staff should be trained to identify the most common pests. This is vital for an effective pest management reporting system.

4. Normally, pesticides should not be applied in the MTF without the PMC personally accompanying the pest controller. This will ensure that appropriate pesticides are used, that proper pest management practices are followed, and that pesticide treatments are placed only where they are needed.

5. A record should be used by MTF personnel to report pest sightings and to document corrective actions taken. This information should be sent to and maintained by the PMC. An example of a form to be used for this purpose is provided in Appendix F.

6. Initial and subsequent training of MTF staff should be conducted to ensure that reporting procedures are clearly understood.

7. Only DoD certified pest controllers or a state certified contractor should be permitted to apply pesticides. All pesticide applications must be made by trained individuals responsible for pest management operations at the MTF.

CONTROL OF COCKROACHES IN FOOD CARTS

A. **GENERAL CONSIDERATIONS.**

1. Food carts often become infested with cockroaches, especially German cockroaches (*Blattella germanica*).

2. Control is difficult because these carts have built-in harborages and food is often available. Meticulous removal of food particles will aid in eliminating food for cockroaches.

3. Steam-cleaning does not penetrate sufficiently to control infestations in insulated voids and may actually cause damage to the electrical wiring in food carts with self-contained food warming devices.

4. Routine procedures for either nonchemical or chemical control should consist of numbering all carts and subjecting them to the treatment of choice on a regularly scheduled basis.

5. Both nonchemical and chemical control methods should be conducted in the designated insect treatment and sanitary wash room (Appendix E).

B. **RECOMMENDATIONS.**

1. **Nonchemical Control Methods.**

a. Use a sealing compound or insulating foam to fill cracks and crevices in the cart to exclude insects. Teflon paint will preclude cockroaches from crawling on vertical surfaces.

b. Damaged or dislocated door gaskets frequently provide harborage for cockroaches. They should be examined once a month and repaired or replaced as necessary.

c. Many carts contain removable tray guides, which should be removed prior to steam cleaning.

d. Compressor compartments frequently gather dust and lint. They also occasionally gather spilled food. Consequently, they must periodically be cleaned (vacuumed) and occasionally treated with a non-residual insecticide.

e. Prior to the initiation of any of the following nonchemical control methods, the cart manufacturer should be contacted to determine if that specific cart model can be subjected to the proposed treatment:

(1) **Heat Treatment**

(a) Heating food carts to sufficient temperatures has been reported to control all stages (egg, nymph, adult) of cockroaches (Reference 2).

(b) Cockroaches are killed within 10 minutes at 140 ^{o}F (60 ^{o}C) and in 1 hour at 115 ^{o}F (46 ^{o}C).

(c) When heating the carts, ensure that the inner void spaces reach the desired temperature for the required length of time. If heat chambers are used, circulation fans should be employed to keep the floor areas as warm as the ceiling.

(d) Heating minimizes condensation problems often encountered when subjecting carts to freezing temperatures.

(2) **Cold Treatment**

(a) Subjecting food carts to freezing temperatures has been reported to kill all stages of cockroaches (Reference 11).

(b) Expose carts to temperatures of 5 to 25 ^{o}F (-15 to -3.9 ^{o}C) for at least 4 hours. This will ensure that insulated voids reach the desired cold temperature. Repeat exposure every 3 to 4 weeks.

(c) Dead cockroaches should be removed from the carts as part of the required scheduled preventive maintenance program or whenever a cart is sent to maintenance for repairs.

(d) Be advised that cold temperatures may stiffen wheel bearing grease, making the cart difficult to roll; stiffen the motor and compressor bearing grease, causing the compressor to fail; or cause condensation, damaging internal electrical equipment.

2. **Chemical Control Methods.**

a. Carbon dioxide in the form of dry ice, at sufficient concentrations, 21 percent at 78 ^{o}F (26 ^{o}C), has been reported (Reference 16) to control all stages of the German cockroach when the following procedures are followed:

(1) Crack approximately 20 lbs of dry ice into 3 equal pieces and place them at different levels of the cart.

(2) Center the cart on a 20 x 20 foot piece of 6-mil polyethylene plastic. Food carts with mounted accessories, such as microwave ovens, may require more plastic (30 x 30). Ensure that all seams are sealed with masking tape.

(3) Draw up the plastic and tie at the center top.

(4) Allow the cart to be fumigated with carbon dioxide for at least 24 hours.

(5) Repeat this process at least once a month or sooner if an active infestation is noted.

b. Nonresidual insecticide contact sprays and dusts may be used to control active cockroach infestations by using the following procedures:

(1) Drill small holes into the carts that will allow treatment of the void areas.

(2) Treat structural parts and void areas via the drilled holes, using a hand sprayer or aerosol container with an extension tube that emits a pin stream. Sprays or aerosols should <u>not</u> be used near heat; therefore, ensure that food carts with self-contained food warming devices are not in operation and that the heating device has cooled completely before applying insecticide.

(3) Dusts or gels may also be applied through the drilled holes. Apply only to the void areas or inject carefully into cracks and crevices, avoiding surfaces above food tray areas. If not properly applied, the dust or gel may be removed during routine cleaning or may be knocked onto food during transport.

(4) Following treatment, close the holes with sheet metal screws. These screws can be removed for subsequent insecticide treatments.

(5) Following treatment, do <u>not</u> use the cart for the transport of food to patients for at least 24 hours.

(6) Nonresidual contact sprays and dusts may also be applied when carts are partially disassembled for repairs or maintenance.

c. Residual insecticides should never be applied to food carts because of the increased danger of contaminating food items.

APPENDIX A

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APPENDIX C

EXAMPLES OF MEDICAL TREATMENT FACILITY AREAS

Administrative, Maintenance and Utility Areas

Autopsy Room

Bookkeeping and Office

Doctor and Staff Lounges

Housekeeping Areas, including Closets

Laundry

Lobby, Gift Shop, Chapel

Locker Room

Oxygen and General Storage

Repair Room

Therapy

Waiting Room

Disposal Area

Mechanical room

Nuclear Waste Area

Utility Area (Clean and Soiled)

Patient Sensitive Areas

Doctors' Scrub Room

Emergency Room

Intensive Care Unit

Laboratory

Nurses' Aid Station

Nurses' Station

Nursery

Operating Suite

Patient Room

Pharmacy

Sterile Rooms and Central Sterile Supply

Ward

X-Ray Room

Food Areas

Coffee Shop

Dishwashing Area

Food Assembly Area

Food Packaging Area

Food Preparation Area

Food Receiving and Storage Area

Food Service and Dining Areas

Master Kitchen

Vending Machine Area