

September 11, 2002

UNDER SECRETARY FOR HEALTH'S INFORMATION LETTER

MYIASIS

1. Background. Myiasis is the condition of infestation of the body by fly larvae (maggots). Myiasis is a worldwide issue that should concern every hospital and health care facility. The complexity of health care, the aging of the population, and the severity of illness of many patients in health care facilities creates a venue in which myiasis can occur. While the adverse patient care consequences in the United States are almost always modest, the other implications can be prominent. It is reasonable, therefore, to provide information regarding myiasis with particular emphasis on prevention and intervention if myiasis is discovered. While intestinal myiasis is also known to occur, this Information Letter will address primarily the cutaneous form.

2. Prevention. There are two components to the issue of myiasis prevention. The first is care (inside and outside the health care facility) of at-risk patients to prevent infestation particularly related to chronic skin lesions, and the second is the environment of care that could influence the potential occurrence of myiasis.

a. Prevention in Patients with Chronic Skin Lesions and Wounds

(1) Most flies that cause myiasis deposit eggs or larvae directly onto the host at predisposed sites, such as chronic wounds and necrotic or infected tissue. Blood, body fluids, body substances, excrement, and volatile products of putrefaction act as olfactory attractants for common flies. **NOTE:** *Healthy hosts are at less risk for myiasis.*

(2) To prevent myiasis in wounds, the following recommendations are provided:

(a) Standardized wound care needs to be established through policy, protocol, procedure and/or dedicated wound care team.

(b) Chronic wounds, regardless of their etiology, need to be dressed at all times.

(c) In general, dressings need to be changed and the wound visually inspected daily.

(d) Dressings that are leaking, wet, or malodorous need to be promptly removed.

(e) Wounds heal better in a moist and covered environment, not open and dry.

(f) Even small cuts and abrasions need to be covered.

(g) A total skin examination needs to be performed on all patients.

(h) Staff, patients, and families need to be educated about proper wound care.

(3) Other patients at risk for myiasis include those with depressed levels of consciousness, or decreased mobility, and the homeless.

b. **Environment of Care.** With respect to the environment of care, the key to prevention of myiasis in a health care facility is to minimize the number of flies that could come into contact with patients. This is a complex issue that involves multiple services throughout the facility. Both the external and internal environment of the facility must be considered. Of critical importance is the fact that fly reduction is everyone's responsibility, since even small sites where flies can multiply can dramatically increase the number of flies in the facility. Attachment A gives strategies for decreasing the fly population in and around health care facilities. Ongoing attention and monitoring is critical to the success of fly prevention programs. Such an ongoing prevention program is the lynchpin for myiasis control in a facility. As a component of the prevention program, cleanliness and sanitation within the facility and outside the facility cannot be overstated. Specifically, cleanliness and sanitation cannot be considered merely an aesthetic need, but they are critical to the well-being of everyone in the facility. A specific cleaning regimen, including cleaning intervals and protocols, needs to be in place with continued vigilance that all is being accomplished as planned. Sample schedules and protocols can be found in the Emerging Pathogens Guidebook available at VA facilities. **NOTE:** See <http://vaww.ceosh.med.va.gov>

3. Pest Control. Pest control is critical to prevention of myiasis and mitigation of the problem should it occur. Attachment A provides some examples of programmatic initiatives that can be useful in dealing with flies. It should be noted, again, that pest control is everyone's responsibility, not just the pest control officers'. Even small areas that allow amplification of the fly population can increase the risk of myiasis in the facility. Everyone is encouraged to contribute to the cleanliness and sanitation of the facility. In addition, structural components of the facility are also important with particular emphasis on areas where flies can enter the premises. Overall, an integrated approach to pest management that uses multiple modalities with contribution by all VA employees is the goal of a myiasis prevention and mitigation program.

4. Education. Education regarding prevention and control of myiasis is critical to an overall facility program. The education needs to include all levels of VA staff since everyone has a contribution to make to prevent the occurrence of myiasis. It may be cost effective and appropriate to combine education for myiasis with education for other infestations such as scabies, lice, and potentially disease-associated vectors such as bats and rodents. Generally, information regarding these issues is not well known, and all staff would likely benefit from more information.

5. Intervention

a. Intervention strategies, if myiasis needs to occur, must be carried out on multiple levels. Attachment A identifies some strategies for implementation considerations. If human myiasis occurs, several considerations are to be kept in mind. Care for the patient is the first priority, and this is described in paragraph 6. The second issue is mitigation of the factors contributing to or associated with the infestation. Since health care-associated myiasis is generally related to a source of flies, mitigation needs to be begun by addressing that situation.

b. It is appropriate to appoint a single person to lead the mitigation effort at the local site. This ensures organizational continuity in the abatement efforts. Areas for coordination of efforts include pest control, the environment of care, and, as needed, public relations issues regarding myiasis. Senior leadership needs to be closely involved with the entire process, since specific actions may require focused management support. Follow-up is necessary in order to ensure that identified problems are rapidly and efficiently resolved.

c. The identification of the specific genus and species of the larva(e) is often appropriate. Identification is somewhat complex since dead fly larvae may be difficult to identify even by an experienced entomologist. Sending live larvae that will mature into identifiable flies is complex in that sending the larvae to an available facility with the expertise to nurture the organism to maturity and then for identification, necessitates careful transport. **NOTE:** *VHA Program Guide 1850.2 Integrated Pest Management (IPM) October 5, 1998, lists contact numbers for the individual states where organism identification could potentially be accomplished.* Identification of the specific organism can be important to local and overall VA risk management. In rare cases, identification may influence individual patient care if an unusual organism is found, and, occasionally, can have epidemiologic value, if used in conjunction with other cases in a geographic area. It is less clear that identification specifically affects the pest control effort unless an unusual organism is found. It is important to participate in any fly larval identification effort, if it is being done for the purposes of public health in a geographic area that includes VA and non-VA facilities. Whether or not live larvae are submitted for identification, it is appropriate for several larvae to be placed in alcohol or formalin and sent to Pathology, as would be done for any other clinical specimen from a patient, to generate an official pathology report and for future reference or identification.

6. Patient Care

a. If fly larvae are found on a patient, they need to be removed. While the issue of the beneficial effects of such an infestation for cleaning a wound may be medically relevant, this only needs to be done when using laboratory-reared, disinfected fly larvae. Leaving fly larvae in a wound for their putative benefit is not a general standard of care.

(1) There are multiple modalities suggested for removing fly larvae from lesions or wounds. A clinically reasonable approach would be to:

(a) Follow standard precautions, including gloved hands;

(b) Wipe the wound with sterile saline, hydrogen peroxide (3 percent), or Dakin's solution moisturized gauze; and

(c) Dispose of the wet gauze and the organisms in appropriate waste containers.

NOTE: *It is appropriate to preserve several of the fly larvae in alcohol or formalin to be sent to Pathology for an official report and for possible future identification.*

(2) To deal with any remaining organisms, the wound can be soaked for 20 minutes using one part hydrogen peroxide (3 percent) mixed with four or five parts of room temperature sterile saline or sterile water. The wound can then be irrigated with sterile water or sterile saline. All of these modalities are more difficult if the wound is in a complex location, rather than on an extremity. In all cases, consultation needs to be obtained from Dermatology and/or Surgery to ensure that care for the individual patient is optimized.

b. With regard to the linen from a patient who may have or had a larval infestation, it is to be handled in the same manner as used for all soiled hospital linen. All soiled hospital linen is considered contaminated. Standard precautions need to be used in dealing with the linen associated with patients with myiasis. The laundering process, following VA specifications, is adequate for any soiled linen.

c. The issue of immunization with tetanus and diphtheria (toxoids [Td]) is important. While the evidence is not entirely clear that tetanus immunization is required for patients with myiasis, patients with chronic wounds or skin lesions may well benefit by ensuring the individual patient's immunization for tetanus is up-to-date. This includes ascertaining that the patient has had primary immunization for tetanus and that the patient is current with the most recent recommendations from the Centers for Disease Control and Prevention's Advisory Committee on Immunization Practices for tetanus immunization.

d. Lastly, it is to be noted that myiasis is not just a health care-associated occurrence, but it can be seen in other patient groups including the homeless, any person with chronic open skin lesions, those who are comatose, and other debilitated persons. **NOTE:** *It is important to note that this Information Letter applies whether the patient has health care-associated myiasis or presents to the health care provider with myiasis from the community.*

7. Conclusion. Myiasis is an important condition in medical care, whether it is health care-associated or community-acquired. The hallmark of a myiasis program is an ongoing prevention effort that is multidisciplinary and includes the entire health care facility workforce. Through vigorous prevention strategies and mitigation efforts, myiasis can be addressed in a deliberate and appropriate manner. The key to success is continued and ongoing attention to appropriate prevention and control concepts with resolution of identified opportunities for intervention as they occur.

8. References

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- n. VHA Manual M-1, Part VII, Chapter 14.
- o. Wilson, M. Up-To-Date. www.uptodate.com. Vol 9, No. 2. Skin Lesions in the Returning Traveler.

8. Inquiries

- a. For questions related to the clinical aspects of myiasis, contact the Office of the Program Director for Infectious Diseases, Dr. Gary A. Roselle, (513) 475-6398.
- b. For questions regarding pest control, sanitation, and linen contact the Environmental Programs Service at (202) 565-8525.

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c. For questions regarding general programmatic and safety issues, contact the National Center for Patient Safety at (734) 930-5890.

S/ Louise R. Van Diepen for
Robert H. Roswell, M.D.
Under Secretary for Health

Attachment

DISTRIBUTION: CO: E-mailed 9/11/2002
FLD: VISN, MA, DO, OC, OCRO, and 200 – E-mailed 9/11/2002

ATTACHMENT A

FLY CONTROL IN HEALTH CARE FACILITIES

1. There are very few places where flies are less welcome than in a health care facility. Nevertheless, it is a setting that holds numerous attractions for them, such as the presence of food, moisture, and a temperate environment. Although sanitation measures in health care facilities are generally stringent enough to inhibit their breeding, the amount of human traffic in and out of a health care facility makes complete exclusion of the highly mobile adult flies extremely difficult. During warm weather, the adult fly population is ubiquitous in society at-large. Herein lies the problem: the fly is an opportunistic pest.
2. Sanitation is an important element of integrated pest management. There must be an ongoing and concentrated effort to reduce the "bio-burden" of soil that is constantly being introduced into the health care environment. Routine inspection of all areas to determine what services are needed is essential to provide the right amount of effort at the right time to the most critical need. Scheduled cleaning, or waste removal, for specific areas is appropriate if the soil and waste generation is consistent. However, with changes in waste generation and variation in waste composition, constant adjustment of effort brings efficiency and effectiveness to the environmental sanitation program.
3. The frequent collection, containerization, and removal of waste prevent the opportunity for pest infestation within or around the health care facility. Disposable waste container liners or the practice of consistent container and storage area cleaning further eliminates pest-breeding areas. *NOTE: The containers need to be equipped with lids.* Collection, or storage areas, need(s) to be designed to both secure the waste and to enable easy and constant cleaning, e.g., self-closing and locking doors, floor drains, hot water bibs, glazed tile walls, and negative air pressure. Dumpster areas may be problematic as they are often serviced by contractual arrangement, and the responsibility for cleaning and area policing are sometimes not well defined. The contract needs to be specifically define the responsibility of the contractor in relation to pest control and sanitation. Local facility policy needs to address all pest control and sanitation issues not included in the contract. This area is to be well maintained in order to eliminate food and the harborage that serves to attract pests. The location of dumpsters and waste receptacles needs to be considered carefully to avoid close proximity to access points to the facility.
4. Mechanical or physical exclusion from structures (including screening, caulking, self-closing doors or barriers such as air-curtains or flaps) coupled with positive air-flow, and air intake controls, do much to prevent wholesale infestation; however, constant attention needs to be given to prevent the purposeful override of those exclusions. Individuals who open unscreened windows, prop open doors, leave litter, etc., are generally not aware that they are potentially affecting the well-being of the patients and employees. Consistent vigilance, education, and reinforcement is necessary.
5. If flies or other flying pests are observed in a health care facility, the staff needs to clearly understand the necessary procedures as a first step for mitigation. The office and/or individual responsible for pest management needs to be notified immediately. If it is possible to segregate the area, i.e., close a door so that the pest may be identified and eliminated, it helps to manage

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the situation. The use of space sprays, commonly used in residential settings, are seldom suitable in the presence of confined individuals who may be particularly sensitive to the potential toxicity of these chemicals, and may have allergic reactions; likewise, the fly swatter is an inappropriate tool in a health care setting. However, a portable vacuum cleaner, equipped with a HEPA filter, is an excellent flying pest management tool and is recommended.

***NOTE:** Pesticide application for macro-organisms can only be performed by certified, licensed pest control personnel.*

6. The insect light trap (ILT), which introduces no chemical hazards to the environment and provides a continuous source of control may be one of the most favorable options to prevent incursion of flying insects into the health care facility. Typically, large electrocuting models are used in combination with alcoves, vestibules, and air curtains at access points out of public view, as: entrances, receiving docks, storage areas, and waste collection or holding points. ILTs utilizing glue-boards for silent capture are more appropriate for customer entrances and along all principal access routes used by the public. Smaller decoratively designed versions of this type are frequently used for aesthetic reasons to intercept flying insects in areas where their removal is more critical, as the access routes leading to: surgery, intensive care, and laboratories.

7. Additional information concerning sanitation, waste management, and pest management policy is contained under paragraph 7 of the main Information Letter. They include: VHA Handbook 1850.2, Integrated Pest Management, and M-1, Part VII Chapters 2, 4, and 14.