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CRITERIA FOR SMALLPOX IS-

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CRITERIA FOR SMALLPOX ISOLATION PREMISES

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Isolation of smallpox patients is required to both prevent the dissemination of infection from the patients to others and to provide appropriate care for the patients. The importance of the former is apparent, but increased attention is required to prevent the infection spreading among hospital personnel and other patients. With regard to the latter, it should be noted that experience has shown that families and patients are often reluctant to report illnesses to the health authorities. Often there is fear that proper treatment will not be provided during hospitalization, and the hospital personnel and premises often do little to dispel this fear. Efforts should be made to provide appropriate treatment in clean and comfortable surroundings and in facilities suited to local customs.

Criteria for smallpox isolation premises should be planned in accordance with the availability of health facilities. In developing isolation facilities, there are some considerations that should be observed. These may be listed as follows:

- a) All personnel caring for smallpox patients must have been properly vaccinated with potent smallpox vaccine, and must be revaccinated at least at three year intervals.
- b) The isolation premises should be clearly distinct from other parts of the facility.
- c) Within the isolation area there should be a clear distinction between contaminated and clean areas, with handwashing facilities in each area;
- d) Strict attention to medical aseptic techniques must be observed by the hospital personnel, or others caring for the patient. Thorough handwashing by personnel who deal with contaminated material and patients, is the most important single feature.
- e) Regulations regarding the disposal of contaminated material must be established so that such material will not be a hazard to others not in the isolation unit.
- f) Visitors must be excluded or limited to those with evidence of a recent effective vaccination.

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Several types of smallpox isolation facilities are in use in endemic and non-endemic countries. In this paper, attention is given to criteria for smallpox isolation wards in infectious disease hospitals, perhaps the most frequently used type of isolation facility, and for home isolation, which may be preferred in rural areas of endemic countries. Other types of isolation large house isolation, smallpox isolation station, etc. may also be used, but the principles to be described for these representative facilities may be applied to such units as well.

1. Smallpox Isolation Ward in an Infectious Disease Hospital

It is customary to maintain or develop a smallpox isolation ward in an infectious disease hospital under the following three conditions:

- a) In highly endemic areas where the population density is also high. Large cities with a population of over a million located in endemic areas usually maintain such facilities.
- b) In a smallpox-free area where smallpox has been recently introduced.
- c) In a presumably low incidence or smallpox-free country where smallpox suspects are occasionally reported and isolation of patients is required until the diagnosis can be confirmed.

In the first instance, the ward would be a permanent facility used until smallpox disappears from the area. In the last two instances, arrangements might be temporary or provisional requiring alteration of the existing facilities of the hospital to provide proper facilities. For each of these, the general criteria for operation would be similar.

Location of the Ward

a) The site of the isolation ward in the hospital should ideally be in a building distinctly separate from that utilized for the care of other patients. If this is not possible, a separate wing or floor should be selected which ensures as much separation as possible of the isolation ward from the remainder of the hospital.

b) The isolation ward itself must have a separate contaminated area (patient ward) and clean area (for service and supplies). Supplies from other parts of the hospital should be provided only through the clean area. ~~Individual supplies and equipment used frequently, such as bedpans, thermometer wash basins, etc. should remain in the patient's bedside unit in the contaminat~~ area.

c) An "intermediate area" between the contaminated and clean areas is also desirable. This area serves as a vestibule where staff can change their hospital gowns and shoes for those to be used only in the contaminated area.

d) A separate entrance to the unit is needed for admission of patients and removing contaminated material for disinfection or incineration. This entrance should not be the main entrance of the infectious disease hospital. Further, it should be a direct communication for the isolation ward to the outside.

e) It is also necessary to set up an observation unit where suspected patients can be accommodated until the diagnosis is confirmed. This observation unit may be a temporary establishment outside the isolation ward but located nearby in the hospital ground. In areas with a warm climate, tents have sometimes been used for this purpose.

Staff and Clothing

Staff: Sufficient hospital personnel should be trained for duty in the ward to provide reserves for increased case loads. These personnel, as emphasized previously, should have been revaccinated successfully at least within the last three years. It is also advisable to vaccinate their families at similar intervals.

Clothing:

a) When entering the intermediate area of the ward, the staff should change their clothing and don gowns. These should be tightly fitting at the neck and wrists and overlap at the back. It is also desirable to wear a head cover, mask and special shoes which remain in the unit or shoe covers to prevent crusts or other contaminated material being carried on the soles of the shoes. A small pad or mattress soaked in disinfectant is useful as a doormat between the contaminated and clean areas to aid in removing infected material from shoes.

b) After work in the contaminated area, the staff should change their clothing again in the intermediate area before entering the clean area. They should wash their hands and arms thoroughly with soap and running water. It is desirable for the staff to wear short-sleeved uniforms under their gowns.

c) The "discard method" is preferred for clothing used in the contaminated area. The gowns, masks and other clothing used in the contaminated area are to be placed in a discard container in the intermediate area of the ward for disinfection and laundering.

Patient Care

Bed, food, clothing and toilet facilities are essentials which must be provided for the patients. Some entertainment, such as radios and books, are greatly appreciated by patients during the convalescent stage. Visitors should be greatly restricted or forbidden. If any are allowed to see the patient, it should be confirmed in advance that they have been properly vaccinated within the previous three years. Revaccination of visitors by hospital staff provides further assurance of immunity.

Cleaning and Disinfection

a) Floors in the isolation ward should be cleaned with a wet mop and soapy water. They should not be dry-swept.

b) Steam sterilization or incineration are the preferable methods for treating the contaminated materials (reusable or discarded) from the isolation ward. Since these materials must be transported to the autoclave or incinerator from the isolation ward, particular attention should be paid to prevent the materials becoming a source of infection en route.

1) The double container system is useful. The containers for the contaminated material, such as bed clothes, eating utensils, etc. may be placed in an outer container, made of a large (preferably plastic) bag, when it leaves the ward for further disinfection procedures.

ii) If such a system is not available, the contaminated material should be soaked for about 24 hours in disinfectant, which can be kept in the entrance to the contaminated area. Coal tar derivatives such as lysol (2.5%) or formalin solution (2.5 to 5%) are the usual disinfectants for such purposes. After this treatment, the material can be handled safely for further processing. Particular attention ~~should be paid to the treatment of contaminated linen which not~~ infrequently produces smallpox infection in laundry workers.

iii) The treatment of patients' excreta should be carried out following the method described in ii).

iv) Disposable paper plates or cups are convenient eating utensils since they may be burned after use.

c) With regard to the disposal of patients who have died of smallpox, the practices so far employed in some countries are reviewed by Dixon⁽¹⁾ and the Memorandum of the Ministry of Health, Scottish Home and Health Department⁽²⁾. The recommendations may be summarized as follows:

Cremation on the hospital premises is preferable. If this is not possible and the body is to be transported to the place of burial, it should be enshrouded after being sprayed with disinfectant and the coffin packed with cotton wool or sawdust saturated with disinfectant. Another method to prevent infection during transportation and burial is to place the body, after disinfection, in a polythene bag. The outside of the bag should be thoroughly washed down with disinfectant and then it may be safely placed in the coffin. In this case, it would be necessary to seal a glass tube plugged with cotton wool into the opening of the bag so that gas production will not rupture the bag.

d) When the area becomes free of smallpox, the hospital ward, after suitable disinfection, can be reused for the admission of other patients. Dixon's proposal can be considered as a useful suggestion for this, as partly quoted below with some modification.

Rooms:

Method A - vacuum, burn the dust, wash floors with soap and water, expose to air and sunlight for 48 hours. Steam-disinfect bedding, curtains, and other removable fabrics.

Method B - remove fabrics for steam disinfection, etc., followed by disinfection with formalin solution.

Hospital Wards:

Vacuum, wash down walls, disinfect with formalin, expose to air and sunlight for 48 hours, reoccupy. Repainting has a valuable psychological effect on subsequent occupants.

Ambulances:

Wash with soap and water and treat removable cloth materials as above.

Spray with disinfectants such as formalin solution (2.5%). The ambulance is left sealed for one hour, then opened.

Bedding:

- (a) If stained, soak in cold water, steam disinfect.
- (b) Soak in lysol (2.5%), 24 hours, launder.

Blankets:

Steam disinfect.

2. Home Isolation

The criteria discussed represent the standard techniques presently used within smallpox isolation facilities. In rural areas in many endemic countries, such facilities are not available. In such cases, patients may be isolated in their homes under the supervision and guidance of the health officer. Particular measures must be taken, however, to isolate such houses. Special dwellings may be assigned for isolation purposes. A limited number of persons (the health officer and the patient's family) should be allowed to enter to provide medical and personal care for the patient. Heavily contaminated materials, such as soiled clothes, should be burned after use by the patient. Other articles may be exposed to sunlight or boiled. In West Africa, a few smallpox outbreaks have been observed after funerals, therefore the disinfection and burial of the dead should be done under the guidance of the health officer. Vaccination of all persons involved with the preparation of the body is required in order to avoid further disease.

References:

- (1) Smallpox, C. W. Dixon. 1962.
- (2) Memorandum on the Control of Outbreaks of Smallpox, Ministry of Health, Scottish Home and Health Department. 1964.

Suggested Reference:

Communicable and Infectious Diseases, Franklin H. Top. St. Sixth Edition 1968. Chapter 7. Pages 95-114.
(Further references are available from Chapter 7).