

Cross Infection in Hospitals (5)

By

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Fingers are the most dangerous disease producing carriers and so members of the hospital staff should take meticulous care of their hands and to thoroughly wash them with soap and running water before and immediately after attending to patients and handling specimens or excreta. Roller towels should not be used in the hospitals. The use of communal towels should be avoided; clean separate towels should be used for each person. Paper roller towels are the ideal.

Linen

Great care should be taken in handling soiled linen. Special canvas bags on stands which can be wheeled to the bed-side should be provided and these bags taken away by *dhobi*. Fouled linen and linen from infectious wards should be disinfected by steeping it over-night in white fluid (one in 160). Every ward should have a bin of disinfectant solution reserved for this purpose. Some hospitals are provided with special autoclaves for disinfecting and sterilizing infectious linen, mattresses and pillows, which is a very good idea.

Napkins should not be washed in the wards. Covered bins containing "white fluid" should be provided and the napkins should be taken to the laundry in a bin. Napkins must be boiled; the boiling process in the laundry should kill all non-sporing micro-organisms.

Kitchen and store rooms should be kept scrupulously clean and free from vermin and flies. Milk and milk products and other food stuffs, which need cold storage, should be kept in refrigerators. But penicillin, blood, or pathological specimens should not be kept in the same refrigerators. Milk should be pasteurised and storage and distribution

attended by scrupulous cleanliness. Nursing mothers should be encouraged to continue breast feeding of their infants even in hospitals. Every possible obstacle should be overcome. The kitchen should be provided with facilities for washing and sterilizing the dishes, cutlery, crockery utensils etc. Towels should not be used to dry them but must be aired to dry. Infants feeding bottles should be rinsed, cleaned and sterilized *after each use and kept covered*. Milk kitchens should have the necessary arrangements for the purpose.

Ward Articles

Each patient should be provided with individual thermometers during his stay in the hospital. Exchange of articles between patients should be prevented. The toys should be provided from the hospital for infants and should be washable. Proper disinfection of these articles should be done before being taken to another. Books present a great problem, but they can be disinfected by exposure to sun or autoclaving.

Dressing wounds, both clean and infected, should be done with meticulous attention to aseptic principles preferably in special rooms with air purification plant and with 'no-touch technique'. If this is not possible, the ward should be closed to non-essential traffic as soon as the dressings are begun. Windows should be closed and sweeping should be done at least one hour before any dressings are begun. The dressings too complicated to be managed with forceps, can be done with sterile gloved hands.

Proper disposal of soiled dressings should be done. Bins with lids and foot pedals are the best. Where possible the destructor bins, laundry and sundry bins should be kept on a platform outside

the ward annex. Provision should be made for the collection of these bins from outside so that they do not have to be taken through the ward or corridor. These bins and their lids should be thoroughly disinfected both inside and outside after emptying and before being returned to the ward. A new machine for this purpose is now being used in some hospitals abroad and is proving very satisfactory. The final disposal should be by incineration, ward incinerators are a great asset.

Baths should be disinfected between each use. It is best to provide individual baths or showers as far as possible.

Post-mortem room should have adequate supply of clean gowns, gloves, and overshoes which should be discarded on leaving the room and facilities for a shower provided.

Control of Droplet and Dust Borne Infections

Ventilation should be as free as possible throughout day and night, and light must be adequate preferably day light.

Masks

Masks should be worn by the members while attending to children, while handling children feeds, when attending labour cases, while in the theatre and during all surgical nursing procedures. It should be of correct size to cover both nose and mouth with six layers of 40 mesh gauze, with a layer of cellophane in between. There should be an adequate supply of clean masks in the wards, theatre, casualty and out-patient departments. Indiscriminate use of masks is more dangerous than not wearing them at all. Masks should not be reworn, touched inside, left about the ward or carried in the pocket of the staff. Immediately after use, they go into a receptacle of disinfectant.

Dust Control

Dusting should be reduced to the minimum by limiting the movement of persons, damp dusting and sweeping of floor, or vacuum cleaning. Surely in our hospitals the broom and dry sweeping should be completely replaced by

vacuum cleaning. In new hospitals, we should provide a built-in suction system to which the ward cleaners have only to attach the nozzles and flexible tubing. While bed making, the blankets and pillows should be handled gently to reduce the scattering of dust. An application of spindle wood oil is used in some countries as an effective dust-control measure.

Ultra Violet Rays

Ultra violet radiation is now produced on a commercial scale, to reduce the bacterial population in hospital wards, theatres and food stores. Ultra violet lamps are useful for this purpose. But their installation should be regarded as a luxury unless every other precaution is already taken to reduce the number of bacteria in the air.

Sterile materials, instruments, food, milk etc., should be kept in covered containers to protect from dust and crockery and china in cupboards. Any article which falls on the floor should be regarded as infected.

The hospital should be made fly proof and D.D.T. or other insecticides should be used to control flies and cockroaches.

Sterilization

In aseptic surgery, sterilization of equipments and hospital supplies is absolutely essential to kill all pathogenic organisms, no matter how resistant. This is achieved in hospitals by moist heat, dry heat, chemical substances, physical agents and filtration. The operator of a sterilization unit, and nurses, should understand the principles (limit, advantages, and disadvantages) of the methods adopted.

Sterilization by moist heat

Moist heat is lethal to bacteria at a lower temperature than dry heat. Boiling water and steam under pressure are the common sources of moist heat. Steam under pressure by an efficient autoclave is ideal for sterilisation of textiles, dressings, instruments and bowls. The operator should have a thorough

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knowledge of the underlying principles and the working of the autoclave. Anhydrous oils, greases and powders cannot be permeated by steam.

Dry Heat

Dry heat or hot air sterilization is less dependable because it is difficult to ensure an even temperature in all parts of the hot air oven. But it is the method of choice for needles, syringes, cutting instruments, powders, wax and oils.

Chemical Substances

Bacterial death depends on the concentration of the disinfectant and the time during which it acts. The failure of most disinfectants to kill bacteria present in a wound without impairing the vitality of the tissues, and to kill spores, limit their use in reliable sterilization procedures.

Physical agents, include sunlight, ultra-violet light, drying and high frequency sound waves. Sun light has a definite bactericidal action due to a combination of heat, ultra-violet radiation and drying. Rooms and articles that have been contaminated by bacteria, are benefitted by frequent exposure to the sun.

Sterilization by Filtration

Is used only for the preparation of serum, antibiotic solutions etc., which cannot be sterilized by heat. Recently attempts have been made to purify the air of wards and operating theatres by passing it through filters made of cotton wool, felt, glass wool. But these filters are not highly efficient and unless maintained properly are a menace in that they give misleading belief.

Central Supplies

The desirability of having in our hospitals a central sterile supply department for the issue of syringes, saline solutions, dressings, infusion sets and other various needs of the wards, is gaining momentum day by day. The American Hospitals led the way in this respect and started central supply departments as early as 1937. The importance of such a department was stressed by the

Nuffield Trust Reports in 1955. The non-existence of such a department was responsible for very many serious and fatal infections in the past years. Every hospital, big or small, should have a central supply department with a well experienced senior sister in charge.

Staff Education

The prevention of infection in hospitals depends on a high sense of personal obligation in every member of the hospital staff including nursing and medical students. They must have a sound drilling in the prevention of infection, backed by enough knowledge of bacteriology and hygiene, stressing the importance of personal cleanliness, to make them think imaginatively what they are doing. There is no hope of getting nurses to observe stringent technique, if they see it continually infringed by others. The doctors also have the responsibility in setting an example of good technique. The ward sister has an important duty to fulfill in teaching sound hygiene practice to her staff and students, and in maintaining a high standard of aseptic technique in the hospital. Domestic, kitchen and other staff should be given elementary instruction in hygiene and its relation to their particular duties and responsibilities. All members of the hospital, no matter who, if he is in any way concerned with the patient and the ward, should be drilled properly in procedures they have to do.

Ward sisters, teaching sisters and administrators would benefit from refresher courses in preventive measures of cross infection at intervals. The ward sisters should not stay too long in one ward lest their methods become too rigid. Films should be shown periodically about the dangers, prevention and control of cross infection. Lectures should be given which will give them up-to-date knowledge in modern developments of preventive medicine and the staff should be compelled to attend them. Periodic conferences of the hospital staff and of the administrators of different hospitals to discuss the problems they are meeting every day, will help to exchange their views and ideas in the prevention and

control of cross infection.

Conclusion

A great deal has been done to reduce the incidence of infection of all kinds, but the time has not yet arrived when we can let down our guard. In fact there is some evidence that we should be increasingly on the alert to prevent infection from developing in patients after they enter the hospital. The indications are clear, but the necessary procedures require constant careful attention. Unless we give this our attention, we will not be looking after the best interests of the patient or using our hospitals with maximum efficiency and infections acquired in the hospital will increase.

Every hospital should have a clear idea of the working procedure in the prevention of cross infection. It would be a salutary thing if each hospital carry out a combined clinical and bacteriological survey of all their clean surgical cases, for a period of at least one year. This would give the true position of that hospital and a valuable yard stick by which to compare its own results from year to year. It might also bring to light some of the sources of those troublesome cross infections.

In our large hospitals, we often see many chiefs—Medical Superintendent, Matrons, Surgeons and Physicians—all of them concerned with this problem but without any provisions for any body to take any responsibility in seeing that things are done properly, such as whether sterilizers are functioning properly, whether the blankets are being sterilized in the laundry after use by a patient with a streptococcal infection, or whether adequate provision is being made to prevent flies breeding in dust bins etc.

It would be ideal if an infection-control officer is appointed to take care of these things. He may be authorised to make an immediate survey when any instance of cross infection occurs in the hospital and issue a report on his investigations. Thus the mistakes can be easily recognised from any procedure and rectified.

The appointment of such an officer might well prove to be an economy

because in exercising his functions, he would inevitably exert a check upon the enormously wasteful and very often ineffectual use of disinfectants, antibiotics and other antibacterial agents, which is still prevalent in most of our hospitals. By reducing cross infections he would correspondingly increase the value of the hospitals' service to the community.

(Concluded)

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