Cross Infection in Hospitals

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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 a chabi. Fouled linen and linen from infectious wards should be disinfected by steeping it overnight 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-sporeng 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 re-worn, 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

During raising 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
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 needless, syringes, cutting
instruments, powders, wax and oils.

Chemical Substances

Bacterial death depends on the con-
centration 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 con-
aminated 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 main-
tained properly are a menace in that
they give misleading belief.

Central Supplies

The desirability of having in our
hospitals a central sterile supply depart-
ment for the issue of syringes, saline
solutions, dressings, infusion sets and
other various needs of the wards, is gain-
ing momentum day by day. The Ameri-
can 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 dril-
ing 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 main-
taining 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 re-
resher 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 carried 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 yardstick 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 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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