

Cross Infection in Hospitals

By

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Circumstance which Contribute to Cross Infection

Wards

Many of the measures to prevent cross infection in hospitals, recommended by the Medical Research Council (London) are not in operation in most hospitals although in some hospitals they attempt to follow these principles. Most of the wards are of the large open type which the council has described as obsolete. Some hospitals have no single rooms. Some are divided by temporary partitions. The distance between the centre of the bed vary considerably. Almost all hospitals depend on large windows for cross ventilation, and there is no consistent policy towards opening or shutting windows. They are ill equipped in other ways. These defects of structure and equipment are all naturally a great handicap to the staff and make the prevention of cross infection difficult. The outstanding defects are the lack of space, the mixture of clean and dirty functions, the association of patients baths and water closets and general congestion. It is not unusual to see sluice rooms, bath rooms, corridors, and toilets accommodating personal belongings of hospital staff along with brooms, dusters mackintoshes, dirty linen bins, garbage tins, and the dressing trolley. In some wards there are not enough wash basins for the nurses to wash their hands. Very few hospitals have modern multiple sink units for washing up in each wards. In most hospitals it is an unsatisfactory procedure with one sink and the drying towels used are found to be heavily contaminated.

During the ordinary process of bed making, dusting and sweeping, bacterial count in the air rises rapidly. Blankets are the worst offenders because they

liberate so much fluff and also because they are rarely sterilized in hospitals. Very little is done inwards to suppress dusts.

Many infections in hospitals can be attributed to organisms expelled from the throat and nose of patients suffering from infective conditions of the upper respiratory tract. It is learned that every time the dressing on a wound is disturbed in the open ward, there occurs a scatter of thousands of subvisible particles carrying pathogenic bacteria into the surrounding air. These are transported by air currents to another patient's wound and the number of wounds infected in this way is very large. The increasing number of hospital inmates both patients and staff who are carriers of staphylococci resistant to antibiotics in their noses, without manifest signs of infection, offers another difficult problem in cross infection of wounds and treatment. No course of elementary hygiene is held for the domestic staff. The nurses who do relieving duty are seen to work in nurseries, diet kitchen, milk kitchen and theatres after coming from infectious wards, sluice rooms etc.

The numberless organisms expelled on to handkerchief, hands, bedding and clothing call for very special precautions — precautions which are seldom taken in most of the hospitals. Since bedding is often contaminated with pathogens, it is surprising that nurses hands may transmit them. This menace occurs more frequently in wards where ear, nose, throat, accident and burns cases are treated because the conditions in these wards are always favourable to infection. Many patients are infected already on admission.

Intravenous infusions, anaesthetic machines, hot water bottles and covers, and the ordinary trolley on which patients

are taken to and fro have also been incriminated as carriers of infection. The unsterile water or saline used for rinsing syringes or sharp instruments that have been kept in antiseptics unknowingly transmit infections. It has been shown that in a bacteriological investigation done in an infant ward, cribs, linen—in fact everything was contaminated with intestinal organisms of a specific type. In other cases flies, cockroaches and other insects have been proven as transmitting agents.

Only few hospitals provide a thermometer for each patient. In some hospitals the average is one thermometer to twenty or thirty patients and the disinfectant used is changed once a week, or daily which is still an existing bad practice.

A fairly uniform disposal of dirty dressings is in operation in most hospitals. The garbage bins and the dirty linen containers have often to be carried the length of the ward to be emptied. Usually the porters do this job, but in some hospitals the nurses carry the bin to empty into the larger bin. Provision has not been made in most hospitals for the proper cleaning and disinfection of these bins.

Some hospitals still count their linen in wards. The soiled linen is then taken to the sluice room and stuffed into either a bag or bin with lid. Sometimes there will be so much soiled linen that it is impossible to close the lid or the top of the bag. Some wards rinse grossly contaminated articles in the sluice room sink or bath room before sending them to the laundry.

The advances that have been achieved in our operation theatres have had no counterpart in the management of the wards. Even the most modern hospitals have no treatment rooms with controlled ventilation where dressings could be done. The covering of an open wound by the conventional sterile dressing affords only less protection than that is supposed to give. If the dressings become soaked with exudate many pathogens from outside can grow through the mass of serious fluid and colonise the wound beneath. But a definite attempt is made

to avoid any form of dust raising for half to one hour before dressings are changed. On the other hand windows are sometimes left open. Bed clothes are not oiled because this requires a special washing machine. The treatment of floors by spindle oil as a means of matting up the dust, has not been an accepted procedure in most hospitals. Sometimes wards are unable to spare two nurses at a time for dressings and a single nurse, in a hurry is unable to carry out the "no touch technique".

In the out-patient department a large number of patients suffering from all types of diseases move about within the hospital area. Even though there are various clinics, the waiting room will be a common one facilitating the spread of cross infection. To lessen this in some hospitals they have the appointment system. But the very idea is defeated by making the patients who attend different clinics assemble at the dispensary for medicine and thus give a scope for the mixing up of all patients suffering from various diseases and spread the infection. The X-ray department has to handle patients of all diseases and no proper precaution is taken to prevent infection from one to another. The disposal of pathological specimens in out-patient department and casualty is most unsatisfactory.

Elevators form an important focus of cross infection. No definite restriction is drawn as to the conveyance of clean and dirty things. All of them may convey patients of all diseases, pathological specimens, food from central kitchen, sterile dressings, as well as dirty linen bins and garbage tins.

Post Mortem Room and Mortuary

Persons who attend post-mortem examinations come to the wards without thorough change of dress, mainly due to lack of sufficient facilities.

Sterilisation

Sterilisation demands special attention in the prevention of cross infection. Varied methods of sterilisation are adopted in different hospitals. Undue reliance is being placed on antiseptics

and disinfectants without considering their strength or capacity to sterilize. Rubber goods, bed pans, sputum mugs, are not sterilized effectively. Towels, gowns, dressings and gloves are sterilized in the autoclave, usually in the operating theatre or in central sterilizing departments. At times these autoclaves are operated by a porter or other attendant who has no idea of sterilization and techniques of the autoclave. The efficiency of the autoclave is seldom checked by the bacteriologist or engineer. The linen and dressings receive twenty minutes treatment with steam at 20 to 25 lbs pressure and gloves for 10 minutes at 10 or 15 lbs pressure. But no mention of temperature is generally made.

Operating Theatre

Pathogens in the air contaminated by human beings are responsible for most of our operating room infections. Few hospitals demand change of all outside clothing before entering the operating room although shoes and clothes contain many dangerous pathogens. More than 50 of the surgical personnel do not cover their hair fully. The mask may act as a carrier or transmitter if it is not properly used. Fans used in hot weather to circulate the air are a dangerous source of contamination. The ventilation system adopted in some operating rooms sucks contaminated dust in the theatres from corridors and lift shaft. The method usually employed in powdering hands and gloves in the operating room is faulty, since large amounts of light powder spilled on the floor become mixed with dirt and bacteria under foot and may be carried by draught to the sterile field. The use of metal wash basins for scrubbing hands instead of running water is still seen in many hospitals. The mask of the rebreathing bag and rubber tubings of the anaesthetic machine are seldom sterilised adequately and they act as vectors in the transmission of infection.

Laundry

Cross infection in the laundry is becoming a world wide problem. In most hospitals the laundry is so organised that a great deal of handling of dirty as well as clean linen and mixing is done. Sorting is done on the floor and no proper sorting bins are installed of the cubical content equal to the capacity of washing machines. So, soiled linen of all types and quality are washed in the same machines and they may be over-loaded or underloaded. Special washing machines are necessary for napkins, oiled blankets and sheets. There is a false sense of security that linen coming from the laundry being boiled, exposed to steam and ironed would be reasonably sterile. Cultures were taken from clean napkins from the laundry and coagulate positive staphylococci isolated from them. The cause was attributed to a sorter in the laundry working with an infected lesion on her hand.

Kitchen

Carriers especially of gastro-intestinal disease working in the kitchen contribute a major cause of hospital infection. Uncooked food like salad preparations and bread and milk products form the chief mediators. Lack of efficient facilities to wash and sterilise cutlery, crockery, china and glassware and kitchen utensils, adequate staff amenities, storage rooms for all kinds of goods, and proper disposal of remnants are some of the factors. Food, prepared early and kept at a temperature in which bacteria can thrive most, will get easily infected by food handlers, flies or cockroaches. The ordinary insecticides cannot be used in the store room and kitchen for fear of poisoning. In some hospitals refrigerators used for storing milk and butter also contain pathological specimens.

(To be continued)

